VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

December 17, 2020

10 CFR 50.90

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Serial No.: 20-385
NRA/DEA: R0
Docket Nos.: 50-338
50-339
License Nos.: NPF-4
NPF-7

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNITS 1 AND 2
PROPOSED LICENSE AMENDMENT REQUEST TO
CHANGE BATTERY SURVEILLANCE REQUIREMENTS

Pursuant to 10 CFR 50.90, Virginia Electric and Power Company (Dominion Energy Virginia) is submitting a license amendment request to revise Technical Specifications (TS) Surveillance Requirements 3.8.4.2 and 3.8.4.5, specifically, the inter-cell resistance value of 150 x 10-6 ohm is nonconservative if all, or a considerable number, of the inter-cell connections are at their maximum resistance value, since the acceptable total battery resistance value would be exceeded. Therefore, the proposed change adds new acceptance criteria that will confirm total battery connection resistance is within preestablished limits and ensures that the batteries can perform their specified safety function by maintaining required battery terminal voltage under design basis load conditions.

Attachment 1 to this letter describes the proposed changes and provides justification for the changes. The marked-up and proposed North Anna Power Station (NAPS) TS pages are provided in Attachments 2 and 3, respectively. There is no associated TS Bases change.

Dominion Energy Virginia has evaluated the proposed amendment and determined that it does not involve a significant hazards consideration as defined in 10 CFR 50.92. The basis for this determination is included in Attachment 1. Dominion Energy Virginia has also determined that operation with the proposed change will not result in any significant increase in the amount of effluents that may be released offsite or any significant increase in individual or cumulative occupational radiation exposure. Therefore, the proposed amendment is eligible for categorical exclusion from an environmental assessment as set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment is needed in connection with the approval of the proposed change.

The proposed TS change has been reviewed and approved by the NAPS Facility Safety Review Committee.

Dominion Energy Virginia requests approval of the proposed amendment by January 4, 2022. Once approved, the amendment will be implemented within 90 days.

If you have any questions or require additional information, please contact Erica Combs at (804) 273-3386.

Respectfully,

Mark D. Sartain
Vice President – Nuclear Engineering and Fleet Support

Commitments contained in this letter: None

Attachments:

1. Discussion of Change
2. Marked-up Technical Specifications Page
3. Proposed Technical Specifications Page

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Mr. Mark D. Sartain, who is Vice President – Nuclear Engineering and Fleet Support, of Virginia Electric and Power Company. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of that company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 17th day of December, 2020.

My Commission Expires: 12/31/24.

CRAIG D SLY
Notary Public
Commonwealth of Virginia
Reg. # 7518653
My Commission Expires December 31, 2024

Notary Public

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NRC Senior Resident Inspector
North Anna Power Station

Attachment 1

DISCUSSION OF CHANGE

Virginia Electric and Power Company
(Dominion Energy Virginia)
North Anna Power Station Units 1 and 2

DISCUSSION OF CHANGE

1.0 SUMMARY DESCRIPTION

Pursuant to 10 CFR 50.90, Dominion Energy Virginia requests an amendment to Facility Operating License No NPF-4 and NPF-7 for North Anna Power Station (NAPS) Units 1 and 2. The inter-cell connection resistance value of 1.5E-4 ohm specified in NAPS Technical Specification (TS) 3.8.4, "Electrical Power Systems, DC Sources – Operating," Surveillance Requirements (SRs) 3.8.4.2 and 3.8.4.5 for safety-related batteries is non-conservative if all, or a considerable number, of the connections are postulated to be at the TS limit value, since the acceptable total battery connection resistance value would be exceeded.

The proposed amendment revises NAPS TS SRs 3.8.4.2 and 3.8.4.5 by adding new acceptance criteria for each safety-related battery that specifies a total connection resistance value as established by North Anna Calculations.

The new acceptance criteria will confirm that the total battery connection resistance is within pre-established limits and ensures that the batteries will perform their specified safety function by maintaining required battery terminal voltage under designed load conditions.

2.0 DETAILED DESCRIPTION

2.1 System Design and Operation

The Direct Current (DC) power system is rated at 125V and provides a highly reliable source of power for the operation of vital safety and non-safety-related equipment necessary for the proper and safe operation of the station, as well as safe reactor shutdown under postulated accident conditions. There are four independent and identical 125V DC systems for each unit that supply power to; emergency lighting, DC motor-driven pumps, Alternating Current (AC) inverters that supply the 120V AC vital buses, and control power to 480V and 4160V AC breakers.

The 125V DC power source in each unit consists of four independent 60-cell lead calcium batteries, six battery chargers (two of which are spares), and four battery distribution switchboards. The batteries supply enough power for two hours, if the battery chargers fail. Each battery consists of 60 cells connected in series and are located in individual missile-protected battery rooms. Each battery room has its own ventilation fan to ensure that hydrogen does not build up to the explosive limit. The separation of the battery rooms ensures that, in

the unlikely event of an explosion in one room, there would be no damage to any of the other batteries.

The battery chargers convert 480V AC power to a 125V DC regulated output, which powers the associated 125V DC buses and maintains a floating charge on the batteries connected to the buses. Four of the battery chargers are called normal battery chargers and are normally used to provide 125V DC to their respective DC bus and battery. Two of the battery chargers are swing battery chargers and each can be used as an installed spare for either of the two normal battery chargers in its respective safeguards train. The 125V DC distribution switchboards supply 125V DC power to safety system trains A and B. Each DC switchboard supplies 125V DC to its respective vital bus inverter. Each battery distribution switchboard is provided with an isolating transducer that feeds a battery voltage recorder in the main control room.

During normal operation, the 125V DC load is fed from the battery chargers with the batteries floating on the system. The chargers are designed to charge the batteries from the maximum discharged condition to full charge in 24 hours while supplying the normal or emergency steady-state loads. The chargers are internally protected from a feedback surge from the batteries resulting from internal damage or loss of AC power. On loss of normal power to the battery chargers, the DC load is automatically fed from the station batteries.

2.2 Proposed Changes to Current Technical Specification Requirements

The following changes are being proposed to two SRs in TS Section 3.8.4, "Electrical Power Systems, DC Sources – Operating," applicable in modes 1, 2, 3, and 4.

Change 1

TS SR 3.8.4.2 currently states:

Verify for each required Station and EDG battery, there is no visible corrosion at battery terminals and connectors.

OR

Verify battery connection resistance is ≤ 1.5E-4 ohm for inter-cell connections, ≤ 1.5E-4 ohm for inter-rack connections, ≤ 1.5E-4 ohm for inter-tier connections, and ≤ 1.5E-4 ohm for terminal connections.

TS SR 3.8.4.2 Proposed change:

Verify for each required Station and EDG battery, there is no visible corrosion at battery terminals and connectors.

OR

Verify battery connection resistance is ≤ 1.5E-4 ohm for inter-cell connections, ≤ 1.5E-4 ohm for inter-rack connections, ≤ 1.5E-4 ohm for inter-tier connections, and ≤ 1.5E-4 ohm for terminal connections.

AND

Verify total connection resistance for each Station battery is less than or equal to the value listed below.

Total Battery Connection Resistance	
Station Battery	**Maximum Allowable Total Battery Connection Resistance**
1-I, 1-III, 2-I, 2-III	**≤ 2.5E-3 ohm**
1-II	**≤ 0.9E-3 ohm**
1-IV, 2-II, 2-IV	**≤ 1.5E-3 ohm**

Change 2

TS SR 3.8.4.5 currently states:

Verify for each required Station and EDG battery, connection resistance is ≤ 1.5E-4 ohm for inter-cell connections, ≤ 1.5E-4 ohm for inter-rack connections, ≤ 1.5E-4 ohm for inter-tier connections, and ≤ 1.5E-4 ohm for terminal connections.

TS SR 3.8.4.5 Proposed change:

Verify for each required Station and EDG battery, connection resistance is ≤ 1.5E-4 ohm for inter-cell connections, ≤ 1.5E-4 ohm for inter-rack connections, ≤ 1.5E-4 ohm for inter-tier connections, and ≤ 1.5E-4 ohm for terminal connections.

AND

Verify total connection resistance for each Station battery is less than or equal to the value listed below.

Total Battery Connection Resistance	
Station Battery	**Maximum Allowable Total Battery Connection Resistance**
1-I, 1-III, 2-I, 2-III	**≤ 2.5E-3 ohm**
1-II	**≤ 0.9E-3 ohm**
1-IV, 2-II, 2-IV	**≤ 1.5E-3 ohm**

A markup of the proposed TS changes is provided in Attachment 1. There are no associated TS Bases changes.

2.3 Reason for the Proposed Change

INPO Operating Experience (Experience ID #299289, formerly OE23813), dated November 28, 2006, detailed a condition at Quad Cities Station Units 1 and 2 where the TS value for safety-related battery inter-cell resistance of ≤ 1.5E-4 ohm was determined to be non-conservative. Specifically, if all the inter-cell connections for a battery were to degrade to the TS SR limit value of 1.5E-4 ohm, the battery would not be able to perform its safety function. The Quad Cities operating experience provided an alert to other nuclear power plants of the potential for having similar non-conservative TS SRs for nuclear safety-related batteries.

NAPS performed a review of the Quad Cities operating experience and determined that the battery inter-cell connection resistance value of ≤ 1.5E-4 ohm in TS SR 3.8.4.2 and 3.8.4.5 is non-conservative if all, or a considerable number, of the connections are at that value since the maximum allowable total battery resistance value would be exceeded. In accordance with Nuclear Regulatory Commission (NRC) Administrative Letter 98-10 (Reference 1), NAPS is revising these SRs to add new acceptance criteria for total battery connection resistance.

3.0 TECHNICAL EVALUATION

3.1 Background

3.1.1 DC Power System Description

The DC power system is described in the NAPS Updated Final Safety Analysis Report (UFSAR) section 8.3.2. The NAPS Units 1 and 2 DC power systems are identical and independent of each other. The 125V DC system for each unit consists four battery banks (60-cell lead calcium batteries), six battery chargers (two of which are spares), and four battery distribution switchboards. The system is divided into four channels identified by Roman numeral I, II, III, and IV, each operating independently of the other.

Each unit has six battery chargers. Four of the battery chargers are called normal battery chargers. Two of the battery chargers are swing battery chargers and each can be used as an installed spare for either of the two normal battery chargers in its respective safeguards train. Battery chargers are powered from 480V AC emergency busses 1H, 1J, 2H, and 2J. The battery chargers convert 480V AC power to a 125V DC regulated output, which powers the associated 125V DC buses and maintains a floating charge on the batteries connected to the buses to ensure the battery remains in a fully charged condition by maintaining a zero charge/discharge rate on the battery. Each battery charger has a maximum continuous output current of 250A with an input of 460 ±15% V AC.

Each normal battery charger supplies power to one 125V DC panel:

- Normal battery chargers 1-I and 2-I supply 125V DC panel 1-I and 2-I respectively
- Normal battery chargers 1-II and 2-II supply 125V DC panel 1-II and 2-II respectively
- Normal battery chargers 1-III and 2-III supply 125V DC panel 1-III and 2-III respectively
- Normal battery chargers 1-IV and 2-IV supply 125V DC panel 1-IV and 2-IV respectively

Two swing battery chargers supply power to one of two 125V DC panels:

- Swing battery chargers 1C-I and 2C-I supply 125V DC panel 1-I or 1-II, and 2-I or 2-II respectively

- Swing battery chargers 1C-II and 2C-II supply 125V DC panel 1-III or 1-IV, and 2-III or 2-IV respectively

During normal operation, the 125V DC load is fed from the battery chargers with the batteries floating on the system. If a loss of normal power to the battery chargers occurs, the DC load is automatically fed from the station batteries. Each battery is rated and designed to operate all required loads for 2 hours, after which standby generation power will be available to energize the battery chargers as described in UFSAR section 8.3.2.1. Additionally, each battery can also operate all required loads for a 4-hour Station Blackout (SBO) event, after which standby generation power will be available to energize the battery chargers as required by 10 CFR 50.63.

3.1.2 Class 1E Batteries

Each of the eight (8) class 1E batteries is an Exide (Enersys) type 2GN-23, 60-cell lead calcium battery with 11 positive plates per cell designed for continuous duty. The batteries are rated at 225A for an 8-hour period or 1800 ampere-hours. Battery capacity is measured periodically under the Periodic Test (PT) program. Each battery bank has enough capacity to supply all connected safety-related loads for a minimum of two (2) hours without the use of battery chargers. The battery bank also has enough capacity for supplying connected loads for a minimum of four (4) hours during an SBO event. During the two-hour design basis duty cycle and four-hour SBO duty cycle, overall battery terminal voltage (combination of all 60 individual cell voltages), never drops below 105 volts (a minimum of 1.75V DC per cell).

The selection criteria for battery capacity and reliability meets the requirements of Institute of Electrical and Electronics Engineers (IEEE) Standard 308, "Standard Criteria for Class 1E Power Systems for Nuclear Power Generating Stations" (Reference 4) and GDC 17, "Electric Power Systems". The batteries are sized using the methods from IEEE Standard 485 (Reference 7). The reliability of the batteries is assured by periodic discharge testing at a frequency specified by the NAPS Surveillance Frequency Control Program in accordance with IEEE Standard 450, "Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating

Stations and Substations" (References 5 and 6). The performance and service tests comply with Regulatory Guide 1.129 (Reference 2).

The class 1E batteries are seismically qualified and are mounted on Seismic Category I battery racks in separate missile-protected battery rooms. The battery rooms are continuously ventilated to reduce the accumulation of hydrogen gas that is emitted during charging and discharging. The ventilation system in the battery room is designed to maintain the hydrogen concentration below the explosive limit, as discussed in UFSAR 8.3.2.1.

Each Class 1E battery contains 60 cells, each cell has 11 positive plates to meet the duty cycle requirements. Each battery cell is contained in a sealed, heat-resistant, shock-absorbent, clear plastic jar. The use of clear plastic jars allows quick visual checks of electrolyte level in the cells and each jar is sealed to prevent entry of dirt or other foreign material and to reduce evaporation of the electrolyte. Lead-plated copper is used for series intercell connections.

Equalizing charges are conducted periodically to ensure that sulfate is driven from the battery plates and that electrolyte is restored to a maximum specific gravity (fully charged) condition. A battery on a float charge or not discharged for a long period of time can experience sulfate buildup on the plates, which reduces battery efficiency and life expectancy.

3.2 Technical Analysis

3.2.1 Battery Resistance Evaluation

The proposed amendment seeks to correct a non-conservative TS by adding total connection resistance acceptance criteria to SRs 3.8.4.2 and 3.8.4.5 for class 1E batteries as established by North Anna Calculations. These values are currently documented in the station's surveillance requirements test procedures as administrative controls to ensure the total connection resistance of the battery bank remains within the analytical design limits and to ensure the batteries remain capable of performing their design basis function when needed.

For each sixty cell 2GN-23 battery there are 56 intercell connections and 8 connections to cables (two leads, two connections to the ends of each

of the two inter-rack cables, and two to the ends of the inter-tier jumpers).

North Anna voltage profile calculations for the Class 1E batteries provide a basis for the maximum allowable total connection resistance values (to include the inter-cell, inter-jar, and cable termination connectors) that would ensure proper operation of the 125V DC Vital Bus in Design Basis Accident (DBA) and SBO scenarios. The inter-rack and inter-tier cable resistance is not included within the basis of total connection resistance values. The periodic tests measure from the cell post to the cable termination for the cable termination connectors. The inter-rack and inter-tier cables are separately included in the calculation analysis, and any configuration change that would impact these cables would require an update to the analysis. The table below summarizes calculation results for the total allowable connection resistance for various class 1E batteries.

Class 1E Battery	**Maximum Allowable Total Connection Resistance (Analyzed)**
1-I, 1-III, 2-I, 2-III	≤ 2.502E-3 ohm
1-II	≤ 0.9E-3 ohm
1-IV, 2-II, 2-IV	≤ 1.502E-3 ohm

Maintaining the total battery connection resistance at or below the maximum allowable resistance analyzed in the calculations ensures DC related loads fed from 125V DC distribution panels will have adequate voltage to perform their design basis function. The Loss of Off-Site Power (LOOP) event coincident with the EDG failing to start and power its related emergency bus and station battery charger apply to two-hour DBA, and four-hour SBO events. The above analyzed values also provide a design basis for the maximum allowable total connection resistance of the Class 1E batteries and supports the proposed Technical Specifications Surveillance Requirements change.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements and Criteria

The following regulatory requirements are applicable to battery inter-cell connections:

(1) *GDC – 17 Electric Power Systems*

10 CFR 50, Appendix A, General Design Criterion 17 for electric power systems requires that "nuclear power plants have onsite and offsite electric power systems to permit the functioning of structures, systems and components (SSCs) that are important to safety." GDC-17 also requires that "the onsite electric power supplies, including the batteries, and the onsite electric distribution system, must have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure."

(2) *GDC 18 - Inspection and Testing of Electric Power Systems*

10 CFR 50, Appendix A, General Design Criterion 18 for inspection and testing of electric power systems requires that "electric power systems important to safety shall be designed to permit appropriate periodic inspection and testing of important areas and features, such as wiring, insulation, connections, and switchboards, to assess the continuity of the systems and the conditions of their components."

(3) *10 CFR 50.36 – Technical Specifications*

10 CFR 50.36(c)(3) requires Technical Specifications to include Surveillance Requirements, which are "requirements relating to test, calibration, or inspection to ensure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions of operation will be met."

(4) *10 CFR 50.63 – Loss of All Alternating Current Power*

10 CFR 50.63 requires that "each light-water cooled nuclear power plant licensed to operate must be able to withstand for a specified duration and recover from a station blackout (SBO)."

(5) *10 CFR 50.65*

CFR 50.65 contains requirements for monitoring the effectiveness of maintenance at nuclear power plants and requires that preventive maintenance activities must not reduce the overall availability of the SSCs.

Conclusion

The requirements of GDC 17 and 18, along with the other regulatory requirements listed above, will continue to be met because the proposed changes will not affect the design capability, function, operation, maintenance or method of testing of Class 1E batteries.

4.2 Precedents

Previous NRC approvals of similar license amendment requests to correct non-conservative Technical Specification Surveillances Requirements for a battery inter-cell connection resistance value of 1.5E-4 ohm include the following:

1. Quad Cities Nuclear Power Station, Units 1 and 2 - Issuance of Amendments Regarding Battery Surveillance Requirements (TAC Nos. MF4589 AND MF4590), dated March 30, 2015 [ML15056A772]
2. Fermi 2 - Issuance of Amendment Regarding Request to Revise Technical Specification Surveillance Requirements for Direct Current Batteries (TAC No. MF4002), dated March 16, 2015 [ML15057A297]

4.3 No Significant Hazards Consideration

A change is proposed to North Anna TS SRs 3.8.4.2 and 3.8.4.5 to add new acceptance criteria for each safety-related battery total connection resistance value as established by North Anna Calculations. Dominion Energy Virginia has evaluated whether a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as described below:

1. *Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?*

   Response: No.

The proposed change does not modify any plant equipment and does not impact any failure modes that could lead to an accident. The proposed change does not affect the safety function of the batteries. Additionally, the proposed change has no effect on the consequence of any analyzed accident since the change does not affect the accident mitigating functions supported by the DC electrical power system.

The proposed change to add a total battery resistance constitutes an additional operational limitation or restriction on the acceptable range of values for battery total resistance required to ensure that the batteries can perform as designed. Therefore, the proposed change will not increase the probability or consequences of any accident previously evaluated.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. *Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?*

Response: No.

The proposed change does not involve a modification to the physical configuration of the plant or how the plant is operated. The proposed change to add a total battery resistance constitutes an additional operational limitation or restriction on the acceptable range of values for battery resistance required to ensure that the batteries will perform as designed. No new accident scenarios, transient precursors, failure mechanisms, or limiting single failures will be introduced as a result of this amendment. There will be no adverse effect or challenges imposed on any safety related system as a result of this proposed change. The DC electrical power system supplies power to support systems and components that perform accident mitigation and is not an initiator of any accident.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. *Does the proposed amendment involve a significant reduction in a margin of safety?*

   Response: No.

   The proposed change to add a total battery resistance constitutes an additional operational limitation or restriction on the acceptable range of values for battery resistance required to ensure that the batteries can perform as designed. The safety function of the DC electrical power system to support the plant's accident mitigating systems and components is not affected.

   The proposed changes do not physically alter safety-related systems. There will be no effect on those plant systems necessary to assure the accomplishment of protection functions. There will be no impact on the overpower limit, departure from nucleate boiling limits, loss of cooling accident peak cladding temperature, or any other margin of safety. The applicable radiological dose consequence acceptance criteria will continue to be met.

   Therefore, the proposed change does not involve a significant reduction in a margin of safety.

4.4 Conclusion

Based on the considerations discussed above:

(1) there is reasonable assurance the health and safety of the public will not be endangered by operation in the proposed manner,

(2) such activities will be conducted in compliance with the Commission's regulations, and

(3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 Environmental Considerations

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed change does not involve:

(i) a significant hazards consideration,

(ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or

(iii) a significant increase in individual or cumulative occupational radiation exposure.

Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed change.

6.0 References

(1) NRC Administrative Letter 98-10, Dispositioning of Technical Specifications that are Insufficient to Assure Plant Safety.

(2) NRC Regulatory Guide 1.129, Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Nuclear Power Plants, Revision 1, February 1978.

(3) INPO Experience ID #299289, formerly OE23813, Technical Specification for Safety Related Battery Intercell Connection Resistance Determined to be Non-Conservative (Quad Cities).

(4) IEEE 308-1975, IEEE Criteria for Class IE Electric Systems for Nuclear Power Generating Stations.

(5) IEEE 450-1980, Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations.

(6) IEEE Standard 450-1987, Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations.

(7) IEEE 485-1997, Recommended Practice for Sizing Large Lead Storage Batteries for Generating Stations and Substations.

(8) Electric Power Research Institute (EPRI) Technical Report TR-1 00248, Stationary Battery Guide: Design, Application, and Maintenance, Revision 2.

Attachment 2

MARKED-UP TECHNICAL SPECIFICATIONS PAGE

Virginia Electric and Power Company
(Dominion Energy Virginia)
North Anna Power Station Units 1 and 2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. --------NOTE---------- Separate Condition entry is allowed for each DC subsystem. ---------- One or more required LCO 3.8.4.c DC electrical power subsystem(s) inoperable.	D.1 Declare associated shared component(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify for each required Station and EDG battery, terminal voltage is ≥ 129 V on float charge.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.2	Verify for each required Station and EDG battery, there is no visible corrosion at battery terminals and connectors. OR Verify battery connection resistance is ≤ 1.5E-4 ohm for inter-cell connections, ≤ 1.5E-4 ohm for inter-rack connections, ≤ 1.5E-4 ohm for inter-tier connections, and ≤ 1.5E-4 ohm for terminal connections.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.3	Verify for each required Station and EDG battery, cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	In accordance with the Surveillance Frequency Control Program

AND

Verify total connection resistance for each Station battery is less than or equal to the value listed below.

Total Battery Connection Resistance	
Station Battery	Maximum Allowable Total Battery Connection Resistance
1-I, 1-III, 2-I, 2-III	≤ 2.5E-3 ohm
1-II	≤ 0.9E-3 ohm
1-IV, 2-II, 2-IV	≤ 1.5E-3 ohm

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.4	For each required Station and EDG battery, remove visible terminal corrosion, verify battery cell to cell and terminal connections are clean and coated with anti-corrosion material.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.5	Verify for each required Station and EDG battery, connection resistance is ≤ 1.5E-4 ohm for inter-cell connections, ≤ 1.5E-4 ohm for inter-rack connections, ≤ 1.5E-4 ohm for inter-tier connections, and ≤ 1.5E-4 ohm for terminal connections.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.6	Verify each required Station battery charger supplies ≥ 270 amps at ≥ 125 V for ≥ 4 hours.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.7	Verify each required EDG battery charger supplies ≥ 10 amps at ≥ 125 V for ≥ 4 hours.	In accordance with the Surveillance Frequency Control Program

AND

Verify total connection resistance for each Station battery is less than or equal to the value listed below.

Total Battery Connection Resistance	
Station Battery	Maximum Allowable Total Battery Connection Resistance
1-I, 1-III, 2-I, 2-III	≤ 2.5E-3 ohm
1-II	≤ 0.9E-3 ohm
1-IV, 2-II, 2-IV	≤ 1.5E-3 ohm

Attachment 3

PROPOSED TECHNICAL SPECIFICATIONS PAGE

Virginia Electric and Power Company
(Dominion Energy Virginia)
North Anna Power Station Units 1 and 2

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.2	Verify for each required Station and EDG battery, there is no visible corrosion at battery terminals and connectors. OR Verify battery connection resistance is ≤ 1.5E-4 ohm for inter-cell connections, ≤ 1.5E-4 ohm for inter-rack connections, ≤ 1.5E-4 ohm for inter-tier connections, and ≤ 1.5E-4 ohm for terminal connections. AND Verify total connection resistance for each Station battery is less than or equal to the value listed below.	In accordance with the Surveillance Frequency Control Program

Total Battery Connection Resistance	
Station Battery	Maximum Allowable Total Battery Connection Resistance
1-I, 1-III, 2-I, 2-III	≤ 2.5E-3 ohm
1-II	≤ 0.9E-3 ohm
1-IV, 2-II, 2-IV	≤ 1.5E-3 ohm

SR 3.8.4.3	Verify for each required Station and EDG battery, cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.4	For each required Station and EDG battery, remove visible terminal corrosion, verify battery cell to cell and terminal connections are clean and coated with anti-corrosion material.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.5	Verify for each required Station and EDG battery, connection resistance is ≤ 1.5E-4 ohm for inter-cell connections, ≤ 1.5E-4 ohm for inter-rack connections, ≤ 1.5E-4 ohm for inter-tier connections, and ≤ 1.5E-4 ohm for terminal connections. AND Verify total connection resistance for each Station battery is less than or equal to the value listed below.	In accordance with the Surveillance Frequency Control Program

Total Battery Connection Resistance	
Station Battery	Maximum Allowable Total Battery Connection Resistance
1-I, 1-III, 2-I, 2-III	≤ 2.5E-3 ohm
1-II	≤ 0.9E-3 ohm
1-IV, 2-II, 2-IV	≤ 1.5E-3 ohm

SR 3.8.4.6	Verify each required Station battery charger supplies ≥ 270 amps at ≥ 125 V for ≥ 4 hours.	In accordance with the Surveillance Frequency Control Program
SR 3.8.4.7	Verify each required EDG battery charger supplies ³ 10 amps at ³ 125 V for ³ 4 hours.	In accordance with the Surveillance Frequency Control Program