

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 circuits between the offsite transmission network and the onsite Class 1E distribution system, and
- b. Two separate and independent diesel generators, each with:
 - 1. Two separate engine-mounted fuel tanks containing a minimum volume of 200 gallons of fuel each,
 - 2. A separate fuel storage system containing a minimum volume of 40,000 gallons of fuel, and
 - 3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

- a. *one*
With ~~either an offsite circuit other than the conditions delineated in Action 3.8.1.1.g. or diesel generator of the above required A.C.~~ *3.8.1.1.a* 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.4.~~ within 1 hour and at least once per 8 hours thereafter; *and Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours unless previously and successfully tested within the last seven days;*
- b. *restore at least two offsite circuits and two 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 either an offsite circuit other than the conditions delineated in Action 3.8.1.1.f. or diesel generator of the above required A.C.* *3.8.1.1.b* 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.4.~~ within 1 hour and at least once per 8 hours thereafter; *and Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours.*

Restore at least two offsite circuits and two 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.

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ACTION (Continued)

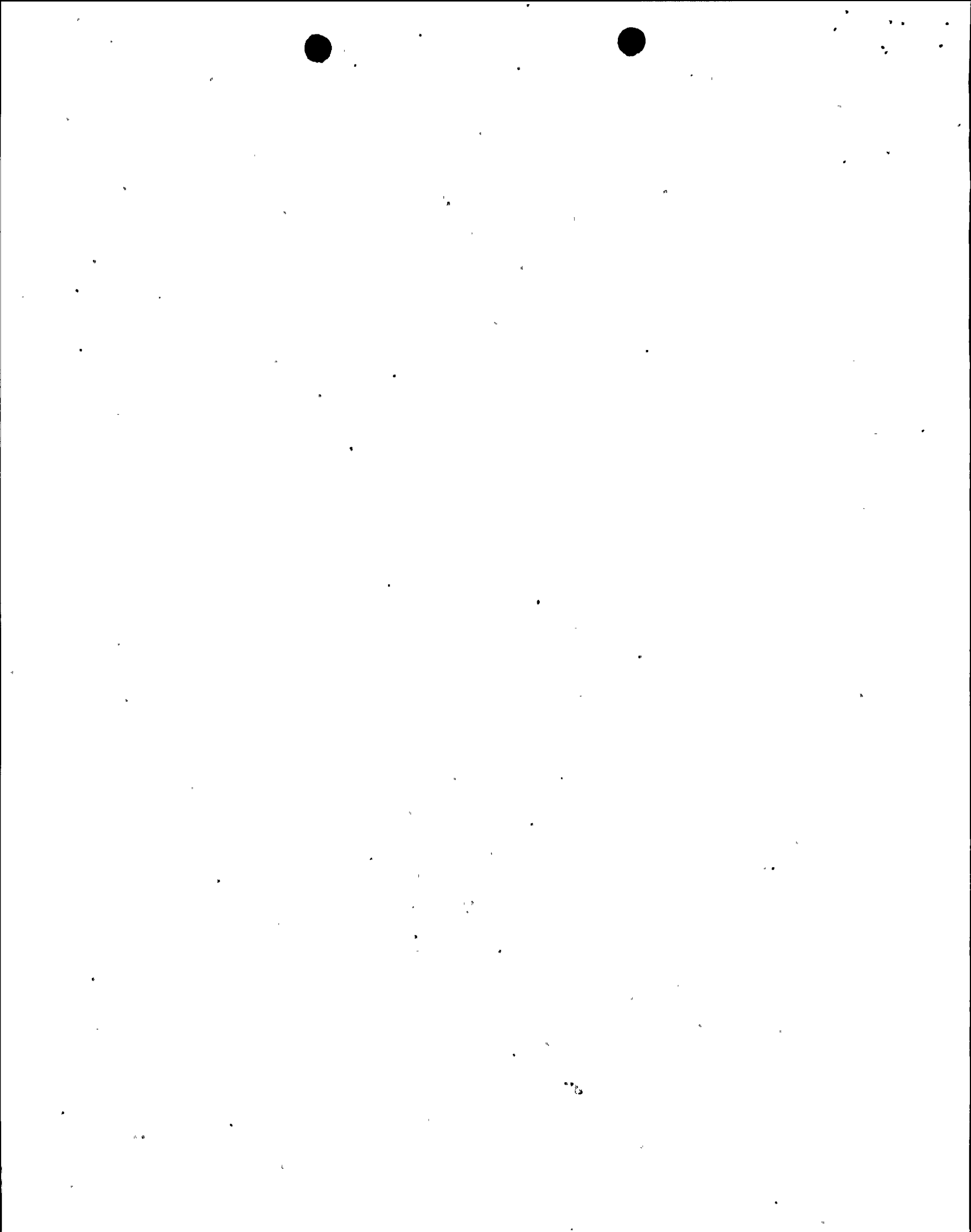
~~b.~~
c. With one offsite circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement ~~4.8.1.1.1a. and 4.8.1.1.2a.4.~~ within 1 hour and at least once per 8 hours thereafter; and Surveillance Requirement ~~4.8.1.1.2a.4~~ within 8 hours on the redundant diesel generator. 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 within the following 30 hours. ~~Restore at least two offsite circuits and two 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.~~ The other AC power source (off site circuit or diesel generator) to OPERABLE status in accordance with the provisions of Specification 3.8.1.1. Action Statement a or b, as appropriate, from the time of initial loss.

d. ~~e.~~ With one diesel generator inoperable, in addition to ACTION ~~a.~~ or ~~b.~~ above, verify that:
b. c.

1. All required systems, subsystems, trains, components and devices that depend on the remaining OPERABLE diesel generator as a source of emergency power are also OPERABLE, and
2. When a MODE 1, 2, or 3, the steam-driven auxiliary feed pump is OPERABLE.

If these conditions are not satisfied within 2 hours be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

e. ~~d.~~ With two of the above required offsite A.C. circuits inoperable, demonstrate the OPERABILITY of two diesel generators by performing Surveillance Requirement 4.8.1.1.2a.4. within 1 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.~~ Following restoration of one offsite source, Follow Action State a. based on time of the initial loss of offsite A.C. circuit.



ELECTRICAL POWER SYSTEMS

ACTION (Continued)

f. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; restore at least one 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 at least two diesel generators 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.~~ Following restoration one diesel generator unit, Follow Action Statement b, based on the time of the initial loss of a diesel generator.

g. With one Unit 2 startup transformer (2A or 2B) inoperable and with a Unit 1 startup transformer (1A or 1B) connected to the same A or B offsite power circuit and administratively available to both units, then should Unit 1 require the use of the startup transformer administratively available to both units, Unit 2 shall demonstrate the operability of the remaining A.C. sources by performing Surveillance Requirement ~~4.8.1.1.1a. and 4.8.1.1.2a.4.~~ within 1 hour and at least once per 8 hours thereafter ~~and Surveillance Requirement 4.8.1.1.2a.4~~ within 24 hours unless previously and successfully tested within the last seven days.

Restore the inoperable startup transformer to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

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 by transferring (manually and automatically) unit power supply from the normal circuit to the alternate circuit.

ST. LUCIE - UNIT 2

3/4 8-X

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Amendment No.

ELECTRICAL POWER SYSTEM

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 the engine-mounted fuel tank,
2. Verifying the fuel level in the fuel storage tank,
3. Verifying the fuel transfer pump can be started and transfers fuel from the storage system to the engine-mounted tank,

4. Verifying the diesel starts ~~from ambient condition and then accelerates to at least 900 rpm in less than or equal to synchronous~~ speed (900rpm) with ~~10 seconds~~. The generator voltage and frequency shall be at 4160 ± 420 volts and 60 ± 1.2 Hz, within ~~10 seconds~~ after 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. ^{Subsequently} Verifying the generator is synchronized, ^{gradually} loaded to greater than or equal to ~~3685 kW in less than or equal to 60 seconds~~, and operates with a load greater than or equal to ~~3685 kW~~ for at least an additional 60 minutes, ^{and} ~~and~~ ³⁴⁸⁵

6. Verifying the diesel generator is aligned to provide standby power to the associated emergency 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 from the engine-mounted fuel tanks.

c. At least once per 92 days and from new fuel prior to addition to the storage tanks, by obtaining a sample of fuel oil in accordance with ASTM-D270-1975, and by verifying that the sample meets the following minimum requirements and is tested within the specified time limits:

1. As soon as sample is taken or prior to adding new fuel to the storage tank verify in accordance with the test specified in ASTM-D975-77 that the sample has:



SURVEILLANCE REQUIREMENTS (Continued)

- a) A water and sediment content of less or equal to 0.05 volume percent.
 - b) A kinematic viscosity @ 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes.
 - c) A specific gravity as specified by the manufacturer @ 60/60°F of greater than or equal to 0.8 but less than or equal to 0.99 or an API gravity @ 60°F of greater than or equal to 11 degrees but less than or equal to 47 degrees.
2. Within 1 week after obtaining the sample, verify an impurity level of less than 2 mg of insolubles per 100 ml when tested in accordance with ASTM-D2274-70.
3. Within 2 weeks of obtaining the sample verify that the other properties specified in Table 1 of ASTM-D975-77 and Regulatory Guide 1.137 Position 2.a are met when tested in accordance with ASTM-D975-77.

~~d. At least once per 12 months by verifying that the automatic load sequence timers are OPERABLE with the interval between each load block within ± 1 second of its design interval. See new e. 12 below~~

d. At least once per 184 days the diesel generator shall be started

~~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 volts and 60 ± 1.2 Hz within 10 seconds after the start signal.

manually to its appropriate emergency bus, then

3485 ~~Verifying the generator is~~ synchronized, loaded to greater than or equal to 3685 kW in less than or equal to 60 seconds, and operates with a load greater than or equal to 3685 kW for at least an additional 60 minutes, ~~and~~ 3485

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.

This test, if it is performed so that it coincides with the testing required by Surveillance Requirements 4, 8, 1, 1, 2, 4 and 5 may also serve to concurrently meet those requirements as well.



- e. 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 the generator capability to reject a load of greater than or equal to 453 kW while maintaining voltage at 4160 ± 420 volts and frequency at 60 ± 1.2 Hz.
 3. Verifying the generator capability to reject a load of 3685 kW without tripping. The generator voltage shall not exceed 4784 volts during and following the load rejection.
 4. Simulating a loss-of-offsite power by itself, and:
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses.
 - b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 10 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. 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.
 5. 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 steady-state generator voltage and frequency shall be 4160 ± 420 volts and 60 ± 1.2 Hz within 10 seconds after the auto-start signal; the generator voltage and frequency shall be maintained within these limits during this test.
 6. Simulating a loss-of-offsite power in conjunction with an ESF actuation test signal, and
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses.
 - b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 10 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. 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.
 - c) Verifying that all automatic diesel generator trips, except engine overspeed and generator differential, are automatically bypassed upon loss of voltage on the emergency bus concurrent with a safety injection actuation signal.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

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 greater than or equal to ~~3985~~³⁷⁸⁵ kW and during the remaining 22 hours of this test, the diesel generator shall be loaded to greater than or equal to ~~3685~~³⁴⁸⁵ kW. The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± 1.2 Hz within 10 seconds after the start signal; the steady-state generator voltage and frequency shall be maintained within these limits during this test. Within 5 minutes after completing this 24-hour test, perform Surveillance Requirement 4.8.1.1.2e.4.b).
8. Verifying that the auto-connected loads to each diesel generator do not exceed the 2000-hour rating of ~~3985~~³⁹³⁵ kW.
9. Verifying the diesel generator's capability to:
 - a) Synchronize with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power,
 - b) Transfer its loads to the offsite power source, and
 - c) Be restored to its standby status.
10. 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 energizes the emergency loads with offsite power.
11. Verifying that the fuel transfer pump transfers fuel from each fuel storage tank to the engine-mounted tanks of each diesel via the installed cross connection lines.
- ~~12. At least once per 12 months by~~ Verifying that the automatic load sequence timers are OPERABLE with the interval between each load block within ± 1 second of its design interval.
- f. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting the diesel generators simultaneously, during shutdown, and verifying that the diesel generators accelerate to at least 900 rpm in less than or equal to 10 seconds.
- g. At least once per 10 years by:
 1. Draining each fuel oil storage tank, removing the accumulated sediment and cleaning the tank using a sodium hypochlorite solution, and
 2. Performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection ND of the ASME Code at a test pressure equal to 110% of the system design pressure.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

Deleted

~~4.8.1.1.3 Reports - All diesel generator failures, valid or non-valid, shall be reported to the Commission pursuant to Specification 6.9.1. 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 Class 1E underground cable system shall be demonstrated OPERABLE within 30 days after the movement of any loads in excess of 80% of the ground surface design basis load over the cable ducts by pulling a mandrel with a diameter of at least 80% of the duct's inside diameter through a duct exposed to the maximum loading (duct nearest the ground's surface) and verifying that the duct has not been damaged.

TABLE 4.8-1

DIESEL GENERATOR TEST SCHEDULE

<u>Number of Failures In Last 100 Valid Tests.*</u>	<u>Test Frequency</u>
< 1	At least once per 31 days
2	At least once per 14 days
3	At least once per 7 days
> 4	At least once per 3 days

*Criteria for determining 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 last 100 tests are determined on a per nuclear unit basis. For the purposes of this test schedule, only valid tests conducted after the Operating License issuance date shall be included in the computation of the "last 100 valid tests". Entry into this test schedule shall be made at the 31 day test frequency.

<u>Number of Failures in Last 20 Valid Tests*</u>	<u>Number of Failures in last 100 Valid Tests*</u>	<u>Test Frequency*</u>
≤ 1	≤ 4	At least once per 31 days
≥ 2**	≥ 5	At least once per 7 days

*Criteria for determining 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.* *and test frequency*

For the purpose of determining required test frequency, a manufacturer approved diesel overhaul followed by fourteen successive and successful diesel surveillance tests, including four fast starts, per Surveillance Requirements 4.8.1.1.2.a.4* and 4.8.1.1.2.c will serve to transvalue the failure count to zero and reinitiate application of this table as if the overhauled diesel was new.

**The associated 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 one or less.

ELECTRICAL POWER SYSTEMS

A.C. SOURCES

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. One diesel generator with:
 - 1. Two engine-mounted fuel tanks each containing a minimum volume of 200 gallons of fuel,
 - 2. A fuel storage system containing a minimum volume of 40,000 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, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, movement of irradiated fuel, or crane operation with loads over the fuel storage pool, and within 8 hours, depressurize and vent the Reactor Coolant System through a greater than or equal to 3.58 square inch vent. In addition, when in MODE 5 with the reactor coolant loops not filled, or in MODE 6 with the water level less than 23 feet above the reactor vessel flange, immediately initiate corrective action to restore the required sources to OPERABLE status as soon as possible.

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.5), and ~~4.8.1.1.3.~~

and

3/4.8. ELECTRICAL POWER SYSTEMS

BASES

3/4.8.1, 3/4.8.2 and 3/4.8.3 A.C. SOURCES, D.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 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 safety analyses and are based upon maintaining at least one redundant set 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 onsite A.C. source. The A.C. and D.C. source allowable out-of-service times are based on Regulatory Guide 1.93, "Availability of Electrical Power Sources," December 1974. When one diesel generator is inoperable, there is an additional ACTION requirement to verify that all required systems, subsystems, trains, components and devices, that depend on the remaining OPERABLE diesel generator as a source of emergency power, are also OPERABLE, and that the steam-driven auxiliary feedwater pump is OPERABLE. This requirement is intended to provide assurance that a loss of offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term verify as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the surveillance requirements needed to demonstrate the OPERABILITY of the component.

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.

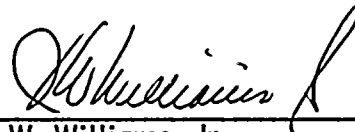
The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guides 1.9 "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, and 1.108 "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977, and 1.137, "Fuel Oil Systems for Standby Diesel Generators," Revision 1, October 1979, ~~and~~ Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability" dated July 2, 1984 and NRC staff positions reflected in Amendment No. 48 to Facility Operating License NPF-7 for North Anna Unit 2, dated April 25, 1985.

STATE OF FLORIDA)
)
COUNTY OF DADE) ss.

J. W. Williams, Jr. being first duly sworn, deposes and says:

That he is a Group Vice President of Florida Power & Light Company, the Licensee herein;

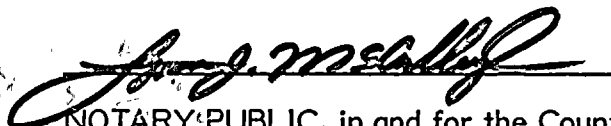
That he has executed the foregoing document; that the statements made in this document are true and correct to the best of his knowledge, information, and belief, and that he is authorized to execute the document on behalf of said Licensee.



J. W. Williams, Jr.

Subscribed and sworn to before me this

28 day of AUGUST, 1985.



NOTARY PUBLIC, in and for the County
of Dade, State of Florida

NOTARY PUBLIC STATE OF FLORIDA
MY COMMISSION EXP. FEB 14, 1988
BONDED THRU GENERAL INS. UND.

My Commission expires: 2-14-88

THE
MAY 1964
CHIEF OF POLICE