Dominion Energy Nuclear Connecticut, Inc.
5000 Dominion Boulevard, Glen Allen, VA 23060
DominionEnergy.com

April 30, 2020

Dominion Energy®

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

Serial No. 19-369
NSS&L/TFO: R0
Docket No. 50-423
License No. NPF-49

DOMINION ENERGY NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3
PROPOSED TECHNICAL SPECIFICATIONS CHANGE
BATTERY SURVEILLANCE REQUIREMENTS

Pursuant to 10 CFR 50.90, Dominion Energy Nuclear Connecticut, Inc. (DENC) requests an amendment to Facility Operating License NPF-49 for Millstone Power Station Unit 3 (MPS3). The inter-cell connection resistance value of 150 x 10^{-6} ohm in MPS3 Technical Specification (TS) Surveillance Requirement (SR) 4.8.2.1.b.2 and 4.8.2.1.c.3 for the station batteries is nonconservative if all, or a considerable number, of the connections are at that value since the acceptable total battery resistance value would be exceeded. Therefore, DENC is revising the SRs to add a new acceptance criterion for total battery connection resistance. The new acceptance criterion will confirm that the total battery connector 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. Attachment 2 provides marked-up MPS3 TS pages showing the proposed change. There is no associated TS Bases change.

The proposed amendment does not involve a Significant Hazards Consideration under the standards set forth in 10 CFR 50.92. The basis for this determination is included in Attachment 1. DENC 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 Facility Safety Review Committee has reviewed and concurred with the determinations herein.

DENC requests approval of this license amendment request by April 30, 2021, with implementation within 60 days of issuance.

In accordance with 10 CFR 50.91(b), a copy of this license amendment request is being provided to the State of Connecticut.

If you have any questions or require additional information, please contact Mr. Shayan Sinha at (804) 273-4687.

Sincerely,

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

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Mark D. Sartain, who is Vice President – Nuclear Engineering and Fleet Support of Dominion Energy Nuclear Connecticut, Inc. He has affirmed before me that he is duly authorized to execute and file the foregoing document on 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 30th day of April, 2020.

My Commission Expires: March 31, 2022

Diane E Aitken
Notary Public

DIANE E. AITKEN
NOTARY PUBLIC
REG. #7763114
COMMONWEALTH OF VIRGINIA
MY COMMISSION EXPIRES MARCH 31, 2022

Attachments:

1. Evaluation of Proposed License Amendment
2. Marked-Up Technical Specification Pages

Commitments made in this letter: None

cc: U.S. Nuclear Regulatory Commission
Region I
2100 Renaissance Blvd, Suite 100
King of Prussia, PA 19406-2713

Richard V. Guzman
Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North, Mail Stop 08 C2
11555 Rockville Pike
Rockville, MD 20852-2738

NRC Senior Resident Inspector
Millstone Power Station

Director, Radiation Division
Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

ATTACHMENT 1

EVALUATION OF PROPOSED LICENSE AMENDMENT

DOMINION ENERGY NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3

EVALUATION OF PROPOSED LICENSE AMENDMENT

1.0 SUMMARY DESCRIPTION

Pursuant to 10 CFR 50.90, Dominion Energy Nuclear Connecticut, Inc. (DENC) requests an amendment to Facility Operating License NPF-49 for Millstone Power Station Unit 3 (MPS3). The inter-cell connection resistance value of 150 x 10^{-6} ohm in MPS3 Technical Specification (TS) Surveillance Requirement (SR) 4.8.2.1.b.2 and 4.8.2.1.c.3 for the MPS3 batteries is nonconservative if all, or a considerable number, of the connections are at that value since the acceptable total battery resistance value would be exceeded. Therefore, DENC is revising the SRs to add a new acceptance criterion for total battery connection resistance. The new acceptance criterion will confirm that the total battery connector 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.

2.0 DETAILED DESCRIPTION

2.1 System Design and Operation

The Direct Current (DC) power system has six separate systems, consisting of two normal DC power systems serving non-safety related loads, and four Class 1E DC power systems serving safety related loads.

The DC power systems are each powered by two types of onsite DC sources; lead-calcium batteries and static battery chargers. The lead-calcium batteries are self-contained stored energy sources, and the battery chargers provide DC by rectifying power from the 480 Volt Alternating Current (VAC) buses.

The Class 1E DC power system has sufficient redundancy, capacity, capability, and reliability to supply power to all safety related loads, even in the event of a single failure, by maintaining electrical independence between redundant trains and channels in accordance with General Design Criteria (GDC) 17, 22, 33, 34, 35, 38, 41 and 44. Additionally, GDC 18 applies to battery inter-cell connections related to inspection and testing to ensure continuity of systems and the condition of their components.

During normal operation, the 125 Volt Direct Current (VDC) load is supplied from the battery chargers with the batteries floating on the 125 VDC buses. The four Class 1E batteries are lead-calcium type and are designed for continuous duty. Each battery consists of 60 cells connected in series. Inter-cell and terminal connectors consist of lead-plated copper connectors.

The ampere-hour capacity of each 125 VDC battery is suitable for supplying all connected safety related loads for a minimum of 2 hours without use of the battery chargers. The characteristics of each load, the length of time each load is required, and the basis used to establish the power required for each safety related load, are utilized to establish the combined load demand to be connected to each DC supply during the "worst" operating

conditions. At the end of the 2-hour period, the final battery voltage is a minimum of 1.75 VDC per cell.

2.2 Description of the Proposed Change

The following changes are being proposed to the SRs in TS Section 4.8.2.1, Electrical Power Systems, DC Sources, Operating, which is applicable to the DC electrical sources in modes 1, 2, 3, and 4. These changes also impact TS Section 4.8.2.2, Electrical Power Systems, DC Sources, Shutdown, which is applicable in modes 5 and 6, in that TS SR 4.8.2.2 requires SR 4.8.2.1 be met for the applicable DC battery banks.

Change 1

Current SR 4.8.2.1.b

At the frequency specified in the Surveillance Frequency Control Program and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:

1) The parameters in Table 4.8-2a meet the Category B limits,
2) There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150 x 10^{-6} ohm, and
3) The average electrolyte temperature of six connected cells is above 60°F.

Proposed SR 4.8.2.1.b

At the frequency specified in the Surveillance Frequency Control Program and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:

1) The parameters in Table 4.8-2a meet the Category B limits,
2) There is no visible corrosion at either terminals or connectors, or the connection resistance of ~~these items~~ ***each cell-to-cell and terminal connection*** is less than 150 x 10^{-6} ohm ***and total battery resistance is less than 3700 x 10^{-6} ohm***, and
3) The average electrolyte temperature of six connected cells is above 60°F.

Change 2

Current SR 4.8.2.1.c

At the frequency specified in the Surveillance Frequency Control Program by verifying that:

1) The cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration,
2) The cell-to-cell and terminal connections are clean, tight, and coated with anticorrosion material,
3) The resistance of each cell-to-cell and terminal connection is less than or equal to 150 x 10^{-6} ohm, and
4) Each battery charger will supply at least the amperage indicated in Table 4.8-2b at greater than or equal to 132 volts for at least 24 hours.

Proposed SR 4.8.2.1.c

At the frequency specified in the Surveillance Frequency Control Program by verifying that:

1) The cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration,
2) The cell-to-cell and terminal connections are clean, tight, and coated with anticorrosion material,
3) The resistance of each cell-to-cell and terminal connection is less than ~~or equal to~~ 150 x 10^{-6} ohm ***and total battery resistance is less than 3700 x 10^{-6} ohm***, and
4) Each battery charger will supply at least the amperage indicated in Table 4.8-2b at greater than or equal to 132 volts for at least 24 hours.

Effect of Changes on SR 4.8.2.2

SR 4.8.2.2

TS SR 4.8.2.2 requires one train of batteries and its associated charger to be operable in modes 5 and 6. The associated SR 4.8.2.2 states the following:

> The above required train shall be demonstrated OPERABLE in accordance with Specification 4.8.2.1.

Therefore, Changes 1 and 2 for SR 4.8.2.1.b and 4.8.2.1.c are also applicable to SR 4.8.2.2 in modes 5 and 6.

A markup of the proposed TS changes is provided in Attachment 2. There are no associated TS Bases changes.

2.3 Reason for Proposed Change

Operating Experience (OE) item OE 23813 for Quad Cities, dated November 28, 2006, identified an issue concerning potentially non-conservative surveillance values for battery connection resistance in TS. DENC performed a review of MPS3 battery voltage verification calculations and determined that no provisions were included to accommodate the inter-cell resistances involved in the construction of the sixty (60) cell battery bank. Therefore, it is a conservative assumption that the battery intercell connection resistance was not taken into consideration in the battery duty cycle voltage verification. The inter-cell connection resistance value of 150 x 10^{-6} ohm (micro-ohm) in TS SR 4.8.2.1.b.2 and 4.8.2.1.c.3 for the MPS3 batteries is nonconservative if all, or a considerable number, of the connections are at that value since the acceptable total battery resistance value would be exceeded. In accordance with Nuclear Regulatory Commission's Administrative Letter 98-10 (Reference 6.1), DENC is revising these SRs to add a new acceptance criterion 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 Final Safety Analysis Report (FSAR) section 8.3.2. The MPS3 DC power system has six separate systems which include two normal DC power systems serving non-safety related loads, and four Class 1E DC power systems serving safety related loads. The DC power systems are each powered by two types of onsite DC sources, consisting of lead-calcium batteries and static battery chargers. The lead-calcium batteries are self-contained stored energy sources, and the battery chargers provide DC power by rectifying power from the 480 VAC buses.

The Class 1E 125 VDC power system is a safety related, two-wire, ungrounded bus system, divided into four separate channels as described in FSAR section 8.3.2.1.2. Two of the DC power system channels (batteries 301A-2 and 301B-2) exclusively supply the associated regulated 120 VAC vital bus loads, and the other two channels (batteries 301A-1 and 301B-1) supply safety related DC loads in addition to the associated regulated 120 VAC load. Each channel consists of one operating battery charger, one 125 VDC battery, and one distribution switchboard. The power source for each channel is supplied from either its associated battery charger or battery. The battery charger is powered from the associated train emergency 480 VAC bus. A spare battery charger is shared by two channels of the same train.

During normal operation, the 125 VDC load is supplied from the battery chargers with the batteries floating on the 125 VDC buses. On a loss of AC power to the battery chargers, the DC load is supplied from the batteries. Power is available to these DC loads for a period of 2 hours. After 2 hours, it is assumed that AC power is either restored or that the emergency generators are available to energize the battery chargers. The Class 1E battery chargers are described in FSAR Section 8.3.2.1.2.1.

3.1.2 Class 1E Batteries

Each of the four 125 VDC Class 1E batteries is a 60-cell lead-calcium battery designed for continuous duty, manufactured by GNB. Batteries 301A-1 and 301B-1 are model number NCN-27. Batteries 301A-2 and 301B-2 are model number NCN-11. The ampere-hour capacity of each battery is suitable for supplying all connected safety related loads for a minimum or 2 hours without the use of the battery chargers. At the end of the 2-hour period, the final battery voltage is a minimum of 1.75 VDC 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 IE Power Systems for Nuclear Power Generating Stations" (Reference 6.2) and GDC 17, "Electric Power Systems". The batteries are sized using the methods from IEEE standard 485 (Reference 6.8). The reliability of the batteries is assured by periodic discharge testing at a frequency specified by the MPS2 Surveillance Frequency Control Program and maintenance in accordance with IEEE standard 450, "Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations" (References 6.3 and 6.4). The performance and service tests comply with Regulatory Guide 1.129 (Reference 6.5). The batteries are seismically qualified and are mounted on Seismic Category I battery racks.

The battery inter-cell and terminal connectors are lead-plated copper. Each battery voltage level is continuously monitored and displayed in the control room. FSAR Table 8.1-2 describes the industry standards related to the DC power system. Additional battery and battery rack details are described in FSAR Sections 8.3.2.1.2.2 and 8.3.2.1.2.3. Battery location in the plant and ventilation of these areas is also discussed in FSAR Section 8.3.2.

3.2 Technical Analysis

3.2.1 Battery Resistance Evaluation

The proposed amendment seeks to correct a non-conservative TS by revising the inter-cell and interconnection resistance value listed in SR 4.8.2.1.b, and 4.8.2.1.c. A high connection resistance value is an indication of an additional battery impedance due to loose connection fittings, improper mating surfaces, connector corrosion, or material degradation. In the worst-case condition, a majority of the inter-cell and inter-connection

resistances at the bounding value could result in a total impedance value that would challenge the safety related battery loading profile due to increased voltage drops.

A technical evaluation (Reference 6.6) was completed to identify the maximum allowable connection resistance values that would ensure the duty profiles are maintained as designed. Resistance sources in the battery setup include plate-to-post connections, inter-cell connections, and cabling connections. As noted previously, the model numbers for the MPS3 batteries are NCN-11 for batteries 301A-2 and 301B-2 and NCN-27 for batteries 301A-1 and 301B-1. Two models are needed due to the design loading on each battery bus. The larger battery model, NCN-27, was used to determine the bounding resistance value due to having more posts and connections. Using the typical 60-cell configuration, including inter-tier and inter-rack cables, a combined resistance value was determined. To ensure additional margin, a safety factor of 1.25 was applied to the total 60-cell resistance value to allow for variation of the inter-cell, inter-tier, and inter-rack connections.

The total allowable battery inter-cell impedance was determined to be 4764 micro-ohm. However, because surveillance procedure C SP 760, "Battery Discharge Test" (Reference 6.7) monitors only the plate-to-post and inter-cell connections and does not include the resistance from the inter-tier and inter-rack cabling (which have a total calculated impedance of 870 micro-ohm), the new calculated bounding acceptance criteria value is 3894 micro-ohm. For additional conservative margin, the new TS SR limit for total inter-cell resistance will be 3700 micro-ohm. By supplementing the surveillance to confirm that individual cell resistances are below 150 micro-ohm with a requirement to verify a conservative bounding total of 3700 micro-ohm, the battery functionality (including voltage) will not be challenged by one or multiple resistances approaching the 150 micro-ohm value. Therefore, a revision to the 150 micro-ohm criteria value in the MPS3 TS SRs is not required.

To ensure full functionality of the battery and associated loads with the new total allowable battery inter-cell impedance of 4764 micro-ohm, the most conservative battery draw and associated voltage drop was verified against the load profiles to ensure all battery minimum voltage requirements would be met. The primary bounding event for batteries is Loss of Onsite Power (LOP), but the calculations supporting the technical evaluation (Reference 6.6) also reviewed the normal and emergency operation loading as part of the sizing verification. The new voltage profile was evaluated as acceptable using the same initial conditions, limiting operation assumptions, and accounts of additional conservative margins in the current MPS3 battery profile calculations. Furthermore, a work order history review was performed to ensure that the recorded minimum battery voltages were acceptable during plant surveillance battery discharge testing. The final evaluation results for MPS3 battery banks 1 through 4 have ensured that the battery banks remain fully capable of meeting design function requirements with the new conservative bounding total impedance.

For the purposes of updating the MPS3 TSs, the new bounding acceptance criteria of 3700 x 10^{-6} ohm will be used. This ensures alignment of the total value with the measurements performed under procedure C SP 760, including a safety factor margin, and is verified to be acceptable for all battery profile loads.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

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

GDC 17 - Electric Power Systems

10 CFR 50, Appendix A, General Design Criterion (GDC) 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 additionally notes 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."

Revision of the SRs as herein proposed does not affect compliance with GDC 17.

GDC 18 - Inspection and Testing of Electric Power Systems

10 CFR 50, Appendix A, GDC 18 for inspection and testing of electric power systems requires that "electric power systems important to safety 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."

Revision of the SRs as herein proposed does not affect compliance with GDC 18.

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."

Revision of the SRs will ensure that the MPS3 DC Systems are able to perform their safety related functions. Thus, the Limiting Condition for Operation (LCO) will continue to be met.

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)."

Revision of the SRs as herein proposed do not affect compliance with 10 CFR 50.63.

10 CFR 50.65

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

Revision of the SRs as herein proposed will not affect compliance with 10 CFR 50.65. The batteries and other components of the DC electric power system continue to be within the scope of 10 CFR 50.65.

Conclusion

The proposed change does not adversely affect MPS3 compliance with the applicable regulatory requirements or criteria.

4.2 Precedent

1. 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]
2. QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2 - Issuance of Amendments Regarding (TAC Nos. MF4589 AND MF4590), dated March 30, 2015 [ML15056A772]

4.3 Significant Hazards Consideration

Pursuant to 10 CFR 50.90, Dominion Energy Nuclear Connecticut, Inc. (DENC) requests an amendment to Facility Operating License NPF-49 for Millstone Power Station Unit 3 (MPS3). The inter-cell connection resistance value of 150×10^{-6} ohm in MPS3 Technical Specification (TS) Surveillance Requirement (SR) 4.8.2.1.b.2 and 4.8.2.1.c.3 for the MPS3 batteries is nonconservative if all, or a considerable number, of the connections are at that value since the acceptable total battery resistance value would be exceeded. Therefore, DENC is revising the SRs to add a new acceptance criterion for total battery connection resistance. The new acceptance criterion will confirm that the total battery connector resistance is within preestablished limits, and will ensure that the

batteries can perform their specified safety function by maintaining required battery terminal voltage under design-basis load conditions.

DENC has evaluated whether a significant hazards consideration is involved with the proposed changes by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed 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 Direct Current (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 of the battery inter-cell 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 that involves any of the safety related batteries or associated equipment powered by these batteries.

   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 of the battery inter-cell resistance required to ensure that the batteries can 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.

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 of the battery inter-cell 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.

   The proposed change does not involve a significant reduction in a margin of safety.

4.4 Conclusions

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 CONSIDERATION

A review has determined that the proposed change 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

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

6.2 Institute of Electrical and Electronics Engineers, IEEE Standard 308, Standard Criteria for Class IE Power Systems for Nuclear Power Generating Stations, 1975.

6.3 Institute of Electrical and Electronics Engineers, IEEE Standard 450, Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations, 1975.

6.4 Institute of Electrical and Electronics Engineers, IEEE Standard 450, Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations, 1980.

6.5 Regulator Guide 1.129, Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Nuclear Power Plants, Revision 1, February 1978.

6.6 ETE-MP-2019-1083, "MP3 Non-Conservative Battery Intercell Resistance Evaluation."

6.7 C SP 760, "Battery Discharge Test," Millstone Power Station Surveillance Procedure, Rev. 13.

6.8 Institute of Electrical and Electronics Engineers, IEEE Standard 485, IEEE Recommended Practice for Sizing Lead-Acid Batteries for Stationary Applications, 1997.

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

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ATTACHMENT 2

MARKED-UP TECHNICAL SPECIFICATION PAGES

DOMINION ENERGY NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3

For Information Only

February 25, 2014

ELECTRICAL POWER SYSTEMS

3/4.8.2 D.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.1 As a minimum, the following D.C. electrical sources shall be OPERABLE:

a. 125-volt Battery Bank 301A-1, and an associated full capacity charger,

b. 125-volt Battery Bank 301A-2, and an associated full capacity charger,

c. 125-volt Battery Bank 301B-1 and an associated full capacity charger, and

d. 125-volt Battery Bank 301B-2 and an associated full capacity charger.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With either Battery Bank 301A-1 or 301B-1, and/or one of the required full capacity chargers inoperable, restore the inoperable battery bank and/or full capacity charger to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With either Battery Bank 301A-2 or 301B-2 inoperable, and/or one of the required full capacity chargers inoperable, restore the inoperable battery bank and/or full capacity charger to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.8.2.1 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

a. At the frequency specified in the Surveillance Frequency Control Program by verifying that:

1) The parameters in Table 4.8-2a meet the Category A limits, and

2) The total battery terminal voltage is greater than or equal to 129 volts on float charge.

ohm and total battery resistance is less than 3700 x 10^{-6} ohm, and

b. At the frequency specified in the Surveillance Frequency Control Program and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:

each cell-to-cell and terminal connection

1) The parameters in Table 4.8-2a meet the Category B limits.

2) There is no visible corrosion at either terminals or connectors, or the connection resistance of ~~these items~~ is less than 150 x 10^{-6} ~~ohm, and~~

3) The average electrolyte temperature of six connected cells is above 60°F.

c. At the frequency specified in the Surveillance Frequency Control Program by verifying that:

1) The cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration.

2) The cell-to-cell and terminal connections are clean, tight, and coated with anticorrosion material.

ohm and total battery resistance is less than 3700 x 10^{-6} ohm, and

3) The resistance of each cell-to-cell and terminal connection is less than ~~or equal to~~ 150 x 10^{-6} ~~ohm, and~~

4) Each battery charger will supply at least the amperage indicated in Table 4.8-2b at greater than or equal to 132 volts for at least 24 hours.

d. At the frequency specified in the Surveillance Frequency Control Program, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test;

e. At the frequency specified in the Surveillance Frequency Control Program, during shutdown, by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test may be performed in lieu of the battery service test required by Specification 4.8.2.1d.; and

f. At least once per 18 months, during shutdown, by giving performance discharge tests of battery capacity to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.

For Information Only

3/09/92

TABLE 4.8-2B
BATTERY CHARGER CAPACITY

CHARGER	AMPERAGE
301A-1	200
301A-2	50
301A-3	200
301B-1	200
301B-2	50
301B-3	200

For Information Only

3/09/92

TABLE 4.8-2A
BATTERY SURVEILLANCE REQUIREMENTS

PARAMETER	CATEGORY A(1)	CATEGORY B(2)	
	LIMITS FOR EACH DESIGNATED PILOT CELL	LIMITS FOR EACH CONNECTED CELL	ALLOWABLE(3) VALUE FOR EACH CONNECTED CELL
Electrolyte Level	>Minimum level indication mark, and ≤ ¼" above maximum level indication mark	>Minimum level indication mark, and ≤ ¼" above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts(6)	> 2.07 volts
Specific Gravity(4)	≥ 1.200(5)	≥ 1.195	Not more than 0.020 below the average of all connected cells
		Average of all connected cells ≥ 1.205	Average of all connected cells ≥ 1.195(5)

TABLE NOTATIONS

(1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.

(2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.

(3) Any Category B parameter not within its allowable value indicates an inoperable battery.

(4) Corrected for electrolyte temperature and level.

(5) Or battery charging current is less than 2 amps when on charge.

(6) Corrected for average electrolyte temperature.