

ELECTRICAL POWER SYSTEMS

3/4.8.2 DC SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.1 As a minimum, the following DC electrical sources shall be OPERABLE:

- a. Channel I 125-volt Battery Bank E1A11 (Unit 1), E2A11 (Unit 2) and one of its two associated chargers,
- b. Channel II 125-volt Battery Bank E1D11 (Unit 1), E2D11 (Unit 2) and one of its two associated full capacity chargers,
- c. Channel III 125-volt Battery Bank E1B11 (Unit 1), E2B11 (Unit 2) and one of its two associated full capacity chargers, and
- d. Channel IV 125-volt Battery Bank E1C11 (Unit 1), E2C11 (Unit 2) and one of its two associated chargers.

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

ACTION:

NOTE

If the batteries discharge for more than 2 hours as the sole source of power to their DC bus while the CRMP is being applied and no alternate source of power is available, the LCO shall be considered not met.

- a. With one of the required battery banks inoperable, within 2 hours restore the inoperable battery bank to OPERABLE status or apply the requirements of the CRMP or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With more than one of the required battery banks inoperable, within 1 hour restore at least three battery banks to OPERABLE status or apply the requirements of the CRMP or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- c. With one channel with no battery chargers OPERABLE,
 - 1. Restore battery terminal voltage to greater than or equal to the minimum established float voltage within 2 hours, AND
 - 2. Verify float current for the affected battery does not exceed 2 amps once per 12 hours, AND
 - 3. Restore one battery charger to OPERABLE status within 72 hours.

If the battery terminal voltage cannot be restored in the allowed time, float current is excessive, or a battery charger is not restored to operability in the time allowed, apply the requirements of the CRMP or the affected reactor unit is to be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

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LIMITING CONDITION FOR OPERATION (continued)

- d. With more than one channel with no battery chargers OPERABLE,
1. Restore terminal voltage for at least three battery banks to greater than or equal to the minimum established float voltage within 1 hour, AND
 2. Verify float current for the affected batteries does not exceed 2 amps once per 12 hours, AND
 3. Restore one battery charger to OPERABLE status on at least three channels within 1 hour.

If the battery terminal voltage cannot be restored in the allowed time, float current is excessive, or a battery charger is not restored to operability in the time allowed, apply the requirements of the CRMP or the affected reactor unit is to be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

- e. With one of the required channels inoperable for reasons other than (a), (b), (c), or (d) above, restore the channel 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. At least once per 7 days by verifying that:

The total battery terminal voltage is greater than or equal to the minimum established float voltage.

- b. Not used.

- c. At least once per 18 months by verifying that:

1. The battery charger can supply at least 300 amperes at greater than or equal to the minimum established float voltage for at least 8 hours.

OR

2. Each battery charger can recharge the battery to the fully charged state within 12 hours while supplying the largest combined demands of the various continuous steady-state loads following a battery discharge to the bounding design-basis event discharge state.

- d. Not used.

- e. Not used.

- f. Not used.

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DC SOURCES

SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.2.2 DC electrical power subsystem shall be OPERABLE to support the DC electrical power distribution subsystem(s) required by LCO 3.8.3.2, "Onsite Power Distribution – Shutdown."

APPLICABILITY: MODES 5 and 6

ACTION:

- a. With one or more required DC electrical power subsystems inoperable:
 1. Immediately declare affected required feature(s) inoperable, OR
 2. Immediately:
 - Initiate action to suspend operation with a potential for draining the reactor vessel, AND
 - Suspend all operations involving CORE ALTERATIONS, operations involving positive reactivity additions that could result in loss of required SHUTDOWN MARGIN or required boron concentration, or movement of irradiated fuel, AND
 - Initiate corrective action to restore the required DC electrical power subsystems to OPERABLE status as soon as possible.
- b. With no battery chargers for a required channel OPERABLE:
 1. Restore battery terminal voltage to greater than or equal to the minimum established float voltage within 2 hours, AND
 2. Verify float current for the affected battery does not exceed 2 amps once per 12 hours, AND
 3. Restore one battery charger to OPERABLE status within 72 hours.

If the battery terminal voltage cannot be restored within the allowed time, float current is excessive, or a battery charger is not restored to operability in the time allowed:

- Initiate action to suspend operation with a potential for draining the reactor vessel, AND

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LIMITING CONDITION FOR OPERATION (continued)

- Suspend all operations involving CORE ALTERATIONS, operations involving positive reactivity additions that could result in loss of required SHUTDOWN MARGIN or required boron concentration, or movement of irradiated fuel, AND
- Initiate corrective action to restore the required DC electrical power subsystems to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.8.2.2 Each 125-volt battery bank shall be demonstrated OPERABLE:

- a. At least once per 7 days by verifying that the total battery terminal voltage is greater than or equal to the minimum established float voltage.
- b. At least once per 18 months by verifying that the battery charger can supply at least 300 amperes at greater than or equal to the minimum established float voltage for at least 8 hours.

OR

Verify each battery charger can recharge the battery to the fully charged state within 12 hours while supplying the largest combined demands of the various continuous steady-state loads following a battery discharge to the bounding design-basis event discharge state.

- c. NOTE:
 1. The modified performance discharge test in SR 4.8.2.3.f may be performed in lieu of Surveillance Requirement 4.8.2.2.c.
 2. This surveillance shall only be performed during shutdown. Credit may be taken for unplanned events that satisfy this surveillance requirement.

At least once per 18 months by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated ESF loads for the design duty cycle when the battery is subjected to a battery service test.

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BATTERY PARAMETERS

LIMITING CONDITION FOR OPERATION

3.8.2.3 Parameters for the Class 1E batteries shall be within the specified limits.

APPLICABILITY: When associated DC electrical power subsystems are required to be OPERABLE.

ACTION:

- a. If a battery has one or more cells with float voltage < 2.07 V:
 1. Perform surveillance requirement 4.8.2.1.a within 2 hours, AND
 2. Perform surveillance requirement 4.8.2.3.a within 2 hours, AND
 3. Restore float voltage of the affected cell(s) to ≥ 2.07 volts within 24 hours.

If the required action and associated completion of the above conditions are not met, declare the associated battery INOPERABLE immediately.
- b. If a battery has float current > 2 amps:
 1. Perform surveillance requirement 4.8.2.1.a within 2 hours, AND
 2. Restore battery float current to ≤ 2 amps within 12 hours.

If the required action and associated completion of the above conditions are not met, declare the associated battery INOPERABLE immediately.
- c. If a battery has one or more cells with electrolyte level less than minimum established design limits:
 1. Restore electrolyte level in the affected cell(s) to above the top of the plates within 8 hours if electrolyte level is below the top of the plates, AND
 2. Verify there is no evidence of electrolyte leakage within 12 hours if electrolyte level is below the top of the plates, AND
 3. Restore electrolyte level in the affected cell(s) to greater than or equal to minimum established design limits within 31 days.

If the required action and associated completion of the above conditions are not met, declare the associated battery INOPERABLE immediately.
- d. If a battery has a pilot cell electrolyte temperature less than minimum established design limits, restore battery pilot cell electrolyte temperature to greater than or equal to minimum established design limits within 12 hours.

If the required action and associated completion of the above conditions are not met, declare the associated battery INOPERABLE immediately.
- e. If battery parameters are not within limits for 2 or more batteries, restore battery parameters to within design limits within 2 hours with no more than one battery outside design limits if a longer time for completion is applicable.

If the required action and associated completion of the above conditions are not met, declare the associated batter(ies) INOPERABLE immediately.

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LIMITING CONDITION FOR OPERATION (continued)

- f. If a battery has one or more battery cells with float voltage < 2.07 volts and float current > 2 amps, declare the associated battery INOPERABLE immediately.

SURVEILLANCE REQUIREMENTS

4.8.2.3. Each 125-volt battery bank and charger shall be demonstrated operable:

- a. **NOTE:** Performance of this surveillance is not required when battery terminal voltage is less than the minimum established float voltage of surveillance requirement 4.8.2.1.a.

At least once per 7 days, verify the float current for each battery is ≤ 2 amps.

- b. At least once per 31 days, verify each battery pilot cell voltage is ≥ 2.07 V on float charge.
- c. At least once per 92 days, verify each battery connected cell voltage is ≥ 2.07 V on float charge.
- d. At least once per 31 days, verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.
- e. At least once per 31 days, verify each battery pilot cell temperature is greater than or equal to minimum established design limits.

- f. **NOTE:** Battery capacity is to be verified during shutdown.

1. At least once per 12 months by giving modified performance discharge tests of battery capacity to any battery that shows degradation or reaches 85% of the service life expected for the application with capacity less than 100% of the manufacturer's rating. Degradation is indicated when battery capacity drops more than 10% from its capacity on the previous performance/modified performance discharge test, or is below 90% of the manufacturer's rating; AND
2. At least once per 24 months by giving modified performance discharge tests of battery capacity to any battery reaching 85% of the service life with capacity greater than or equal to 100% of the manufacturer's rating; AND
3. At least once per 60 months by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a modified performance discharge test.

6.0 ADMINISTRATIVE CONTROLS

6.8 Procedures, Programs, and Manuals

6.8.3.o (continued)

3. If crack indications are found in any SG tube, then the next inspection for each SG for the degradation mechanism that caused the crack indication shall not exceed 24 effective full power months or one refueling outage (whichever is less). If definitive information, such as from examination of a pulled tube, diagnostic non-destructive testing, or engineering evaluation indicates that a crack-like indication is not associated with a crack(s), then the indication need not be treated as a crack.

e. Provisions for monitoring operational primary-to-secondary leakage.

p. Battery Monitoring and Maintenance Program

This Program provides for battery restoration and maintenance, which includes the following:

- 1) Actions to restore battery cells discovered with float voltage < 2.13 V;
- 2) Actions to equalize and test battery cells found with electrolyte level below the top of the plates;
- 3) Actions to verify that the remaining cells are > 2.07 V when a cell or cells are found to be < 2.13 V; AND
- 4) Actions to ensure that specific gravity readings are taken prior to each discharge test.