NEXTera® ENERGY SEABROOK

July 28, 2017

10 CFR 50.90

SBK-L-17081

Docket No. 50-443

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

Seabrook Station

License Amendment Request 17-02

Change to the Technical Specifications Requirement for DC Batteries

Pursuant to 10 CFR 50.90, NextEra Energy Seabrook, LLC (NextEra) is submitting License Amendment Request (LAR) 17-02 to revise the Seabrook Station Technical Specifications (TS). The proposed change revises the TS requirement for DC batteries. The current TS require two 100% capacity batteries for operability of a train of DC electrical sources. NextEra proposes to revise the TS requirement such that a DC electrical train is operable with one 100% capacity battery aligned to both DC buses in the associated electrical train. The change also removes a footnote associated with a surveillance requirement.

The enclosure to this letter provides NextEra's evaluation of the proposed change. Attachment 1 to the enclosure provides markups of the TS showing the proposed changes, and Attachment 2 contains markups showing proposed changes to the TS Bases. The proposed changes to the TS Bases are provided for information only and will be implemented in accordance with the TS Bases Control Program upon implementation of the amendment. Retyped TS pages containing the proposed changes will be provided when requested by the NRC Project Manager.

As discussed in the evaluation, the proposed changes do not involve a significant hazards consideration pursuant to 10 CFR 50.92, and there are no significant environmental impacts associated with the change.

The Station Operation Review Committee has reviewed the proposed license amendment. In accordance with 10 CFR 50.91(b) (1), a copy of this letter is being forwarded to the designee of the State of New Hampshire.

There are no new or revised commitments made in this submittal.

NextEra requests NRC review and approval of this license amendment request by August 1, 2018 and implementation within 90 days.

Should you have any questions regarding this letter, please contact Mr. Ken Browne, Licensing Manager, at (603) 773-7932.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on July 28, 2017

Sincerely,

Eric McCartney
Regional Vice President - Northern Region
NextEra Energy

Enclosure: Evaluation of the Proposed Change

cc: NRC Region I Administrator
NRC Project Manager
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Enclosure

NextEra Energy Seabrook's Evaluation of the Proposed Change

Subject: Change to the Technical Specifications Requirement for DC Batteries

Evaluation of the Proposed Change

1.0 SUMMARY DESCRIPTION

NextEra Energy Seabrook, LLC (NextEra) is submitting License Amendment Request (LAR) 17-02 to revise the Seabrook Station Technical Specification (TS). The proposed change revises the TS requirement for DC batteries. The current TS require two 100% capacity batteries for operability of a train of DC electrical sources. NextEra proposes to revise the TS requirement such that a DC electrical train is operable with one 100% capacity battery aligned to both DC buses in the associated electrical train. The change also removes a footnote associated with a surveillance requirement.

2.0 DETAILED DESCRIPTION

2.1 System Design and Operation

The DC power system is comprised of the battery chargers, station batteries, and the 125V distribution system. The safety-related portion of the station DC power system consists of four 125-volt batteries, chargers, and DC buses. Each bus is normally aligned to its own battery and battery charger. The battery chargers provide the normal steady-state DC power; the station batteries provide for normal transient loads and act as the reserve source upon failure of the AC supply to the battery chargers. The loads supplied from the DC buses include inverters for redundant vital instrument buses, distribution panels for power to the Class 1E direct current loads, power for control and operation of the Class 1E systems for engineered safety features, and power for selected non-Class 1E loads.

Each battery, which is housed in an individual room in the seismic Category I control building, has its own charger and DC bus. The battery chargers and DC buses in each train are located in an area adjacent to their associated battery rooms and are physically separated from the chargers and buses associated with the redundant train.

Each safety-related battery is sized to supply its safety-related and non-safety-related loads for the required durations specified in the Updated Final Safety Analyses Report. In addition, each safety-related battery is sized to have sufficient capacity to serve as the source for the two DC buses in the associated train for the required duration. The worst-case battery loading occurs when the diesel generator fails to load, i.e., the diesel generator fails to start, the diesel generator circuit breaker fails to close, or the breaker closes but subsequently trips, and the batteries continue to supply the DC loads while AC power is unavailable to the battery chargers. The safety-related batteries also have sufficient capacity for the four-hour station blackout coping duration. The station blackout battery sizing evaluation includes the configuration of one battery supplying both electrical buses.

2.2 Current TS Requirements

- TS 3.8.2.1, DC Sources - Operating, requires two trains of DC sources in Modes 1 through 4 as shown below:

  a. Train A

  1) 125-volt Battery Banks 1A and 1C,

  2) One full-capacity battery charger on Bus #11A, and

  3) One full-capacity battery charger on Bus #11C.

  b. Train B

  1) 125-volt Battery Banks 1B and 1D,

  2) One full-capacity battery charger on Bus #11B, and

  3) One full-capacity battery charger on Bus #11D.

- Surveillance requirement (SR) 4.8.2.1.b 2 requires:

  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

- Surveillance requirement (SR) 4.8.2.1.c 3 requires:

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

- SR 4.8.2.1 includes a footnote *:

  * Obtained by subtracting the normal resistance of: (1) the cross room rack connector (210 x 10-6 ohm, typical) and (2) the bi-level rack connector (35 x 10-6 ohm, typical) from the measured cell-to-cell connection resistance.

- TS 3.8.2.2, DC Sources - Shutdown, requires one operable DC train in Modes 5 and 6:

  3.8.2.2 As a minimum, two 125-volt battery banks in one D.C. Train and the associated full-capacity chargers shall be OPERABLE

- TS 3.8.3.1, Onsite Power Distribution - Operating, requires two trains of energized DC buses in Modes 1 through 4 as shown below:

  i. Train A, 125-volt D.C. Busses consisting of:

  1) 125-volt D.C. Bus #11A energized from Battery Bank 1A* or 1C*, and

  2) 125-volt D.C. Bus #11C energized from Battery Bank 1C* or 1A*.

  j. Train B, 125-volt D.C. Busses consisting of:

  1) 125-volt D.C. Bus #11B energized from Battery Bank 1B* or 1D*, and

  2) 125-volt D.C. Bus #11D energized from Battery Bank 1D* or 1B*.

- TS 3.8.3.2, Onsite Power Distribution - Shutdown, requires one operable DC train in Modes 5 and 6:

    d. Two 125-volt D.C. buses (in the same train) energized from their associated battery banks.

2.3 Reason for the Proposed Change

The current TS, which require 200% battery capacity for operability of each DC electrical train, are unnecessarily restrictive. A single battery has the electrical capacity to supply 100% of the load requirements of both DC electrical buses within the train. Therefore, NextEra is proposing this change to revise the TS requirement such that a DC electrical train is operable with one 100% capacity battery aligned to both DC buses in the associated electrical train. The requested change will provide additional flexibility by revising the unnecessarily restrictive TS that currently requires extra redundancy.

2.4 Description of the Proposed Change

1. The Limiting Condition for Operation (LCO) in TS 3.8.2.1, D.C. Sources - Operating, is revised as shown below:

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

    a. Train A

        1) 125-volt Battery Bank~~s~~ 1A ~~and~~ ***or*** 1C,
        2) One full-capacity battery charger on Bus #11A, and
        3) One full-capacity battery charger on Bus #11C.

    b. Train B

        1) 125-volt Battery Bank~~s~~ 1B ~~and~~ ***or*** 1D,
        2) One full-capacity battery charger on Bus #11B, and
        3) One full-capacity battery charger on Bus #11D.

2. Action a in TS 3.8.2.1 is revised as shown below:

    a. ~~With one of the required battery banks in one train inoperable, close the bus tie to connect the remaining operable battery bank to the D.C. bus supplied by the inoperable battery bank within 2 hours; restore the inoperable battery bank to OPERABLE status within 30 days~~* ***With the required battery bank in one train inoperable, restore the battery bank 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.

3. The footnote in TS 3.8.2.1 is deleted:

    ~~*No more than one battery at a time may be taken out of service for more than 30 days.~~

4. The Limiting Condition for Operation (LCO) in TS 3.8.2.2, D.C. Sources - Shutdown, is revised as shown below:

   3.8.2.2 As a minimum, ~~two~~ ***one*** 125-volt battery bank~~s~~ in one D.C. Train and the ***two*** associated full-capacity chargers shall be OPERABLE.

5. The footnote in SR 4.6.2.1 is deleted:

   ~~* Obtained by subtracting the normal resistance of: (1) the cross room rack connector (210 x 10-6 ohm, typical) and (2) the bi-level rack connector (35 x 10-6 ohm, typical) from the measured cell-to-cell connection resistance.~~

6. The reference to the footnote is deleted from SR 4.8.2.1.b 2:

   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

7. The reference to the footnote is deleted from SR 4.8.2.1.c 3:

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

8. The Actions in TS 3.8.2.2 are revised as shown below:

   ~~a. With one of the required battery banks inoperable, immediately close the bus tie to the alternate OPERABLE battery.~~

   ~~b.~~***a.*** With ~~both required battery banks and/or full-capacity chargers inoperable~~ ***less than one battery bank and two chargers in one DC train OPERABLE***, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, or movement of irradiated fuel; initiate corrective action to restore the required battery bank~~s~~ and full-capacity chargers to OPERABLE status as soon as possible, and within 8 hours, depressurize and vent the Reactor Coolant System through a 1.58-square-inch vent.

9. The LCO in TS 3.8.3.1, Onsite Power Distribution - Operating, is revised as shown below to delete the asterisks:

   3.8.3.1 The following electrical busses shall be energized in the specified manner:

   i. Train A, 125-volt D.C. Busses consisting of:

   1) 125-volt D.C. Bus #11A energized from Battery Bank 1A~~*~~ or 1C~~*~~, and
   2) 125-volt D.C. Bus #11C energized from Battery Bank 1C~~*~~ or 1A~~*~~.~~.~~

   j. Train B, 125-volt D.C. Busses consisting of:

   1) 125-volt D.C. Bus #11B energized from Battery Bank 1B~~*~~ or 1D~~*~~, and
   2) 125-volt D.C. Bus #11D energized from Battery Bank 1D~~*~~ or 1B~~*~~.

10. Action c in TS 3.8.3.1 is revised as shown below:

    c. With one D.C. bus not energized from ~~its associated~~ ***an OPERABLE*** battery bank, reenergize the D.C. bus from ~~its associated~~ ***an OPERABLE*** battery bank ~~or close the bus tie to the alternate OPERABLE battery of the same train~~ within 2 hours~~*~~ or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

11. The footnote in TS 3.8.3.1 is deleted:

    ~~*No more than one Batter Bank (1A, 1B, 1C, or 1D) at a time may be taken out of service for more than 30 days.~~

12. The LCO in TS 3.8.3.2, Onsite Power Distribution - Shutdown, is revised as shown below:

    3.8.3.2 As a minimum, the following electrical buses shall be energized in the specified manner:

    d. Two 125-volt D.C. buses (in the same train) energized from ~~their~~ ***the*** associated battery bank~~s~~.

3.0 TECHNICAL EVALUATION

The current TS require two 100% capacity batteries for operability of a train of DC electrical sources. NextEra proposes to revise the TS requirement such that a DC electrical train is operable with one 100% capacity battery.

Each independent, redundant DC electrical train includes two batteries, two battery chargers, and two electrical buses. Although each bus is normally aligned to its own battery and battery charger, the system design provides for aligning a single battery to supply both electrical buses with one battery out of service. When operating in this configuration, the single battery has the electrical capacity to supply 100% of the load requirements of both DC electrical buses within the train. Therefore, with each DC electrical train supplied by a single battery bank, each train maintains the capability to provide 100% of the required capacity.

The proposed change modifies the LCO in TS 3.8.2.1 and 3.8.2.2 to require a minimum of one battery in each DC electrical train. Because of this change, the Actions and footnotes that address a 30-day completion time for restoring an inoperable battery are no longer applicable and are deleted. With the one required battery in a train inoperable, the Actions provide a two-hour completion time to restore the inoperable battery to operable status.

While one battery is capable of supplying the load requirements of one train, two battery chargers are required in each train to support the loads on the DC buses and charge the battery. Accordingly, the LCO in TS 3.8.2.1 continues to require two battery chargers in each train, and the LCO in TS 3.8.2.2 is modified to require two battery chargers in the one required DC train.

The regulation at 10 CFR 50.36(c)(2), *Technical specifications*, requires that the TS include LCOs, which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. The lowest functional capability of a train of TS-required equipment is that the equipment must have the ability to perform its specified safety function. Each DC electrical train maintains full capability to perform its safety function with one battery bank supplying both electrical buses. Therefore, the LCO for DC electrical sources is met with one battery bank per train. Although each train is provided with two 100% capacity batteries, 200% capacity in one DC electrical train is not needed to provide the minimum capability or to meet the performance levels required for safe operation of the facility. Moreover, with each DC electrical train capable of supplying 100% of the load requirements for the required duration with a single battery bank aligned to both electrical buses, the loss of a DC electrical train does not prevent fulfillment of the safety function of the DC power system. The availability of two independent, redundant DC electrical trains with a 100% capacity battery in each train ensures the system's ability to perform its safety function in the event of a single failure.

Standard TS (STS) 3.8.4, DC Sources - Operating, in NUREG-1431, Standard Technical Specifications - Westinghouse Plants [Reference 1], requires two trains of DC electrical power, similar to Seabrook TS 3.8.2.1. STS 3.8.4 requires that each train of DC electrical power has 100% battery capacity. The Bases for STS 3.8.4 discuss, in part, that each subsystem consists of [two] 125 VDC batteries [(each battery [50] % capacity)]. Consistent with STS 3.8.4, the proposed change modifies the LCO to require that each train has 100% battery capacity. In addition, the proposed changes to the Actions are consistent with the Actions in STS 3.8.4, which require restoration of inoperable batteries in one train within two hours. As discussed in the Standard Review Plan, TS change requests for facilities with TS based on previous STS (NUREG-0452, Westinghouse Plants) [Reference 2], should comply with comparable provisions in current STS NUREGs to the extent possible, or justify deviations from the STS. The proposed changes are consistent with the requirements in the current STS.

SR 4.8.2.1 includes a footnote that provides guidance and typical resistance values for determining battery connection resistances. NextEra proposes to delete this footnote from the TS because the footnote only provides guidance related to performing the SR while the SRs themselves (4.6.2.1.b2 and 4.6.2.1.c3) establish acceptance criteria for confirming operability of the batteries. The footnote provides a level of detail that is more appropriately suited for inclusion in maintenance procedures than in the TS. In addition, neither NUREG-0452, the standard TS on which the Seabrook TS are based, nor the TS in NUREG-1431, Standard Technical Specifications Westinghouse Plants, contain a similar note regarding performing the SR for obtaining battery resistance values. Therefore, NextEra concludes that elimination of the footnote is appropriate.

The proposed amendment includes an editorial change to the LCO in TS 3.8.2.1 that deletes the words *and energized.* No need exists to stipulate that the DC electrical sources required to be operable must also be energized. The electrical sources must be energized to perform their specified functions and this is adequately covered under the TS definition of operability. Further, TS 3.8.3.1 provides the requirements for electrical buses that must be energized. Therefore, the additional words *and energized* are redundant. This change aligns the LCO in TS 3.8.2.1 more closely with STS 3.8.4 in NUREG-1431.

Conclusion

NextEra has determined that the proposed change is acceptable because the revised LCO will ensure that each DC electrical train maintains the capability to perform its specified safety function. One battery in each DC electrical train has sufficient capacity to handle the full load requirements of both Class 1E DC buses within its associated electrical train. In addition, the proposed change is consistent with NUREG-1431.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

- 10 CFR 50.36 Technical specifications - provides the requirements for the contents of the technical specifications. Section (c)(2), Limiting conditions for operation, states that limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility.

- Appendix A to Part 50—General Design Criteria for Nuclear Power Plants, Criterion 17 - Electric power systems - requires that an onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The onsite electric power supplies, including the batteries, and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure.

- Regulatory Guide 1.6, Independence Between Redundant Standby (Onsite) Power Sources and Between Their Distribution Systems (Safety Guide 6) - describes an acceptable degree of independence between redundant standby (onsite) power sources and between their distribution systems.

- Regulatory Guide 1.155, Station Blackout - the design is consistent with the requirements of this Regulatory Guide. The safety-related station batteries have sufficient capacity for the four-hour Station Blackout coping duration.

The proposed change is consistent with the above regulatory requirements and criteria.

4.2 Precedent

The NRC approved License Amendment 1 [References 3 and 4] for Seabrook in December 1990. The amendment revised certain surveillance requirements related to battery service test and discharge test to remove the phrase "during shutdown" from the surveillance requirements. In the safety evaluation for the amendment, the NRC staff concluded: *since one battery in each train has sufficient capacity to handle the full 100% load requirements of both Class 1E DC buses within its electrical train, performance of the surveillance testing at power with one battery removed from service will not decrease the functional capability of the Seabrook DC system below the level currently allowed by the Technical Specifications. With a battery bank removed from service, the affected train continues to meet assumed 100% capacity.*

The NRC previously approved changes to the Seabrook TS that removed unnecessarily restrictive TS requirements for systems designed with extra redundancy. Amendment 32 [Reference 5] approved changes that removed requirements for the service water and component cooling water systems to have two 100% capacity pumps in each train.

4.3 No Significant Hazards Consideration

The proposed change revises the TS requirement for DC batteries. The current TS require two 100% capacity batteries for operability of a train of DC electrical sources. NextEra proposes to revise the TS requirement such that a DC electrical train is operable with one 100% capacity battery aligned to both DC buses in the associated electrical train. The change also removes an unnecessary footnote associated with a surveillance requirement.

NextEra has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10CFR50.92, "Issuance of Amendment," as discussed below:

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

   Response: No.

   The technical specification (TS) limiting conditions for operation and required actions associated with the proposed changes to the TS are not initiators of any accidents previously evaluated, so the probability of accidents previously evaluated is unaffected by the proposed changes. The proposed change does not alter the design, function, or operation of any plant structure, system, or component (SSC). The capability of any operable TS-required SSC to perform its specified safety function is not impacted by the proposed change. As a result, the outcomes of accidents previously evaluated are unaffected. Therefore, the proposed changes do not result in a significant increase in the probability or consequences of an accident previously evaluated.

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

   Response: No

   The proposed change does not challenge the integrity or performance of any safety-related systems. No plant equipment is installed or removed, and the changes do not alter the design, physical configuration, or method of operation of any plant SSC.

   No physical changes are made to the plant, so no new causal mechanisms are introduced. Therefore, the proposed changes to the TS do not create the possibility of a new or different kind of accident from any accident previously evaluated.

   The proposed change does not challenge the integrity or performance of any safety-related systems. No plant equipment is installed or removed, and the changes do not alter the design, physical configuration, or method of operation of any plant SSC. No physical changes are made to the plant, so no new causal mechanisms are introduced. Therefore, the proposed changes to the TS do not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   Response: No.

   The ability of any operable SSC to perform its designated safety function is unaffected by the proposed changes. The proposed changes do not alter any safety analyses assumptions, safety limits, limiting safety system settings, or method of operating the plant. The changes do not adversely affect plant operating margins or the reliability of equipment credited in the safety analyses. With the proposed change, each DC electrical trains remains fully capable of performing its safety function. Therefore, the proposed changes do not involve a significant reduction in the margin of safety.

Based on the above, NextEra concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10CFR50.92(c) and, accordingly, a finding of "no significant hazards consideration" is justified.

4.4 Conclusion

In conclusion, based on the considerations above, (1) there is reasonable assurance that 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 general public.

5.0 ENVIRONMENTAL CONSIDERATION

NextEra has evaluated the proposed amendment for environmental considerations. The 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 10CFR20, or would change an inspection or surveillance requirement. However, the proposed amendment 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 amendment 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 needs to be prepared in connection with the proposed amendment.

6.0 REFERENCES

1. NUREG-1431, Standard Technical Specifications - Westinghouse Plants, Revision 4, April 2012
2. NUREG-0452, Standard Technical Specifications for Westinghouse Pressurized Water Reactors, Revision 4, 1981
3. NRC letter "Issuance of Amendment No. 2 to Facility Operating License No. NPF-86 - Seabrook Station, Unit No. 1 (TAC No. 77860)," December 6, 1990 (ML 011830176)
4. NRC letter "Correction to Amendment No. 2 to Facility Operating License No. DPR-86," July 30, 1990 (ML 011830181)
5. NRC letter "Amendment 32 to Facility Operating License NPF-86: Primary Component Cooling Water System Operability Requirements - License Amendment Request 93-01 and Service Water System/Ultimate Heat Sink Operability Requirements - License Amendment Request 93-02 (TAC M85491 and M85750)," October 5, 1994

Attachment 1

Markup of the Technical Specifications

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 ~~and energized~~:

a. Train A

or

1) 125-volt Battery Bank~~s~~ 1A ~~and~~ 1C,
2) One full-capacity battery charger on Bus #11A, and
3) One full-capacity battery charger on Bus #11C.

b. Train B

or

1) 125-volt Battery Bank~~s~~ 1B ~~and~~ 1D,
2) One full-capacity battery charger on Bus #11B, and
3) One full-capacity battery charger on Bus #11D.

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

With the required battery bank in one train inoperable, restore the battery bank to OPERABLE status within 2 hours

ACTION:

a. ~~With one of the required battery banks in one train inoperable, close the bus tie to connect the remaining operable battery bank to the D.C. bus supplied by the inoperable battery bank within 2 hours; restore the inoperable battery bank to OPERABLE status within 30 days*~~ or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one of the full-capacity chargers inoperable, restore the inoperable 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.

SURVEILLANCE REQUIREMENTS

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

a. In accordance with the Surveillance Frequency Control Program by verifying that:

1) The parameters in Table 4.8-2 meet the Category A limits, and
2) The total battery terminal voltage is greater than or equal to 128 volts on float charge.

b. In accordance with 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:

~~*No more than one battery at a time may be taken out of service for more than 30 days.~~

4.8.2.1b (Continued)

1) The parameters in Table 4.8-2 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 16 connected cells (4 cells per row) is above 65°F.

c. In accordance with 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 150 amperes at a minimum of 132 volts for at least 8 hours.

d. In accordance with the Surveillance Frequency Control Program 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. In accordance with the Surveillance Frequency Control Program by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. Once per 60-month interval 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 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.

~~* Obtained by subtracting the normal resistance of: (1) the cross room rack connector (210 x 10^{-6} ohm, typical) and (2) the bi-level rack connector (35 x 10^{-6} ohm, typical) from the measured cell-to-cell connection resistance.~~

ELECTRICAL POWER SYSTEMS

D.C. SOURCES

SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.2.2 As a minimum, ~~two~~ one 125-volt battery banks in one D.C. Train and the associated full-capacity chargers shall be OPERABLE.

APPLICABILITY: MODES 5 and 6.

ACTION:

~~a. With one of the required battery banks inoperable, immediately close the bus tie to the alternate OPERABLE battery.~~

~~b.~~ a. With ~~both required battery banks and/or full-capacity chargers inoperable,~~ less than one battery bank and two chargers in one DC train OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, or movement of irradiated fuel; initiate corrective action to restore the required battery banks and full-capacity chargers to OPERABLE status as soon as possible, and within 8 hours, depressurize and vent the Reactor Coolant System through a 1.58-square-inch vent.

SURVEILLANCE REQUIREMENTS

4.8.2.2 The above-required 125-volt battery banks and full-capacity chargers shall be demonstrated OPERABLE in accordance with Specification 4.8.2.1.

LIMITING CONDITION FOR OPERATION

3.8.3.1 (Continued)

i. Train A, 125-volt D.C. Busses consisting of:

1) 125-volt D.C. Bus #11A energized from Battery Bank 1A* or 1C*, and
2) 125-volt D.C. Bus #11C energized from Battery Bank 1C* or 1A*.

j. Train B, 125-volt D.C. Busses consisting of:

1) 125-volt D.C. Bus #11B energized from Battery Bank 1B* or 1D*, and
2) 125-volt D.C. Bus #11D energized from Battery Bank 1D* or 1B*.

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

ACTION:

a. With one of the required trains of A.C. emergency busses (except 480-volt Emergency Bus # E64) not fully energized, reenergize the train within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

1. With 480-volt Emergency bus #E64 not fully engergized, reenergize the bus within 7 days or be in HOT STANDBY within 6 hours and COLD SHUTDOWN within the following 30 hours.

b. With one A.C. vital panel either not energized from its associated inverter, or with the inverter not connected to its associated D.C. bus: (1) reenergize the A.C. vital panel within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours; and (2) reenergize the A.C. vital panel from its associated inverter connected to its associated D.C. bus within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

c. With one D.C. bus not energized from ~~its associated~~ an OPERABLE battery bank, reenergize the D.C. bus from ~~its associated~~ battery bank ~~or close the bus tie to the alternate OPERABLE battery of the same train~~ within 2 hours* ~~or~~ or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

ELECTRICAL POWER SYSTEMS

ONSITE POWER DISTRIBUTION

OPERATING

LIMITING CONDITION FOR OPERATION

SURVEILLANCE REQUIREMENTS

4.8.3.1 The specified busses and panels shall be determined energized in the required manner in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignment and indicated voltage on the busses.

~~*No more than one Battery Bank (1A, 1B, 1C, or 1D) at a time may be taken out of service for more than 30 days.~~

ELECTRICAL POWER SYSTEMS

ONSITE POWER DISTRIBUTION

SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.3.2 As a minimum, the following electrical buses shall be energized in the specified manner:

a. One train of A.C. emergency buses consisting of the 4160-volt and the 480-volt A.C. emergency buses listed in 3.8.3.1a. and b. (excluding 480-volt Emergency Bus #E64);

b. Two of the four 120-volt A.C. vital Panels 1A, 1B, 1C, and 1D energized from their associated inverters connected to their respective D.C. buses;

c. One of the two 120-volt A.C. Vital Panels 1E or 1F energized from its associated inverter connected to the respective D.C. bus; and

d. Two 125-volt D.C. buses (in the same train) energized from their associated battery banks.

delete

APPLICABILITY: MODES 5 and 6.

ACTION:

With any of the above required electrical buses and panels not energized in the required manner, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, or movement of irradiated fuel, initiate corrective action to energize the required electrical buses and panels in the specified manner as soon as possible, and within 8 hours, depressurize and vent the RCS through at least a 1.58-square-inch vent.

SURVEILLANCE REQUIREMENTS

4.8.3.2 The specified buses and panels shall be determined energized in the required manner in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignment and indicated voltage on the busses.

Attachment 2

Markup of the Technical Specifications Bases

BASES INSERT

The safety-related portion of the DC power system shown consists of four 125-volt batteries, chargers and DC buses. During normal operation, the DC power system is powered from the battery chargers with the batteries floating on the system. In the event of a loss of normal power to the battery charger, the DC buses are automatically powered from the station batteries.

Two DC electrical trains are required to be OPERABLE in Modes 1 through 4 to supply the inverters for redundant vital instrument buses, distribution panels for power to the Class 1E direct current loads, power for control and operation of the Class 1E systems for Engineered Safety Features, and power for selected non-Class 1E loads. The system is normally operated with each battery aligned to its own charger and DC bus. In this configuration, each battery supplying a DC bus must be OPERABLE. However, each battery has 100% capability of supplying the full load requirements of both Class 1E DC buses within its associated electrical train. Consequently, a DC electrical train is OPERABLE when one battery and the two associated battery chargers are aligned to power both Class 1E DC buses in the train.

In the event that a battery bank supplying one or both DC electrical buses becomes inoperable, the Action provides two hours to restore the inoperable battery to OPERABLE status. Each DC bus must be aligned to an OPERABLE battery; therefore, restoring the inoperable battery to OPERABLE status or aligning the affected DC buses to an alternate, OPERABLE battery, will restore compliance with the limiting condition for operation.

3/4.8.1 AC SOURCES (Continued)

SURVEILLANCE REQUIREMENTS (SR) (continued)

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. UFSAR, Chapter 8.
3. Regulatory Guide 1.9, Rev. 3. *
4. UFSAR, Chapter 6.
5. UFSAR, Chapter 15.
6. Regulatory Guide 1.93, Rev. 0, December 1974.
7. Generic Letter 84-15, "Proposed Staff ACTIONs to Improve and Maintain Diesel Generator Reliability," July 2, 1984.
8. 10 CFR 50, Appendix A, GDC 18.
9. Regulatory Guide 1.108, Rev. 1, August 1977.*
10. Regulatory Guide 1.137, Rev. 1, October 1979.*
11. ANSI Std. C84.1
12. IEEE Std. 387-1984**
13. Generic Letter 91-04, April 1991.
14. Regulatory Guide 1.182, May 2000.

3/4.8.2 DC SOURCES

The OPERABILITY of the minimum D.C. power sources during shutdown and refueling ensures that: (1) the facility can be maintained in the shutdown or refueling condition for extended time periods and (2) sufficient instrumentation and control capability is available for monitoring and maintaining the unit status.

With less than the minimum required DC power sources, the action statement requires immediately suspending core alternations, positive reactivity changes, or movement of irradiated fuel. With respect to suspending positive reactivity changes, operations that individually add limited, positive reactivity are acceptable when, combined with other actions that add negative reactivity, the overall net reactivity addition is zero or negative. For example, a positive reactivity addition caused by temperature fluctuations from inventory addition or temperature control fluctuations is acceptable if it is combined with a negative reactivity addition such that the overall, net reactivity addition is zero or negative. Refer to TS Bases 3/4.9.1, Boron Concentration, for limits on boron concentration and water temperature for MODE 6 action statements involving suspension of positive reactivity changes.

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* Seabrook Station is only committed to demonstrating the OPERABILITY of the diesel generators in accordance with the recommendations of Regulatory Guides 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," Revision 2, December 1979; 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977, Errata September 1977; and 1.137, "Fuel-Oil Systems for Standby Generators." Revision 1, October 1979. Exceptions to these Regulatory Guides are noted in the UFSAR.

** Seabrook Station is only committed to IEEE Std. 387-1972 and 1977.

BASES INSERT

3/4.8.3 ONSITE POWER DISTRIBUTION (continued)

1. An assumed loss of all offsite power or all onsite AC electrical power, and

2. A worst case single failure.

The OPERABILITY of the minimum AC, DC, and AC vital bus electrical power distribution subsystems during MODES 5 and 6 ensures that:

1. The unit can be maintained in the shutdown or refueling condition for extended periods,

2. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status, and

3. Adequate power is provided to mitigate events postulated during shutdown.

The AC and DC electrical power distribution systems satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The power distribution subsystems required to be OPERABLE in MODES 1 through 4 ensure the availability of AC, DC, and AC vital bus electrical power for the systems required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence (AOO) or a postulated design basis accident (DBA). Maintaining the Train A and Train B AC, DC, and AC vital bus electrical power distribution subsystems OPERABLE ensures that the redundancy incorporated into the design of ESF is not defeated. Therefore, a single failure within any system or within the electrical power distribution subsystems will not prevent safe shutdown of the reactor.

In MODES 5 and 6, various subsystems, equipment, and components are required OPERABLE by other LCOs. Implicit in those requirements via the definition of OPERABILITY is the requirement for availability of necessary electrical power. Maintaining the minimum required onsite power distribution system OPERABLE in MODES 5 and 6 ensures the availability of sufficient power to operate the unit in a safe manner to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

OPERABLE electrical power distribution subsystems require correct breaker alignments and indicated voltage on the required buses. In addition, OPERABLE DC electrical power distribution subsystems require that the 125-volt DC buses be energized from a vital battery in the same train. OPERABLE 120-volt vital instrument panels are required to be energized from the associated inverter connected to its DC bus.

The DC electrical system is normally operated with each battery aligned to its own charger and DC bus. In this configuration, each battery supplying a DC bus must be OPERABLE. However, each battery has 100% capability of supplying the full load requirements of both Class 1E DC buses within its associated electrical train. Consequently, a DC electrical train is OPERABLE when one battery and the two associated battery chargers are aligned to power both Class 1E DC buses in the train.