3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

A.C.

a. Two physically independent ~~circuits~~ between the offsite transmission network and the onsite Class 1E distribution system (vital bus system), and

b. Three separate and independent diesel generators with:

1. Separate day tanks containing a minimum volume of 130 gallons of fuel, and

2. A common fuel storage system consisting of two storage tanks, each containing a minimum volume of 20,000 gallons of fuel, and two fuel transfer pumps.*

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

independent A.C.

independent A.C. circuit

a. With ~~either~~ an ~~offsite~~ circuit ~~or diesel generator~~ of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining ~~A.C. sources~~ by performing Surveillance Requirement 4.8.1.1.1.a ~~and 4.8.1.1.2.a.2~~ within one hour and at least once per 8 hours thereafter; ~~restore at least two offsite~~ circuit ~~and three diesel generators~~ to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

and demonstrate OPERABILITY of three diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.2 within 24 hours;

the inoperable independent A.C

INSERT 1

independent A.C.

c. With one ~~offsite~~ circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining ~~A.C. sources~~ by performing Surveillance Requirement 4.8.1.1.1.a ~~and 4.8.1.1.2.a.2~~ within one hour and at least once per 8 hours thereafter; ~~restore~~ at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours

independent A.C. circuit

INSERT 2

~~* One inoperable fuel transfer pump is equivalent to one inoperable diesel generator.~~

Insert 1 to p. 3/4 8-1

b. With one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the independent A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. If the diesel generator is inoperable for preventive maintenance, the two remaining OPERABLE diesel generators need not be tested. If the diesel generator is inoperable for any reason other than preventive maintenance, demonstrate the OPERABILITY of the remaining diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.2 within 24 hours. In any case, restore the inoperable diesel generator to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Insert 2 to p. 3/4 8-1

demonstrate the OPERABILITY of the remaining OPERABLE diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.2 within 8 hours;

ELECTRICAL POWER SYSTEMS

ACTION (Continued)

independent A.C.

and in COLD SHUTDOWN within the following 30 hours. Restore at least two ~~offsite~~ circuits and three diesel generators to OPERABLE status within 72 hours from the time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

(d) With two of the above required ~~offsite~~ independent A.C. circuits inoperable, demonstrate the OPERABILITY of three diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.2 within ~~one hour and at least once per~~ 8 hours ~~thereafter~~, unless the diesel generators are already operating; restore at least one of the inoperable ~~offsite sources~~ to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. With only one of the ~~offsite source restored~~, restore ~~at least two offsite circuits~~ to OPERABLE status within 72 hours from time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

OPERABLE

independent A.C. circuits

the other independent A.C. circuit

(e) With two or more of the above required diesel generators inoperable, demonstrate the OPERABILITY of two ~~offsite~~ independent A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter; restore at least two of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore three diesel generators to OPERABLE status within 72 hours from time of initial loss or be in least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

INSERT 1 →

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Two physically independent A.C. circuits between the offsite transmission network and the onsite Class 1E distribution system (vital bus system) shall be:

a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments, power availability, and

b. Demonstrated OPERABLE at least once per 18 months during shutdown by transferring (manually and automatically) vital bus supply from one 13/4 kv transformer to the other 13/4 kv transformer.

Insert 1 to p. 3/4 8-2

f. With one of the above required fuel transfer pumps inoperable, either restore it to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

g. With one of the above required fuel storage tanks inoperable, either restore it to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS (Continued)

In accordance with the Frequency specified in Table 4.8-1

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

a. ~~At least once per 31 days~~ on a STAGGERED TEST BASIS by:

1. Verifying the fuel level in its day tank. — INSERT 1

2. ~~Verifying the diesel starts from ambient condition and accelerates to at least 900 rpm in ≤ 10 seconds.~~

3. ~~Verifying the generator is synchronized, loaded to ≥ 1400 kw, and operates for ≥ 60 minutes.~~

3 → ~~b~~. Verifying the diesel generator is aligned to provide standby power to the associated vital busses. — INSERT 2

d → ~~b~~. At least once per 18 months during shutdown by:

1. Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service,

2. Verifying (that) ~~the generator capability to reject a load of 785 ± 40 kw without tripping,~~ — INSERT 3

6 → ~~f~~. Simulating a loss of offsite power in conjunction with an ~~safety injection test~~ signal, and: — ESF actuation test

a) Verifying de-energization of the vital busses and load shedding from the vital busses,

b) Verifying the diesel starts ~~from ambient condition~~ on the auto-start signal, energizes the vital busses with permanently connected loads, energizes the auto-connected emergency loads through the load sequencer and operates for ≥ 5 minutes while its generator is loaded with the emergency loads. — within 13 seconds — (accident)

* greater than or equal to

The steady state voltage and Frequency of the vital bus shall be maintained at ~~4160 ± 420~~ volts and 60 ± 1.2 Hz during this test. — ≥ 3950 and ≤ 4580

Insert 1 to p. 3/4 8-3

2. Verifying the diesel starts and accelerates to 900 rpm in less than or equal to 10 seconds*. The generator voltage and frequency shall be $\geq$ 3950 and $\leq$ 4580 volts and 60 $\pm$ 1.2 Hz within 13 seconds after the start signal.

   Subsequently, verifying the generator is synchronized, gradually loaded to 2500-2600 kw**, and operates at a load of 2500-2600 kw for greater than or equal to 60 minutes.

Insert 2 to p. 3/4 8-3

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 one hour by checking for and removing accumulated water from the day tanks.

c. At least once per 6 months the diesel generator shall be started from ambient conditions and accelerated to at least 900 rpm in less than or equal to 10 seconds*. The generator voltage and frequency shall be $\geq$ 3950 and $\leq$ 4580 volts and 60 $\pm$ 1.2 Hz within 13 seconds after the start signal.

   The generator shall be synchronized to its emergency bus, loaded to 2500-2600** kw in less than or equal to 60 seconds, and operate at a load of 2500-2600 kw for at least 60 minutes.

   This test, if it is performed so it coincides with the testing required by Surveillance Requirement 4.8.1.1.2.a.2, may also serve to concurrently meet those requirements.

Insert 3 to p. 3/4 8-3

on rejection of a load greater than or equal to 820 kw, the voltage and frequency are restored to $\geq$ 3950 and $\leq$ 4580 volts and 60 $\pm$ 1.2 Hz within 4 seconds.

3. Simulating a loss of offsite power by itself, and:

   a) Verifying de-energization of the vital bus and load shedding from the vital bus.

   b) Verifying the diesel starts on the auto-start signal*, energizes the vital bus with permanently connected loads within 13 seconds, energizes the

Insert 3 to p. 3/4 8-3 (cont'd)

auto-connected shutdown loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. The steady state voltage and frequency of the vital bus shall be maintained at $\geq$ 3950 and $\leq$ 4580 volts and 60 $\pm$ 1.2 Hz during this test.

4. Verifying that on an ESF 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 $\geq$ 3950 and $\leq$ 4580 volts and 60 $\pm$ 1.2 Hz within 13 seconds after the auto-start signal and shall be maintained within these limits during this test.

5. Not Used.

SURVEILLANCE REQUIREMENTS (Continued)

c) Verifying that all nonessential automatic diesel generator trips, (i.e, other than) ~~except~~ engine overspeed, lube oil pressure low, 4KV bus differential and generator differential, are automatically bypassed upon loss of voltage on the vital bus concurrent with a ~~emergency bus and/or~~ safety injection actuation signal.

~~4. Verifying the diesel generator operates for ≥ 60 minutes while loaded to ≥ 2665 kw.~~

~~5. Verifying that the auto-connected loads to each diesel generator do not exceed the 2000 hour rating of 2750 kw.~~

INSERT 1 →

4.8.1.1.3 The diesel fuel oil storage and transfer system shall be demonstrated OPERABLE:

a. At least once per 31 days by:

1. Verifying the level in each of the above required 20,000 gallon fuel storage tanks.

2. Verifying that both fuel transfer pumps can be started and transfer fuel from the 20,000 gallon storage tanks to the day tanks.

b. At least once per 92 days by verifying that a sample of diesel fuel from each of the above required 20,000 gallon fuel storage tanks is within the acceptable limits specified in Table 1 of ASTM D975-~~62~~77 when checked for viscosity, water and sediment.

INSERT 2 →

Insert 1 to p. 3/4 8-4

7. Verifying the diesel generator operates for at least 24 hours*. During the first 2 hours of this test, the diesel generator shall be loaded to 2760-2860 kw.** During the remaining 22 hours of this test, the diesel generator shall be loaded to 2500-2600 kw**. The steady state voltage and frequency shall be maintained at $\geq$ 3950 and $\leq$ 4580 volts and 60 $\pm$ 1.2 Hz during this test. Within 5 minutes after completing this 24 hour test, perform Surveillance Requirement 4.8.1.1.2.d.6.b.***

8. Verifying that the auto-connected loads to each diesel generator do not exceed the two hour rating of 2860 kw.

9. Verifying that with the 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 emergency loads with offsite power.

e. At least once per ten years or after any modifications which could affect diesel generator interdependence by starting all diesel generators simultaneously*, during shutdown, and verifying that all diesel generators accelerate to at least 900 rpm in less than or equal to 10 seconds.

Insert 2 to p. 3/4 8-4

4.8.1.1.4 Reports - All diesel generator failures, valid or non-valid, shall be reported to the Commission in a Special Report pursuant to Specification 6.9.2 within 30 days. 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.

Insert 2 to p. 8/4 8-4 (cont'd)

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* Surveillance testing shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube, warm-up and loading (unless loading times are specified in the individual Surveillance Requirements).

** This band is meant as guidance to preclude routine exceedances of the diesel generator manufacturer's design ratings. Loads in excess of this band for special testing or momentary variations due to changing bus loads shall not invalidate the test.

*** Failure of a test per Surveillance Requirement 4.8.1.1.2.d.6.b, following performance of Surveillance Requirement 4.8.1.1.2.d.7, does not require that the 24 hour test of 4.8.1.1.2.d.7 be repeated. As an alternative, the EDG shall be loaded to 2500-2600 kw for one hour, or until operating temperatures have stabilized, prior to repeating Surveillance Requirement 4.8.1.1.2.d.6.b.

from NLR-N91149, 9/20/91
No Further changes are proposed

SURVEILLANCE REQUIREMENTS (Continued)

TABLE 4.8-1

DIESEL GENERATOR TEST SCHEDULE

Number of Failures in Last 20 Valid Tests *	Test Frequency
Zero or 1	M
2 or more	W**

* Criteria for determining the number of failures and number of valid tests shall be in accordance with Regulatory Position C.2.e of Regulatory Guide 1.108, Revision 1, August 1977, where the number of tests and failures is determined on a per diesel generator basis.

** This test frequency shall be maintained until seven consecutive failure free demands have been performed and the number of failures in the last 20 valid demands has been reduced to zero or one.

ELECTRICAL POWER SYSTEMS

SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.1.2 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. One circuit between the offsite transmission network and the onsite Class 1E distribution system, and

(vital bus system)

Separate and independent

b. Two diesel generators with:

1. Separate day tanks containing a minimum volume of 130 gallons of fuel, and

2. A common fuel storage system containing a minimum volume of 20,000 gallons of fuel, and

3. A fuel transfer pump.

APPLICABILITY: MODES 5 and 6.

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes until the minimum required A.C. electrical power sources are restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the Surveillance Requirements of 4.8.1.1.~~b~~ and 4.8.1.1.2 ~~except for requirement 4.8.1.1.2.e~~.

OR

~~the synchronization and 60 minute run~~

~~and~~, 4.8.1.1.3 (except For requirement 4.8.1.1.3.a.2)

and 4.8.1.1.4.

~~INSERT~~

Insert 1 to p. 3/4 8-5

* The demonstration of diesel generator operability per this Surveillance Requirement is only considered a valid test (for the purpose of reducing testing frequency in accordance with Table 4.8-1) if the requirements of surveillance 4.8.1.1.2.a.2 are satisfied. However, should the diesel fail during testing per this Surveillance Requirement, it shall be considered a valid test and failure and the additional actions prescribed by Table 4.8-1 shall apply.

3/4.8.1 and 3/4.8.2 A.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS

3/4.8 ELECTRICAL POWER SYSTEMS

BASES

The OPERABILITY of the A.C. and D.C power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety related equipment required for 1) the safe shutdown of the facility and 2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criteria 17 of Appendix "A" to 10 CFR Part 50.

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least ~~one of each~~ of the onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss of offsite power and single failure of ~~the other~~ onsite A.C. source.

The OPERABILITY of the minimum specified A.C. and D.C. power sources and associated distribution systems during shutdown and refueling ensures that 1) the facility can be maintained in the shutdown or refueling condition for extended time periods and 2) sufficient instrumentation and control capability is available for monitoring and maintaining the ~~facility~~ status.

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are based upon the recommendations of Regulatory Guide 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, and ~~meeting the reliability goals discussed in~~ Regulatory Guide 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977.

Insert 1

Insert 1 to p. B 3/4 8-1

For the purposes of establishing initial conditions for surveillance testing, "ambient conditions" mean that the diesel lube oil temperature is 120 $\pm$ 20 degrees F. The minimum lube oil temperature for an OPERABLE diesel is 100 degrees F. Lube oil heaters are designed to maintain the oil temperature at approximately 120 degrees F.

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. Two physically independent A.C. circuits between the offsite transmission network and the onsite Class 1E distribution system (vital bus system), and

b. Three separate and independent diesel generators with:

1. Separate day tanks containing a minimum volume of 130 gallons of fuel, and

2. A common fuel storage system consisting of two storage tanks, each containing a minimum volume of 20,000 gallons of fuel, and two fuel transfer pumps.*

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With ~~either~~ an ~~offsite~~ circuit ~~or diesel generator~~ of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining ~~A.C. sources~~ by performing Surveillance Requirements 4.8.1.1.1.a and ~~4.8.1.1.2.a.2~~ within one hour and at least once per 8 hours thereafter; restore ~~at least two offsite circuits and three diesel generators~~ to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one ~~offsite~~ circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining ~~A.C. sources~~ by performing Surveillance Requirements 4.8.1.1.1.a ~~and 4.8.1.1.2.a.2~~ within one hour and at least once per 8 hours thereafter; restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN

~~* One inoperable fuel transfer pump is equivalent to one inoperable diesel generator.~~

SALEM - UNIT 2 3/4 8-1

Insert 1 to p. 3/4 8-1

b. With one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the independent A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. If the diesel generator is inoperable for preventive maintenance, the two remaining OPERABLE diesel generators need not be tested. If the diesel generator is inoperable for any reason other than preventive maintenance, demonstrate the OPERABILITY of the remaining diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.2 within 24 hours. In any case, restore the inoperable diesel generator to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Insert 2 to p. 3/4 8-1

demonstrate the OPERABILITY of the remaining OPERABLE diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.2 within 8 hours;

ELECTRICAL POWER SYSTEMS

ACTION (Continued)

independent A.C.

within the following 30 hours. Restore at least two ~~offsite~~ circuits and three diesel generators to OPERABLE status within 72 hours from the time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

d → c. With two of the above required independent ~~offsite~~ A.C. circuits inoperable, demonstrate the OPERABILITY of three diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.2 within ~~one hour and at least once per~~ 8 hours ~~thereafter~~, unless the diesel generators are already operating; restore at least one of the inoperable ~~offsite sources~~ to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. With only one ~~offsite source restored,~~ restore ~~at least two offsite~~ circuits to OPERABLE status within 72 hours from time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

independent A.C. circuit

of the independent A.C. circuits OPERABLE,

the other independent A.C.

e → d. With two or more of the above required independent diesel generators inoperable, demonstrate the OPERABILITY of two ~~offsite~~ A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter; restore at least two of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore three diesel generators to OPERABLE status within 72 hours from time of initial loss or be in least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

INSERT 1 →

SURVEILLANCE REQUIREMENTS

A.C.

4.8.1.1.1 Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system (vital bus system) shall be:

a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments, power availability, and

b. Demonstrated OPERABLE at least once per 18 months during shutdown by transferring (manually and automatically) vital bus supply from one 13/4 kv transformer to the other 13/4 kv transformer.

Insert 1 to p. 3/4 8-2

f. With one of the above required fuel transfer pumps inoperable, either restore it to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

g. With one of the above required fuel storage tanks inoperable, either restore it to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS (Continued)

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

a. In accordance with the frequency specified in Table 4.8-1 on a STAGGERED TEST BASIS by:

1. Verifying the fuel level in its day tank.

2. Verifying the diesel starts ~~from ambient condition~~ and accelerates ~~to at least~~ 900 rpm in less than or equal to 10 seconds. The generator voltage and frequency shall be ~~4160 ± 420~~ ≥ 3950 and ≤ 4580 volts and 60 ± 1.2 Hz within 13 seconds after the start signal.

3. Subsequently, verifying the generator is synchronized, loaded to ~~greater than or equal to 2600 kw in less than or equal to 60 seconds~~ 2500-2600 kw**, and operates for greater than or equal to 60 minutes.

4. Verifying the diesel generator is aligned to provide standby power to the associated vital ~~busses~~.

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 fom the day tanks.

c. At least once per 18 months during shutdown by:

1. Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service,

2. Verifying that, on rejection of a load of greater than or equal to ~~785~~ 820 kw, the voltage and frequency are restored to ~~within 4160 ± 420~~ ≥ 3950 and ≤ 4580 volts and 60 ± 1.2 Hz within 4 seconds.

3. Simulating a loss of offsite power by itself, and:

a) Verifying de-energization of the vital ~~busses~~ and load shedding from the vital ~~busses~~.

b) Verifying the diesel starts on the auto-start signal, energizes the vital ~~busses~~ with permanently connected loads within 13 seconds, energizes the auto-connected shutdown loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. The steady state voltage and frequency of the ~~emergency~~ vital ~~busses~~ shall be maintained at ~~4160 ± 420~~ ≥ 3950 and ≤ 4580 volts and 60 ± 1.2 Hz during this test.

4. Verifying that on an ESF 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 ~~4160 ± 420~~ ≥ 3950 and ≤ 4580 volts and 60 ± 1.2 Hz within 13 seconds after the auto-start signal~~, the steady state generator voltage and frequency~~ shall be maintained within these limits during this test.

Insert 1 to p. 3/4 8-3

c. At least once per 6 months the diesel generator shall be started from ambient conditions and accelerated to at least 900 rpm in less than or equal to 10 seconds*. The generator voltage and frequency shall be $\geq$ 3950 and $\leq$ 4580 volts and 60 $\pm$ 1.2 Hz within 13 seconds after the start signal.

The generator shall be synchronized to its emergency bus, loaded to 2500-2600** kw in less than or equal to 60 seconds, and operate at a load of 2500-2600 kw for at least 60 minutes.

This test, if it is performed so it coincides with the testing required by Surveillance Requirement 4.8.1.1.2.a.2, may also serve to concurrently meet those requirements.

SURVEILLANCE REQUIREMENTS (Continued)

Deleted

5. ~~Verifying that on a simulated loss of the diesel generator (with offsite power not available), the diesel generator cannot be auto-connected to a loaded bus and that subsequent loading of the diesel generator is in accordance with design requirements.~~

6. Simulating a loss of offsite power in conjunction with an ESF actuation test signal, and

   a) Verifying de-energization of the vital bus~~ses~~ and load shedding from the vital bus~~ses~~.

   b) Verifying the diesel starts ~~from ambient condition~~ on the auto-start signal*, energizes the vital bus~~ses~~ with permanently connected loads within 13 seconds, energizes the auto-connected emergency (accident) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. The steady state voltage and frequency of the ~~emergency~~ vital bus~~ses~~ shall be maintained at ~~4160 ± 420~~ ≥ 3950 and ≤ 4580 volts and 60 ± 1.2 Hz during this test.

   c) Verifying that all nonessential automatic diesel generator trips (i.e., other than ~~except~~ engine overspeed, lube oil pressure low, 4 KV Bus differential and generator differential) are automatically bypassed upon loss of voltage on the vital bus concurrent with a safety injection actuation signal.

7. Verifying the diesel generator operates for at least 24 hours.* During the first 2 hours of this test, the diesel generator shall be loaded to 2760 - 2860 Kw** ~~greater than or equal to 2860 kw and~~ during the remaining 22 hours of this test, the diesel generator shall be loaded to 2500 - 2600 Kw** ~~greater than or equal to 2600 kw.~~ Within 5 minutes after completing this 24-hour test, perform d.6.b.*** Specification 4.8.1.1.2~~.c.4.~~ The steady state voltage and frequency shall be maintained at ~~4160 ± 420~~ ≥ 3950 and ≤ 4580 volts and 60 ± 1.2 Hz during this test.

8. Verifying that the auto-connected loads to each diesel generator do not exceed the ~~2000-hour rating of 2760 kw~~ two hour rating of 2860 Kw.

9. Verifying that with the 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 energize~~s~~ing the emergency loads with offsite power.

SURVEILLANCE REQUIREMENTS (Continued)

2. → d. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting all diesel generators simultaneously*, during shutdown, and verifying that all diesel generators accelerate to at least 900 rpm in less than or equal to 10 seconds.

4.8.1.1.3 The diesel fuel oil storage and transfer system shall be demonstrated OPERABLE:

a. At least once per 31 days by:

1. Verifying the level in each of the above required 20,000 gallon fuel storage tanks.

2. Verifying that both fuel transfer pumps can be started and transfer fuel from the 20,000 gallon storage tanks to the day tanks.

b. At least once per 92 days by verifying that a sample of diesel fuel from each of the above required 20,000 gallon fuel storage tanks is within the acceptable limits specified in Table 1 of ASTM D975-68 when checked for viscosity, water and sediment. in a Special Report within 30 days 77

4.8.1.1.4 Reports - All diesel generator failures, valid or non-valid, shall be reported to the Commission 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.

INSERT 1 →

Insert 1 to p. 3/4 8-5

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* Surveillance testing shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube, warm-up and loading (unless loading times are specified in the individual Surveillance Requirements).

** This band is meant as guidance to preclude routine exceedances of the diesel generator manufacturer's design ratings. Loads in excess of this band for special testing or momentary variations due to changing bus loads shall not invalidate the test.

*** Failure of a test per Surveillance Requirement 4.8.1.1.2.d.6.b, following performance of Surveillance Requirement 4.8.1.1.2.d.7, does not require that the 24 hour test of 4.8.1.1.2.d.7 be repeated. As an alternative, the EDG shall be loaded to 2500-2600 kw for one hour, or until operating temperatures have stabilized, prior to repeating Surveillance Requirement 4.8.1.1.2.d.6.b.

From NLR-N91149, 9/20/91
No further changes are proposed.

TABLE 4.8-1

DIESEL GENERATOR TEST SCHEDULE

Number of Failures in Last 20 Valid Tests *	Test Frequency
Zero or 1 → ~~Less than or Equal to 1~~	M → ~~At least once per 31 days~~
2 or more → ~~Greater than or Equal to 2~~	W** → ~~At least once per 7 days~~

* Criteria for determining the number of failures and number of valid tests shall be in accordance with Regulatory Position C.2.e of Regulatory Guide 1.108, Revision 1, August 1977, where the number of tests and failures is determined on a per diesel generator basis.

** This test frequency shall be maintained until seven consecutive Failure free demands have been performed and the number of Failures in the last 20 valid demands has been reduced to zero or one.

ELECTRICAL POWER SYSTEMS

SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.1.2 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. One circuit between the offsite transmission network and the onsite Class 1E distribution system, and

b. Two diesel generators with:

1. Separate day tanks containing a minimum volume of 130 gallons of fuel, and

2. A common fuel storage system containing a minimum volume of 20,000 gallons of fuel, and

3. A fuel transfer pump.

APPLICABILITY: MODES 5 and 6.

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes until the minimum required A.C. electrical power sources are restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the Surveillance Requirements of 4.8.1.1.1, ~~4.8.1.1.2~~ ~~(except for requirement 4.8.1.1.2a.3)~~, 4.8.1.1.3, except for requirement 4.8.1.1.3a.2 and 4.8.1.1.3a.4.

~~Insert 1~~ →

Insert 1 to p. 3/4 8-7

* The demonstration of diesel generator operability per this Surveillance Requirement is only considered a valid test (for the purpose of reducing testing frequency in accordance with Table 4.8-1) if the requirements of surveillance 4.8.1.1.2.a.2 are satisfied. However, should the diesel fail during testing per this Surveillance Requirement, it shall be considered a valid test and failure and the additional actions prescribed by Table 4.8-1 shall apply.

BASES

3/4.8.1 AND 3/4.8.2 A.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS

The OPERABILITY of the A.C. and D.C. power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety related equipment required for 1) the safe shutdown of the facility, and 2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criterion 17 of Appendix "A" to 10 CFR Part 50.

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least ~~one redundant set~~ two independent sets of onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss of offsite power and single failure of ~~the other~~ one onsite A.C. source.

The OPERABILITY of the minimum specified A.C. and D.C. power sources and associated distribution systems during shutdown and refueling ensures that 1) the facility can be maintained in the shutdown or refueling condition for extended time periods, and 2) sufficient instrumentation and control capability is available for monitoring and maintaining the unit status.

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators ~~is~~ are based upon the recommendations of Regulatory Guide 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, and Regulatory Guide 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977.

Insert 1

3/4.8.3 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

Containment electrical penetrations and penetration conductors are protected by either deenergizing circuits not required during reactor operation or by demonstrating the OPERABILITY of primary and backup overcurrent protection circuit breakers during periodic surveillance.

The surveillance frequency applicable to molded case circuit breakers and lower voltage circuit breakers provides assurance of breaker reliability by testing at least one representative sample of each manufacturer's brand of molded case and lower voltage circuit breakers. Each manufacturer's molded case circuit breakers and lower voltage circuit breakers are grouped into representative samples which are then tested on a rotating basis to ensure that all breakers are tested. If a wide variety exists within any manufacturer's brand of molded case or lower voltage circuit breakers, it is necessary to further divide that manufacturer's breakers into groups and treat each group as a separate type of breaker for surveillance purposes.

Insert 1 to p. B 3/4 8-1

For the purposes of establishing initial conditions for surveillance testing, "ambient conditions" mean that the diesel lube oil temperature is 120 $\pm$ 20 degrees F. The minimum lube oil temperature for an OPERABLE diesel is 100 degrees F. Lube oil heaters are designed to maintain the oil temperature at approximately 120 degrees F.