

ENERGY NORTHWEST

P.O. Box 968 ■ Richland, Washington 99352-0968

July 16, 2002
GO2-02-111

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

Subject: COLUMBIA GENERATING STATION, DOCKET NO. 50-397, LICENSE AMENDMENT REQUEST TO REVISE THE MINIMUM EMERGENCY DIESEL GENERATOR OUTPUT VOLTAGE SPECIFIED IN TECHNICAL SPECIFICATION LIMITING CONDITION FOR OPERATION 3.8.1.

Reference: Letter dated October 19, 2002, NRC to JV Parrish (Energy Northwest), "Columbia Generating Station - NRC Inspection Report No. 50-397/01-06."

Dear Sir or Madam:

Pursuant to the Code of Federal Regulations, Title 10 CFR 50.90, Energy Northwest hereby requests an amendment to the Columbia Generating Station Technical Specifications. Specifically, Energy Northwest is requesting a revision to Technical Specification Surveillance Requirements (SRs) 3.8.1.2.b, 3.8.1.7.b, 3.8.1.11.c.3, 3.8.1.12.a, 3.8.1.15.b, 3.8.1.19.c.3, and 3.8.1.20 to change the specified minimum Emergency Diesel Generator (DG) steady state output voltage from 3740 Volts to 3910 Volts. Energy Northwest has concluded that the proposed change warrants a no significant hazards consideration and does not result in a significant increase in the amount or type of any effluent that may be released offsite.

Approval of this Technical Specification amendment request will remove the overlap that exists between the DG output voltage range specified in limiting condition for operation 3.8.1 and the Loss of Power Instrumentation allowable setpoint range specified in Technical Specification Table 3.3.8.1-1, Functions 1.e and 2.c.

A deterministic engineering evaluation has shown that changing the minimum DG steady state output voltage to 3910 Volts for all three DGs has no impact on the ability to accomplish their safety function to supply power to engineered safety feature systems.

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LICENSE AMENDMENT REQUEST TO REVISE THE MINIMUM EMERGENCY DIESEL GENERATOR OUTPUT VOLTAGE SPECIFIED IN TECHNICAL SPECIFICATIONS LIMITING CONDITION FOR OPERATION 3.8.1.

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Attachment 1 contains the Basis for the Technical Specification Amendment Request. Attachment 2 provides the Evaluation of Significant Hazards Consideration. Attachment 3 contains the Evaluation of Environmental Considerations. Attachment 4 contains the marked up pages from Technical Specifications, which, if approved, will be used to implement the modified SRs. Attachment 5 contains the typed revised Technical Specification page, as it would be revised by this amendment.

The Plant Operations Committee and the Corporate Nuclear Safety Review Board have reviewed this Technical Specification amendment request.

I declare under penalty of perjury, that the foregoing is true and correct. Executed on July 16, 2002.

Should you have any questions or desire additional information regarding this matter, please call Ms. CL Perino at (509) 377-2075.

Respectfully,



RL Webring

Vice President, Operations Support/PIO

Mail Drop PE08

Attachments:

1. Basis for Technical Specification Amendment Request
2. Evaluation of Significant Hazards Consideration
3. Evaluation of Environmental Considerations
4. Marked up Technical Specification pages
5. Typed revised Technical Specification pages

cc: EW Merschoff - NRC RIV
JB Hickman - NRC NRR
BJ Benney - NRC NRR
NRC Sr. Resident Inspector - 988C
DL Williams - BPA/MD1399
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JO Luce - ESFEC

TECHNICAL SPECIFICATION AMENDMENT REQUEST TO REVISE DIESEL GENERATOR ALLOWED OUTPUT VOLTAGE RANGE SPECIFIED IN TECHNICAL SPECIFICATION 3.8.1.

Attachment 1

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Basis For Technical Specification Amendment Request

Background

During the course of a safety system design and performance capability inspection in September of 2001, a finding resulted from an incongruence identified in the Columbia Generating Station (Columbia) Technical Specifications. The inspection finding was one of very low safety significance and was characterized as a non-cited violation. The details of the finding (50-397/0106-02) are documented in NRC inspection report 50-397/01-06. During the inspection, it was discovered that the Emergency Diesel Generator (DG) output voltage range specified in Surveillance Requirement (SR) 3.8.1.19.c.3 is from 3740 Volts (V) to 4400 V and the degraded emergency bus voltage instrumentation allowable value range specified in Loss Of Power (LOP) Instrumentation Table 3.3.8.1-1.1.e is from 3685 V to 3755 V. This presents a condition wherein the Technical Specifications allow a steady state minimum DG output that is 15 V lower than the maximum setpoint at which degraded voltage instruments may be actuated to perform their safety function. It was postulated in the inspection report that if the degraded voltage instruments are set near the upper end of their acceptable range and output voltages for both DGs were at the lower end of their acceptable ranges, the degraded voltage instrumentation could actuate and strip all loads off of the Division 1 and 2 critical busses during a loss of offsite power and/or a loss of coolant accident. Critical-bus loads include residual heat removal pumps, low pressure core spray pumps, service water pumps, and other equipment necessary to mitigate accident conditions. The postulated load shedding scenario also considered that if the critical busses recovered above the degraded voltage setpoint, the loads would be re-sequenced on and could be subsequently shed if the voltage again dropped below the degraded voltage setpoint. Historical surveillance test data has shown that the postulated scenario could not have occurred at Columbia because degraded voltage instruments and DG output voltages have never been adjusted to operate in the overlap region between their respective ranges.

To reconcile the overlap between the two allowable ranges and provide consistent allowable output voltage ranges for all DGs, Columbia is proposing to increase the minimum steady state DG output voltage limit to 3910 V for the Division 1, 2, and 3 DGs. This proposed change would revise Technical Specifications SRs 3.8.1.2.b, 3.8.1.7.b, 3.8.1.11.c.3, 3.8.1.12.a, 3.8.1.15.b, 3.8.1.19.c.3, and 3.8.1.20 that currently specify a minimum steady state output voltage of 3740 V.

TECHNICAL SPECIFICATION AMENDMENT REQUEST TO REVISE DIESEL GENERATOR ALLOWED OUTPUT VOLTAGE RANGE SPECIFIED IN TECHNICAL SPECIFICATION 3.8.1.

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Justification

The three DGs at Columbia provide a source of power to independent 4160 V busses to ensure an available source of power is dedicated to Engineered Safety Feature (ESF) loads. In the event of a loss of offsite power, the ESF electrical loads are automatically connected to the DGs in sufficient time to provide for a safe reactor shutdown and to mitigate the consequences of a design basis accident. The Technical Specifications specify the minimum steady state output voltage range for a loaded DG to be 3740 V. This is a Standard Technical Specification value based on American National Standards Institute (ANSI) standard C84.1-1970 for nominal utilization voltage for a typical 4000 V medium voltage distribution system. To reconcile the overlap with the LOP instrumentation degraded voltage range specified in Technical Specifications Table 3.3.8.1-1 Functions 1.e and 2.c and to provide consistency, a minimum steady state DG output voltage value of 3910 V is proposed for all three DGs. This value is chosen because it is the minimum voltage necessary to meet the breaker closure (ready to load) interlock for DG-1 and DG-2 and it is the minimum DG output voltage specified by Technical Specifications for unloaded DGs. The appropriateness of this value has been demonstrated for DG-1 and DG-2 during surveillance testing pursuant to SR 3.8.1.19 that requires starting and loading of the DGs (ergo, the DGs would not connect to the bus if at least the minimum voltage was not maintained). DG-3 is different in that it uses an 850 RPM speed interlock for its breaker closure permissive. However, it is reasonable to select 3910 V as an appropriate minimum steady state voltage for DG-3 since it is a dedicated power source for only one ESF load and its bus voltage does not fluctuate as loads are sequenced on. Additionally, changing the minimum steady state voltage specification for DG-3 to 3910 V (or 94% of a nominal 4160 V) provides more margin to the analytical limit for the degraded voltage relay dropout and ensures that the EDG supplies a more conservative voltage to start the High Pressure Core Spray pump motor (75% Voltage is the minimum specified voltage needed at the motor terminals to start and accelerate the pump motor).

Further justification exists considering the proposed amendment is administrative and does not involve a change to the actual performance parameters of the DGs. There will be no change in the method of DG operation or in the way that DG operability is demonstrated. The designs of Columbia's DGs feature precise regulation of output voltage using a Class 1E Static Exciter Voltage Regulator (SEVR) that controls generator output voltage to within +/-1% of its setpoint and the setpoint for the LOP instrumentation is also controlled to within +/-1%. The proposed amendment does not involve a change to the margin between these two parameters. Historical surveillance test data indicates the SEVR and LOP equipment performs reliably.

TECHNICAL SPECIFICATION AMENDMENT REQUEST TO REVISE DIESEL GENERATOR ALLOWED OUTPUT VOLTAGE RANGE SPECIFIED IN TECHNICAL SPECIFICATION 3.8.1.

Attachment 2

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Evaluation of Significant Hazards Consideration

Summary of Proposed Change:

The output voltage range specified in Technical Specification limiting condition for operation 3.8.1 for Emergency Diesel Generators (DG) under loaded conditions is from 3740 Volts (V) to 4400 V and the degraded emergency bus voltage instrumentation allowable value range specified in Loss Of Power (LOP) Instrumentation Table 3.3.8.1-1.1.e is from 3685 V to 3755 V. This presents a condition wherein the Technical Specifications allow a minimum steady state DG output that is 15 V lower than the maximum voltage at which LOP instruments may be actuated to perform their safety function. It can be postulated that if the degraded voltage instruments are set near the upper end of their acceptable range and output voltages for the DGs were at the lower end of their acceptable ranges, the degraded voltage instrumentation could actuate and strip all loads off of the critical busses during a loss of offsite power and/or a loss of coolant accident. Critical-bus loads include residual heat removal pumps, low pressure core spray pumps, service water pumps, and other equipment necessary to mitigate accident conditions.

To reconcile the overlap between the two allowable ranges and provide consistent allowable output voltage ranges for all DGs, Columbia Generating Station (Columbia) is proposing to increase the minimum steady state DG output voltage limit to 3910 V for the Division 1, 2, and 3 DGs. This proposed change would revise Technical Specifications SRs 3.8.1.2.b, 3.8.1.7.b, 3.8.1.11.c.3, 3.8.1.12.a, 3.8.1.15.b, 3.8.1.19.c.3, and 3.8.1.20 that currently specify a minimum steady state output voltage of 3740 V.

Significant Hazards Evaluation:

Energy Northwest has evaluated the proposed change using the criteria established in 10CFR50.92(c) and has determined that it warrants a no significant hazards consideration as described below.

The operation of Columbia Generating Station in accordance with the proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated:

The proposed license amendment is administrative and does not involve any design changes or physical changes to plant equipment. The ability of the DGs to perform their safety functions to mitigate consequences is not affected and will continue to be demonstrated in the same manner. Therefore the proposed amendment will not affect the probability or consequences of an accident previously evaluated.

TECHNICAL SPECIFICATION AMENDMENT REQUEST TO REVISE DIESEL GENERATOR ALLOWED OUTPUT VOLTAGE RANGE SPECIFIED IN TECHNICAL SPECIFICATION 3.8.1.

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The operation of Columbia Generating Station in accordance with the proposed amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated:

The proposed license amendment does not involve changes to plant equipment and the DGs will continue to perform to their required parameters in the same manner. Because the performance of the DGs will remain unchanged, this proposed amendment does not present the possibility of a new or different kind of accident from any accident previously evaluated.

The operation of Columbia Generating Station in accordance with the proposed amendment will not involve a significant reduction in the margin of safety for the following reasons:

The proposed amendment is solely a request to revise the Technical Specifications regarding minimum steady state DG output voltage requirements. This change would not affect any operating parameter or equipment performance. Because this proposed amendment would not affect operation, the margin of safety maintained by Columbia would remain unchanged.

TECHNICAL SPECIFICATION AMENDMENT REQUEST TO REVISE DIESEL GENERATOR ALLOWED OUTPUT VOLTAGE RANGE SPECIFIED IN TECHNICAL SPECIFICATION 3.8.1.

Attachment 3

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Evaluation of Environmental Considerations

Energy Northwest has evaluated the proposed amendment against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10CFR51.21. It has been determined that the proposed changes meet the criteria for categorical exclusion as provided for under 10CFR51.22(c)(9). This evaluation has determined that the change requested does not pose a significant hazards consideration nor does it involve an increase in the amounts, or a change in the types of any effluent that may be released off-site. Additionally, this request does not involve a significant increase in individual or cumulative occupational radiation exposure.

TECHNICAL SPECIFICATION AMENDMENT REQUEST TO REVISE DIESEL GENERATOR ALLOWED OUTPUT VOLTAGE RANGE SPECIFIED IN TECHNICAL SPECIFICATION 3.8.1.

Attachment 4

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Marked up Technical Specification pages

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 -----NOTES----- 1. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 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. ----- Verify each required DG starts from standby conditions and achieves steady state: a. Voltage \geq 3910 V and \leq 4400 V and frequency \geq 58.8 Hz and \leq 61.2 Hz for DG-1 and DG-2; and b. Voltage \geq 3740 V and \leq 4400 V and frequency \geq 58.8 Hz and \leq 61.2 Hz for DG-3.	31 days

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.6 Verify each required fuel oil transfer subsystem operates to automatically transfer fuel oil from the storage tank to the day tank.</p>	<p>92 days</p>
<p>SR 3.8.1.7 -----NOTE----- All DG starts may be preceded by an engine prelube period. ----- Verify each required DG starts from standby condition and achieves: a. For DG-1 and DG-2 in ≤ 15 seconds, voltage ≥ 3910 V and frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains voltage ≥ 3910 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz; and b. For DG-3, in ≤ 15 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains voltage ≥ 3740 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.</p> <p>3910</p> <p>3910</p>	<p>184 days</p>
<p>SR 3.8.1.8 -----NOTE----- The automatic transfer function of this Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. ----- Verify automatic and manual transfer of the power supply to safety related buses from the startup offsite circuit to the backup offsite circuit.</p>	<p>24 months</p>

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.11 -----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 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. <p>-----</p> <p>Verify on an actual or simulated loss of offsite power signal:</p> <ol style="list-style-type: none"> a. De-energization of emergency buses; b. Load shedding from emergency buses for Divisions 1 and 2; and c. DG auto-starts from standby condition and: <ol style="list-style-type: none"> 1. energizes permanently connected loads in ≤ 15 seconds for DG-1 and DG-2, and in ≤ 18 seconds for DG-3. 2. energizes auto-connected shutdown loads, 3. maintains steady state voltage ≥ 3740 V and ≤ 4400 V. 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes. 	<p>24 months</p>

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(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.12 -----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 2. 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>Verify on an actual or simulated Emergency Core Cooling System (ECCS) initiation signal each required DG auto-starts from standby condition and:</p> <ol style="list-style-type: none"> a. For DG-1 and DG-2, in ≤ 15 seconds achieves voltage ≥ 3910 V, and after steady state conditions are reached, maintains voltage ≥ 3910 V and ≤ 4400 V and, for DG-3, in ≤ 15 seconds achieves voltage ≥ 3740 V, and after steady state conditions are reached, maintains voltage ≥ 3740 V and ≤ 4400 V; b. In ≤ 15 seconds, achieves frequency ≥ 58.8 Hz and after steady state conditions are achieved, maintains frequency ≥ 58.8 Hz and ≤ 61.2 Hz; c. Operates for ≥ 5 minutes; d. Permanently connected loads remain energized from the offsite power system; and e. Emergency loads are auto-connected to the offsite power system. 	<p>24 months</p>

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SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.15 -----NOTES-----</p> <p>1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 1 hour loaded ≥ 4000 kW for DG-1 and DG-2, and ≥ 2340 kW for DG-3.</p> <p> Momentary transients outside of load range do not invalidate this test.</p> <p>2. All DG starts may be preceded by an engine prelube period.</p> <p>-----</p> <p>Verify each required DG starts and achieves:</p> <p>a. For DG-1 and DG-2, in ≤ 15 seconds, voltage ≥ 3910 V and frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains voltage ≥ 3910 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz; and</p> <p>b. For DG-3, in ≤ 15 seconds, voltage ≥ 3910 V and frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains voltage ≥ 3910 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.</p>	<p>24 months</p>

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.18 -----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. -----</p> <p>Verify interval between each sequenced load block is within $\pm 10\%$ of design interval for each time delay relay.</p>	<p>24 months</p>
<p>SR 3.8.1.19 -----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 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. ----- <p>Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal:</p> <ol style="list-style-type: none"> a. De-energization of emergency buses; b. Load shedding from emergency buses for DG-1 and DG-2; and c. DG auto-starts from standby condition and: <ol style="list-style-type: none"> 1. energizes permanently connected loads in ≤ 15 seconds, 2. energizes auto-connected emergency loads, 3. maintains steady state voltage ≥ 3740 V and ≤ 4400 V, <p>3910 </p>	<p>24 months</p> <p>(continued)</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.19 (continued)</p> <p>4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and</p> <p>5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.</p>	
<p>SR 3.8.1.20 -----NOTE----- All DG starts may be preceded by an engine prelube period. -----</p> <p>Verify, when started simultaneously from standby condition, DG-1 and DG-2 achieves, in ≤ 15 seconds, voltage ≥ 3910 V and frequency ≥ 58.8 Hz, and DG-3 achieves, in ≤ 15 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz.</p> <p>3910</p>	<p>10 years</p>

BASES

SURVEILLANCE
REQUIREMENTS
(continued)

Where the SRs discussed herein specify voltage and frequency tolerances, the following summary is applicable. For Division 1 and 2 DGs, the minimum steady state output voltage depends upon whether or not the DG is tied to its respective 4.16 kV ESF bus. If the SR does not require the DG to be tied to its bus, then the minimum steady state output voltage is 3910 V, which is the minimum voltage necessary to meet the DG breaker closure interlock. If the SR requires the DG to be tied to its respective 4.16 kV ESF bus, then the minimum steady state output voltage is 3740 V. Studies have shown that with design basis maximum loading on the Class 1E distribution system, the Class 1E loads at all voltage levels (4160 V, 480 V, and 120 V) will have sufficient voltage at their terminals to meet or exceed their minimum voltage requirements when the voltage on the Class 1E 4.16 kV ESF bus is 3696 V or higher (Ref. 15). The specified value of 3740 V provides a conservative allowance for calculational uncertainties. For the Division 3 DG, the minimum steady state output voltage is 3740 V. The basis for this value is the same as for the Division 1 and 2 DGs 3740 V value. The specified maximum steady state output voltage of 4400 V is equal to the maximum operating voltage specified for 4000 V motors. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages. The specified minimum and maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively. These values are equal to $\pm 2\%$ of the 60 Hz nominal frequency and are derived from the recommendations given in Safety Guide 9 (Ref. 5) and Regulatory Guide 1.9 (Ref. 12).

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SR 3.8.1.1

This SR ensures proper circuit continuity for the offsite AC electrical power supply to the onsite distribution network and availability of offsite AC electrical power. The breaker alignment verifies that each breaker is in its correct position to ensure that distribution buses and loads are connected to their preferred power source and that appropriate independence of offsite circuits is maintained. The 7 day Frequency is adequate since breaker position is not likely to change without the operator being aware of it and because its status is displayed in the control room.

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TECHNICAL SPECIFICATION AMENDMENT REQUEST TO REVISE DIESEL GENERATOR ALLOWED OUTPUT VOLTAGE RANGE SPECIFIED IN TECHNICAL SPECIFICATION 3.8.1.

Attachment 5

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Typed revised Technical Specification page

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two required DGs inoperable.	E.1 Restore one required DG to OPERABLE status.	2 hours <u>OR</u> 24 hours if Division 3 DG is inoperable
F. Required Action and Associated Completion Time of Condition A, B, C, D, or E not met.	F.1 Be in MODE 3. <u>AND</u> F.2 Be in MODE 4.	12 hours 36 hours
G. Three or more required AC sources inoperable.	G.1 Enter LCO 3.0.3.	Immediately

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 -----NOTES----- 1. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 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. ----- Verify each required DG starts from standby conditions and achieves steady state: a. Voltage \geq 3910 V and \leq 4400 V and frequency \geq 58.8 Hz and \leq 61.2 Hz for DG-1 and DG-2; and b. Voltage \geq 3910 V and \leq 4400 V and frequency \geq 58.8 Hz and \leq 61.2 Hz for DG-3.	31 days

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.3 -----NOTES-----</p> <ol style="list-style-type: none"> 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. This Surveillance shall be conducted on only one DG at a time. 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. 5. The endurance test of SR 3.8.1.14 may be performed in lieu of the load-run test in SR 3.8.1.3 provided the requirements, except the upper load limits, of SR 3.8.1.3 are met. <p>-----</p> <p>Verify each required DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 4000 kW and ≤ 4400 kW for DG-1 and DG-2, and ≥ 2340 kW and ≤ 2600 kW for DG-3.</p>	<p>31 days</p>
<p>SR 3.8.1.4 Verify each required day tank contains ≥ 1400 gal of fuel oil.</p>	<p>31 days</p>
<p>SR 3.8.1.5 Check for and remove accumulated water from each required day tank.</p>	<p>31 days</p>

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.6 Verify each required fuel oil transfer subsystem operates to automatically transfer fuel oil from the storage tank to the day tank.</p>	<p>92 days</p>
<p>SR 3.8.1.7 -----NOTE----- All DG starts may be preceded by an engine prelude period. ----- Verify each required DG starts from standby condition and achieves:</p> <p>a. For DG-1 and DG-2 in ≤ 15 seconds, voltage ≥ 3910 V and frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains voltage ≥ 3910 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz; and</p> <p>b. For DG-3, in ≤ 15 seconds, voltage ≥ 3910 V and frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains voltage ≥ 3910 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.</p>	<p>184 days</p>
<p>SR 3.8.1.8 -----NOTE----- The automatic transfer function of this Surveillance shall not be performed in MODE 1 or 2. However, credit may be taken for unplanned events that satisfy this SR. ----- Verify automatic and manual transfer of the power supply to safety related buses from the startup offsite circuit to the backup offsite circuit.</p>	<p>24 months</p>

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.9 -----NOTES-----</p> <ol style="list-style-type: none"> 1. Credit may be taken for unplanned events that satisfy this SR. 2. If performed with the DG synchronized with offsite power, it shall be performed at a power factor as close to the power factor of the single largest post-accident load as practicable. <p>-----</p> <p>Verify each required DG rejects a load greater than or equal to its associated single largest post-accident load, and following load rejection, the frequency is ≤ 66.75 Hz.</p>	<p>24 months</p>
<p>SR 3.8.1.10 -----NOTES-----</p> <ol style="list-style-type: none"> 1. Credit may be taken for unplanned events that satisfy this SR. 2. If performed with the DG synchronized with offsite power, it shall be performed at the accident load power factor, or at a power factor as close to the accident load power factor as practicable with the field excitation current $\geq 90\%$ of the continuous rating. <p>-----</p> <p>Verify each required DG does not trip and voltage is maintained ≤ 4784 V during and following a load rejection of a load ≥ 4400 kW for DG-1 and DG-2 and ≥ 2600 kW for DG-3.</p>	<p>24 months</p>

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.11 -----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 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. <p>-----</p> <p>Verify on an actual or simulated loss of offsite power signal:</p> <ol style="list-style-type: none"> a. De-energization of emergency buses; b. Load shedding from emergency buses for Divisions 1 and 2; and c. DG auto-starts from standby condition and: <ol style="list-style-type: none"> 1. energizes permanently connected loads in ≤ 15 seconds for DG-1 and DG-2, and in ≤ 18 seconds for DG-3, 2. energizes auto-connected shutdown loads, 3. maintains steady state voltage ≥ 3910 V and ≤ 4400 V, 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes. 	<p>24 months</p>

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.12 -----NOTES-----</p> <ol style="list-style-type: none"> 1. All DG starts may be preceded by an engine prelube period. 2. 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>Verify on an actual or simulated Emergency Core Cooling System (ECCS) initiation signal each required DG auto-starts from standby condition and:</p> <ol style="list-style-type: none"> a. For DG-1 and DG-2, in ≤ 15 seconds achieves voltage ≥ 3910 V, and after steady state conditions are reached, maintains voltage ≥ 3910 V and ≤ 4400 V and, for DG-3, in ≤ 15 seconds achieves voltage ≥ 3910 V, and after steady state conditions are reached, maintains voltage ≥ 3910 V and ≤ 4400 V; b. In ≤ 15 seconds, achieves frequency ≥ 58.8 Hz and after steady state conditions are achieved, maintains frequency ≥ 58.8 Hz and ≤ 61.2 Hz; c. Operates for ≥ 5 minutes; d. Permanently connected loads remain energized from the offsite power system; and e. Emergency loads are auto-connected to the offsite power system. 	<p>24 months</p>

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.13 -----NOTE----- Credit may be taken for unplanned events that satisfy this SR. -----</p> <p>Verify each required DG's automatic trips are bypassed on an actual or simulated ECCS initiation signal except:</p> <ul style="list-style-type: none"> a. Engine overspeed; b. Generator differential current; and c. Incomplete starting sequence. 	<p>24 months</p>

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.14 -----NOTES-----</p> <ol style="list-style-type: none"> 1. Momentary transients outside the load, excitation current, and power factor ranges do not invalidate this test. 2. Credit may be taken for unplanned events that satisfy this SR. 3. If performed with the DG synchronized with offsite power, it shall be performed at the accident load power factor, or at a power factor as close to the accident load power factor as practicable with the field excitation current $\geq 90\%$ of the continuous rating. <p>-----</p> <p>Verify each required DG operates for ≥ 24 hours:</p> <ol style="list-style-type: none"> a. For ≥ 2 hours loaded ≥ 4650 kW for DG-1 and DG-2, and ≥ 2850 kW for DG-3; and b. For the remaining hours of the test loaded ≥ 4400 kW for DG-1 and DG-2, and ≥ 2600 kW for DG-3. 	<p>24 months</p>

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.15 -----NOTES-----</p> <p>1. This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated \geq 1 hour loaded \geq 4000 kW for DG-1 and DG-2, and \geq 2340 kW for DG-3.</p> <p> Momentary transients outside of load range do not invalidate this test.</p> <p>2. All DG starts may be preceded by an engine prelube period.</p> <p>-----</p> <p>Verify each required DG starts and achieves:</p> <p>a. For DG-1 and DG-2, in \leq 15 seconds, voltage \geq 3910 V and frequency \geq 58.8 Hz, and after steady state conditions are reached, maintains voltage \geq 3910 V and \leq 4400 V and frequency \geq 58.8 Hz and \leq 61.2 Hz; and</p> <p>b. For DG-3, in \leq 15 seconds, voltage \geq 3910 V and frequency \geq 58.8 Hz, and after steady state conditions are reached, maintains voltage \geq 3910 V and \leq 4400 V and frequency \geq 58.8 Hz and \leq 61.2 Hz.</p>	<p>24 months</p>

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.16 -----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. -----</p> <p>Verify each required DG:</p> <ul style="list-style-type: none"> a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation. 	<p>24 months</p>
<p>SR 3.8.1.17 -----NOTE----- Credit may be taken for unplanned events that satisfy this SR. -----</p> <p>Verify, with a DG operating in test mode and connected to its bus, an actual or simulated ECCS initiation signal overrides the test mode by:</p> <ul style="list-style-type: none"> a. Returning DG to ready-to-load operation; and b. Automatically energizing the emergency load from offsite power. 	<p>24 months</p>

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.18 -----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 interval between each sequenced load block is within $\pm 10\%$ of design interval for each time delay relay.</p>	<p>24 months</p>
<p>SR 3.8.1.19 -----NOTES----- 1. All DG starts may be preceded by an engine prelube period. 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, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses for DG-1 and DG-2; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 15 seconds, 2. energizes auto-connected emergency loads, 3. maintains steady state voltage ≥ 3910 V and ≤ 4400 V,</p>	<p>24 months</p> <p>(continued)</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.19 (continued)</p> <p>4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and</p> <p>5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.</p>	
<p>SR 3.8.1.20 -----NOTE----- All DG starts may be preceded by an engine prelube period. -----</p> <p>Verify, when started simultaneously from standby condition, DG-1 and DG-2 achieves, in ≤ 15 seconds, voltage ≥ 3910 V and frequency ≥ 58.8 Hz, and DG-3 achieves, in ≤ 15 seconds, voltage ≥ 3910 V and frequency ≥ 58.8 Hz.</p>	<p>10 years</p>