

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources - Operating

- LCO 3.8.1            The following AC electrical sources shall be OPERABLE:
- a. Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System; and
  - b. Four diesel generators (DGs) capable of supplying the onsite Class 1E AC Electrical Power Distribution System.

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

ACTIONS

-----NOTE-----

LCO 3.0.4.b is not applicable to DGs.

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| CONDITION                          | REQUIRED ACTION   | COMPLETION TIME   |
|------------------------------------|---|---|
| A. One offsite circuit inoperable. | A.1      Perform SR 3.8.1.1 for OPERABLE offsite circuit.   | 1 hour<br><br><u>AND</u><br><br>Once per 8 hours thereafter   |
|                                    | <u>AND</u><br><br>A.2      Declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable. | 24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s) |
|                                    |   | (continued)   |

ACTIONS

| CONDITION   | REQUIRED ACTION  | COMPLETION TIME   |
|---|--|---|
| <p>A. (continued)</p>   | <p><u>AND</u></p> <p>A.3 Restore offsite circuit to OPERABLE status.</p>   | <p>72 hours</p> <p><u>AND</u></p> <p>6 days from discovery of failure to meet LCO</p>   |
| <p>B. One or more DG(s) in Train A inoperable.</p> <p><u>OR</u></p> <p>One or more DG(s) in Train B inoperable.</p> | <p>B.1 Perform SR 3.8.1.1 for the offsite circuits.</p> <p><u>AND</u></p> <p>B.2 Declare required feature(s) supported by the inoperable DG(s) inoperable when its required redundant feature(s) is inoperable</p> <p><u>AND</u></p> <p>B.3.1 Determine OPERABLE DG(s) is not inoperable due to common cause failure.</p> <p><u>OR</u></p> <p>B.3.2 Perform SR 3.8.1.2 for OPERABLE DG(s).</p> <p><u>AND</u></p> | <p>1 hour</p> <p><u>AND</u></p> <p>Once per 8 hours thereafter</p> <p>4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)</p> <p>24 hours</p> <p>24 hours</p> <p>(continued)</p> |

ACTIONS

| CONDITION  | REQUIRED ACTION  | COMPLETION TIME  |
|--|--|--|
| <p>B. (continued)</p>  | <p>B.4 Restore required DG(s) to OPERABLE status.</p>  | <p>72 hours<br/><u>AND</u><br/>6 days from discovery of failure to meet LCO</p>  |
| <p>C. Two offsite circuits inoperable.</p>   | <p>C.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.<br/><br/><u>AND</u><br/>C.2 Restore one offsite circuit to OPERABLE status.</p>  | <p>12 hours from discovery of Condition C concurrent with inoperability of redundant required features<br/><br/>24 hours</p> |
| <p>D. One offsite circuit inoperable.<br/><br/><u>AND</u><br/>One or more required DG(s) in Train A inoperable.<br/><br/><u>OR</u><br/>One or more required DG(s) in Train B inoperable.</p> | <p>-----NOTE-----<br/>Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating," when Condition D is entered with no AC power source to any train.<br/>-----<br/>D.1 Restore offsite circuit to OPERABLE status.<br/><br/><u>OR</u><br/>D.2 Restore required DG(s) to OPERABLE status.</p> | <p>12 hours<br/><br/>12 hours</p>  |

(continued)

ACTIONS (continued)

| CONDITION   | REQUIRED ACTION  | COMPLETION TIME                |
|---|--|--------------------------------|
| <p>E. One or more required DG(s) in Train A inoperable.</p> <p><u>AND</u></p> <p>One or more required DG(s) in Train B inoperable.</p>  | <p>E.1 Restore required DGs in Train A to OPERABLE status.</p> <p><u>OR</u></p> <p>E.2 Restore required DGs in Train B to OPERABLE status.</p> | <p>2 hours</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>F.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>F.2 Be in MODE 5.</p>  | <p>6 hours</p> <p>36 hours</p> |
| <p>G. Two offsite circuits inoperable.</p> <p><u>AND</u></p> <p>One or more required DG(s) in Train A inoperable.</p> <p><u>OR</u></p> <p>One or more required DG(s) in Train B inoperable.</p> | <p>G.1 Enter LCO 3.0.3.</p>  | <p>Immediately</p>             |
| <p>H. One offsite circuit inoperable.</p> <p><u>AND</u></p> <p>One or more required DG(s) in Train A inoperable.</p> <p><u>AND</u></p> <p>One or more required DG(s) in Train B inoperable.</p> | <p>H.1 Enter LCO 3.0.3.</p>  | <p>Immediately</p>             |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE |   | FREQUENCY                     |
|--------------|---|-------------------------------|
| SR 3.8.1.1   | Verify correct breaker alignment and indicated power availability for each offsite circuit.   | 7 days                        |
| SR 3.8.1.2   | <p>-----NOTES-----</p> <ol style="list-style-type: none"> <li>1. Performance of SR 3.8.1.7 satisfies this SR.</li> <li>2. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR as recommended by the manufacturer. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.7 must be met.</li> </ol> <p>-----</p> <p>Verify each DG starts from standby conditions and achieves steady state voltage <math>\geq 6800</math> V and <math>\leq 7260</math> V, and frequency <math>\geq 58.8</math> Hz and <math>\leq 61.2</math> Hz.</p>     | As specified in Table 3.8.1-1 |
| SR 3.8.1.3   | <p>-----NOTES-----</p> <ol style="list-style-type: none"> <li>1. DG loadings may include gradual loading as recommended by the manufacturer.</li> <li>2. Momentary transients outside the load range do not invalidate this test.</li> <li>3. This Surveillance shall be conducted on only one DG at a time.</li> <li>4. This SR shall be preceded by and immediately follow without shutdown a successful performance of SR 3.8.1.2 or SR 3.8.1.7.</li> </ol> <p>-----</p> <p>Verify each DG is synchronized and loaded and operates for <math>\geq 60</math> minutes at a load <math>\geq 3960</math> kW and <math>\leq 4400</math> kW.</p> | As specified in Table 3.8.1-1 |
| SR 3.8.1.4   | Verify each skid mounted day tank contains $\geq 218.5$ gal of fuel oil.  | 31 days                       |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE |  | FREQUENCY |
|--------------|--|-----------|
| SR 3.8.1.5   | Check for and remove accumulated water from each skid mounted day tank.  | 31 days   |
| SR 3.8.1.6   | Verify the fuel oil transfer system operates to automatically transfer fuel oil from 7 day storage tank to the skid mounted day tank.  | 31 days   |
| SR 3.8.1.7   | Verify each DG starts from standby condition and achieves in $\leq 10$ seconds, voltage $\geq 6800$ V, and frequency $\geq 58.8$ Hz. Verify after DG fast start from standby conditions that the DG achieves steady state voltage $\geq 6800$ V and $\leq 7260$ V, and frequency $\geq 58.8$ Hz and $\leq 61.2$ Hz.  | 184 days  |
| SR 3.8.1.8   | <p>-----NOTE-----<br/>                     This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR.<br/>                     -----</p> <p>Verify automatic and manual transfer of each 6.9 kV shutdown board power supply from the normal offsite circuit to each alternate offsite circuit.</p> | 18 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE   | FREQUENCY        |
|--|------------------|
| <p>SR 3.8.1.9 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR.</li> <li>2. If performed with the DG synchronized with offsite power, it shall be performed at a power factor <math>\geq 0.8</math> and <math>\leq 0.9</math>.</li> </ol> <p>-----</p> <p>Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and:</p> <ol style="list-style-type: none"> <li>a. Following load rejection, the frequency is <math>\leq 66.75</math> Hz;</li> <li>b. Within 3 seconds following load rejection, the voltage is <math>\geq 6555</math> V and <math>\leq 7260</math> V; and</li> <li>c. Within 4 seconds following load rejection, the frequency is <math>\geq 58.8</math> Hz and <math>\leq 61.2</math> Hz.</li> </ol> | <p>18 months</p> |
| <p>SR 3.8.1.10 -----NOTE-----</p> <p>This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR.</p> <p>-----</p> <p>Verify each DG operating at a power factor <math>\geq 0.8</math> and <math>\leq 0.9</math> does not trip and voltage is maintained <math>\leq 8880</math> V during and following a load rejection of <math>\geq 3960</math> kW and <math>\leq 4400</math> kW and <math>\geq 2970</math> kVAR and <math>\leq 3300</math> kVAR.</p>  | <p>18 months</p> |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE   | FREQUENCY        |
|--|------------------|
| <p>SR 3.8.1.11 -----NOTE-----<br/> This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR.<br/> -----<br/> Verify on an actual or simulated loss of offsite power signal:</p> <ul style="list-style-type: none"> <li>a. De-energization of emergency buses;</li> <li>b. Load shedding from emergency buses;</li> <li>c. DG auto-starts from standby condition and: <ul style="list-style-type: none"> <li>1. energizes permanently connected loads in <math>\leq 10</math> seconds,</li> <li>2. energizes auto-connected shutdown loads through automatic load sequencer,</li> <li>3. maintains steady state voltage <math>\geq 6800</math> V and <math>\leq 7260</math> V,</li> <li>4. maintains steady state frequency <math>\geq 58.8</math> Hz and <math>\leq 61.2</math> Hz, and</li> <li>5. supplies permanently connected and auto-connected shutdown loads for <math>\geq 5</math> minutes.</li> </ul> </li> </ul> | <p>18 months</p> |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE  | FREQUENCY        |
|---|------------------|
| <p>SR 3.8.1.12 -----NOTE-----<br/>This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR.<br/>-----</p> <p>Verify on an actual or simulated Engineered Safety Feature (ESF) actuation signal each Unit 2 DG auto-starts from standby condition and:</p> <ul style="list-style-type: none"> <li>a. In <math>\leq 10</math> seconds after auto-start and during tests, achieves voltage <math>\geq 6800</math> V and frequency <math>\geq 58.8</math> Hz;</li> <li>b. After DG fast start from standby conditions the DG achieves steady state voltage <math>\geq 6800</math> V and <math>\leq 7260</math> V, and frequency <math>\geq 58.8</math> Hz and <math>\leq 61.2</math> Hz.</li> <li>c. Operates for <math>\geq 5</math> minutes;</li> <li>d. Permanently connected loads remain energized from the offsite power system; and</li> <li>e. Emergency loads are energized from the offsite power system.</li> </ul> | <p>18 months</p> |
| <p>SR 3.8.1.13 -----NOTE-----<br/>This Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR.<br/>-----</p> <p>Verify each DG's automatic trips are bypassed on automatic or emergency start signal except:</p> <ul style="list-style-type: none"> <li>a. Engine overspeed; and</li> <li>b. Generator differential current</li> </ul>  | <p>18 months</p> |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE  | FREQUENCY        |
|---|------------------|
| <p>SR 3.8.1.14 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. Momentary transients outside the load and power factor ranges do not invalidate this test.</li> <li>2. For performance of this test in MODE 1, 2, 3 or 4, three DGs must be maintained operable and in a standby condition.</li> <li>3. Credit may be taken for unplanned events that satisfy this SR.</li> </ol> <p>-----</p> <p>Verify each DG operating at a power factor <math>\geq 0.8</math> and <math>\leq 0.9</math> operates for <math>\geq 24</math> hours:</p> <ol style="list-style-type: none"> <li>a. For <math>\geq 2</math> hours loaded <math>\geq 4620</math> kW and <math>\leq 4840</math> kW and <math>\geq 3465</math> kVAR and <math>\leq 3630</math> kVAR; and</li> <li>b. For the remaining hours of the test loaded <math>\geq 3960</math> kW and <math>\leq 4400</math> kW and <math>\geq 2970</math> kVAR and <math>\leq 3300</math> kVAR.</li> </ol> | <p>18 months</p> |
| <p>SR 3.8.1.15 -----NOTES-----</p> <p>This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated <math>\geq 2</math> hours loaded <math>\geq 3960</math> kW and <math>\leq 4400</math> kW.</p> <p>Momentary transients outside of load range do not invalidate this test.</p> <p>-----</p> <p>Verify each DG starts and achieves, in <math>\leq 10</math> seconds, voltage <math>\geq 6800</math> V, and frequency <math>\geq 58.8</math> Hz. Verify after DG fast start from standby conditions that the DG achieves steady state voltage <math>\geq 6800</math> V and <math>\leq 7260</math> V, and frequency <math>\geq 58.8</math> Hz and <math>\leq 61.2</math> Hz.</p>   | <p>18 months</p> |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE   | FREQUENCY        |
|--|------------------|
| <p>SR 3.8.1.16 -----NOTE-----<br/> This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR.<br/> -----<br/> Verify each DG:<br/> a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power;<br/> b. Transfers loads to offsite power source; and<br/> c. Returns to ready-to-load operation.</p>                                  | <p>18 months</p> |
| <p>SR 3.8.1.17 -----NOTE-----<br/> This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR.<br/> -----<br/> Verify, with each Unit 2 DG operating in test mode and connected to its bus, an actual or simulated ESF actuation signal overrides the test mode by:<br/> a. Returning DG to ready-to-load operation; and<br/> b. Automatically energizing the emergency load from offsite power.</p> | <p>18 months</p> |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE  | FREQUENCY        |
|---|------------------|
| <p>SR 3.8.1.18 -----NOTE-----</p> <p>This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR.</p> <p>-----</p> <p>Verify the time delay setting for each sequenced load block is within limits for each accident condition and non-accident condition load sequence.</p>   | <p>18 months</p> |
| <p>SR 3.8.1.19 -----NOTE-----</p> <p>This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR.</p> <p>-----</p> <p>Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal:</p> <ul style="list-style-type: none"> <li>a. De-energization of emergency buses;</li> <li>b. Load shedding from emergency buses; and</li> <li>c. DGs of the same power train auto-start from standby condition and: <ul style="list-style-type: none"> <li>1. energizes permanently connected loads in <math>\leq 10</math> seconds,</li> <li>2. energizes auto-connected emergency loads through load sequencer,</li> <li>3. achieves steady state voltage: <math>\geq 6800</math> V and <math>\leq 7260</math> V,</li> <li>4. achieves steady state frequency <math>\geq 58.8</math> Hz and <math>\leq 61.2</math> Hz, and</li> <li>5. supplies permanently connected and auto-connected emergency loads for <math>\geq 5</math> minutes.</li> </ul> </li> </ul> | <p>18 months</p> |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE |   | FREQUENCY |
|--------------|---|-----------|
| SR 3.8.1.20  | Verify during idle operation that any automatic or emergency start signal disables the idle start circuitry and commands the engine to full speed.  | 18 months |
| SR 3.8.1.21  | Verify when started simultaneously from standby condition, each DG achieves, in $\leq 10$ seconds, voltage $\geq 6800$ V and frequency $\geq 58.8$ Hz. Verify after DG fast start from standby conditions that the DG achieves steady state voltage $\geq 6800$ V and $\leq 7260$ V, and frequency $\geq 58.8$ Hz and $\leq 61.2$ Hz. | 10 years  |

Table 3.8.1-1 (page 1 of 1)  
Diesel Generator Test Schedule

| NUMBER OF FAILURES<br>IN LAST 25 VALID TESTS <sup>(a)</sup> | FREQUENCY  |
|---|--|
| $\leq 3$  | 31 days  |
| $\geq 4$  | 7 days <sup>(b)</sup><br>(but no less than 24 hours) |

(a) Criteria for determining number of failures and valid tests shall be in accordance with Regulatory Position C.2.1 of Regulatory Guide 1.9, Revision 3, where the number of tests and failures is determined on a per DG basis.

(b) This test frequency shall be maintained until seven consecutive failure free starts from standby conditions and load and run tests have been performed. If, subsequent to the 7 failure free tests, 1 or more additional failures occur, such that there are again 4 or more failures in the last 25 tests, the testing interval shall again be reduced as noted above and maintained until 7 consecutive failure free tests have been performed.

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources - Shutdown

- LCO 3.8.2 The following AC electrical power sources shall be OPERABLE:
- a. One qualified circuit between the offsite transmission network and the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems-Shutdown;" and
  - b. Two diesel generators (DGs) either Train A or Train B capable of supplying one train of the onsite Class 1E AC electrical power distribution subsystem(s) required by LCO 3.8.10.

APPLICABILITY: MODES 5 and 6,  
During movement of irradiated fuel assemblies.

ACTIONS

| CONDITION  | REQUIRED ACTION   | COMPLETION TIME  |
|--|---|--|
| <p>A. One required offsite circuit inoperable.</p> | <p>-----NOTE-----<br/>Enter applicable Conditions and Required Actions of LCO 3.8.10, with one required train de-energized as a result of Condition A.<br/>-----</p> <p>A.1 Declare affected required feature(s) with no offsite power available inoperable.</p> <p><u>OR</u></p> <p>A.2.1 Suspend CORE ALTERATIONS</p> <p><u>AND</u></p> | <p>Immediately</p> <p>Immediately</p> <p>(continued)</p> |

ACTIONS

| CONDITION                      | REQUIRED ACTION   | COMPLETION TIME   |
|--------------------------------|---|---|
| A. (continued)                 | <p>A.2.2 Suspend movement of irradiated fuel assemblies.</p> <p><u>AND</u></p> <p>A.2.3 Initiate action to suspend operations involving positive reactivity additions.</p> <p><u>AND</u></p> <p>A.2.4 Initiate action to restore required offsite power circuit to OPERABLE status.</p>                               | <p>Immediately</p> <p>Immediately</p> <p>Immediately</p>                    |
| B. One required DG inoperable. | <p>B.1 Suspend CORE ALTERATIONS.</p> <p><u>AND</u></p> <p>B.2 Suspend movement of irradiated fuel assemblies.</p> <p><u>AND</u></p> <p>B.3 Initiate action to suspend operations involving positive reactivity additions.</p> <p><u>AND</u></p> <p>B.4 Initiate action to restore required DG to OPERABLE status.</p> | <p>Immediately</p> <p>Immediately</p> <p>Immediately</p> <p>Immediately</p> |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE  | FREQUENCY                                    |
|---|--|
| <p>SR 3.8.2.1 -----NOTE-----</p> <p>The following SRs are not required to be performed:<br/>SR 3.8.1.3, SR 3.8.1.6, SR 3.8.1.9 through<br/>SR 3.8.1.16, SR 3.8.1.18 and SR 3.8.1.19.</p> <p>-----</p> <p>For AC sources required to be OPERABLE, the SRs<br/>of Specification 3.8.1, "AC Sources-Operating,"<br/>except SR 3.8.1.8, SR 3.8.1.17, and SR 3.8.1.21, are<br/>applicable.</p> | <p>In accordance with<br/>applicable SRs</p> |

3.8 ELECTRICAL POWER SYSTEMS

3.8.3 Diesel Fuel Oil, Lube Oil, and Starting Air

LCO 3.8.3            The stored diesel fuel oil, lube oil, and starting air subsystem shall be within limits for each required diesel generator (DG).

APPLICABILITY:    When associated DG is required to be OPERABLE.

ACTIONS

-----NOTE-----  
Separate Condition entry is allowed for each DG.  
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| CONDITION   | REQUIRED ACTION   | COMPLETION TIME |
|---|---|-----------------|
| A. One or more DGs with fuel level < 56,754 gal and > 48,648 gal in storage tank. | A.1      Restore fuel oil level to within limits.             | 48 hours        |
| B. One or more diesel engines with lube oil inventory < 287 gal and > 267 gal.    | B.1      Restore lube oil inventory to within limits.         | 48 hours        |
| C. One or more DGs with stored fuel oil total particulates not within limit.      | C.1      Restore fuel oil total particulates within limit.    | 7 days          |
| D. One or more DGs with new fuel oil properties not within limits.                | D.1      Restore stored fuel oil properties to within limits. | 30 days         |

(continued)

ACTIONS (continued)

| CONDITION  | REQUIRED ACTION   | COMPLETION TIME |
|--|---|-----------------|
| E. One or more DGs with starting air receiver pressure < 190 psig and ≥ 170 psig.  | E.1 Restore starting air receiver pressure to ≥ 190 psig. | 48 hours        |
| F. Required Action and associated Completion Time not met.<br><br><u>OR</u><br><br>One or more DGs diesel fuel oil, lube oil, or starting air subsystem not within limits for reasons other than Condition A, B, C, D, or E. | F.1 Declare associated DG inoperable.                     | Immediately     |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE   | FREQUENCY  |
|--|--|
| SR 3.8.3.1      Verify each 7 day fuel oil storage tank contains ≥ 56,754 gal of fuel.   | 31 days  |
| SR 3.8.3.2      Verify lubricating oil inventory is ≥ 287 gal per engine.  | 31 days  |
| SR 3.8.3.3      Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program. | In accordance with the Diesel Fuel Oil Testing Program |
| SR 3.8.3.4      Verify each DG air start receiver pressure is ≥ 190 psig.  | 31 days  |

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SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE |  | FREQUENCY |
|--------------|--|-----------|
| SR 3.8.3.5   | Check for and remove accumulated water from each of the four interconnected tanks which constitute the 7 day fuel oil storage tank.  | 31 days   |
| SR 3.8.3.6   | Perform a visual inspection for leaks in the exposed fuel oil system piping while the DG is running.   | 18 months |
| SR 3.8.3.7   | For each of the four interconnected tanks which constitute the 7 day fuel oil storage tank:<br><br>a. Drain the fuel oil;<br><br>b. Remove the sediment; and<br><br>c. Clean the tank. | 10 years  |

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources - Operating

LCO 3.8.4 Four channels of vital DC and four Diesel Generator (DG) DC electrical power subsystems shall be OPERABLE.

-----NOTE-----  
Vital Battery V may be substituted for any of the required vital batteries.  
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APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

| CONDITION   | REQUIRED ACTION  | COMPLETION TIME |
|---|--|-----------------|
| A. One vital DC electrical power subsystem inoperable.                    | A.1 Restore vital DC electrical power subsystem to OPERABLE status | 2 hours         |
| B. Required Action and Associated Completion Time of Condition A not met. | B.1 Be in MODE 3.  | 6 hours         |
|   | <u>AND</u><br>B.2 Be in MODE 5.                                    | 36 hours        |
| C. One DG DC electrical power subsystem inoperable                        | C.1 Restore DG DC electrical power subsystem to OPERABLE status    | 2 hours         |
| D. Required Action and associated Completion Time of Condition C not met  | D.1 Declare associated DG inoperable.                              | Immediately     |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE |   | FREQUENCY |
|--------------|---|-----------|
| SR 3.8.4.1   | Verify vital battery terminal voltage is $\geq 128$ V (132 V for vital battery V) on float charge.  | 7 days    |
| SR 3.8.4.2   | Verify DG battery terminal voltage is $\geq 124$ V on float charge.   | 7 days    |
| SR 3.8.4.3   | Verify for the vital batteries that the alternate feeder breakers to each required battery charger are open.  | 7 days    |
| SR 3.8.4.4   | Verify correct breaker alignment and indicated power availability for each DG 125 V DC distribution panel and associated battery charger  | 7 days    |
| SR 3.8.4.5   | Verify no visible corrosion at terminals and connectors for the vital batteries.<br><br><u>OR</u><br><br>Verify connection resistance for the vital batteries is $\leq 80$ E-6 ohm for inter-cell connections, $\leq 50$ E-6 ohm for inter-rack connections, $\leq 120$ E-6 ohm for inter-tier connections, and $\leq 50$ E-6 ohm for terminal connections. | 92 days   |
| SR 3.8.4.6   | Verify no visible corrosion at terminals and connectors for the DG batteries.<br><br><u>OR</u><br><br>Verify connection resistance for the DG batteries is $\leq 80$ E-6 ohm for inter-cell connections, $\leq 50$ E-6 ohm for inter-tier connections, and $\leq 50$ E-6 ohm for terminal connections.  | 92 days   |
| SR 3.8.4.7   | Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration.  | 12 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE |   | FREQUENCY |
|--------------|---|-----------|
| SR 3.8.4.8   | Remove visible terminal corrosion and verify battery cell to cell and terminal connections are coated with anti-corrosion material.   | 12 months |
| SR 3.8.4.9   | Verify connection resistance for the vital batteries is<br>$\leq 80 \text{ E-6 ohm}$ for inter-cell connections,<br>$\leq 50 \text{ E-6 ohm}$ for inter-rack connections,<br>$\leq 120 \text{ E-6 ohm}$ for inter-tier connections, and<br>$\leq 50 \text{ E-6 ohm}$ for terminal connections.  | 12 months |
| SR 3.8.4.10  | Verify connection resistance for the DG batteries is<br>$\leq 80 \text{ E-6 ohm}$ for inter-cell connections,<br>$\leq 50 \text{ E-6 ohm}$ for inter-tier connections, and<br>$\leq 50 \text{ E-6 ohm}$ for terminal connections.   | 12 months |
| SR 3.8.4.11  | <p>-----NOTE-----</p> <p>This Surveillance is normally not performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR.</p> <p>-----</p> <p>Verify each vital battery charger is capable of recharging its associated battery from a service or capacity discharge test while supplying normal loads.</p> <p><u>OR</u></p> <p>Verify each vital battery charger is capable of operating for <math>\geq 4</math> hours at current limit 220 amps – 250 amps.</p> | 18 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE   | FREQUENCY |
|--|-----------|
| <p>SR 3.8.4.12 -----NOTE-----<br/>Credit may be taken for unplanned events that satisfy this SR.<br/>-----<br/>Verify each diesel generator battery charger is capable of recharging its associated battery from a service or capacity discharge test while supplying normal loads.</p>  | 18 months |
| <p>SR 3.8.4.13 -----NOTES-----<br/>1. The modified performance discharge test in SR 3.8.4.14 may be performed in lieu of the service test in SR 3.8.4.13 once per 60 months.<br/>2. This Surveillance is not performed in MODE 1, 2, 3, or 4 for required vital batteries. Credit may be taken for unplanned events that satisfy this SR.<br/>-----<br/>Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads and any connected nonsafety loads for the design duty cycle when subjected to a battery service test.</p> | 18 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE   | FREQUENCY   |
|--|---|
| <p>SR 3.8.4.14 -----NOTE-----<br/> This Surveillance is not performed in MODE 1, 2, 3, or 4 for required vital batteries. Credit may be taken for unplanned events that satisfy this SR.<br/> -----<br/> Verify battery capacity is <math>\geq 80\%</math> of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.</p> | <p>60 months<br/> <u>AND</u><br/> 12 months when battery shows degradation or has reached 85% of expected life with capacity &lt; 100% of manufacturer's rating<br/> <u>AND</u><br/> 24 months when battery has reached 85% of the expected life with capacity <math>\geq 100\%</math> of manufacturer's rating</p> |

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources - Shutdown

LCO 3.8.5 Vital DC and Diesel Generator (DG) DC electrical power subsystems shall be OPERABLE to support the DC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems - Shutdown" and to support the Diesel Generators (DGs) required by LCO 3.8.2, "AC Sources - Shutdown."

-----NOTES-----  
Vital Battery V may be substituted for any of the required vital batteries.  
-----

APPLICABILITY: MODES 5 and 6,  
During movement of irradiated fuel assemblies.

ACTIONS

| CONDITION  | REQUIRED ACTION  | COMPLETION TIME |
|--|--|-----------------|
| A. One or more required vital DC electrical power subsystems inoperable. | A.1.1 Declare affected required feature(s) inoperable. | Immediately     |
|  | <u>OR</u>  |                 |
|  | A.2.1 Suspend CORE ALTERATIONS.                        | Immediately     |
|  | <u>AND</u>   |                 |
|  | A.2.2 Suspend movement of irradiated fuel assemblies.  | Immediately     |
|  | <u>AND</u>   |                 |
|  |  | (continued)     |

ACTIONS (continued)

| CONDITION  | REQUIRED ACTION  | COMPLETION TIME |
|--|--|-----------------|
| A. (continued)   | A.2.3 Initiate action to suspend operations involving positive reactivity additions.         | Immediately     |
|  | <u>AND</u>   |                 |
|  | A.2.4 Initiate action to restore required DC electrical power subsystems to OPERABLE status. | Immediately     |
| B. One required DG DC electrical power subsystem inoperable. | B.1 Declare associated DG inoperable.  | Immediately     |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE   | FREQUENCY                         |
|--|-----------------------------------|
| <p>SR 3.8.5.1 -----NOTE-----</p> <p>The following SRs are not required to be performed: SR 3.8.4.11, SR 3.8.4.12, SR 3.8.4.13, and SR 3.8.4.14.</p> <p>-----</p> <p>For DC sources required to be OPERABLE, the following SRs are applicable:</p> <p>SR 3.8.4.1      SR 3.8.4.6      SR 3.8.4.11<br/> SR 3.8.4.2      SR 3.8.4.7      SR 3.8.4.12<br/> SR 3.8.4.3      SR 3.8.4.8      SR 3.8.4.13<br/> SR 3.8.4.4      SR 3.8.4.9      SR 3.8.4.14<br/> SR 3.8.4.5      SR 3.8.4.10</p> | In accordance with applicable SRs |

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Battery Cell Parameters

LCO 3.8.6 Battery cell parameters for 125 V vital batteries and 125 V diesel generator (DG) batteries shall be within the limits of Table 3.8.6-1.

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

ACTIONS

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

| CONDITION  | REQUIRED ACTION   | COMPLETION TIME  |
|--|---|--|
| A. One or more batteries with one or more battery cell parameters not within Category A or B limits. | A.1<br><br>Verify pilot cells electrolyte level and float voltage meet Table 3.8.6-1 Category C limits. | 1 hour   |
|  | <u>AND</u>  |  |
|  | A.2<br><br>Verify battery cell parameters meet Table 3.8.6-1 Category C limits.                         | 24 hours<br><br><u>AND</u><br>Once per 7 days thereafter |
| <u>AND</u>   |   |  |
| A.3<br><br>Restore battery cell parameters to Category A and B limits of Table 3.8.6-1.              | 31 days   |  |

(continued)

ACTIONS (continued)

| CONDITION  | REQUIRED ACTION                                   | COMPLETION TIME    |
|--|---|--------------------|
| <p>B. Required Action and associated Completion Time of Condition A not met.</p> <p><u>OR</u></p> <p>One or more batteries with average electrolyte temperature of the representative cells &lt; 60°F for vital batteries and &lt; 50°F for DG batteries.</p> <p><u>OR</u></p> <p>One or more batteries with one or more battery cell parameters not within Category C values.</p> | <p>B.1 Declare associated battery inoperable.</p> | <p>Immediately</p> |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE   | FREQUENCY     |
|--|---------------|
| <p>SR 3.8.6.1 Verify battery cell parameters meet Table 3.8.6-1 Category A limits.</p> | <p>7 days</p> |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE |   | FREQUENCY   |
|--------------|---|---|
| SR 3.8.6.2   | Verify battery cell parameters meet Table 3.8.6-1 Category B limits.  | <p>92 days</p> <p><u>AND</u></p> <p>Once within 24 hours after a battery discharge &lt; 110 V for vital batteries (113.5 V for vital battery V) or 106.5 V for DG batteries</p> <p><u>AND</u></p> <p>Once within 24 hours after a battery overcharge &gt; 150 V for vital batteries (155 V for vital battery V) or 145 V for DG batteries</p> |
| SR 3.8.6.3   | Verify average electrolyte temperature of representative cells is $\geq 60^{\circ}\text{F}$ for vital batteries and $\geq 50^{\circ}\text{F}$ for the DG batteries. | 92 days   |

Table 3.8.6-1 (page 1 of 1)  
Battery Cell Parameters Requirements

| PARAMETER                          | CATEGORY A:<br>LIMITS FOR EACH<br>DESIGNATED PILOT<br>CELL  | CATEGORY B:<br>LIMITS FOR EACH<br>CONNECTED CELL  | CATEGORY C:<br>ALLOWABLE LIMIT<br>FOR EACH<br>CONNECTED CELL  |
|------------------------------------|---|---|---|
| Electrolyte Level                  | > Minimum level indication mark, and<br>≤ 1/4 inch above maximum level indication mark <sup>(a)</sup> | > Minimum level indication mark, and<br>≤ 1/4 inch above maximum level indication mark <sup>(a)</sup> | Above top of plates, and not overflowing  |
| Float Voltage                      | ≥ 2.13 V  | ≥ 2.13 V  | > 2.07 V  |
| Specific Gravity <sup>(b)(c)</sup> | ≥ 1.200   | ≥ 1.195<br><br><u>AND</u><br>Average of all connected cells<br>> 1.205                                | Not more than 0.020 below average of all connected cells<br><br><u>AND</u><br>Average of all connected cells<br>≥ 1.195 |

- (a) It is acceptable for the electrolyte level to temporarily increase above the specified maximum level during equalizing charges provided it is not overflowing.
- (b) Corrected for electrolyte temperature and level. Level correction is not required, however, when battery charging is < 2 amps when on float charge for vital batteries and < 1.0 amp for DG batteries.
- (c) A battery charging current of < 2 amps when on float charge for vital batteries and < 1.0 amp for DG batteries is acceptable for meeting specific gravity limits following a battery recharge, for a maximum of 31 days. When charging current is used to satisfy specific gravity requirements, specific gravity of each connected cell shall be measured prior to expiration of the 31 day allowance.

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters - Operating

LCO 3.8.7 Two inverters in each of four channels shall be OPERABLE.

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

ACTIONS

| CONDITION  | REQUIRED ACTION   | COMPLETION TIME |
|--|---|-----------------|
| A. One inverter in one channel inoperable.                 | <p>A.1 -----NOTE-----<br/>Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems-Operating", with any AC Vital Bus deenergized.<br/>-----</p> <p>Restore inverter to OPERABLE status.</p> | 24 hours        |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 3.   | 6 hours         |
|  | <u>AND</u><br>B.2 Be in MODE 5.   | 36 hours        |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE |  | FREQUENCY |
|--------------|--|-----------|
| SR 3.8.7.1   | Verify correct inverter voltage, frequency, and alignment to required AC vital bus and from associated vital battery board and 480 V shutdown board. | 7 days    |

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Inverters - Shutdown

LCO 3.8.8 Inverters shall be OPERABLE to support the onsite Class 1E AC vital bus electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems - Shutdown."

APPLICABILITY: MODES 5 and 6,  
During movement of irradiated fuel assemblies.

ACTIONS

| CONDITION   | REQUIRED ACTION   | COMPLETION TIME |
|---|---|-----------------|
| A. One or more required inverter channels inoperable. | A.1 Declare affected required feature(s) inoperable.                                | Immediately     |
|   | <u>OR</u>   |                 |
|   | A.2.1 Suspend CORE ALTERATIONS.   | Immediately     |
|   | <u>AND</u>  |                 |
|   | A.2.2 Suspend movement of irradiated fuel assemblies.                               | Immediately     |
|   | <u>AND</u>  |                 |
|   | A.2.3 Initiate action to suspend operations involving positive reactivity additions | Immediately     |
|   | <u>AND</u>  |                 |
|   | A.2.4 Initiate action to restore required inverters to OPERABLE status              | Immediately     |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE |   | FREQUENCY |
|--------------|---|-----------|
| SR 3.8.8.1   | Verify correct inverter voltage, frequency, and alignments to required AC vital bus and from associated vital battery board and 480 V shutdown board. | 7 days    |

3.8 ELECTRICAL POWER SYSTEMS

3.8.9 Distribution Systems - Operating

LCO 3.8.9 Train A and Train B AC, four channels of vital DC, and four channels of AC vital bus electrical power distribution subsystems shall be OPERABLE.

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

ACTIONS

| CONDITION   | REQUIRED ACTION  | COMPLETION TIME   |
|---|--|---|
| A. One or more AC electrical power distribution subsystems inoperable.  | A.1 Restore AC electrical power distribution subsystem to OPERABLE status. | 8 hours<br><u>AND</u><br>16 hours from discovery of failure to meet LCO |
| B. One or more AC vital buses in one channel inoperable.                | B.1 Restore AC vital bus(es) to OPERABLE status.                           | 2 hours<br><u>AND</u><br>16 hours from discovery of failure to meet LCO |
| C. One or more vital DC electrical power distribution buses inoperable. | C.1 Restore DC electrical power distribution bus to OPERABLE status.       | 2 hours<br><u>AND</u><br>16 hours from discovery of failure to meet LCO |

(continued)

ACTIONS (continued)

| CONDITION   | REQUIRED ACTION      | COMPLETION TIME |
|---|----------------------|-----------------|
| D. Required Action and associated Completion Time not met.  | D.1 Be in MODE 3.    | 6 hours         |
|   | <u>AND</u>           |                 |
|   | D.2 Be in MODE 5.    | 36 hours        |
| E. Two trains with one or more inoperable distribution subsystems that result in a loss of safety function. | E.1 Enter LCO 3.0.3. | Immediately     |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE  | FREQUENCY |
|---|-----------|
| SR 3.8.9.1 Verify correct breaker alignments and voltage to required AC, vital DC, and AC vital bus electrical power distribution subsystems. | 7 days    |

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems - Shutdown

LCO 3.8.10            The necessary portion of AC, vital DC, and AC vital bus electrical power distribution subsystems shall be OPERABLE to support equipment required to be OPERABLE.

APPLICABILITY:    MODES 5 and 6,  
During movement of irradiated fuel assemblies.

ACTIONS

| CONDITION  | REQUIRED ACTION   | COMPLETION TIME |
|--|---|-----------------|
| A. One or more required AC, vital DC, or AC vital bus electrical power distribution subsystems inoperable. | A.1      Declare associated supported required feature(s) inoperable.                   | Immediately     |
|  | <u>OR</u>   |                 |
|  | A.2.1    Suspend CORE ALTERATIONS.  | Immediately     |
|  | <u>AND</u>  |                 |
|  | A.2.2    Suspend movement of irradiated fuel assemblies.                                | Immediately     |
|  | <u>AND</u>  |                 |
|  | A.2.3    Initiate action to suspend operations involving positive reactivity additions. | Immediately     |
|  | <u>AND</u>  |                 |
|  |   | (continued)     |

ACTIONS

| CONDITION      | REQUIRED ACTION  | COMPLETION TIME                       |
|----------------|--|---------------------------------------|
| A. (continued) | <p>A.2.4 Initiate actions to restore required AC, vital DC, and AC vital bus electrical power distribution subsystems to OPERABLE status.</p> <p><u>AND</u></p> <p>A.2.5 Declare associated required residual heat removal subsystem(s) inoperable and not in operation.</p> | <p>Immediately</p> <p>Immediately</p> |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE  | FREQUENCY     |
|---|---------------|
| <p>SR 3.8.10.1 Verify correct breaker alignments and voltage to required AC, vital DC, and AC vital bus electrical power distribution subsystems.</p> | <p>7 days</p> |