



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

September 27, 2021

Mr. Robert T. Simril  
Site Vice President  
Duke Energy Carolinas, LLC  
4800 Concord Road  
Duke Energy  
York, SC 29745

**SUBJECT: CATAWBA NUCLEAR STATION – DESIGN BASIS ASSURANCE INSPECTION  
(TEAMS) INSPECTION REPORT 05000413/2021010 AND 05000414/2021010**

Dear Mr. Simril:

On August 18, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Catawba Nuclear Station and 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.

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

R. Simril

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Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

*/RA/*

James B. Baptist, Chief  
Engineering Branch 1  
Division of Reactor Safety

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

Enclosure:  
As stated

cc w/ encl: Distribution via LISTSERV®

SUBJECT: CATAWBA NUCLEAR STATION – DESIGN BASIS ASSURANCE INSPECTION (TEAMS) INSPECTION REPORT 05000413/2021010 AND 05000414/2021010 DATED SEPTEMBER 27, 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: 05000413/2021010 and 05000414/2021010

Enterprise Identifier: I-2021-010-0039

Licensee: Duke Energy Carolinas, LLC

Facility: Catawba Nuclear Station

Location: York, SC

Inspection Dates: July 26, 2021 to August 18, 2021

Inspectors: J. Bozga, Senior Reactor Inspector  
P. Braxton, Reactor Inspector  
W. Deschaine, Senior Resident Inspector  
R. Patterson, Senior Reactor Inspector  
S. Kobylarz, Electrical Contractor  
M. Yeminy, Mechanical Contractor

Approved By: James B. Baptist, Chief  
Engineering Branch 1  
Division of Reactor Safety

Enclosure

## SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a design basis assurance inspection (teams) 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 Appropriately Analyze Containment Spray (NS) Heat Exchanger Performance Test Results  |   |                      |                |
|--|---|----------------------|----------------|
| Cornerstone  | Significance                                      | Cross-Cutting Aspect | Report Section |
| Mitigating Systems   | Green<br>NCV 05000413,05000414/2021010-01<br>Open | None (NPP)           | 71111.21M      |
| The inspectors identified a Green finding and associated Non-cited Violation (NCV) of Appendix B, Criterion III of 10 CFR Part 50 for the licensee's failure to properly analyze the heat exchanger outlet temperature of service water and adequately assess containment spray heat exchanger test results. |   |                      |                |

### Additional Tracking Items

None.

## 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), inspectors were directed to begin telework. In addition, 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

### 71111.21M - Design Bases Assurance Inspection (Teams)

The inspectors evaluated the following components and listed applicable attributes, permanent modifications, and operating experience:

### Design Review - Risk-Significant/Low Design Margin Components (IP Section 02.02) (4 Samples)

- (1) Unit 2 Auxiliary Feedwater Motor-Driving Pumps and Check Valves
  - Normal and Emergency Operating Procedures
  - Surveillance Test Procedures and Recent Results
  - In-service Test Procedures and Recent Results
  - Bases for Pump Test Acceptance Criteria
  - Bases for Pump Trip Setpoints
  - Calculation of Pump Capacity
  - Calculation of Pump NPSH
  - Strong Pump/Weak Pump Interaction
  - Material Condition of Pump and Associated Equipment
  - Vendor Manuals for Pump and Check Valves
  - HELB Analysis for Equipment Location
  - Corrective Action History
  
- (2) 2A Containment Spray (NS) Heat Exchanger
  - Heat Exchanger Procurement Specification
  - Heat Exchanger Data sheets
  - Maximum Allowed Fouling Factor and Tube Plugging
  - Corrective Action History
  - GL 89-13 Program Plan and Commitments

- Surveillance Test Procedures and Recent Results
  - System Heat Transfer Calculations
  - Bases for IST Acceptance Criteria
- (3) 2B 125 VDC Power Bus
- Compliance with UFSAR, TS and TS Bases
  - Material Condition and Configuration
  - Design Requirements (i.e. loading, short circuit analysis, etc.)
  - Environmental Conditions
  - Work Maintenance and surveillance test reviews
- (4) 4160V Switchgear 1ETA Bus
- Material condition and configuration (e.g., visual inspection during a walkdown)
  - Operating environment
  - Consistency between station documentation (e.g. procedures) and vendor specifications
  - Maintenance and preventive maintenance effectiveness
  - Corrective maintenance records, and corrective action history
  - Breaker short circuit capacity
  - Normal and accident load flow
  - Protective relay setting and calibration
  - Overcurrent protection and coordination

Design Review - Large Early Release Frequency (LERFs) (IP Section 02.02) (2 Samples)

- (1) Unit 2 Containment Vent/Purge Valves
- Normal and Emergency Operating Procedures
  - Surveillance Test Procedures and Recent Results
  - Appendix J Test Procedures and Recent Results
  - Design Specification of Vent/Purge Valve
  - Structural Analysis of Vent/Purge Valve
  - Pipe Stress Analysis of Vent/Purge Valve Piping
  - Pipe Support Analysis of Vent/Purge Valve Piping
  - Corrective Action History
- (2) 2A Containment Spray Pump
- Normal and Emergency Operating Procedures
  - Surveillance Test Procedures and Recent Results
  - Inservice Test Procedures and Recent Results
  - Bases for Pump Test Acceptance Criteria
  - Calculation of Pump Capacity
  - Calculation of Pump NPSH
  - Seismic Analysis for Pump and Associated Equipment

- Pipe Stress Analysis of Pump Discharge and Suction Piping
- Pipe Support Analysis of Pump Discharge and Suction Piping
- Material Condition of Pump and Associated Equipment (e.g., visual inspection during a walkdown)
- Corrective Action History

Modification Review - Permanent Mods (IP Section 02.03) (7 Samples)

- (1) EC94578, Emergency Diesel Generator (EDG) 1A Voltage Regulator Replacement
- (2) EC112463, Emergency Diesel Generator (EDG) 1B Voltage Regulator Replacement
- (3) EC 419072, U2 Steam Generator (SG) Nozzle Dam Model WR-2B for SG 2B Cold Leg
- (4) EC 413168, Acceptability of 1ETA-12 Overcurrent Setpoint
- (5) EC 410983, Reduce Unit 1 NC Flow Limits to 384,000 GPM
- (6) EC 413055, Revise NS Heat Exchanger Test Acceptance Criteria Sheets
- (7) EC111340, Replace 2ERPD Panelboard

Review of Operating Experience Issues (IP Section 02.06) (2 Samples)

- (1) NRC IN 2017-06: Battery and Battery Charger Short-circuit Current Contributions to a Fault on the Direct Current Distribution System
- (2) NRC IN 2010 -25: Inadequate Electrical Connections

**INSPECTION RESULTS**

| Failure to Appropriately Analyze Containment Spray (NS) Heat Exchanger Performance Test Results   |   |                      |                |
|---|---|----------------------|----------------|
| Cornerstone   | Significance                                      | Cross-Cutting Aspect | Report Section |
| Mitigating Systems  | Green<br>NCV 05000413,05000414/2021010-01<br>Open | None (NPP)           | 71111.21M      |
| The inspectors identified a Green finding and associated Non-cited Violation (NCV) of Appendix B, Criterion III of 10 CFR Part 50 for the licensee's failure to properly analyze the heat exchanger outlet temperature of service water and adequately assess containment spray heat exchanger test results.  |   |                      |                |
| <u>Description:</u> The team reviewed engineering change (EC) package EC0000413055000, "Revise NS Heat Exchanger Test Acceptance Criteria", Rev. 0, to verify that system design and safety margins were not impacted by the change. During the review of the supporting documentation, the team identified that the licensee did not properly calculate the exiting water temperature of Service Water(RN) to ensure that piping design temperatures were not exceeded and also did not properly test and/or analyzed the Containment Spray (NS) heat exchanger performance test results. The NS heat exchangers are of the vertical shell and tube type with tubes rolled and welded to the tube sheet. Borated water from either the refueling water storage tank or the containment sump circulates through the shell side while the service water from the RN system circulates through the tubes. |   |                      |                |



The team reviewed calculation CNC-1223.13-00-0002, "Acceptable Flow and Fouling for the NS Heat Exchangers", Rev. 14, which determines the maximum temperature of service water exiting the NS heat exchanger. The analysis was determined to be deficient in the following areas:

(1) The licensee used the minimum acceptable flow rate of NS, rather than using the maximum flow rate of NS. Using the minimum NS flow rate of 3323 gpm, minimizes the heat gain of RN, which is non-conservative when the maximum temperature of RN is the parameter of interest. The calculation should have used the maximum flow rate, of NS, of 4090 gpm.

(2) In addition, the calculation used 0.0005 Hr·°F·ft<sup>2</sup> per Btu overall fouling factor to determine the RN temperature because the lower the fouling factor, the more heat that is transferred from NS to RN and the greater the RN temperature. The team determined that 0.0005 Hr·°F·ft<sup>2</sup> per Btu was non-conservative with respect to the outlet RN temperature because the licensee's analyses of the heat exchanger performance test results have shown that the overall fouling factor (using the combined fouling factor inside and outside tubes), was often lower than 0.0005 Hr·°F·ft<sup>2</sup> per Btu.

Finally, the team reviewed the performance test trend of the fouling factors of the NS heat exchangers and determined that the calculated fouling factors were discrepant. During the review, the team identified large fluctuations of fouling factors without any cleaning of the heat exchanger tubes. A review of the fouling factors following the last cleaning date of each NS heat exchanger revealed several instances where a heat exchanger fouling factor was increasing following cleaning (as it should), then dropping significantly without any cleaning, then increasing significantly, and then decreasing significantly. The team determined that such a trend could be misleading and could potentially give false indications of heat exchanger performance capability.

Corrective Actions: The licensee entered these concerns into the site's corrective action program as NCRs 02393016, 02393458, 02393874 and performed additional analyses and evaluations to assure operability of the NS heat exchangers and the applicable SSCs.

Performance Assessment:

Performance Deficiency: The licensee's failure to properly analyze the heat exchanger outlet temperature of service water and to adequately assess containment spray heat exchanger test results was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Equipment 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, using incorrect RN flow rates and not properly analyzing performance data adversely impacted the site's ability to ensure that the NS heat exchanger capability is maintained.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." This finding was screened to Green because the finding was a deficiency affecting the design or qualification of a mitigating structure, system or component (SSC) and the SSC maintained its operability and PRA functionality.

Cross-Cutting Aspect: Not Present Performance. No cross cutting aspect was assigned to this finding because the inspectors determined the finding did not reflect present licensee performance.

Enforcement:

Violation: 10CFR50, Appendix B, Design Control, states in part that “the design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program.” Contrary to the above, since May of 2006 (a) the testing program applied by the site, resulted in values not supporting the regular increase of fouling factor following heat exchanger cleaning, and (b) the calculation used to determine the maximum temperature of the RN pipe exiting the NS heat exchanger did not use the proper input parameter (NS flow rate) which resulted in a non-conservative temperature.

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 August 18, 2021, the inspectors presented the design basis assurance inspection (teams) inspection results to Robert T. Simril and other members of the licensee staff.

## DOCUMENTS REVIEWED

| Inspection Procedure | Type         | Designation         | Description or Title  | Revision or Date |
|----------------------|--------------|---------------------|---|------------------|
| 71111.21M            | Calculations | CNC-1206.02-87-0014 | Containment Air Release and Addition System (VQ) Rigorous Stress Analysis of Piping Math Model VQ-201 | Rev. 8           |
| 71111.21M            | Calculations | CNC-1206.02-87-0015 | Rigorous Stress Analysis of Piping Math Model Number VQ-202 for Unit 2                                | Rev. 4           |
| 71111.21M            | Calculations | CNC-1206.02-87-0017 | Rigorous Stress Analysis of Piping Math Model Number VQ-202 for Unit 1                                | Rev. 3           |
| 71111.21M            | Calculations | CNC-1206.12-23-1021 | Containment Spray Suction Pipe Supports   | Rev. 1           |
| 71111.21M            | Calculations | CNC-1206.12-28-1005 | Containment Spray Discharge Pipe Supports   | Rev. 2           |
| 71111.21M            | Calculations | CNC-1206.12-42-2021 | Design of Support/Restraint No. 2-A-VQ-4036   | Rev. 2           |
| 71111.21M            | Calculations | CNC-1206.12-42-2022 | Design of Support/Restraint No. 2-A-VQ-4000   | Rev. 1           |
| 71111.21M            | Calculations | CNC-1206.12-42-2023 | Quickpipe Analysis for Piping for: VQ023  | Rev. 1           |
| 71111.21M            | Calculations | CNC-1206.12-42-2024 | Quickpipe Analysis for Piping for: VQ024  | 1                |
| 71111.21M            | Calculations | CNC-1223.03-00-0042 | Unit 2 Design and Seismic Report for Type WR-2B Steam Generator Nozzle Dams                           | 0                |
| 71111.21M            | Calculations | CNC-1223.13-00-0016 | NS Pump Maximum Flow Evaluation   | Rev. 5           |
| 71111.21M            | Calculations | CNC-1223.13-00-002  | Acceptable RN Flow and Fouling in the NS Heat Exchangers for One RN Pump Operation                    | Rev. 14          |
| 71111.21M            | Calculations | CNC-1223.13-00-0028 | Containment Spray Pumps Test Loop Flow Model  | Rev. 1           |
| 71111.21M            | Calculations | CNC-1223.13-00-0036 | NS Pump Required Developed Head to Produce the Minimum Required Flowrate                              | Rev. 0           |
| 71111.21M            | Calculations | CNC-1223.35-00-0008 | Containment Air Release and Addition System (VQ) Verification   | Rev. 2           |
| 71111.21M            | Calculations | CNC-1381.05-00-0012 | 4160 Volt Essential Auxiliary Power System Switchgear Relay Settings                                  | Rev. 18          |

| Inspection Procedure | Type                        | Designation  | Description or Title  | Revision or Date |
|----------------------|-----------------------------|--|---|------------------|
| 71111.21M            | Calculations                | CNC-1381.05-00-0012  | 4160 Volt Essential Auxiliary Power System Switchgear Relay Settings                | Rev. 18          |
| 71111.21M            | Calculations                | CNC-1381.05-00-0135  | U1/2, 125VDC Vital I&C Power System (EPL) Short Circuit Analysis                    | Rev. 7           |
| 71111.21M            | Calculations                | CNC-1381.05-00-0163  | 125VDC Instrumentation and Control Battery Load Study Summary                       | Rev. 3           |
| 71111.21M            | Calculations                | CNC-1381.05-00-0198  | U1, 6.9KV, 4.16KV & 600V Auxiliary Power Systems Safety-Related Voltage Analysis    | Rev. 16          |
| 71111.21M            | Calculations                | CNC-1381.05-00-0198  | U1, 6.9KV, 4.16KV & 600V Auxiliary Power Systems Safety-Related Voltage Analysis    | Rev. 16          |
| 71111.21M            | Calculations                | CNC-1381.05-00-0251  | Unit 1 and 2 NFPA 805 Circuit Breaker and Fuse Coordination Study                   | Rev. 35          |
| 71111.21M            | Calculations                | CNC-1552.08-00-0390  | Long Term Containment Response Manual NS Initiation                                 | Rev. 7           |
| 71111.21M            | Calculations                | CNC-2206.02-82-2007  | Residual Heat Removal System - NO, NS, FW and NI Piping to RHR and CTMT Spray Pumps | Rev. 40          |
| 71111.21M            | Calculations                | CNC-2206.02-83-2003  | Containment Spray Pump 2A to HX2A   | Rev. 10          |
| 71111.21M            | Calculations                | CNM 1201.05-0382.001   | NS Containment Spray Pump Seismic Report  | 09/05/1985       |
| 71111.21M            | Calculations                | CNM 1201.05-0384.001   | NS Containment Spray Pump Motor Frame Analysis                                      | 02/10/1981       |
| 71111.21M            | Calculations                | CNM 1205.00-0669   | 4" EMO CS Gate Valve Seismic Report Item No. 2B-400                                 | Rev. D3          |
| 71111.21M            | Calculations                | CNM 1205.04-0445.001   | 4"-150 Active Diaphragm Valve Seismic Report Item 5B-473                            | Rev. 2           |
| 71111.21M            | Corrective Action Documents | 02298887<br>02222499<br>02227657<br>02323913<br>02210412<br>02178574<br>02175426<br>02375813 |   |                  |

| Inspection Procedure | Type  | Designation   | Description or Title                                       | Revision or Date |
|----------------------|---|---|--|------------------|
|                      |   | 02271394<br>02375813<br>02307540<br>02315781<br>022298887<br>02222499<br>02227657<br>02323913<br>02210412<br>02178574<br>02175426 |  |                  |
| 71111.21M            | Corrective Action Documents Resulting from Inspection | 02391252  | NS HX Heat Capacity Test Fouling Factor                    |                  |
| 71111.21M            | Corrective Action Documents Resulting from Inspection | 02393016  | Maximum RN Outlet Temperature on NS Hx is Non conservative |                  |
| 71111.21M            | Corrective Action Documents Resulting from Inspection | 02393458  | NS Heat Exchanger Outlet Temperature Non-Conservatism      |                  |
| 71111.21M            | Corrective Action Documents Resulting from Inspection | 02393874  | Non-Conservative Containment Sump Temperature              |                  |
| 71111.21M            | Corrective Action Documents Resulting from Inspection | 02393985  | Editorial Issues with 2-R-ND-0221 Support Calculation      |                  |
| 71111.21M            | Corrective Action Documents Resulting from            | 02394127  | NRC DBAI Update calc CNC-1223.03-00-0042, U2 SG Nozzle Dam |                  |

| Inspection Procedure | Type                | Designation          | Description or Title  | Revision or Date |
|----------------------|---------------------|----------------------|---|------------------|
|                      | Inspection          |                      |   |                  |
| 71111.21M            | Drawings            | CN-1702-02.01        | One Line Diagram 4160 Volt Essential Auxiliary Power System (EPC) 4160V Switchgear No. 1ETA                     | Rev. 18          |
| 71111.21M            | Drawings            | CN-2705-01.01        | VTO One Line Diagram 125VDC Vital Instr. and Control Power System ( EPL)  | Rev. 18          |
| 71111.21M            | Drawings            | CNEE-0115-01.12      | Elementary Diagram 4160V Switchgear 1ETA Unit #12 Centrifugal Charging Pump Motor 1A (1PMTR0014)                | Rev. 10          |
| 71111.21M            | Drawings            | CNM 2201.01-0990.001 | Unit 2 Type WR-2B Steam Generator Nozzle Dam Outline Drawing  | Rev. 0           |
| 71111.21M            | Engineering Changes | EC 413168            | Acceptability of 1ETA-12 Overcurrent Setpoint   | Rev. 0           |
| 71111.21M            | Engineering Changes | EC0000410983000      | Reduce NC Flow Limits to 384000 GPM   | Rev. 0           |
| 71111.21M            | Engineering Changes | EC0000413055000      | Revise NS HX test acceptance criteria   | Rev. 0           |
| 71111.21M            | Miscellaneous       |                      | Containment Leak Rate Program (CLRP) MANUAL   | Rev. 11          |
| 71111.21M            | Miscellaneous       |                      | Catawba Nuclear Station ASME OM Code In-Service Testing Program Document CNS Fourth Ten-Year Interval           | Rev. 8           |
| 71111.21M            | Miscellaneous       | 1D88695              | Westinghouse A.C. Motor Frame #5808-S 'LLD' – Split Slv. Brg. Outline – Totally Enclosed, Water Cooled – 4 Pole | Rev. D5          |
| 71111.21M            | Miscellaneous       | 1D88695              | Westinghouse A.C. Motor Frame #5808-S 'LLD' – Split Slv. Brg. Outline – Totally Enclosed, Water Cooled – 4 Pole | Rev. D5          |
| 71111.21M            | Miscellaneous       | 50.59 Screening      | SLC 16.5-1 Reference 15 Update  | Rev. 0           |
| 71111.21M            | Miscellaneous       | 611996-001           | Brown Boveri Electric, Inc. Schematic Single Phase Undervoltage Relay   | Rev. 0           |
| 71111.21M            | Miscellaneous       | 611996-001           | Brown Boveri Electric, Inc. Schematic Single Phase Undervoltage Relay   | Rev. 0           |
| 71111.21M            | Miscellaneous       | CNLT-1780-03.03      | Environmental Qualification Criteria Manual   | Rev. 38          |
| 71111.21M            | Miscellaneous       | CNM 1318.29-0002     | Motor Data Sheet – CHG Pump, Rev. 001   | Rev. 001         |
| 71111.21M            | Miscellaneous       | CNM 1318.29-0002     | Motor Data Sheet – CHG Pump   | Rev. 001         |
| 71111.21M            | Miscellaneous       | CNS-106.01-EPG-0001  | Design Basis Specification 120VAC Vital Instrumentation and Control Power System (EPG)                          | Rev. 14          |

| Inspection Procedure | Type          | Designation                           | Description or Title  | Revision or Date |
|----------------------|---------------|---------------------------------------|---|------------------|
| 71111.21M            | Miscellaneous | CNS-106.01-EPL-0001                   | Design Basis Specification for the 125VDC Vital I&C Power System ( EPL)                               | Rev. 15          |
| 71111.21M            | Miscellaneous | CNS-115.01-EPC-0001                   | 4.16KV Essential Auxiliary Power System (EPC) Design Basis Specification                              | Rev. 17          |
| 71111.21M            | Miscellaneous | CNS-115.01-EPC-0001                   | 4.16KV Essential Auxiliary Power System (EPC) Design Basis Specification                              | Rev. 17          |
| 71111.21M            | Miscellaneous | CNTC-1563-NS.H002-02                  | Test Acceptance Criteria NS HX 1B Heat Capacity Criteria  | Rev. 8           |
| 71111.21M            | Miscellaneous | RE-3.01                               | Relaying – Auxiliary Systems – Equipment Protection Settings  | Rev. 38          |
| 71111.21M            | Miscellaneous | RE-3.01                               | Relaying – Auxiliary Systems – Equipment Protection Settings  | Rev. 6           |
| 71111.21M            | Miscellaneous | SDQA-0081-CNS                         | Heat Exchanger Fouling Factor   | Rev. 5           |
| 71111.21M            | Miscellaneous | Specification No. CNR-1201.35-00-0006 | Technical Requirements for Procurement of Catawba Nuclear Station Unit 2, Steam Generator Nozzle Dams | Rev. 0           |
| 71111.21M            | Miscellaneous | TM-2134                               | Heat Exchanger Data Sheets for NS Containment Spray Cooler  | Rev. 3           |
| 71111.21M            | Procedures    | AD-EG-ALL-1133                        | Preparation and Control of Design Equivalent Change Engineering Changes                               | Rev. 14          |
| 71111.21M            | Procedures    | AD-PI-ALL-0100                        | Corrective Action Program   | Rev. 25          |
| 71111.21M            | Procedures    | AD-PI-ALL-0100                        | Corrective Action Program   | Rev. 25          |
| 71111.21M            | Procedures    | OP/1/1/B/6100/010 L                   | Annunciator Response for Panel 1AD-11   | Rev. 066         |
| 71111.21M            | Procedures    | OP/1/1/B/6100/010 L                   | Annunciator Response for Panel 1AD-11   | Rev. 66          |
| 71111.21M            | Procedures    | PT/1/A/4250/006B                      | CA System Flow Verification Test  | dated 05/28/20   |
| 71111.21M            | Procedures    | PT/1/A/4400/006A                      | NS Heat Exchanger 1A Heat Capacity Test   | dated 11/05/20   |
| 71111.21M            | Procedures    | PT/2/A/4200/001 I                     | As Found Containment Isolation Valve Leak Rate Test   | Rev. 34          |
| 71111.21M            | Procedures    | PT/2/A/4200/004 B                     | Containment Spray Pump 2A Performance Test  | Rev. 46          |
| 71111.21M            | Procedures    | PT//A/4350/002 B                      | Diesel Generator IB Operability Test  | Rev. 159         |
| 71111.21M            | Work Orders   | 20471995,                             |   |                  |

| Inspection Procedure | Type | Designation  | Description or Title | Revision or Date |
|----------------------|------|--|----------------------|------------------|
|                      |      | 20431963-01,<br>20189638-01,<br>20338857-01,<br>20189639-01,<br>20338921-01,<br>20190168-01,<br>20392795-01,<br>20319452-01,<br>20461614-01,<br>20216053-01,<br>20351938 01,<br>20216482 01,<br>20194363-04,<br>20194363-06,<br>20194363-08,<br>20194363-10,<br>20194363-12,<br>20194363-13,<br>20194363-18,<br>20194363-20,<br>20194363-21,<br>20194363-25,<br>20194363-31,<br>20194363-30,<br>20471995,<br>20431963-01,<br>20189638-01,<br>20338857-01,<br>20189639-01,<br>20338921-01,<br>20190168-01,<br>20392795-01,<br>20110132,<br>20202974 |                      |                  |



| Inspection Procedure | Type | Designation | Description or Title | Revision or Date |
|----------------------|------|-------------|----------------------|------------------|
|                      |      |             |                      |                  |