



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

August 5, 2021

Mr. Tom Simril  
Site Vice President  
Duke Energy Carolinas, LLC  
4800 Concord Rd.  
York, SC 29745-9635

**SUBJECT: CATAWBA NUCLEAR STATION – INTEGRATED INSPECTION REPORT  
05000413/2021002 AND 05000414/2021002**

Dear Mr. Simril:

On June 30, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Catawba 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 involved a violation of NRC requirements. We are treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violation or the significance or severity of the violation documented in this inspection report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC Resident Inspector at Catawba Nuclear Station.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC Resident Inspector at Catawba Nuclear Station.

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

Sincerely,

*/RA/*

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

Docket Nos. 05000413 and 05000414  
License Nos. NPF-35 and NPF-52

Enclosure:  
As stated

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SUBJECT: CATAWBA NUCLEAR STATION – INTEGRATED INSPECTION REPORT  
05000413/2021002 AND 05000414/2021002 DATED August 5, 2021

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DATE	08/03/2021	08/05/2021	08/02/2021	08/05/2021	

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

Docket Numbers: 05000413 and 05000414

License Numbers: NPF-35 and NPF-52

Report Numbers: 05000413/2021002 and 05000414/2021002

Enterprise Identifier: I-2021-002-0021

Licensee: Duke Energy Carolinas, LLC

Facility: Catawba Nuclear Station

Location: York, South Carolina

Inspection Dates: April 1, 2021 to June 30, 2021

Inspectors: J. Austin, Senior Resident Inspector  
C. Scott, Resident Inspector  
S. Downey, Senior Reactor Inspector  
M. Magyar, Reactor Inspector  
A. Nielsen, Senior Health Physicist  
W. Pursley, Health Physicist  
D. Rivard, Resident Inspector  
J. Rivera, Health Physicist

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 Catawba Nuclear Station, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

### List of Findings and Violations

Failure to Meet Minimum Dewatering Requirements for Radioactive Waste Sent Directly for Burial			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Public Radiation Safety	Green NCV 05000413,05000414/2021002-01 Open/Closed	[H.1] - Resources	71124.08
A self-revealing, Green, Non-Cited violation of 10 CFR 20 Appendix G.III.A.1 occurred when the licensee transferred solid radioactive waste to the Barnwell Waste Disposal Facility that did not meet the waste characterization requirements in 10 CFR 61.56(a)(3) for free standing liquid.			

### 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 shutdown for a scheduled refueling outage. The unit was placed on line and returned to 99 percent RTP on May 7, 2021. The unit operated at or near 100 percent RTP for the remainder of the inspection period.

## **INSPECTION SCOPES**

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors 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. Unit 1 and Unit 2 service water pumphouse
  2. The Safe Shutdown Facility (SSF)

#### 71111.04 - Equipment Alignment

##### Partial Walkdown Sample (IP Section 03.01) (4 Samples)

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

- (1) 1A emergency diesel generator (EDG) on April 24, 2021
- (2) Unit 1 and 2 service water room pumphouse on June 30, 2021
- (3) Unit 1 outside "Doghouse" (penetration room) on June 30, 2021
- (4) Unit 1 and 2 EDG fuel oil transfer station on June 30, 2021

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

- (1) The inspectors evaluated system configurations during a complete walkdown of the SSF on June 30, 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) Unit 1 battery rooms on April 17, 2021
- (2) Unit 2 blackout room on April 17, 2021
- (3) Unit 1 blackout room on April 17, 2021
- (4) Unit 2 6.9 KV rooms on April 17, 2021
- (5) Unit 2 lower containment on April 29, 2021

#### 71111.08P - Inservice Inspection Activities (PWR)

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

- (1) The inspectors evaluated pressurized water reactor non-destructive testing by reviewing the following examinations from April 12 - 30, 2021:
  1. Ultrasonic Testing
    - a. 2RPV-101-104B, Head to Head (meridional), ASME Class 1 (reviewed)
    - b. 2RPV-HEAD-PEN-10, CRDM Nozzle, ASME Class 1 (reviewed)
    - c. 2RPV-HEAD-PEN-60, CRDM Nozzle, ASME Class 1 (reviewed)
    - d. 2RPV-HEAD-PEN-74, CRDM Nozzle, ASME Class 1 (reviewed)
  2. Magnetic Particle Testing
    - a. 2PZR-SKIRT, Pressurizer Support Skirt to Head, ASME Class 1 (reviewed)
  3. Penetrant Testing
    - a. 2RPV-HEAD-PEN-67, Base Metal Repair, ASME Class 1 (reviewed)
    - b. 2RPV-HEAD-PEN-74, CRDM Nozzle to RVCH Shell Weld Surface, ASME Class 1 (reviewed)
  4. Eddy Current Examination

- a. Steam Generator 2A: ET for tube R44C23
- b. Steam Generator 2B: ET for tube R6C45
- c. Steam Generator 2C: ET for tubes R44C81 and R49C60
- d. Steam Generator 2D: ET for tubes R43C78 and R48C61

The Inspectors evaluated the licensee's boric acid corrosion control program performance.

71111.11Q - Licensed Operator Regualification Program and Licensed Operator Performance

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

- (1) The inspectors observed and evaluated licensed operator performance in the Control Room during Unit 2 reactor start-up following the refueling outage on May 2, 2021.

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

- (1) The inspectors observed and evaluated licensed operator simulator regualification training consisting of a steam generator (S/G) tube leak, S/G tube rupture, loss of all AC, and a seismic event on May 25, 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) Nuclear condition report (NCR) 2381270, Unit 2 turbine driven auxiliary feed (TDAFW) pump inoperable, on May 6, 2021
- (2) NCR 2383190, Unit 2 protection power supply failure, on May 20, 2021

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (4 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) Unit 2 risk analysis following an auxiliary feed actuation, on May 1, 2021
- (2) Protected equipment plan review while 1A EDG out of service (OOS) for maintenance, on May 11, 2021
- (3) Protected equipment plan review while replacing Unit 2 protective channel power supply, on May 20, 2021
- (4) Protected plan review while 1B EDG OOS to repair a jacket cooling water leak, on June 3, 2021



### 71111.15 - Operability Determinations and Functionality Assessments

#### Operability Determination or Functionality Assessment (IP Section 03.01) (4 Samples)

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

- (1) NCR 2377664, 2NI-136B MOV motor tripped on thermal overload, on April 8, 2021
- (2) NCR 2377704, 2 ND-67 broken valve disc guide, on April 9, 2021
- (3) NCR 2378803, 2 SSPSB failed permissive test, on April 19, 2021
- (4) NCR 2377775, power range (2n44) showing low insulation resistance, on April 20, 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) 415639 install high point vents on EDG 1A and 1B lube oil systems on June 29, 2021

### 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) Work Order (WO) 20408271-02, functional test following cleaning of the 2A Heat Exchanger, on April 27, 2021
- (2) WO 20259243, breaker refurbishment, on April 28, 2021
- (3) NCR 2380730, 2CA64 body to bonnet leak, on May 11, 2021
- (4) NCR 23883190, Unit 2 SSPS (channel 3) power supply failure, on May 21, 2021
- (5) WO 2030746, perform "F" instrument air compressor surge test, on May 24, 2021

### 71111.20 - Refueling and Other Outage Activities

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

- (1) The inspectors evaluated refueling outage C2R24 activities from March 27, 2021 to May 3, 2021.

### 71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Tests (other) (IP Section 03.01) (1 Sample)

- (1) PT/2/A/4200/009, Engineering Safety Features Actuation Periodic Test, on April 19, 2021

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

- (1) PT/2/A/4150/001 D reactor coolant system (NC) system leakage calculation, on May 14, 2021

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

- (1) PT/2/A/4200/001 C as left containment isolation valve leak rate test, on April 28, 2021

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

- (1) PT/2/A/4200/014 D ice condenser top deck door inspection, on April 30, 2021

**RADIATION SAFETY**

71124.06 - Radioactive Gaseous and Liquid Effluent Treatment

Walkdowns and Observations (IP Section 03.01) (3 Samples)

The inspectors evaluated the following radioactive effluent systems during walkdowns:

- (1) Unit 1 Plant Vent and associated effluent monitors 1-EMF-35 and 1-EMF-36
- (2) Waste Monitor Tank Building (gaseous pathway) and associated effluent monitor 0-EMF-58
- (3) Waste Monitor Tank Building (liquid pathway) and associated effluent monitor 0-EMF-57

Sampling and Analysis (IP Section 03.02) (3 Samples)

Inspectors evaluated effluent samples, sampling processes and compensatory samples, as available.

- (1) Unit 2 containment air for VQ system releases, particulate, iodine, noble gas
- (2) Compensatory sampling records for 1-EMF-36, plant vent monitor, out of service. August 24, 2020 and April 9, 2021
- (3) Waste Monitor Tank Building liquid discharge

Dose Calculations (IP Section 03.03) (2 Samples)

The inspectors evaluated the following dose calculations:

- (1) Projected Offsite Dose from Radioactive Effluents, March 2021
- (2) Projected Offsite Dose from Radioactive Effluents, April 2021

Abnormal Discharges (IP Section 03.04) (2 Samples)

The inspectors evaluated the following abnormal discharges:

- (1) Waste Gas Shutdown Decay Tank A pressure drop, July 30, 2020
- (2) Waste Gas Decay Tank D downward pressure trend, February 25, 2021 – March 2, 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) (3 Samples)

- (1) Inspectors evaluated the licensee's performance in controlling, labeling, and securing radioactive materials in the unit one auxiliary building Waste Solidification Facility.
- (2) Inspectors evaluated the licensee's performance in controlling, labeling, and securing radioactive materials in the Radioactive Material Storage Building.
- (3) Inspectors evaluated the licensee's performance in controlling, labeling, and securing radioactive materials at the independent spent fuel storage facility radioactive storage area.

Radioactive Waste System Walkdown (IP Section 03.02) (3 Samples)

- (1) Inspectors walked down accessible portions of the solid radioactive waste systems and evaluated system configuration and functionality in the Waste Solidification Building.
- (2) Inspectors walked down accessible portions of the high flow demineralization skid in the waste monitor tank building.
- (3) Inspectors walked down accessible portions of the low flow demineralization skid in the waste monitor tank building.

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

- (1) The inspectors evaluated the licensee's characterization and classification of Powdex Storage Tank resin performed on September 20, 2020.
- (2) The inspectors evaluated the licensee's characterization and classification of Resin Batch Tank resin performed on April 26, 2021.
- (3) The inspectors evaluated the licensee's characterization and classification of Dry Active Waste Composite Solid performed on October 8, 2019.

Shipping Records (IP Section 03.05) (3 Samples)

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

- (1) Radioactive Shipment Number RSR-20-02, UN3321, LSA II, Demineralizer Resin
- (2) Radioactive Shipment Number RSR-21-07, UN3321, LSA II, Demineralizer Resin
- (3) Radioactive Shipment Number RSR-20-16, UN2916, Radioactive Material Type B(U), Primary Demineralizer Resin

**OTHER ACTIVITIES – BASELINE**

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

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)

MS08: Heat Removal Systems (IP Section 02.07) (2 Samples)

- (1) Unit 1 (April 1, 2020 - March 31, 2021)
- (2) Unit 2 (April 1, 2020 - March 31, 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) May 23, 2020 through April 30, 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 resolution of adverse conditions 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 2372969, operability concerns with residual heat removal system on June 21, 2021

## **OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL**

### 71003 - Post-Approval Site Inspection for License Renewal

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

- (1) The inspectors observed the implementation of the following license renewal activities (listed by aging management program, as identified by Updated Final Safety Analysis Report, Technical Specification Chapter or Surveillance Requirement) from April 26 - May 14, 2021:
  1. Borated Water Stainless Steel Inspection, UFSAR 18.2.2
    - a. WO 20286000 02, 2NS PP SYS: UT Weld Number 2NS27-8 and Heat-Affected Zone
  2. Containment Inservice Inspection Plan - IWE, UFSAR 18.2.5
    - a. WO 20289917 01, PT/2/A/4200/78, Containment Structural Integrity Insp. (General Visual Insp. Preoutage)
  3. Containment Leak Rate Testing Program Aging Management Program, ITS 3.6.1 & ITS 5.5.2
    - a. WO 20408075 01, PT/2/A/4200/01J SF6 Gas LRT
  4. Divider Barrier Seals Inspection and Testing Program, ITS SR 3.6.14.2 & .4 & .5
    - a. WO 20408957 01, 2NF DR LAD: Insp I/C Access Dr Seal, dated April 30, 2021
  5. Flow-Accelerated Corrosion Program, UFSAR 18.2.9
    - a. WO 20379481 01, 2HS EC E2HS116: Perform FAC Inspection on 32HS116 in C2R24
  6. Fluid Leak Management Program, UFSAR 18.2.10
    - a. WO 20407989 02, PT/2/A/4150/01H (OPS) Inside Cont. Boric Acid Check
  7. Heat Exchanger Activities: Component Cooling Heat Exchangers, UFSAR 18.2.12.1
    - a. WO 20408271 01, 2KC HX A: Test/Clean Heat Exchanger
  8. Heat Exchanger Activities: Diesel Generator Engine Cooling Water Heat Exchangers, UFSAR 18.2.12.3
    - a. WO 20362713 01, 2KC HX B; Perform Eddy Current Testing of Tubes

9. High-Range Radiation and Neutron Flux Instrumentation Circuits, ITS 3.3.1 & ITS 3.3.3
  - a. WO 20397475 01, 2EMF: Perform Channel Cal on 2EMF53B
10. Ice Condenser Engineering Inspection Program, UFSAR 18.2.13
  - a. WO 20407519 02, 2NF Ice Basket: Unload/Reload Ice Baskets
11. Inaccessible Non-EQ Medium Voltage Cables Aging Management Program, UFSAR 18.2.14
  - a. WO 20407565 01, U2 Offline Inspection of Cable in License Renewal Structures
12. Inservice Inspection Plan, UFSAR 18.2.15
  - a. WO 20347400 03, 2NI PP SYS: Perform ISI (R1.16 UT) on 2NI185-18 Pipe to Elbow
13. Liquid Waste System Inspection, UFSAR 18.2.17
  - a. WO 20368990 06, 2WL-321: Engineering to Review License Inspection Results
14. Reactor Vessel Internals Inspection Program, UFSAR 18.2.21
  - a. WO 20408099 01, 2ENA-Eddy Current Incore Flux Thimbles
15. Steam Generator Surveillance, ITS 5.5.9
  - a. WO 20415441 03, Perform E/C Test on S/G-2A

## INSPECTION RESULTS

Observation: Implementation of Acceptance Criteria	71003
<p>Regarding two aging management programs (Borated Water Stainless Steel Inspection and Liquid Waste Inspection), the inspectors noted two instances involving the following circumstances:</p> <ul style="list-style-type: none"> <li>• In the License Renewal Application (“Application to Renew the Operating Licenses of McGuire Nuclear Station, Units 1 &amp; 2 and Catawba Nuclear Station, Units 1 &amp; 2 – Technical Information,” ADAMS Accession No. ML011660145), the licensee provided generic acceptance criteria for inspections that would be performed as part of the aging management process.</li> <li>• By letter dated January 28, 2002 (Letter from Rani L. Franovich to Mr. M. S. Tuckman, “Request for Additional Information for the Review of the McGuire Nuclear Station, Units 1 and 2, and Catawba Nuclear Station, Units 1 and 2, License Renewal Application (LRA),” ADAMS Accession No. ML020310200), in Request for Additional Information (RAI) 3.4-2, the staff asked the licensee to provide more specific acceptance criteria.</li> <li>• By letter dated March 15, 2002 (Letter from Ken S. Canady to U.S. Nuclear Regulatory Commission “Response to Requests for Additional Information in Support of the Staff Review of the Application to Renew the Facility Operating Licenses of McGuire Nuclear Station, Units 1 &amp; 2 and Catawba Nuclear Station, Units 1 &amp; 2,” ADAMS Accession No. ML020810451), the licensee stated that the specific acceptance criteria would be developed at the time of the inspections.</li> <li>• In Section 3.0.3.1.2 of the Safety Evaluation Report (SER; NUREG-1772, “Safety Evaluation Report Related to the License Renewal of McGuire Nuclear Station, Units 1 and 2, and Catawba Nuclear Station, Units 1 and 2,” ADAMS Accession No. ML030850164), the staff accepted this response and closed out RAI 3.4-2.</li> <li>• Upon review of these inspection activities during this Phase 1 inspection, the inspectors noted that the procedures used by field personnel still contained the</li> </ul>	

generic criteria, indicating that the licensee had not developed specific acceptance criteria for each activity.

The inspectors interviewed licensee personnel and reviewed associated documentation and determined that the activities had been conducted in a quality manner, and – given the skill of the craft of the field personnel performing the activities – any degradation that would have warranted corrective action would have been identified. No such degradation was evident in either inspection.

Based on this information, the inspectors determined that no finding existed for this issue. The licensee acknowledged the issue and entered it into their Corrective Action Program (NCR 02383078) and will evaluate whether the associated documentation needs to be revised to clarify the manner in which the acceptance criteria were applied.

**Failure to Meet Minimum Dewatering Requirements for Radioactive Waste Sent Directly for Burial**

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Public Radiation Safety	Green NCV 05000413,05000414/2021002-01 Open/Closed	[H.1] - Resources	71124.08

A self-revealing, Green, Non-Cited violation of 10 CFR 20 Appendix G.III.A.1 occurred when the licensee transferred solid radioactive waste to the Barnwell Waste Disposal Facility that did not meet the waste characterization requirements in 10 CFR 61.56(a)(3) for free standing liquid.

Description: On January 29, 2020, a shipment of spent resin media was sent directly for burial at the Barnwell Waste Disposal Facility. On February 4, 2020, the licensee was notified that the High Integrity Container (HIC) associated with this shipment, which contained a mixture of dewatered bead resin, zeolite, and carbon, failed to meet the regulatory limit of one percent for Free Standing Liquid (FSL). The HIC had been randomly selected and tested for FSL by the South Carolina Department of Health and Environmental Control (SCDHEC) and, when punctured, 13.75 gallons of FSL were collected. The limit for FSL for this shipment was calculated to be 11.4 gallons.

The licensee performed a causal analysis and determined the most probable cause of the cask shipment exceeding the FSL limit was due to a variation in the Powdex Storage Tank (PST) resin media which contained a mixture of dewatered bead resin, zeolite, and carbon which when aggregated can trap water in this mixture and result in unsuccessful dewatering. This trapped water remains in the HIC even when the dewatering process is performed in accordance with current licensee procedures. During transport, the motion of the cask and vehicle may have caused the trapped FSL in the resin matrix to migrate to the bottom of the HIC.

**Corrective Actions:** Shipments of resin to the Barnwell Waste Disposal Facility for direct burial were suspended. Licensee staff met with the Barnwell Waste Disposal Facility staff and the SCDHEC to discuss the event. Licensee evaluated possible changes to site and corporate procedures and published an industry "Operating Experience" summary of the event.

**Corrective Action References:** NCR 02314994.

Performance Assessment:

Performance Deficiency: The licensee's failure to meet the 10 CFR 61.56(a)(3) waste characterization requirement for FSL in solid radioactive waste prior to transferring it to the Barnwell Waste Disposal for direct burial was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Program & Process attribute of the Public Radiation Safety cornerstone and adversely affected the cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation. Failure to meet the radioactive waste characterization requirements in 10 CFR 61.56(a)(3) for shallow land burial potentially challenges the facility's long-term confinement of the radioactive material in accordance with its design criteria.

Significance: The inspectors assessed the significance of the finding using Appendix D, "Public Radiation Safety SDP." The finding was determined to be of very low safety significance (Green) because the waste was not improperly classified per 10 CFR 61.55 and did not result in the improper disposal of the waste.

Cross-Cutting Aspect: H.1 - Resources: Leaders ensure that personnel, equipment, procedures, and other resources are available and adequate to support nuclear safety. The licensee's Process Control Program requires adequate evaluations be performed to ensure waste characterization requirements are met prior to processing each waste stream. Based on the licensee's root cause evaluation, compliance with the procedures and processes for dewatering mixed resin from the PST could not consistently ensure that the FSL was less than one percent of the waste volume.

Enforcement:

Violation: Green, Non-Cited violation of 10 CFR 20 Appendix G.III.A.1. which requires any licensee who transfers radioactive waste to a land disposal facility to prepare all wastes such that it meets waste characteristic requirements in 10 CFR 61.56. 10 CFR 61.56(a)(3) states that FSL must in no case exceed one percent of the volume of the waste. Contrary to these requirements, on January 29, 2020, radioactive waste shipment RSR-20-02 was shipped to the Barnwell Waste Disposal Facility for direct burial with FSL that exceeded one percent of the volume of the waste.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

## **EXIT MEETINGS AND DEBRIEFS**

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

- On July 28, 2021, the inspectors presented the integrated inspection results to Tom Simril and other members of the licensee staff.
- On May 28, 2021, the inspectors presented the Radiation Protection inspection results to Tom Simril and other members of the licensee staff.
- On May 19, 2021, the inspectors presented the Catawba Unit 1 License Renewal Phase 1 inspection results to Mr. Tom Simril and other members of the licensee staff.



**DOCUMENTS REVIEWED**

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71003	Corrective Action Documents	NCR02376015	2-NV-VA-0124B Excessive White Dry Boron from Unknown Source	03/28/2021
		NCR02376335	2-NM-VA-0969 Brown/Rust-Colored Boron at Downstream Pipe Cap	03/30/2021
		NCR02376575	2-ND-VA-0110 Excessive Boron Deposit & Active Seat Leakage	03/31/2021
		NCR02376594	2-WL-PU-ANC Pressure Boundary Leakage below Suction Flange	03/31/2021
		NCR02376792	2-NV-VA-0493 Body-Bonnet Rust-Colored Boron/Active Leakage	04/02/2021
		NCR02376871	2-WL-VA-B043 Dry Rust-Colored Boron and Residue on Packing	04/03/2021
	Corrective Action Documents Resulting from Inspection	NCR02383078	NRC Phase 1 Inspection Comment on Acceptance Criteria	05/19/2021
	Procedures	AD-EG-PWR-1611	Boric Acid Corrosion Control Program – Implementation	4
		AD-EG-PWR-1814	Steam Generator Condition Monitoring	2
		AD-EG-PWR-1815	Steam Generator Operational Assessments	2
		AD-MN-ALL-0006	Fluid Leak Management	3
		IP/0/A/3314/053 T	Char Testing of Containment High Range Radiation Monitor Cables	001
		MPP/0/A/7650/199	Maintenance Procedure for Eddy Current Testing	003
NDE-NE-ALL-6102		Utilization of PDI-UT-2 Generic Procedure for the Ultrasonic Examination of Austenitic Pipe Welds	003	
NDE-NE-ALL-6401		Ultrasonic Thickness Measurement	002	
NE-20-08-01		Iepson Consulting Enterprises: Non-EQ Insulated Cables and Connections Program	0	
PDI-UT-2		Generic Procedure for the Ultrasonic Examination of Austenitic Pipe Welds	1	
PT/0/A/4600/010	Incore Detector Thimble Eddy Current Testing	004		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		A		
		PT/2/A/4150/001 H	Inside Containment Boric Acid Check	018
		PT/2/A/4200/001J	Electrical Penetration SF6 Gas Leak Rate Test	023
		PT/2/A/4200/78	Containment Structural Integrity Inspection	006
		SM/0/A/8510/007	Ice Basket Corrective Maintenance and Tracking	025
		SM/0/B/8630/001	Flow Accelerated Corrosion Component Inspection	005
		TE-MN-PWR-0006	Inspection, Assessment, and Cleanup of Boric Acid on Plant Materials	1
	Work Orders	WO20286000 01	2NS PP SYS: UT Weld Number 2NS27-8 and Heat-Affected Zone	04/07/21
		WO20289917 01	PT/2/A/4200/78, Containment Structural Integrity Inspection	10/24/18
		WO20362713 01	2KC HX B: Perform Eddy Current Testing of Tubes	04/06/21
		WO20368990 06	2WL-321: Engineering to Review License Inspection Results	12/05/19
		WO20379481 01	2HS EC E2HS116: Perform FAC Inspection on E2HS116 in C2R24	08/21/20
		WO20407519 02	2NF Ice Basket: Unload/Reload Ice Baskets	04/01/21
		WO20407565 01	U2 Offline Inspection of Cable in License Renewal Structures	08/07/20
		WO20408075 01	PT/2/A/4200/01J, SF6 Gas LRT	06/29/20
		WO20408099 01	2ENA-Eddy Current Incore Flux Thimbles	03/24/21
		WO20408889 01	2NF DR LAD: PM I/C Lower Personnel Door	12/30/20
		WO20408954 01	2EMF RT 53B: Perform Char Testing on Cables	04/21/21
		WO20408957 01	2NF DR LAD: Insp I/C Access Dr Seal	04/30/21
WO20415441 03	Perform E/C Test on 2SG-A	07/30/20		
71111.08P	Miscellaneous		Catawba 2EOC24 SG Degradation Assessment	0
		0274-TECR-103895	Steam Generator Operational Assessment for Foreign Object Wear at Catawba Unit 2 C2R23 Outage	000
		51-9323917-000	Catawba Unit 2 C2R24 Steam Generator ECT Inspection Plan	000
		C-ISISG-0169.030.0040	Fourth Interval Steam Generator Tube Inservice Inspection Plan	0

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		NDE-NE-CNS-0122	Catawba 2 Site Validated Techniques	4
		PD-EG-PWR-1801	Steam Generator Management Program	7
		SG-CDMP-19-13	Catawba Unit 2 EOC23 Condition Monitoring and Final Operational Assessment	1
71124.06	Miscellaneous	G2021154	Gaseous Effluent Release Permit	5/4/21
		L2021136	Liquid Effluent Release Permit	5/4/21
71124.07	Calibration Records	WO 2039322501	Calibration of Meteorological Tower Instrumentation	07/16/2020
		WO 2041673801	Calibration of Meteorological Tower Instrumentation	01/14/2021
	Procedures	IP/0/B/3343/013	Meteorological Monitoring System (EEB) Calibration and Maintenance Procedure	048
71124.08	Corrective Action Documents	NCR 02314994	Shipment Discrepancy Identified Associated with RSR-20-02	02/07/2020
	Procedures	AD-RP-ALL-5002	10 CFR 61 RADIOACTIVE WASTE CLASSIFICATION	2
		CNS PCP	Catawba Nuclear Station Process Control Program	14
		CS-OP-PR-009	Ecodex Precoat/Powdex/Solka-Floc/Diatomaceous Earth/Zeolite Dewatering Procedure for Energy Solutions 14-215 or Smaller Liners Utilizing Energy Solutions Self-Engaging Dewatering System (S.E.D.S)	2
		DEC Corporate PCP	Radioactive Waste Process Control Program Duke Energy Carolinas (DEC) Corporate PCP	16