

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

<u>SECTION</u>	<u>PAGE</u>	
<u>3/4.8 ELECTRICAL POWER SYSTEMS</u>		
3/4.8.1	A.C. SOURCES	
	Operating	3/4 8-1
TABLE 4.8-1	(This table number not used)	3/4 8-8
	Shutdown	3/4 8-9
3/4.8.2	D.C. SOURCES	
	Operating	3/4 8-10
TABLE 4.8-2	BATTERY SURVEILLANCE REQUIREMENTS	3/4 8-12
	Shutdown	3/4 8-13
3/4.8.3	ONSITE POWER DISTRIBUTION	
	Operating	3/4 8-14
	Shutdown	3/4 8-16
3/4.8.4	ELECTRICAL EQUIPMENT PROTECTIVE DEVICES	
	Containment Penetration Conductor	
	Overcurrent Protective Devices	3/4 8-17
<u>3/4.9 REFUELING OPERATIONS</u>		
3/4.9.1	BORON CONCENTRATION	3/4 9-1
3/4.9.2	INSTRUMENTATION	3/4 9-2
3/4.9.3	DECAY TIME	3/4 9-3
3/4.9.4	CONTAINMENT BUILDING PENETRATIONS	3/4 9-4
3/4.9.5	COMMUNICATIONS	3/4 9-5
3/4.9.6	REFUELING MACHINE	3/4 9-6
3/4.9.7	CRANE TRAVEL - FUEL HANDLING BUILDING	3/4 9-7
3/4.9.8	RESIDUAL HEAT REMOVAL AND COOLANT CIRCULATION	
	High Water Level	3/4 9-8
	Low Water Level	3/4 9-9
3/4.9.9	CONTAINMENT VENTILATION ISOLATION SYSTEM	3/4 9-10
3/4.9.10	WATER LEVEL - REFUELING CAVITY	3/4 9-11

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS

---

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the Onsite Class 1E Distribution System shall be:

- a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments, indicated power availability, and
- b. Demonstrated OPERABLE at least once per 18 months during shutdown by transferring the unit power supply from the normal circuit to each of the alternate circuits.

4.8.1.1.2 Each standby diesel generator shall be demonstrated OPERABLE: <sup>(2)(11)</sup>

- a. At least once per 31 days on a STAGGERED TEST BASIS by:
  - 1) Verifying the fuel level in its associated fuel tank,
  - 2) Verifying the diesel starts from standby condition and accelerates to 600 rpm (nominal) in less than or equal to 10 seconds.<sup>(3)</sup> The generator voltage and frequency shall be  $4160 \pm 416$  volts and  $60 \pm 1.2$  Hz within 10 seconds<sup>(3)</sup> after the start signal. The diesel generator shall be started for this test by using one of the following signals:
    - a) Manual, or
    - b) Simulated loss-of-offsite power by itself, or
    - c) Simulated loss-of-offsite power in conjunction with a Safety Injection test signal, or
    - d) A Safety Injection test signal by itself.
  - 3) Verifying the generator is synchronized, loaded to 5000 to 5500 kW, and operates with a load of 5000 to 5500 kW for at least 60 minutes,<sup>(4)(6)</sup> and
  - 4) Verifying the standby diesel generator is aligned to provide standby power to the associated emergency buses.
- b. At least once per 31 days and after each operation of the diesel where the period of operation was greater than or equal to 1 hour by checking for and removing accumulated water from its associated fuel tank;
- c. Maintain properties of new and stored fuel oil in accordance with the Fuel Oil Monitoring Program.

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- is loaded with the ESF loads. After energization, the steady-state voltage and frequency of the ESF busses shall be maintained at  $4150 \pm 416$  volts and  $60 \pm 1.2$  Hz during this test; and
- c) Verifying that all automatic diesel generator trips, except engine overspeed, generator differential, and low lube oil pressure are automatically bypassed upon loss of voltage on the ESF bus concurrent with a Safety Injection Actuation signal.
- 7)<sup>(10)</sup> Verifying the standby diesel generator operates for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded to 5700 to 6050 kW<sup>(4)(5)(6)</sup> and during the remaining 22 hours of this test, the diesel generator shall be loaded to 5000 to 5500 kW.<sup>(6)</sup> The steady-state generator voltage and frequency shall be  $4160 \pm 416$  volts and  $60 \pm 1.2$  Hz during this test. Within 5 minutes after completing this 24-hour test, perform a fast start per Specification 4.8.1.1.2a.2<sup>(7)</sup>;
- 8) Verifying that the auto-connected loads to each standby diesel generator do not exceed the 2000-hour rating of 5935 kW;
- 9) Verifying the standby diesel generator's capability to:
- Synchronize with the offsite power source while the generator is loaded with its ESF loads upon a simulated restoration of offsite power,
  - Transfer its loads to the offsite power source, and
  - Be restored to its standby status.
- 10) Verifying that with the standby diesel generator operating in a test mode, connected to its bus, a simulated Safety Injection signal overrides the test mode by: (1) returning the diesel generator to standby operation, and (2) automatically energizing the ESF loads with offsite power;<sup>(5)</sup>
- 11) Verifying that the automatic load sequence timer is OPERABLE with the first sequenced load verified to be loaded between 1.0 second and 1.6 seconds, and all other load blocks within  $\pm 10\%$  of its design interval;
- 12) Verifying that the standby diesel generator emergency stop lockout feature prevents diesel generator starting; and

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

---

- 13) Demonstrating the OPERABILITY of the automatic load shed bypass and the manual load shed reinstatement features of the load sequencer.
  - f. At least once per 10 years or after any modifications which could affect standby diesel generator interdependence by starting all standby diesel generators simultaneously, during shutdown, and verifying that all standby diesel generators accelerate to at least 600 rpm in less than or equal to 10 seconds; and
  - g. At least once per 10 years by draining each fuel tank, removing the accumulated sediment and cleaning the tank.
- 4.8.1.1.3 (Not used)

TABLE 4.8-1

DIESEL GENERATOR TEST SCHEDULE

(Not used)

SPECIFICATION NOTATIONS

- (1) Loss of one 13.8 kV Standby Bus to 4.16 kV ESF bus line constitutes loss of one offsite source. Loss of two 13.8 kV Standby buses to 4.16 kV ESF bus lines constitutes loss of two offsite sources.
- (2) All diesel generator starts for the purpose of these surveillances may be preceded by a prelube period.
- (3) A diesel generator start in less than or equal to 10 seconds (fast start) shall be performed every 184 days. All other diesel generator starts for the purpose of this surveillance may be modified starts involving reduced fuel (load limit) and/or idling and gradual acceleration to synchronous speed.
- (4) Generator loading may be accomplished in accordance with vendor recommendations, including a warmup period prior to loading.
- (5) The diesel generator start for this surveillance may be a modified start (see SR 4.8.1.1.2a.2)).
- (6) Momentary transients outside this load range due to changing conditions on the grid shall not invalidate the test.
- (7) If Specification 4.8.1.1.2a.2) is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead, the standby diesel generator may be operated at 5000-5500 kW for a minimum of 2 hours or until operating temperature has stabilized.
- (8) (Not used)
- (9) (Not used)
- (10) This test may be performed during power operation provided that the other two diesel generators are operable.
- (11) Credit may be taken for events that satisfy any of these Surveillance Requirements.

THIS PAGE IS INTENTIONALLY BLANK

SOUTH TEXAS - UNITS 1 & 2

3/4 E-8

Unit 1 - Amendment No. ~~83~~, 122  
Unit 2 - Amendment No. ~~72~~, 110

## ELECTRICAL POWER SYSTEMS

### BASES

---

---

#### A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION (Continued)

For purposes of this testing, the DGs are started from standby conditions. Standby condition for a DG mean that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations.

In order to reduce stress and wear on diesel engines, some manufacturers recommend a modified start in which the starting speed of DGs is limited, warmup is limited to this lower speed, and the DGs are gradually accelerated to synchronous speed prior to loading. In addition, the modified start may involve reduced fuel (load limit). These start procedures are the intent of Note 3, which is only applicable when such modified start procedures are recommended by the manufacturer.

Once per 184 days the DG starts from standby conditions and achieves required voltage and frequency within 10 seconds. The 10 second start requirement supports the assumptions of the design basis LOCA analysis in the FSAR.

The 10 second start requirement is not applicable (see Note 3) when a modified start procedure as described above is used.

The normal 31 day Frequency for SR 4.8.1.1.2.a is consistent with Regulatory Guide 1.108 and Generic Letter 94-01. The 184 day Frequency in Note 3 is a reduction in cold testing consistent with Generic Letter 84-15. These Frequencies provide adequate assurance of DG OPERABILITY, while minimizing degradation resulting from testing.

#### SR 4.8.1.1.2.a.3

This Surveillance verifies that the DGs are capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize engine temperature, while minimizing the time that the DG is connected to the offsite source.

The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

This SR is modified by two Notes. Note 4 indicates that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 6 states that momentary transients, because of changing bus loads, do not invalidate this test.

A successful DG start under SR 4.8.1.1.2.a.2 must precede this test to credit satisfactory performance.