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

August 1, 2019

Mr. Thomas D. Ray
Site Vice President
Duke Energy Carolinas, LLC
McGuire Nuclear Station
12700 Hagers Ferry Road
Huntersville, NC 28078

SUBJECT: MCGUIRE NUCLEAR STATION – INTEGRATED INSPECTION REPORT 05000369/2019002 AND 05000370/2019002

Dear Mr. Ray:

On June 30, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at McGuire Nuclear Station. On July 9, 2019, the NRC inspectors discussed the results of this inspection with Mr. E. Pigott and other members of your staff. The results of this inspection are documented in the enclosed report.

Two findings of very low safety significance (Green) are documented in this report. Both of these findings involved violations of NRC requirements. We are treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations or significance or severity of the violations 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.

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.

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 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Frank J. Ehrhardt, 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 05000369/2019002 AND 05000370/2019002

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DATE	7/29/2019	7/29/2019	7/29/2019	7/29/2019	

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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:	05000369/2019002 and 05000370/2019002
Enterprise Identifier:	I-2019-002-0021
Licensee:	Duke Energy Carolinas, LLC
Facility:	McGuire Nuclear Station
Location:	Huntersville, NC 28078
Inspection Dates:	April 01, 2019 to June 30, 2019
Inspectors:	G. Hutto, Senior Resident Inspector R. Cureton, Resident Inspector A. Butcavage, Reactor Inspector B. Collins, Reactor Inspector C. Dykes, Health Physicist M. Magyar, Reactor Inspector M. Toth, Project Engineer
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 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. Findings and violations being considered in the NRC's assessment are summarized in the table below.

List of Findings and Violations

McGuire Loss of Inventory in Mode 5			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Green NCV 05000369/2019002-01 Open/Closed	[H.12] - Avoid Complacency	71111.20
A self-revealed Green finding and associated NCV of Technical Specification (TS) 5.4.1, "Procedures," was identified when the licensee failed to adequately implement the procedure requirements for installing a test gauge tubing for emergency core cooling system (ECCS) testing. Specifically, the licensee installed the incorrect tubing on a test connection which resulted in the loss of approximately 300 gallons of reactor coolant system (RCS) inventory while in Mode 5.			

Unit 1 Over Temperature/Delta Temperature (OT/DT) Trip			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Green NCV 05000369/2019002-02 Open/Closed	[H.11] – Challenge the Unknown	71153
A self-revealed Green finding and associated NCV of TS 5.4.1 "Procedures," was identified when the licensee failed to adequately implement procedure OP/1/A/6100/003, "Controlling Procedure for Unit Operation," Enclosure 4.6, "Operation of Pressurizer Heaters," resulting in a Unit 1 reactor trip.			

Additional Tracking Items

None.

PLANT STATUS

Unit 1 began the inspection period shutdown for a scheduled refueling outage. The unit was placed on line April 16, 2019, and power was increased to 46 percent rated thermal power (RTP) on April 17, 2019, when the 1B main feedwater pump was damaged while placing it in service. Unit 1 was maintained at 46 to 52 percent RTP while repairs to the pump were attempted. On April 25, 2019, power was reduced to approximately 13 percent RTP to successfully complete the 1B main feedwater pump repairs and on May 2, 2019, Unit 1 achieved 100 percent RTP. On May 3, 2019, Unit 1 experienced a reactor trip due to operator error. Following the trip investigation, Unit 1 was restarted on May 4, 2019, and on May 7, 2019, returned to 100 percent RTP for the remainder of the 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 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

Summer Readiness Sample (IP Section 03.01) (1 Sample)

The inspectors evaluated summer readiness of offsite and alternate alternating current (AC) power systems.

Seasonal Extreme Weather Sample (IP Section 03.02) (1 Sample)

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

(1) Unit 1 diesel generators
(2) Control room chillers

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

The inspectors evaluated readiness for impending adverse weather conditions for a severe thunderstorm warning on April 8, 2019.

71111.04 - Equipment Alignment

Partial Walkdown (IP Section 03.01) (3 Samples)

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

(1) "B" control room chiller on April 3, 2019
(2) 1A diesel generator on May 14, 2019
(3) 2B safety injection system on May 22, 2019

71111.04S - Equipment Alignment

Complete Walkdown (IP Section 03.02) (1 Sample)

The inspectors evaluated system configurations during a complete walkdown of the 2B train auxiliary feedwater system on June 27, 2019.

71111.05Q - Fire Protection

Quarterly Inspection (IP Section 03.01) (5 Samples)

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

(1) Unit 1 spent fuel pool on April 25, 2019
(2) Unit 2 spent fuel pool cooling pump room on April 25, 2019
(3) Unit 1 767' elevation electrical penetration room on June 18, 2019
(4) 1A diesel generator room on June 18, 2019
(5) 1B diesel generator room on June 18, 2019

71111.06 - Flood Protection Measures

Internal Flooding (IP Section 02.02a) (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the:

(1) Unit 1 and 2 auxiliary building 695' elevation on June 17, 2019

71111.07A - Heat Sink Performance

Annual Review (IP Section 02.01) (1 Sample)

The inspectors evaluated readiness and performance of:

(1) KC-1A component cooling water heat exchanger

71111.08P - Inservice Inspection Activities (PWR)

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

The inspectors verified that the reactor coolant system boundary, steam generator tubes, reactor vessel internals, risk-significant piping system boundaries, and containment boundary are appropriately monitored for degradation and that repairs and replacements were appropriately fabricated, examined, and accepted by reviewing the following activities from April 1, 2019 to June 24, 2019:

03.01.a – Nondestructive Examination and Welding Activities

(1) Containment ASME, Section XI IWE examinations, (NRC Walk-down and Document Review)
(2) Visual examination (VT-3), reactor vessel supports, ASME Class 1, (Reviewed)
(3) Control rod guide tube assemblies, guide card visual inspections guide tube locations D14, F02, J13, M08 (Observed)
(4) Liquid penetrant examination (PT), ASME Class 2, nozzle to reinforcing pads, component ID's, 1ACSHX-A-Inlet, 1ACSHX-B-Outlet (Reviewed)
(5) Work Order 2020502, Check Valve 1NI-60 Replacement Welds (Reviewed)
(6) McGuire Unit-1, Steam Generator Inspection Skip Year Basis (Reviewed)

03.01.b – Pressurized-Water Reactor Vessel Upper Head Penetration Examination Activities

(1) Reactor vessel closure head, control rod drive penetrations No's. 13, 64 and 65, ASME Class 1, ultrasonic examination (Observed)

03.01.c – Pressurized-Water Reactor Boric Acid Corrosion Control Activities

(1) Action Reports 02219841, 02224655, 02227433 (Reviewed)
(2) NRC containment boric acid walk-down Inspection
(3) NRC reactor vessel closure head, ASME Class 1, upper surface walk-down inspection

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)

The inspectors observed and evaluated licensed operator performance in the Control Room during Unit 1 start-up activities on April 16, 2019.

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

The inspectors observed and evaluated active simulator exam ASE-10 which involved a rod ejection requiring safety injection, and a subsequent loss of off-site power on June 12, 2019.

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness Inspection (IP Section 02.01) (2 Samples)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

(1) Nuclear condition report (NCR) 2256190, 2EDGB negative side ground on 2B diesel generator control power breaker
(2) NCR 2275468, 2ND-9 valve handwheel spinning freely, not opening valve

71111.13 - Maintenance Risk Assessments and Emergent Work Control

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

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

(1) Unit 1 outage protection plan for "B" train maintenance on April 3, 2019
(2) Unit 1 feedwater protection plan for the 1B main feedwater pump turbine rotor replacement on April 17, 2019
(3) Unit 1 spent fuel pool cooling equipment protection plan following core off-load on April 30, 2019
(4) Unit 1 and 2 equipment protection plan for standby shutdown facility diesel generator maintenance on May 29, 2019.
(5) Unit 2 equipment protection plan for turbine driven auxiliary feedwater pump maintenance on June 19, 2019

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 02.02) (6 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

(1) NCR 2268475, 1NI-119 observed seat leakage, on April 15, 2019
(2) NCR 2267180, KD piping wall thinning at hanger on 1A diesel generator, on April 23, 2019
(3) NCR 2274520, 2B RN pump requires an oil change, on June 3, 2019
(4) NCR 2276128, Westinghouse issued NSAL 19-1, update from NSAL 14-6, on June 10, 2019
(5) NCR 2277158, 1B containment spray pump leak, on June 20, 2019
(6) NCR 2278984, Revised loss of coolant accident F-delta-H criteria, on June 26, 2019

71111.19 - Post-Maintenance Testing

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

The inspectors evaluated the following post maintenance tests:

(1) PT/1/A/4204/002 B, "ND Train B Valve Stroke Timing - Quarterly," following valve 1ND-14B air line replacement, on April 10, 2019
(2) PT/1/A/4350/002 A, "Diesel Generator 1A Operability Test," following outage maintenance, on April 10, 2019
(3) PT/0/A/4150/028, "Initial Criticality and Zero Power Physics Testing," following core alterations, on April 15, 2019
(4) PT/0/A/4200/002, "Standby Shutdown Facility Operability Test," following jacket water temperature switch replacement, on May 7, 2019
(5) PT/2/A/4350/002 A, "Diesel Generator 2A Operability Test," following ventilation damper preventive maintenance, on May 21, 2019
(6) PT/0/A/4200/002, "Standby Shutdown Facility Operability Test," following fuel line flex connection replacement, on May 30, 2019

71111.20 - Refueling and Other Outage Activities

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

(1) The inspectors evaluated Unit 1 refueling outage activities from April 1, 2019 to April 16, 2019.

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

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

(1) PT/1/A/4200/001 C, "Isolation Valve Leak Rate Test, Enclosure 13.48 Test Sheet for Penetration M-390 (RV)," on April 9, 2019

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

(1) PT/0/A/4200/032, "Periodic Inspection of Ice Condenser Lower Inlet Doors," on April 14, 2019

Inservice Testing (IP Section 03.01) (1 Sample)

(1) PT/1/A/4206/001 A, "1A NI Pump Performance Test," on April 24, 2019

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

(1) PT/1/A/4150/001 B, "Reactor Coolant Leakage Calculation," on June 27, 2019

Routine (IP Section 03.01) (1 Sample)

(1) PT/2/A/4350/002 B, "Diesel Generator 2B Operability Test," on May 8, 2019

71114.06 - Drill Evaluation

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

(1) The inspectors evaluated the EP drill conducted on May 13, 2019. The drill involved a turbine trip/reactor trip, followed by large break reactor coolant system leak and subsequent increase in containment radiation levels.

RADIATION SAFETY

71124.01 - Radiological Hazard Assessment and Exposure Controls

During facility tours, the inspectors directly observed radiological postings, dosimetry placement, container labeling, and radiological surveys for areas established within the restricted area including the independent spent fuel storage installation.

Radiological Hazard Assessment (IP Section 02.01) (1 Sample)

The inspectors evaluated radiological hazards assessments and controls. The inspectors reviewed the following:

Radiological surveys

(1) MNS-M-20190302-3, 750 Elevation Hallways, March 2, 2019
(2) MNS-M-20190224-1, 750 Elevation Hallways, February 23, 2019
(3) MNS-M-20190209-1, 733 Elevation Hallways, February 9, 2019
(4) MNS-M-20190313-1, 733 Elevation Hallways, March 13, 2019
(5) MNS-M-20190331-19, U1 Rx Head Inspection Stating area, March 31, 2019
(6) MNS-M-20190401-6, U1 Rx Head Inspection Staging Area, April 1, 2019

Air sample survey records

(1) Sample ID: MN19032900016 U1 U/C Head Work, March 28, 2019
(2) Sample ID: MN19032900025 U1 UC Operating floor, March 28, 2019
(3) Sample ID: MN19032900021 U1 UC cavity during cavity fill, March 28, 2019
(4) Sample ID: MN19040100043 NI 60, April 1, 2019

Instructions to Workers (IP Section 02.02) (1 Sample)

The inspectors evaluated instructions to workers including labels, radiation work permits and electronic dosimeter alarm setpoints used to access high radiation areas. Some samples included the following:

Radiation work permits (RWP), including RWPs for airborne areas as available

(1) RWP 1349 U1 Rx Head, Auxiliary Head Adapter Building (AHA), Inspections and Repairs
(2) RWP 1840 U1 Outage Decon Team; Reactor Cavity, Cleanup and Decon (Shallow End & Deep End)
(3) RWP 1951 U1 Outage: Reactor Services Deep End Activities
(4) RWP 1298 U1 RVCH Inspections

Electronic alarming dosimeter alarms

(1) ED #892860, Invalid dose rate alarm, 10/1/2018

(2) No other unexpected alarms occurred during the period of this inspection
Labeling of containers

(1) Outside RCA for outage related containers
(2) 760 elevation near truck bay
(3) Radwaste storage

Contamination and Radioactive Material Control (IP Section 02.03) (1 Sample)

The inspectors evaluated licensee processes for monitoring and controlling contamination and radioactive material. The inspectors verified transactions nationally tracked sources had been reported and the following sealed sources are accounted for and are intact:

(1) Source # 0303GY, assay date August 18,1991
(2) Source # 68283, assay date October 27, 2014
(3) Source # AJ-9164, assay date May 5, 2017
(4) Source KR- 2750, assay date August 18, 1991

Radiological Hazards Control and Work Coverage (IP Section 02.04) (1 Sample)

The inspectors evaluated in-plant radiological conditions during facility walkdowns and observation of radiological work activities. Inspectors observed the following work activities:

Risk significant radiological work activities

(1) Initial entry under the head, Survey #MNS-M-20190329-12, March 29, 2019
(2) EC412266- Cut out/replace 1N1-60
(3) Inspection of AHA nozzle at 0 degrees and 90 degrees
(4) Control Rod Guide Card Inspections

High Radiation Area and Very High Radiation Area Controls (IP Section 02.05) (1 Sample)

The inspectors evaluated risk-significant high radiation area and very high radiation area controls, including postings and physical controls.

Radiation Worker Performance and Radiation Protection Technician Proficiency (IP Section 02.06) (1 Sample)

The inspectors evaluated radiation worker awareness and performance and radiation protection technician proficiency.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

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

(1) Unit 1 (April 1, 2018 - March 31, 2019)
(2) Unit 2 (April 1, 2018 - March 31, 2019)

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

(1) Unit 1 (April 1, 2018 - March 31, 2019)
(2) Unit 2 (April 1, 2018 - March 31, 2019)

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

(1) Unit 1 (April 1, 2018 - March 31, 2019)
(2) Unit 2 (April 1, 2018 - March 31, 2019)

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

(1) Unit 1 and 2 (October 1, 2018 – February 28, 2019)

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 2264663, Unit 1 AP-10 entry for reactor coolant system leakage.

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

The inspectors reviewed the licensee's corrective action program for potential adverse trends in the area of human performance that might be indicative of a more significant safety issue.

71153 - Followup of Events and Notices of Enforcement Discretion

Event Followup (IP Section 03.01) (1 Sample)

The inspectors evaluated the Unit 1 reactor trip and licensee's response on May 3, 2019.

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

71003 - Post-Approval Site Inspection for License Renewal

Post-Approval Site Inspection for License Renewal (1 Sample)

The inspectors observed and reviewed the implementation of the following license renewal activities (listed by aging management program) from April 1 - 5, 2019:

(1) 18.2.6, Inservice Inspection Program
(2) 18.2.10, Flow-Accelerated Corrosion Program
    a) 1C3 feedwater heater shell
(3) 18.2.12, Galvanic Susceptibility Program
    a) two containment ventilation cooling water system valves (1RV-482, 1RV-485)
(4) 18.2.21.1, Condenser Circulating Water System Internal Coating Inspection

(5) 18.2.24, Selective Leaching Inspection Program
   a) fire protection system jockey pump 1A strainer
   b) fire protection system main fire pump A
   c) three fire protection system valves (1RF-11, 1RF-444, 1RF-446)

INSPECTION RESULTS

McGuire Loss of Inventory in Mode 5			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Green NCV 05000369/2019002-01 Open/Closed	[H.12] - Avoid Complacency	71111.20

A self-revealed Green finding and associated NCV of TS 5.4.1, “Procedures,” was identified when the licensee failed to adequately implement the procedure requirements for installing a test gauge tubing for ECCS testing. Specifically, the licensee installed the incorrect tubing on a test connection which resulted in the loss of approximately 300 gallons of reactor coolant system (RCS) inventory while in Mode 5.

Description:

On March 25, 2019, Unit 1 entered abnormal procedure AP-10 Case 2, "RCS Leakage Less Than the Capacity of Both Charging Pumps," when charging flow became erratic and volume control tank level began to slowly decrease. The licensee determined that the cause of the leak was a failed instrument test line that had been installed on the "A" train charging line. The instrument test line was installed for ECCS testing that was scheduled for later that day. Operators isolated the leak and exited the AP. No other equipment was affected. The operators estimated that approximately 300 gallons of inventory was lost due to the leak. At the time, the unit was in Mode 5 with both trains of decay heat removal in service and pressurizer level was at approximately 50 inches. Procedure PT/1/A/4209/012A, “1A NV Pump Head Curve Performance Test,” specified that Flukecal high pressure tubing or equivalent shall be used when installing the high and low pressure connections to the temporary flow test gauge. Contrary to this procedural requirement, operators used low pressure (150 psig rated) tubing for the low pressure connection. As a result, when seal injection to the reactor coolant pumps was secured as part of the outage plant condition sequence, the resulting pressure surge in the charging discharge line caused the low pressure tubing to fail.

Corrective Actions: Operations personnel identified and isolated the source of the leak. Coaching was provided to all individuals involved based on human performance behaviors exhibited. Lessons learned were communicated to all operations shifts.

Corrective Action References: NCR 2264663, Loss of reactor coolant system inventory due to incorrect use of low pressure test gauge tubing.

Performance Assessment:

Performance Deficiency: The licensee's failure to adequately implement procedure PT/1/A/4209/012A, resulting in a loss of RCS inventory, was a violation of TS 5.4 and a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the human performance attribute of the initiating events cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the loss of inventory in Mode 5, if left uncorrected, would challenge the shutdown cooling safety function.

Significance: The inspectors assessed the significance using IMC 0609, Appendix G, "Shutdown Operations," dated May 9, 2014. The finding was determined to be of very low safety significance (GREEN) based on the screening criteria in Attachment 1, Exhibit 2. Specifically, the loss of inventory would not result in the method of decay heat removal to fail if left unmitigated for a 24-hour period.

Cross-Cutting Aspect: The inspectors determined the finding had a cross cutting aspect of avoid complacency [H.12], in the human performance area, because the technicians did not adequately plan for the possibility of mistakes by implementing the appropriate error reduction tools.

Enforcement:

Violation: Technical Specification 5.4.1, "Procedures," required that procedures shall be established, implemented and maintained covering the applicable procedures recommended in Regulatory Guide 1.33. Regulatory Guide 1.33, Appendix A, Section 8, "Procedures for Control of Measuring and Test Equipment and for Surveillance Tests, Procedures, and Calibrations," required procedures for surveillance tests. Surveillance test procedure PT/1/A/4209/012A, "1A NV Pump Head Curve Performance Test," required the use of high pressure Flukecal tubing when installing the high and low pressure connections to the temporary flow test gauges specified for the test.

Contrary to the above, on March 25, 2019, the licensee failed to adequately implement surveillance procedure PT/1/A/4209/012A. Specifically, operators used low pressure (150 psig rated) tubing for the low pressure connection to the temporary flow test gauge for the charging pump head curve test. This resulted in the failure of the tubing and a loss of 300 gallons of RCS inventory.

Enforcement Action: This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy.

Unit 1 Over Temperature/Delta Temperature (OT/DT) Trip			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Green NCV 05000369/2019002-02 Open/Closed	[H.11] – Challenge the Unknown	71153

A self-revealed Green finding and associated NCV of TS 5.4.1 “Procedures,” was identified when the licensee failed to adequately implement procedure OP/1/A/6100/003, “Controlling Procedure for Unit Operation,” Enclosure 4.6, “Operation of Pressurizer Heaters,” resulting in a Unit 1 reactor trip.

Description:

On May 3, 2019, Unit 1 reactor tripped from 100 percent power due to a human performance error. Operators were performing OP/1/A/6100/003, “Controlling Procedure for Unit Operation,” Enclosure 4.6, “Operation of Pressurizer Heaters,” to place pressurizer heaters in their normal alignment following a recent refueling outage. The procedure directs the operators to adjust the pressurizer master controller in manual until the “C” pressurizer heaters began cycling and the pressurizer spray valves close. The operators’ mental model of the controller was that they needed to depress the “up” pushbutton arrow to increase pressure to achieve the desired result. In reality, the “up” arrow increased the input error to the controller, which tells the controller that pressure is too high. As the “up” arrow was depressed, the operators did not initially observe the expected result of the “C” heaters cycling, and at this point should have stopped to assess their actions. Instead, the operators continued depressing the “up” arrow until the pressurizer spray valves opened, resulting in a rapid decrease in reactor coolant system pressure. This pressure decrease caused the OT/DT set point in the reactor protection system to be exceeded and an automatic reactor trip actuated as designed. The operators manually closed the pressurizer spray valves to stop the pressure decrease, and performed the actions of procedure, E-0, “Reactor trip/Safety Injection,” to stabilize the plant in Mode 3. There were no complications involved with the reactor trip.

Corrective Actions:

- The operators involved were removed from standing watch
- Post-trip fitness-for-duty testing was performed
- Reactor trip investigation was performed

Corrective Action References: NCR 2271181, Unit 1 Reactor Trip

Performance Assessment:

Performance Deficiency: The failure to follow procedure OP/1/A/6100/003, “Controlling Procedure for Unit Operation,” Enclosure 4.6, “Operation of Pressurizer Heaters,” resulting in a Unit 1 reactor trip, was a violation of TS 5.4 and a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the human performance attribute of the initiating events cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the performance deficiency resulted in a Unit 1 reactor trip.

Significance: The inspectors assessed the significance of the finding using IMC 0609 Appendix A, “The Significance Determination Process for Findings at Power,” dated June 19, 2012. The finding was screened as Green because the reactor trip was uncomplicated and there was no loss of mitigating equipment used to transition the plant to a stable condition following the reactor trip.

Cross-Cutting Aspect: None The inspectors determined the finding had a cross cutting aspect of challenge the unknown [H.11] in the human performance area because the operators did not stop when faced with uncertain conditions. Specifically, the operators continued to depress the “up” arrow on the pressurizer master controller after they did not get the expected response initially.
Enforcement: Violation: Technical Specification 5.4.1, “Procedures,” requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide (RG) 1.33, Revision 2, Appendix A, dated February 1978. Regulatory Guide 1.33 Appendix A, Section 2, “General Plant Operating, Procedures,” requires procedures for power operation. Licensee procedure OP/1/A/6100/003, “Controlling Procedure for Unit Operation,” is the plant procedure for power operation. Contrary to the above, on May 3, 2019, the licensee failed to adequately implement procedure OP/1/A/6100/003, “Controlling Procedure for Unit Operation,” during alignment of pressurizer heaters. Specifically, the operators incorrectly manipulated the pressurizer master controller, which resulted in a reactor trip. 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 9, 2019, 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
71003	Drawings	3NC3021 Sheets 4 and 4a	Consolidated Safety Relief Valve (1RV-482)	Rev. 1
		DS C93356	Crosby Pressure Relief Valve (1RV-485)	Rev. D1
		MCFD-1604-03.00	Flow Diagram of Containment Ventilation Cooling Water System (RV)	Rev. 16
	Miscellaneous	Lopez	Sonic Systems International, Inc. Vision Acuity Record	02/19/2019
		UT-IIL (Lopez)	Sonic Systems International, Inc. Certificate of Qualification	2/21/2019
	NDE Reports	5546	Metallurgy Report: RF Jockey Pump Strainer Inspection	January 23, 2017
		5594	Metallurgy Report: “A” Main Fire Pump Selective Leaching Inspection	November 27, 2018
		5646A	Metallurgy Report: MNS 1 – Selective Leaching Inspection of RF Valves	May 22, 2017
		5646C	Metallurgy Report: MNS 1 – Selective Leaching Inspection of 1RF-1165	August 6, 2018
	Procedures	AD-EG-NGO-0110	Conduct of the Nuclear Metallurgy Laboratory and Central Receiving and Dedication Facility Dedication Laboratory	Rev. 3
		MET-004	LEEB Hardness Testing Using the Equotip Hardness Tester	Rev. 2
		MNS-LR-013	MNS License Renewal Flow-Accelerated Corrosion (FAC) Program Aging Management Program Implementation Plan	Rev. 0
		MNS-LR-041	Galvanic Susceptibility Inspection Implementation Plan	Rev. 1
		MP/0/B/7700/103	Flow Accelerated Corrosion Component Inspection	Rev. 006
		NDE-NE-ALL-6401	Ultrasonic Thickness Measurement	Rev. 001
		PT/0/B/4700/063	Periodic Inspection of Service Water Piping for Corrosion Induced Thinning	Rev. 006
	Work Orders	WO20161426 29	Perform Inspection on Flange Face of 1RV-485	04/01/19
		WO20258551 01	PM-1CMHX0028-1C3 Feedwater Heater Shell UT	04/03/19
71111.01	Calculations	DPC-1381.06-00-0001	Catawba, McGuire & Oconee Degraded Grid Voltage Setpoints for Real Time Contingency	
	Miscellaneous		Action register update summary reports for summer readiness between April – June, 2019	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		CSD-EG-ALL-2000.1	Nuclear Switchyard Interface Agreement	
		CSD-EG-ALL-2000.2	Nuclear Switchyard Operating Guidelines	
	Procedures	PT/0/B/4700/039	Warm Weather Equipment Checkout	
		AD-WC-ALL-0230	Seasonal Readiness	
71111.04	Drawings	MCFD-2562-03.00	Flow Diagram of Safety Injection System	
		MCFD-1618-01.00	Flow Diagram of Control Area Chilled Water System	
	Procedures	OP/1/A/6350/002	Diesel Generator	
71111.04S	Drawings	MCFD-2592-01.00	Flow Diagram of Auxiliary Feedwater System (CA)	
		MCFD-2592-01.01	Flow Diagram of Auxiliary Feedwater System (CA)	
	Procedures	OP/2/A/6250/002	Enclosure 4.8, Valve and Power Supply Checklist	
71111.05Q	Drawings	MFSD-022	Auxiliary Building 767’ Level Electrical Penetration Room	
		AD-EG-ALL-1520	Transient Combustible Control	
		MFSD-005	Unit 1 1A Diesel Generator Room	
		MFSD-006	Unit 1 1B Diesel Generator Room	
		MFSD-021	Unit 2 Spent Fuel pool Cooling Pump Room	
	Procedures	MCC-1435.00-00-0059	NFPA 805 – Appendix R Safe Shutdown Deterministic Analysis	
		MCS-1465.00-00-0008	Design Basis Specification for Fire Protection	
		MCS-1465.00-00-0022	Appendix R Safe Shutdown Analysis	
71111.08P	Corrective Action Documents Resulting from Inspection	Work Request 20138740	NRC Identified Loose Grating (Free to Fall) on Platform above PRT, Adjacent to Unit-1 In-core Room Entrance	4/2/2019
		Work Request 20138750	NRC identified Oil Stain on Containment Vessel Wall (ASME IWE Surface) in Unit 1 Pipe Chase	4/2/2019
	Drawings	108D843	Reactor Vessel Support Hardware Assembly	4/13/1972
		MC-1042-05.00	Reactor Building Containment Vessel Base Liner Plate Test Channel Layout	11/18/2015

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		MC-1414-04.20-00	Piping Layout Plan, ND System, Reactor Building	Rev.12
		MC-ISIC2-1042-0022	Reactor Building -Unit-1 Steel Containment Vessel In-service Inspection Areas Plan of Base Liner Plate Inspection Port Location References	12/1/2015
	Engineering Evaluations	1EOC26 Skipped Inspection Cycle	McGuire Unit-1 Steam Generator 1EOC26 Skip Inspection Outage Review	3/9/2019
		AR 02219841 Attachment 1	Boric Acid Corrosion Evaluation	08/30/2018
		AR 02224655	Boric Acid Corrosion Evaluation	08/30/2018
		AR 02227433 Attachment 1	Boric Acid Corrosion Evaluation	10/02/2018
	Miscellaneous	51 - 9295066 - 000	McGuire Unit 1, RVCH Penetration Coverage Assessment for Spring 2019 (1EOC26) Outage	2/20/2019
		Form NIS-2A	Owners Certificate of Conformance, Repair Replacement Plan WO 20240502	6/6/2019
		Westinghouse Employee 18992	Certification Record, Method Visual, VT-1, 2 and 3, Limited to Spring 2019 Guide Card Examinations at McGuire Station	2/11/2019
		Westinghouse Employee ID 18992	Certification Record, Method Visual, VT-1, 2, 3	Expires 1/27/21
		Westinghouse Employee ID 33915	Certification Record, Method Visual, VT-1, 2, 3	8/9/2020
		Westinghouse Employee ID 40001	Certification Record, Method Visual, VT-1, 2 ,3	Expirees 7/10/2020
		Westinghouse Employee ID 88547	Certification Record, Method Visual, VT-1, 2, 3	Expires 8/8/2020
		Westinghouse Employee ID No. 15601	Certification Record, Method Visual, VT-1 and 3, Limited to Spring 2019 Guide Card Examinations at McGuire Station	3/24/2019
	NDE Reports	Control Rod	Observed On Site, Control Rod Guide Tube, Screen Shots	6/28/19

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		Guide Tube Locations D14, FO2, J13, M08	of Results Summary for Limiting Locations, During In-Progress Work, Site Observations	
		Doc. ID. 180-9296414-000	Reactor Vessel Closure Head Penetration Ultrasonic Examination	5/24/2019
		PT-19-002, Summary No. M1-02000	Liquid Penetrant Examination (PT) of Nozzle to Reinforcing Pads/Channel, Component ID. 1ACSHX-A-Inlet	3/26/19
		PT-19-002, Summary No. M1-02001	Liquid Penetrant Examination (PT) of Nozzle to Reinforcing Pads/Channel, Component ID. 1ACSHX-B-Outlet	3/26/19
		Report No. 40350	Liquid Penetrant Examination Report, ID No. NI1F636	4/9/19
		Report No. 40350	Liquid Penetrant Examination Report, ID No. NI1F106	4/9/19
		VT-17-100, Summary No. M1.B4.10.0001	Visual Examination for Boric Acid (VT-2), Reactor Pressure Vessel Closure Head Outer Surface	10/2/17
		VT-19-058, Summary No. M1-07568	Reactor Vessel "C" Hot Leg Support	3/27/2019
		VT-19-061, Summary No. M1-07567	Reactor Vessel "B" Cold Leg Support	3/30/2019
		VT-19-062, Summary No. M1-07569	Reactor Vessel "D" Cold Leg Support	3/30/2019
		VT-19-063, Summary No. M1-07562	Reactor Vessel "A" Hot Leg Support	3/30/2019
	Procedures	54-ISI-604-014	Automated Ultrasonic Examination of Open Tube Reactor Pressure Vessel Closure Head Penetrations	2/19/19
		AD-EG-ALL-1604	NDE Level III Oversight of Complex Nondestructive Examinations	9/20/2017
		AD-EG-PWR-	Boric Acid Corrosion Control Program Implementation	Rev. 2

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		1611		
		MP/0/A/7700/080	Inspection Assessment and Cleanup of Boric Acid on Plant Materials	Rev. 22
		NDE-NE-ALL-7101	Nuclear fleet NDE Special Process Procedure, VT-1 Visual Examination	6/15/2017
		NDE-NE-ALL-7201	Nuclear Fleet NDE Special Process Procedure, VT-2 Visual Examination	9/14/2017
		NDE-NE-ALL-7302	Nuclear Fleet NDE Special Process Procedure, VT-3 Visual Examination of Component Supports	6/15/2017
	Self-Assessments	AR #01985576, Type SAST, Assignment 03	General Office/Corporate, Acid Corrosion Control Program - Implementation Procedure Effectiveness	7/27/2016
		G-ENG-SA-15-01	General Corporate Office, Augmented In-service Inspection, Incorporating McGuire Operating Experience at Oconee and Robinson Sites	6/11/2015
	Work Orders	VT-19-003	Visual Examination of Pipe Hanger Support or Restraint (VT-3) Summary No. M1-07562, Reactor Vessel "A" Hot Leg Support	3/30/2019
		WO 20240502	EC 412266, 1NI-60: REPLACE 10" CHECK VALVE	6/3/2019
71111.11Q	Procedures	SOMP 01-07	Control Room Oversight	
		AD-OP-ALL-1000	Conduct of Operations	
		NSD 509	Site Standards in Support of Operational Focus	
		OMP 4.3	Use of Emergency and Abnormal Procedures and FLEX Support Guidelines	
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 Notebooks	
		AD-EG-ALL-1210	Maintenance Rule Program	
		AD-EG-ALL-1211	System Performance Monitoring and Trending	
71111.13		AD-OP-ALL-0201	Protected Equipment	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		NSD-213	Risk Management Process	
		NSD-415	Operational Risk Management (Modes 1–3) per 10 CFR 50.65(a)(4)	
		OMP 13-7	Operational Control of Protected Equipment	
		SOMP 02-02	Operations Roles in the Risk Management Process	
71111.15		AD-OP-ALL-0102	Operability Decision Making	
		AD-OP-ALL-0105	Operability Determinations and Functionality Assessment	
71111.19		AD-EG-ALL-1155	Post Modification Testing	
		IP/0/A/2001/004 H	Removal and Installation of Station Circuit Breakers	
		MP/0/A/7300/007	Rotating Equipment Inspection and Vibration Measuring	
		NSD-408	Testing	
		PT/1/A/4350/002 A	Diesel Generator 1A Operability Test	
		PT/2/A/4208/001 B	2B NS Performance Test	
		PT/2/A/4350/002 A	Diesel Generator 2A Operability Test	
71111.20		OP/1/A/6100/003	Controlling Procedure for Unit Operation	
		PT/0/A/4150/028	Initial Criticality and Zero Power Physics Testing	
		PT/0/A/4150/047	1/M Monitoring During Startup	
		PT/1/A/4600/003F	Containment Cleanliness and ECCS Operability Inspection	
71111.22		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	
71114.06		RP/0/A/5700/000	Classification of Emergency	
		RP/0/A/5700/002	Alert	
		RP/0/A/5700/003	Site Area Emergency	
		RP/0/A/5700/004	General Emergency	
		RP/0/A/5800/010	NRC Immediate Notification Requirements	
		RP/0/B/5700/029	Notification to Offsite Agencies from the Control Room	
71124.01	ALARA Plans	M1R26-19-04	M1R26 RVCH meteorology, penetration volumetrics, & AHA UT's	Revision 0

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		M1R26-19-06	EC412266- Cut out/replace 1N1-60	Revision 0
		M1R26-19-09	Inspection of AHA nozzles at 0 degrees and 90 degrees	Revision 1
	Corrective Action Documents	02237056		
	Miscellaneous	AD-RP-ALL-2019	TEDE-ALARA Evaluation Worksheet RWP 1298 Task 6	03/28/2019
		AD-RP-ALL-2019	TEDE-ALARA Evaluation Worksheet RWP 1840 Task 4	03/31/19
		Dose Rate Alarms	Dose Rate Alarm table from 10/1/2018 to 2/11/2019	
		HP/0/B/1004/034	Radioactive Sources, Enclosure 5.2 Inventory and Leak Test	December 2018
		NSTS Confirmation	2019 Annual Inventory Reconciliation Confirmation	01/23/2019
		Sample MN19032900018	U1 U/C Head work I/S, RWP 1298	03/28/2019
		Sample MN19032900019	U1 U/C operating floor, RWP 1728	03/28/2019
	Procedures	AD-RP-ALL-0005	Access Controls for High and Locked High Radiation Areas	Revision 0
		RPMP 7-1	Radiological Key Control	Revision 015
	Radiation Surveys	HP/1/B/1006/045	*ISFSI* Radiation Protection Controls for Loading Spent Fuel Assemblies Into NAC-Magnastor Dry Storage Casks	05/28/18 - 06/03/18
		MNS-M-20190323-32	U1- Rx Head area Initial Entry	03/23/2019
		MNS-M-20190331-19; MNS-M-20190401-6	U1 Rx Head Inspection Staging Area	03/31/2019; 04-01-2019
		MNS-M-20190401-17	Cut out of 1NI-60 Survey	03/37/2019
		MNS-M-20190401-30	Room 817 Mechanical Pen Room	04/01/2019
		MNS-M-20190402-B	1NI-60 Survey of Work Are Post Cut out	04/01/2019
	Radiation Work Permits (RWPs)	RWP #1349	U1 Rx Bldg:Emergent Work- Reactor Head Auxiliary Head Adapter (AHA)	Revision 1
71151	Procedures	AD-LS-ALL-0004	NRC Performance Indicators and Monthly Operating Report	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		AD-PI-ALL-0100	Corrective Action Program	
71152		AD-LS-ALL-0006	Notification/Reportability Evaluation	
		AD-PI-ALL-0100	Corrective Action Program	
		AD-PI-ALL-0104	Prompt Investigation Response Team	
		AD-PI-ALL-0105	Effectiveness Reviews	
71153		PT/0/A/4700/045	Reactor Trip Investigation	