

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.3 -----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> <li>5. A single test will satisfy this Surveillance for both units, with synchronization to the Unit 2 4 kV emergency bus for one periodic test and synchronization to the Unit 3 4 kV emergency bus during the next periodic test. However, if the test is not performed on Unit 3, then the test shall be performed synchronized to the Unit 2 4 kV emergency bus.</li> </ol> <p>Verify each DG is synchronized and loaded and operates for <math>\geq</math> 60 minutes at a load <math>\geq</math> 2400 kW and <math>\leq</math> 2800 kW.</p>	31 days
SR 3.8.1.4 Verify each day tank contains $\geq$ 250 gal of fuel oil.	31 days
SR 3.8.1.5 Check for and remove accumulated water from each day tank.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.9 -----NOTES-----</p> <p>1. If performed with the DG synchronized with offsite power, it shall be performed at a power factor <math>\leq 0.89</math>.</p> <p>2. A single test at the specified Frequency will satisfy this Surveillance for both units.</p> <p>-----</p>	
<p>Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and:</p> <ul style="list-style-type: none"> <li>a. Following load rejection, the frequency is <math>\leq 66.75</math> Hz;</li> <li>b. Within 1.8 seconds following load rejection, the voltage is <math>\geq 3750</math> V and <math>\leq 4570</math> V, and after steady state conditions are reached, maintains voltage <math>\geq 4160</math> V and <math>\leq 4400</math> V; and</li> <li>c. Within 2.4 seconds following load rejection, the frequency is <math>\geq 58.8</math> Hz and <math>\leq 61.2</math> Hz.</li> </ul> <p>-----</p>	24 months
<p>SR 3.8.1.10 -----NOTE-----</p> <p>A single test at the specified Frequency will satisfy this Surveillance for both units.</p> <p>-----</p> <p>Verify each DG operating at a power factor <math>\leq 0.89</math> does not trip and voltage is maintained <math>\leq 5230</math> V during and following a load rejection of <math>\geq 2400</math> kW and <math>\leq 2800</math> kW.</p> <p>-----</p>	24 months

(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. If grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.</li><li>3. A single test at the specified Frequency will satisfy this Surveillance for both units.</li></ol> <p>-----</p> <p>Verify each DG operating at a power factor <math>\leq 0.89</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 2800</math> kW and <math>\leq 3000</math> kW; and</li><li>b. For the remaining hours of the test loaded <math>\geq 2400</math> kW and <math>\leq 2800</math> kW.</li></ol>	24 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.15 -----NOTES-----</p> <ol style="list-style-type: none"><li>1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated <math>\geq</math> 2 hours loaded <math>\geq</math> 2400 kW and <math>\leq</math> 2800 kW. Momentary transients outside of load range do not invalidate this test.</li><li>2. All DG starts may be preceded by an engine prelube period.</li><li>3. A single test at the specified Frequency will satisfy this Surveillance for both units.</li></ol> <p>Verify each DG starts and achieves, in <math>\leq</math> 10 seconds, voltage <math>\geq</math> 4160 V and frequency <math>\geq</math> 58.8 Hz, and after steady state conditions are reached, maintains voltage <math>\geq</math> 4160 V and <math>\leq</math> 4400 V and frequency <math>\geq</math> 58.8 Hz and <math>\leq</math> 61.2 Hz.</p>	24 months

(continued)

BASES

SURVEILLANCE  
REQUIREMENTS  
(continued)

SR 3.8.1.14

Consistent with Regulatory Guide 1.9 (Ref. 3), paragraph C.2.2.9, this Surveillance requires demonstration that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours. However, load values may deviate from the Regulatory Guide such that the DG operates for 22 hours at a load approximately equivalent to 92% to 108% of the continuous duty rating of the DG, and 2 hours of which is at a load approximately equivalent to 108% to 115% of the continuous duty rating of the DG. The DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelube and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR.

This Surveillance verifies, indirectly, that the DGs are capable of synchronizing and accepting loads equivalent to post accident loads. The DGs are tested at a load approximately equivalent to their continuous duty rating, even though the post accident loads exceed the continuous rating. This is acceptable because regular surveillance testing at post accident loads is injurious to the DG, and imprudent because the same level of assurance in the ability of the DG to provide post accident loads can be developed by monitoring engine parameters during surveillance testing. The values of the testing parameters can then be qualitatively compared to expected values at post accident engine loads. In making this comparison it is necessary to consider the engine parameters as interrelated indicators of remaining DG capacity, rather than independent indicators. The important engine parameters to be considered in making this comparison include, fuel rack position, scavenging air pressure, exhaust temperature and pressure, engine output, jacket water temperature, and lube oil temperature. With the DG operating at or near continuous rating and the observed values of the above parameters less than expected post accident values, a qualitative extrapolation which shows the DG is capable of accepting post accident loads can be made without requiring detrimental testing.

In order to ensure that the DG is tested under load conditions that are as close to design conditions as possible, testing must be performed using a power factor  $\leq 0.89$ . This power factor is chosen to be representative of the actual design basis inductive loading that the DG could

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.3. -----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> <li>5. A single test will satisfy this Surveillance for both units, with synchronization to the Unit 3 4 kV emergency bus for one periodic test and synchronization to the Unit 2 4 kV emergency bus during the next periodic test. However, if the test is not performed on Unit 2, then the test shall be performed synchronized to the Unit 3 4 kV emergency bus.</li> </ol> <p>-----</p> <p>Verify each DG is synchronized and loaded and operates for <math>\geq</math> 60 minutes at a load <math>\geq</math> 2400 kW and <math>\leq</math> 2800 kW.</p>	31 days
SR 3.8.1.4 Verify each day tank contains $\geq$ 250 gal of fuel oil.	31 days
SR 3.8.1.5 Check for and remove accumulated water from each day tank.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.9 -----NOTES-----</p> <ol style="list-style-type: none"> <li>1. If performed with the DG synchronized with offsite power, it shall be performed at a power factor <math>\leq 0.89</math>.</li> <li>2. A single test at the specified Frequency will satisfy this Surveillance for both units.</li> </ol> <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 1.8 seconds following load rejection, the voltage is <math>\geq 3750</math> V and <math>\leq 4570</math> V, and after steady state conditions are reached, maintains voltage <math>\geq 4160</math> V and <math>\leq 4400</math> V; and</li> <li>c. Within 2.4 seconds following load rejection, the frequency is <math>\geq 58.8</math> Hz and <math>\leq 61.2</math> Hz.</li> </ol>	24 months
<p>SR 3.8.1.10 -----NOTE-----</p> <p>A single test at the specified Frequency will satisfy this Surveillance for both units.</p> <p>Verify each DG operating at a power factor <math>\leq 0.89</math> does not trip and voltage is maintained <math>\leq 5230</math> V during and following a load rejection of <math>\geq 2400</math> kW and <math>\leq 2800</math> kW.</p>	24 months

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.14 -----NOTES-----</p> <p>1. Momentary transients outside the load and power factor ranges do not invalidate this test.</p> <p>2. If grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable.</p> <p>3. A single test at the specified Frequency will satisfy this Surveillance for both units.</p> <p>-----</p> <p>Verify each DG operating at a power factor <math>\leq 0.89</math> operates for <math>\geq 24</math> hours:</p> <p>a. For <math>\geq 2</math> hours loaded <math>\geq 2800</math> kW and <math>\leq 3000</math> kW; and</p> <p>b. For the remaining hours of the test loaded <math>\geq 2400</math> kW and <math>\leq 2800</math> kW.</p>	24 months

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SURVEILLANCE REQUIREMENTS (continued)

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BASES

SURVEILLANCE  
REQUIREMENTS  
(continued)

SR 3.8.1.14

Consistent with Regulatory Guide 1.9 (Ref. 3), paragraph C.2.2.9, this Surveillance requires demonstration that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours. However, load values may deviate from the Regulatory Guide such that the DG operates for 22 hours at a load approximately equivalent to 92% to 108% of the continuous duty rating of the DG, and 2 hours of which is at a load approximately equivalent to 108% to 115% of the continuous duty rating of the DG. The DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelube and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR.

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