

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 and indicated power availability, and
- b. Demonstrated OPERABLE at least once per 18 months during shutdown by transferring, manually and automatically, unit power supply from the normal circuit to the alternate circuit.

4.8.1.1.2 Each of the above required diesel generators shall be demonstrated OPERABLE:

- a. In accordance with the frequency specified in Table 4.8.1.1.2-1 on a STAGGERED TEST BASIS by:

1. Verifying the fuel level in the fuel oil day tank.
2. Verifying the fuel level in the fuel oil storage tank.
3. Verifying the fuel transfer pump starts and transfers fuel from the storage system to the fuel oil day tank.

4. Verifying the diesel starts from ambient conditions and accelerates to at least 514 rpm in less than or equal to 10 seconds after receipt of the start signal.* The generator voltage and frequency shall be ~~4150 ± 420~~ volts and ~~60 ± 1.2~~ Hz within ~~10~~ 58.8 seconds after receipt of the start signal. The diesel generator shall be started for this test by using one of the following signals:

- a) Manual.
- b) Simulated loss of offsite power by itself.
- c) Simulated loss of offsite power in conjunction with an ESF actuation test signal.
- d) An ESF actuation test signal by itself.

5. Verifying the diesel generator is synchronized, loaded to between 4300 and 4400** kw in less than or equal to 130 seconds,* and operates with this load for at least 60 minutes.

*The diesel generator start (10 sec) and subsequent loading (130 sec) from ambient conditions shall be performed at least once per 184 days in these surveillance tests. All other engine starts and loading for the purpose of this surveillance testing may be preceded by an engine prelube period and/or other warmup procedures recommended by the manufacturer so that mechanical stress and wear on the diesel engine is minimized.

**This band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band shall not invalidate the test; the loads, however, shall not be less than 4300 kw nor greater than 4430 kw.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

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5. Verifying that on an ECCS actuation test signal, without loss of offsite power, the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall ~~be maintained at 4160 ± 420~~ ^{AT 4160 ± 420 VOLTS AND 60 ± 1.2 Hz} ~~volts and 60 ± 1.2 Hz~~ ^{≥ 58.8} within 10 seconds after the auto-start signal; the steady state generator voltage and frequency shall be maintained ~~within these limits~~ during this test.
6. Simulating a loss of offsite power in conjunction with an ECCS actuation test signal, and:
 - a) Verifying loss of power is detected and deenergization of the emergency busses and load shedding from the emergency busses.
 - b) Verifying the diesel generator starts* on the auto-start signal, energizes the emergency busses with permanently connected loads within 10 seconds after receipt of the start signal, energizes the autoconnected shutdown loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test.
7. Verifying that all automatic diesel generator trips, except engine overspeed, generator differential current, generator overcurrent, bus differential current and low lube oil pressure are automatically bypassed upon loss of voltage on the emergency bus concurrent with an ECCS actuation signal.#
8. Deleted.
9. Verifying that the auto-connected loads to each diesel generator do not exceed the continuous rating of 4430 kW.

*This diesel generator start (10 sec) and subsequent loading (130 sec) from ambient conditions may be preceded by an engine prelube period and/or other warmup procedures recommended by the manufacturer so that mechanical stress and wear on the diesel engine is minimized.

#Generator differential current, generator overcurrent, and bus differential current is two-out-of-three logic and low lube oil pressure is two-out-of-four logic.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

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- 2. Performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection ND of the ASME Code in accordance with ASME Code Section XI Article IWD-5000.

k. At least once per refueling cycle# by:

- 1. Verifying the diesel generator operates for at least 24 hours. During the first 22 hours of this test, the diesel generator shall be loaded to between 4300 and 4400 kW## and during the remaining 2 hours of this test, the diesel generator shall be loaded to between 4800 and 4873 kW. The generator voltage and frequency shall be ~~4160 ± 420 volts and 60 ± 1.2 Hz~~ within 10 ~~± 58.8~~ seconds after the start signal; the steady state generator voltages and frequency shall be maintained ~~within these limits~~ during the test.

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AT 4160 ± 420 VOLTS AND 60 ± 1.2 Hz

- 2. Within 5 minutes after completing 4.8.1.1.2.k.1, verify that the diesel generator starts and achieves voltage and frequency of ~~4160 ± 420 volts and 60 ± 1.2 Hz~~ within 10 seconds after the start signal. This test shall continue for at least five minutes.

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ATTAINS

≥ 58.8

- OR -

Operate the diesel generator between 4300 kW and 4400 kW for two hours. Within 5 minutes of shutting down the diesel generator, verify that the diesel generator starts and achieves voltage and frequency of ~~4160 ± 420 volts and 60 ± 1.2 Hz~~ within 10 seconds after the start signal. This test shall continue for at least five minutes.

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INSERT A

ATTAINS

≥ 58.8

4.8.1.1.3 Reports - All diesel generator failures, valid or non-valid, shall be reported to the Commission within 30 days pursuant to Specification 6.9.2. Reports of diesel generator failures shall include the information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977. If the number of failures in the last 100 valid tests, on a per nuclear unit basis, is greater than or equal to 7, the report shall be supplemented to include the additional information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977.

4.8.1.1.4 The buried fuel oil transfer piping's cathodic protection system shall be demonstrated OPERABLE at least once per 2 months and at least once per year by subjecting the cathodic protection system to a performance test.

#For any start of a diesel generator, the diesel must be loaded in accordance with manufacturer's recommendations.

##This band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band shall not invalidate the test; the loads; however, shall not be less than 4300 kW nor greater than 4873 kW.

THE STEADY STATE GENERATOR VOLTAGES AND FREQUENCIES SHALL BE MAINTAINED AT 4160 ± 420 VOLTS AND 60 ± 1.2 Hz
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