

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources—Operating

LCO 3.8.4 The Division 1, Division 2, Division 3, and Division 4 DC electrical power subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One battery charger on Division 1 or 2 inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage.	2 hours
	<u>AND</u>	
	A.2 Verify battery float current \leq 2 amps.	Once per 12 hours
	<u>AND</u> A.3 Restore battery charger to OPERABLE status.	7 days
B. One battery on Division 1 or 2 inoperable.	B.1 Restore battery to OPERABLE status.	2 hours
C. Division 1 or 2 DC electrical power subsystem inoperable for reasons other than Condition A or B.	C.1 Restore Division 1 and 2 DC electrical power subsystems to OPERABLE status.	2 hours
D. Division 3 or 4 DC electrical power subsystem inoperable.	D.1 Declare High Pressure Core Spray System inoperable.	Immediately
E. Required Action and associated Completion Time not met.	E.1 Be in MODE 3.	12 hours
	<u>AND</u> E.2 Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.4.1 Verify battery terminal voltage is greater than or equal to the minimum established float voltage.	7 days
SR 3.8.4.2 Verify each Division 1 and 2 battery charger supplies ≥ 300 amps at greater than or equal to the minimum established float voltage for ≥ 4 hours and each Division 3 and 4 battery charger supplies ≥ 100 amps at greater than or equal to the minimum established float voltage for ≥ 4 hours. <u>OR</u> 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, after a battery discharge to the bounding design basis event discharge state.	18 months
SR 3.8.4.3 -----NOTES----- 1. The modified performance discharge test in SR 3.8.6.6 may be performed in lieu of SR 3.8.4.3. 2. This Surveillance shall not be performed in MODE 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR. ----- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	18 months

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3.8.5 DC Sources—Shutdown

LCO 3.8.5 The following shall be OPERABLE:

- a. One Class 1E DC electrical power subsystem capable of supplying one division of the Division 1 or 2 onsite Class 1E DC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems - Shutdown";
- b. One Class 1E battery or battery charger, other than the DC electrical power subsystem in LCO 3.8.5.a, capable of supplying the remaining Division 1 or Division 2 onsite Class 1E DC electrical power distribution subsystem(s) when required by LCO 3.8.10; and
- c. The Division 3 and 4 DC electrical power subsystems capable of supplying the Division 3 and 4 onsite Class 1E DC electrical power distribution subsystems, when the High Pressure Core Spray System is OPERABLE for compliance with LCO 3.5.2, "ECCS-Shutdown."

APPLICABILITY: MODES 4 and 5,
During movement of irradiated fuel assemblies in the primary or secondary containment.

ACTIONS

-----NOTE-----

LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One battery charger on one division inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage.	2 hours
	<u>AND</u>	
	A.2 Verify battery float current \leq 2 amps.	Once per 12 hours
	<u>AND</u>	
	A.3 Restore battery charger to OPERABLE status.	7 days

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>B. One or more required DC electrical power subsystems inoperable for reasons other than Condition A.</p> <p><u>OR</u></p> <p>Required Action and associated Completion Time of Condition A not met.</p>	<p>B.1 Declare affected required feature(s) inoperable.</p>	<p>Immediately</p>
	<p><u>OR</u></p>	
	<p>B.2.1 Suspend CORE ALTERATIONS.</p>	<p>Immediately</p>
	<p><u>AND</u></p>	
	<p>B.2.2 Suspend movement of irradiated fuel assemblies in the primary and secondary containment.</p>	<p>Immediately</p>
	<p><u>AND</u></p>	
	<p>B.2.3 Initiate action to suspend operations with a potential for draining the reactor.</p>	<p>Immediately</p>
	<p><u>AND</u></p>	
	<p>B.2.4 Initiate action to restore required DC electrical power subsystems to OPERABLE status.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.5.1 -----NOTE-----</p> <p>The following SRs are not required to be performed: SR 3.8.4.2 and SR 3.8.4.3</p> <p>-----</p> <p>For DC sources required to be OPERABLE, the following SRs are applicable:</p> <p>SR 3.8.4.1 SR 3.8.4.2 SR 3.8.4.3.</p>	<p>In accordance with applicable SRs</p>

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3.8.6 Battery Parameters

LCO 3.8.6 Battery parameters for the Division 1, 2, 3, and 4 batteries shall be within limits.

APPLICABILITY: When associated battery is required to be OPERABLE.

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each battery.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One battery on one division with one or more battery cells float voltage < 2.07 V	A.1 Perform SR 3.8.4.1	2 hours
	<u>AND</u>	
	A.2 Perform SR 3.8.6.1	2 hours
	<u>AND</u>	
	A.3 Restore affected cell voltage \geq 2.07 V	24 hours
B. One battery on one division with float current > 2 amps	B.1 Perform SR 3.8.4.1.	2 hours
	<u>AND</u>	
	B.2 Restore battery float current to \leq 2 amps.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>----- NOTE ----- Required Action C.2 shall be completed if electrolyte level was below the top of plates. -----</p> <p>C. One battery on one division with one or more cells electrolyte level less than minimum established design limits.</p>	<p>----- NOTE ----- Required Actions C.1 and C.2 are only applicable if the electrolyte level was below the top of plates. -----</p> <p>C.1 Restore electrolyte level to above top of plates.</p> <p><u>AND</u></p> <p>C.2 Verify no evidence of leakage.</p> <p><u>AND</u></p> <p>C.3 Restore electrolyte level to greater than or equal to minimum established design limits.</p>	<p>8 hours</p> <p>12 hours</p> <p>31 days</p>
<p>D. One battery on one division with pilot cell electrolyte temperature less than minimum established design limits.</p>	<p>D.1 Restore battery pilot cell temperature to greater than or equal to minimum established design limits.</p>	<p>12 hours</p>
<p>E. Batteries in redundant divisions with battery parameters not within limits.</p>	<p>E.1 Restore battery parameters for batteries in one division to within limits.</p>	<p>2 hours</p>
<p>F. Required Action and associated Completion Time of Condition A, B, C, D, or E not met.</p> <p><u>OR</u></p> <p>One battery on one division with one or more battery cells float voltage < 2.07 V and float current > 2 amps.</p>	<p>F.1 Declare associated battery inoperable.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.6.1 ----- NOTE ----- Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. ----- Verify each battery float current is ≤ 2 amps.</p>	7 days
<p>SR 3.8.6.2 Verify each battery pilot cell voltage is ≥ 2.07 V.</p>	31 days
<p>SR 3.8.6.3 Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.</p>	31 days
<p>SR 3.8.6.4 Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.</p>	31 days
<p>SR 3.8.6.5 Verify each battery connected cell voltage is ≥ 2.07 V.</p>	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.6.6 -----NOTE----- This Surveillance shall not be performed in MODE 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR. ----- Verify battery capacity is $\geq 80\%$ of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.</p>	<p>60 months <u>AND</u> 12 months when battery shows degradation or has reached 85% of the expected life with capacity < 100% of manufacturer's rating <u>AND</u> 24 months when battery has reached 85% of the expected life with capacity $\geq 100\%$ of manufacturer's rating</p>

5.5 Program and Manuals (continued)

5.5.14 Battery Monitoring and Maintenance Program

This program provides for battery restoration and maintenance, based on the recommendations of IEEE Standard 450-1995, "IEEE Recommended Practice for Maintenance, Testing and Replacement of Vented Lead-Acid Batteries for Stationary Applications," including the following:

- a. Actions to restore battery cells with float voltage < 2.13 V,

and

- b. Actions to equalize and test battery cells that had been discovered with electrolyte level below the minimum established design limit.
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