

## INDEX

### LIST OF TABLES (Continued)

| <u>TABLE</u>  | <u>PAGE</u>     |
|---|-----------------|
| 3.6.5.2-1 SECONDARY CONTAINMENT VENTILATION SYSTEM<br>AUTOMATIC ISOLATION DAMPERS ..... | 3/4 6-39        |
| 3.7.5.2-1 DELUGE AND SPRINKLER SYSTEMS .....  | 3/4 7-16        |
| 3.7.5.4-1 FIRE HOSE STATIONS .....  | 3/4 7-19        |
| 3.7.7-1 AREA TEMPERATURE MONITORING .....   | 3/4 7-25        |
| <u>4.8.1.1.2-1 DIESEL GENERATOR TEST SCHEDULE .....</u>                                 | <u>3/4 8-7b</u> |
| 4.8.2.3.2-1 BATTERY SURVEILLANCE REQUIREMENTS .....                                     | 3/4 8-18        |
| 3.8.3.3-1 MOTOR-OPERATED VALVES THERMAL OVERLOAD<br>PROTECTION .....                    | 3/4 8-27        |
| B3/4.4.6-1 REACTOR VESSEL TOUGHNESS .....   | B 3/4 4-6       |
| 5.7.1-1 COMPONENT CYCLIC OR TRANSIENT LIMITS .....                                      | 5-6             |

### 3/4.B ELECTRICAL POWER SYSTEMS

#### 3/4.B.1 A.C. SOURCES

##### A.C. SOURCES - OPERATING

##### LIMITING CONDITION FOR OPERATION

3.B.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. Separate and independent diesel generators\* 0, 1A, 2A and 1B with:
  1. For diesel generator 0, 1A and 2A:
    - a) A separate day fuel tank containing a minimum of 250 gallons of fuel.
    - b) A separate fuel storage system containing a minimum of 31,000 gallons of fuel.
  2. For diesel generator 1B, a separate fuel storage tank and a day tank containing a combined minimum of 29,750 gallons of fuel.
  3. A separate fuel transfer pump.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

##### ACTION:

- a. With one offsite circuit 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 within 1 hour and at least once per 8 hours thereafter. If any of the diesel generators have not been successfully tested within the past 24 hours, demonstrate their OPERABILITY by performing Surveillance Requirement 4.8.1.1.2.a.4 for each such diesel generator, separately, within 24 hours. Restore the offsite circuit to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- b. With either the 0 or 1A diesel generator inoperable, demonstrate the OPERABILITY of the above required A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hour thereafter. If the diesel generator became inoperable due to any cause other than preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE

\*See page 3/4 B-1(a).

INSERT 1A

**Insert 1A**

**If the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE**

No changes to this page

## ELECTRICAL POWER SYSTEMS

### LIMITING CONDITION FOR OPERATION (Continued)

\*For the purposes of completing maintenance, modification, and/or technical specification surveillance requirements, on the 0 diesel generator and its support systems during a refuel outage, as part of pre-planned maintenance, modifications, and/or the surveillance program, the requirements of action statement b are modified to:

1. Eliminate the requirement for performing technical specification surveillance requirements 4.8.1.1.1.a on each operable AC source, immediately and once per 8 hours thereafter, when the 0 diesel generator is declared inoperable.
2. Allow an additional 96 hours in excess of the 72 hours allowed in action statement b for the 0 diesel generator to be inoperable.

Provided that the following conditions are met:

- A. Unit 2 is in operational condition 4 or 5 or defueled prior to taking the 0 diesel generator out of service.
- B. Surveillance requirements 4.8.1.1.1a and 4.8.1.1.2a.4 are successfully completed, for the offsite power sources and the 1A and 2A diesel generators, within 48 hours prior to removal of the 0 diesel generator from service.
- C. No maintenance is performed on the offsite circuits or the 1A or 2A diesel generators, while the 0 diesel generator is inoperable.
- D. Technical specification requirement 4.8.1.1.1a is performed daily, while the 0 diesel generator is inoperable.
- E. The control circuit for the unit cross-tie circuit breakers between buses 142Y and 242Y are temporarily modified to allow the breakers to be closed with a diesel generator feeding the bus, while the 0 diesel generator is inoperable.

The provisions of technical specification 3.0.4 are not applicable.



## ELECTRICAL POWER SYSTEMS

### LIMITING CONDITION FOR OPERATION (Continued)

#### ACTION: (Continued)

INSERT 1B

diesel generators, separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours<sup>a</sup>. Restore the diesel generator to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

INSERT 1C

- c. With one offsite circuit of the above required A.C. sources and diesel generator 0 or 1A 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 within 1 hour and at least once per 8 hours thereafter. If the diesel generator became inoperable due to any cause other than preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generators, separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours<sup>a</sup>. Restore at least one of the inoperable A.C. sources to OPERABLE status within 12 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. Restore at least two offsite circuits and diesel generators 0 and 1A to OPERABLE status within 72 hours from the time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

INSERT 1D

- d. With diesel generator 1B of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the offsite A.C. sources 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 became inoperable due to any cause other than preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generators, separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours<sup>a</sup>. Restore diesel generator 1B to OPERABLE status within 72 hours or declare the HPCS system inoperable and take the ACTION required by specification 3.5.1.
- e. With both of the above required offsite circuits inoperable, demonstrate the OPERABILITY of the remaining A.C. sources, separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours unless the diesel generators are already operating. Restore at least one offsite circuit to OPERABLE status within 24 hours, or be in at least HOT SHUTDOWN within the next 12 hours. With only one offsite circuit restored to OPERABLE status, restore

<sup>a</sup>This test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY. The provisions of Specification 3.0.2 are not applicable.

**Insert 1B**

**diesel generators, separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours\*, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated.**

**Insert 1C**

**If the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generators, separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours\*, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated.**

**Insert 1D**

**If the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generators, separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours\*, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated.**

## ELECTRICAL POWER SYSTEMS

### LIMITING CONDITIONS FOR OPERATION (Continued)

#### ACTION (Continued)

at least two offsite circuits to OPERABLE status within 72 hours from the time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

A successful test(s) of diesel generator OPERABILITY per Surveillance Requirement 4.8.1.1.2.a.4, performed under this ACTION statement for the OPERABLE diesel generators, satisfies the diesel generator test requirements of ACTION statement a.

- f. With diesel generators 0 and 1A 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 within 1 hour and at least once per 8 hours thereafter, and Surveillance Requirement 4.8.1.1.2.a.4 for the 1B and 2A diesel generators, separately, within 8 hours\*. Restore at least one of the inoperable diesel generators 0 or 1A to OPERABLE status within 2 hours, or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. Restore both diesel generators 0 and 1A to OPERABLE status within 72 hours, from the time of initial loss, or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

- g. With diesel generator 2A 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 within 1 hour and at least once per 8 hours thereafter. If the 2A diesel generator ~~become~~ inoperable due to any cause other than preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the 1A diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4, within 24 hours\*. Restore the inoperable diesel generator 2A to OPERABLE status within 72 hours or declare standby gas treatment system subsystem B, Unit 2 drywell and suppression chamber hydrogen recombiner system, and control room and auxiliary electric equipment room emergency filtration system train B inoperable, and take the ACTION required by specifications 3.6.5.3, 3.6.6.1, and 3.7.2. Continued performance of Surveillance Requirement 4.8.1.1.1.a is not required provided the above systems are declared inoperable and the action of their respective specifications is taken.

INSERT  
IE

\*This test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY. The provisions of Specification 3.0.2 are not applicable.

**Insert 1E**

**If the 2A diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned maintenance or testing, demonstrate the OPERABILITY of the 1A diesel generator, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours\*, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated.**

No changes to this page

ELECTRICAL POWER SYSTEMS

LIMITING CONDITIONS FOR OPERATION (Continued)

---

ACTION (Continued)

- h. With one offsite circuit of the above required A.C. electrical power sources and diesel generator 1B inoperable, apply the requirements of ACTION a and d specified above.
- i. With either diesel generators 0 or 1A inoperable and diesel generator 1B inoperable, apply the requirements of ACTION b and d specified above.
- j. With one offsite circuit of the above required A.C. electrical power sources and diesel generator 2A inoperable, apply the requirements of ACTION a and g specified above.
- k. With diesel generator 1B and diesel generator 2A inoperable, apply the requirements of ACTION d and g specified above.
- l. With diesel generator 0 and diesel generator 2A inoperable, apply the requirements of ACTION b and g specified above.



## 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 manually transferring 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:\*

At least once per 31 days

- 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 day fuel tank.
  2. Verifying the fuel level in the fuel storage tank.
  3. Verifying the fuel transfer pump starts and transfers fuel from the storage system to the day fuel tank.
  4. Verifying the diesel starts from ambient condition and accelerates to 900 rpm  $\pm 5\%$ ,  $-2\%$  in less than or equal to 13 seconds<sup>\*\*</sup>. The generator voltage and frequency shall be  $4160 \pm 150$  volts and  $60 \pm 3.0$ ,  $-1.2$  Hz within 13 seconds<sup>\*\*</sup> after the start signal.
  5. Verifying the diesel generator is synchronized, and then loaded to 2400 kW to 2600 kW<sup>\*\*\*</sup> within 60 seconds<sup>\*\*</sup>, and operates with this load for at least 60 minutes.

in accordance with the manufacturer's recommendations

\*All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period, as recommended by the manufacturer.

<sup>\*\*</sup>Surveillance testing to verify the diesel generator start (13 second) and load (60 second) times from ambient conditions shall be performed at least once per 184 days. All other engine starts performed for the purpose of meeting these surveillance requirements may be conducted in accordance with warmup and loading procedures, as recommended by the manufacturer, in order to minimize mechanical stress and wear on the diesel generator caused by fast starting and loading of the diesel generator.

<sup>\*\*\*</sup>Transients, outside of this load band, do not invalidate the surveillance tests.

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS

6. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.
7. Verifying the pressure in required diesel generator air start receivers to be greater than or equal to 200 psig.
- 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 day fuel tanks.
- c. By sampling and analyzing stored and new fuel oil in accordance with the following:
  1. At least once per 92 days, and for new fuel oil prior to addition to the storage tanks, that a sample obtained and tested in accordance with the applicable ASTM Standards has:
    - a) A water and sediment content within applicable ASTM limits.
    - b) A kinematic viscosity at 40°C within applicable ASTM limits.
  2. At least every 31 days, and for new fuel oil prior to addition to the storage tanks, that a sample obtained in accordance with the applicable ASTM Standard has a total particulate contamination of less than 10 mg/l when tested in accordance with the applicable ASTM Standard.
- d. At least once per 18 months during shutdown by:
  1. (Not Used) 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 diesel generator capability\* to reject a load of greater than or equal to 1190 kW for diesel generator 0, greater than or equal to 638 kW for diesel generators 1A and 2A, and greater than or equal to 2421 kW for diesel generator 1B while maintaining engine speed less than or equal to 75% of the difference between nominal speed and the overspeed trip setpoint or 15% above nominal, whichever is less.
  3. Verifying the diesel generator capability\* to reject a load of 2600 kW without tripping. The generator voltage shall not exceed 5000 volts during and following the load rejection.
  4. Simulating a loss of offsite power\* by itself, and:

\*All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period, as recommended by the manufacturer.



No changes to this page

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- a) For Divisions 1 and 2 and for Unit 2 Division 2:
  - 1) Verifying de-energization of the emergency busses and load shedding from the emergency busses.
  - 2) Verifying the diesel generator starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 13 seconds, energizes the auto-connected loads and operates for greater than or equal to 5 minutes while its generator is so loaded. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at  $4160 \pm 150$  volts and  $60 \pm 1.2$  Hz during this test.
- b) For Division 3:
  - 1) Verifying de-energization of the emergency bus.
  - 2) Verifying the diesel generator starts on the auto-start signal, energizes the emergency bus with its loads within 13 seconds and operates for greater than or equal to 5 minutes while its generator is so loaded. After energization, the steady-state voltage and frequency of the emergency bus shall be maintained at  $4160 \pm 150$  volts and  $60 \pm 1.2$  Hz during this test.
5. Verifying that on an ECCS actuation test signal, without loss of offsite power, diesel generators 0, 1A, and 1B start\* on the auto-start signal and operate on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be  $4160 \pm 416$ ,  $-150$  volts and  $60 \pm 3.0$ ,  $-1.2$  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.
6. Simulating a loss of offsite power in conjunction with an ECCS actuation test signal,\* and:
  - a) For Divisions 1 and 2:
    - 1) Verifying de-energization of the emergency busses and load shedding from the emergency busses.

\*All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period, as recommended by the manufacturer.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 2) Verifying the diesel generator starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 13 seconds, energizes the auto-connected emergency 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  $4160 \pm 416$  volts and  $60 \pm 1.2$  Hz during this test.
- b) For Division 3:
  - 1) Verifying de-energization of the emergency bus.
  - 2) Verifying the diesel generator starts on the auto-start signal, energizes the emergency bus with its loads within 13 seconds 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 bus shall be maintained at  $4160 \pm 416$  volts and  $60 \pm 1.2$  Hz during this test.
7. Verifying that all diesel generator 0, 1A, and 1B automatic trips except the following are automatically bypassed on an ECCS actuation signal:
  - a) For Divisions 1 and 2 - engine overspeed, generator differential current, and emergency manual stop.
  - b) For Division 3 - engine overspeed, generator differential current, and emergency manual stop.
8. Verifying the diesel generator operates<sup>a</sup> 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 2860 kW and during the remaining 22 hours of this test, the diesel generator shall be loaded to 2400 kW to 2600 kW. <sup>\*\*\*</sup> The generator voltage and frequency shall be  $4160 \pm 420$ ,  $-150$  volts and  $60 \pm 3.0$ ,  $-1.2$  Hz within 13 seconds after the start signal; the steady state

<sup>a</sup>All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period, as recommended by the manufacturer.

<sup>\*\*\*</sup>Transients, outside of this load band, do not invalidate the surveillance tests.

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

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 4.8.1.1.2.d.4.a).2) and b).2)

- 4.8.1.1.2.a.4
9. Verifying\* that the auto-connected loads to each diesel generator do not exceed the 2000 hour rating of 2860 kW.
  10. 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.
  11. Verifying that with diesel generator 0, 1A, and 1B operating\* in a test mode and connected to its bus:
    - a) For Divisions 1 and 2, that a simulated ECCS actuation signal overrides the test mode by returning the diesel generator to standby operation.
    - b) For Division 3, that a simulated trip of the diesel generator overcurrent relay trips the SAT feed breaker to bus 143 and that the diesel generator continues to supply normal bus loads.
  12. Verifying that the automatic load sequence timer is OPERABLE with the interval between each load block within  $\pm 10\%$  of its design interval for diesel generators 0 and 1A.
  13. Verifying that the following diesel generator lockout features prevent diesel generator operation only when required:

\*All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period, as recommended by the manufacturer.

\*\*If Surveillance Requirements 4.8.1.1.2.d.4.a).2) and/or b).2) are not satisfactorily completed, it is not necessary to repeat the preceding 24 hour test. Instead, the diesel generator may be operated at 2600 kW for 1 hour or

2 hours

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- a) Generator underfrequency.
  - b) Low lube oil pressure.
  - c) High jacket cooling temperature.
  - d) Generator reverse power.
  - e) Generator overcurrent.
  - f) Generator loss of field.
  - g) Engine cranking lockout.
- e. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting diesel generators 0, 1A, and 1B simultaneously,\* during shutdown, and verifying that all three diesel generators accelerate to 900 rpm  $\pm 5$ ,  $-2\%$  in less than or equal to 13 seconds.
- f. 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 or equivalent solution, and
  - 2. Performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection MD, of the ASME Code in accordance with ASME Code Section II, Article IWD-5000.

4.8.1.1.3 Reports - All diesel generator failures, valid or non-valid, shall be reported to the Commission pursuant to Specification 6.6.C 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.

(Not Used)

\*All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period, as recommended by the manufacturer.



DELETE THIS PAGE

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

TABLE 4.8.1.1.2-1

DIESEL GENERATOR TEST SCHEDULE

| NUMBER OF FAILURES IN<br>LAST 20 VALID TESTS* | NUMBER OF FAILURES IN<br>LAST 100 VALID TESTS* | TEST FREQUENCY               |
|---|--|------------------------------|
| $\leq 1$                                      | $\leq 4$                                       | At least once per<br>31 days |
| $\geq 2$ **                                   | $\geq 5$                                       | At least once per<br>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, but determined on a per diesel generator basis. With the exception of the semi-annual fast start, no starting time requirements are required to meet the valid test requirements of Regulatory Guide 1.108.

For the purposes of determining the required test frequency, the previous test failure count may be reduced to zero if:

- 1) a complete diesel overhaul to like-new condition is completed (provided that the overhaul, including appropriate post-maintenance operation and testing, is specifically approved by the manufacturer), and
- 2) if acceptable reliability has been demonstrated. The reliability criterion shall include the successful completion of 14 consecutive tests in a single series structured as follows:
  - a. ten of these tests shall be performed in accordance with the routine Surveillance Requirements 4.8.1.1.2.a.4 and 4.8.1.1.2.a.5, and
  - b. four tests shall be performed in accordance with the 184-day testing requirement of Surveillance Requirements 4.8.1.1.2.a.4 and 4.8.1.1.2.a.5.

If this criterion is not satisfied during the first series of tests, any alternate criterion to be used to reset the failure count to zero requires NRC approval.

\*\*The associated test frequency shall be maintained until 7 consecutive failure free demands have been performed AND the number of failures in the last 20 valid demands has been reduced to one.

No changes to this page

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 IE distribution system, and
- b. Diesel generator 0 or 1A, and diesel generator 1B when the HPCS system is required to be OPERABLE, and diesel generator 2A when the offsite power source for standby gas treatment system subsystem B or control room and auxiliary electric equipment room emergency filtration system train B is inoperable and either or both systems are required to be OPERABLE, with each diesel generator having:
  1. For diesel generator 0, 1A and 2A:
    - a) A separate day fuel tank containing a minimum of 250 gallons of fuel.
    - b) A separate fuel storage system containing a minimum of 31,000 gallons of fuel.
  2. For diesel generator 1B, a separate fuel storage tank/day tank containing a minimum of 29,750 gallons of fuel.
  3. A fuel transfer pump.

APPLICABILITY: OPERATIONAL CONDITIONS 4, 5, and \*.

ACTION:

- a. With all offsite circuits inoperable and/or with diesel generators 0 or 1A inoperable, suspend CORE ALTERATIONS, handling of irradiated fuel in the secondary containment and operations with a potential for draining the reactor vessel.
- b. With diesel generator 1B inoperable, restore the inoperable diesel generator 1B to OPERABLE status within 72 hours or declare the HPCS system inoperable and take the ACTION required by Specification 3.5.2 and 3.5.3.

\*When handling irradiated fuel in the secondary containment.

No changes to this page

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

- c. With diesel generator 2A inoperable, declare standby gas treatment system subsystem B and control room and auxiliary electric equipment room emergency filtration system train B inoperable and take the ACTION required by Specifications 3.6.5.3 and 3.7.2.
- d. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.8.1.2 At least the above required A.C. electrical power sources shall be demonstrated OPERABLE per Surveillance Requirements 4.8.1.1.1; 4.8.1.1.2 and 4.8.1.1.3, except for the requirement of 4.8.1.1.2.a.5.



BASES3/4.8.1 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 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. ACTION statements have been included in the specification to cover all situations where either one A.C. source or a combination of two A.C. sources are inoperable. ACTION statements c, e, and f are intended to be followed to completion once entered and should not be exited until both A.C. sources are restored. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least Division I or II 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 one of the two onsite A.C. sources. Division III supplies the high pressure core spray (HPCS) system only.

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.

INSERT IF  
The surveillance requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guide 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, with the exception noted in Appendix B to the FSAR, 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.

The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion/operation. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. The tests, limits, and applicable American Society for Testing Materials (ASTM) standards are as follows:

- a. Sample the new fuel oil in accordance with ASTM-D4057-88;
- b. Verify in accordance with the tests specified in ASTM-D975-88 that the sample has a water and sediment content of less than or equal to 0.05 volume percent and a kinematic viscosity at 40 °C of greater than or equal to 1.9 but less than or equal to 4.1.

**Insert 1F**

**The surveillance requirements for demonstrating the OPERABILITY of the diesel generators are based on the recommendations of Regulatory Guide 1.9, Revision 3, "Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants", July 1993, with the exception noted in Appendix B to the UFSAR.**

# INDEX

## LIST OF TABLES (Continued)

| TABLE       |   | PAGE      |
|-------------|---|-----------|
| 3.6.5.2-1   | SECONDARY CONTAINMENT VENTILATION SYSTEM<br>AUTOMATIC ISOLATION DAMPERS ..... | 3/4 6-47  |
| 3.7.5.2-1   | DELUGE AND SPRINKLER SYSTEMS .....  | 3/4 7-16  |
| 3.7.5.4-1   | FIRE HOSE STATIONS .....  | 3/4 7-19  |
| 3.7.7-1     | AREA TEMPERATURE MONITORING .....   | 3/4 7-26  |
| 4.7.9-1     | SNUBBER VISUAL INSPECTION INTERVAL.....                                       | 3/4 7-33a |
| 4.8.1.1.2-1 | DIESEL GENERATOR TEST SCHEDULE .....  | 3/4 8-7b  |
| 4.8.2.3.2-1 | BATTERY SURVEILLANCE REQUIREMENTS .....                                       | 3/4 8-18  |
| 3.8.3.3-1   | MOTOR-OPERATED VALVES THERMAL OVERLOAD<br>PROTECTION .....                    | 3/4 8-27  |
| B3/4.4.6-1  | REACTOR VESSEL TOUGHNESS .....  | B 3/4 4-6 |
| 5.7.1-1     | COMPONENT CYCLIC OR TRANSIENT LIMITS .....                                    | 5-6       |

### 3/4.8 ELECTRICAL POWER SYSTEMS

#### 3/4.8.1 A.C. SOURCES

##### 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. Separate and independent diesel generators\* 0, 1A, 2A and 2B with:
  1. For diesel generator 0, 1A and 2A:
    - a) A separate day fuel tank containing a minimum of 250 gallons of fuel.
    - b) A separate fuel storage system containing a minimum of 31,000 gallons of fuel.
  2. For diesel generator 2B, a separate fuel storage tank and a day tank containing a minimum of 29,750 gallons of fuel.
  3. A separate fuel transfer pump.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

##### ACTION:

- a. With one offsite circuit 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 within 1 hour and at least once per 8 hours thereafter. If any of the diesel generators have not been successfully tested within the past 24 hours, demonstrate their OPERABILITY by performing Surveillance Requirement 4.8.1.1.2.a.4 for each such diesel generator, separately, within 24 hours. Restore the offsite circuit to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- b. With either the 0 or 2A diesel generator inoperable, demonstrate the OPERABILITY of the above required A.C. offsite sources 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 became inoperable due to any cause other than preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE

\*See page 3/4 8-1(a).

INSERT 2A

**Insert 2A**

**If the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE**

No change to this page.

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION (Continued)

\*For the purposes of completing maintenance, modification, and/or technical specification surveillance requirements, on the 0 diesel generator and its support systems during a refuel outage, as part of pre-planned maintenance, modifications, and/or the surveillance program, the requirements of action statement b are modified to:

1. Eliminate the requirement for performing technical specification surveillance requirements 4.8.1.1.1.a on each operable AC source, immediately and once per 8 hours thereafter, when the 0 diesel generator is declared inoperable.
2. Allow an additional 96 hours in excess of the 72 hours allowed in action statement b for the 0 diesel generator to be inoperable.

Provided that the following conditions are met:

- A. Unit 1 is in operational condition 4 or 5 or defueled prior to taking the 0 diesel generator out of service.
- B. Surveillance requirements 4.8.1.1.1a and 4.8.1.1.2a.4 are successfully completed, for the offsite power sources and the 1A and 2A diesel generators, within 48 hours prior to removal of the 0 diesel generator from service.
- C. No maintenance is performed on the offsite circuits or the 1A or 2A diesel generators, while the 0 diesel generator is inoperable.
- D. Technical specification requirement 4.8.1.1.1a is performed daily, while the 0 diesel generator is inoperable.
- E. The control circuit for the unit cross-tie circuit breakers between buses 142Y and 242Y are temporarily modified to allow the breakers to be closed with a diesel generator feeding the bus, while the 0 diesel generator is inoperable.

The provisions of technical specification 5.0.4 are not applicable.



## ELECTRICAL POWER SYSTEMS

### LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

INSERT 2B

diesel generators, separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours\*. Restore the diesel generator to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

electrical

- c. With one offsite circuit of the above-required A.C. sources and diesel generator 0 or 2A 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 within 1 hour and at least once per 8 hours thereafter. If the diesel generator became inoperable due to any cause other than preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generators, separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours\*. Restore at least one of the inoperable A.C. sources to OPERABLE status within 12 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. Restore at least two offsite circuits and diesel generators 0 and 2A to OPERABLE status within 72 hours from the time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

INSERT 2C

- d. With diesel generator 2B of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the offsite A.C. sources 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 became inoperable due to any cause other than preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generators, separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours\*. Restore diesel generator 2B to OPERABLE status within 72 hours or declare the HPCS system inoperable and take the ACTION required by specification 3.5.1.

INSERT 2D

- e. With both of the above required offsite circuits inoperable, demonstrate the OPERABILITY of the remaining A.C. sources, separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours unless the diesel generators are already operating. Restore at least one offsite circuit to OPERABLE status within 24 hours, or be in at least HOT SHUTDOWN within the next 12 hours. With only one offsite circuit restored to OPERABLE status, restore

\*This test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY. The provisions of Specification 3.0.2 are not applicable.



**Insert 2B**

**diesel generators, separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours\*, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated.**

**Insert 2C**

**If the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generators, separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours\*, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated.**

**Insert 2D**

**If the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generators, separately, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours\*, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated.**

## ELECTRICAL POWER SYSTEMS

### LIMITING CONDITIONS FOR OPERATION (Continued)

#### ACTION (Continued)

at least two offsite circuits to OPERABLE status within 72 hours from the time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

A successful test(s) of diesel generator OPERABILITY per Surveillance Requirement 4.8.1.1.2.a.4, performed under this ACTION statement for the OPERABLE diesel generators, satisfies the diesel generator test requirements of ACTION statement a.

- f. With diesel generators 0 and 2A 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 within 1 hour and at least once per 8 hours thereafter, and Surveillance Requirement 4.8.1.1.2.a.4 for the 2B and 1A diesel generators, separately, within 8 hours\*. Restore at least one of the inoperable diesel generators 0 or 2A to OPERABLE status within 2 hours, or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. Restore both diesel generators 0 and 2A to OPERABLE status within 72 hours, from the time of initial loss, or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- g. With diesel generator 1A 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 within 1 hour and at least once per 8 hours thereafter. If the 1A diesel generator became inoperable due to any cause other than preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the 2A diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4, within 24 hours\*. Restore the inoperable diesel generator 1A to OPERABLE status within 72 hours or declare standby gas treatment system subsystem A, Unit 1 drywell and suppression chamber hydrogen recombiner system, and control room and auxiliary electric equipment room emergency filtration system train A inoperable, and take the ACTION required by specifications 3.6.5.3, 3.6.6.1, and 3.7.2. Continued performance of Surveillance Requirement 4.8.1.1.1.a is not required provided the above systems are declared inoperable and the action of their respective specifications is taken.

INSERT  
2E

\*This test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY. The provisions of Specification 3.0.2 are not applicable.

**Insert 2E**

**If the 1A diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned maintenance or testing, demonstrate the OPERABILITY of the 2A diesel generator, by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours\*, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated.**

No changes to this page

ELECTRICAL POWER SYSTEMS

LIMITING CONDITIONS FOR OPERATION (Continued)

---

ACTION (Continued)

- h. With one offsite circuit of the above required A.C. electrical power sources and diesel generator 2B inoperable, apply the requirements of ACTION a and d specified above.
- i. With either diesel generators 0 or 2A inoperable and diesel generator 2B inoperable, apply the requirements of ACTION b and d specified above.
- j. With one offsite circuit of the above required A.C. electrical power sources and diesel generator 1A inoperable, apply the requirements of ACTION a and g specified above.
- k. With diesel generator 2B and diesel generator 1A inoperable, apply the requirements of ACTION d and g specified above.
- l. With diesel generator 0 and diesel generator 1A inoperable, apply the requirements of ACTION b and g specified above.

## 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 manually transferring 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:\*

- At least once per 31 days
- 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 day fuel tank.
    2. Verifying the fuel level in the fuel storage tank.
    3. Verifying the fuel transfer pump starts and transfers fuel from the storage system to the day fuel tank.
    4. Verifying the diesel starts from ambient condition and accelerates to 900 rpm  $\pm$  5%, -2% in less than or equal to 13 seconds.\*\* The generator voltage and frequency shall be  $4160 \pm 150$  volts and  $60 \pm 3.0$ , -1.2 Hz within 13 seconds\*\* after the start signal.
    5. Verifying the diesel generator is synchronized, and then loaded to 2400 kW to 2600 kW\*\*\* within 60 seconds.\*\* and operates with this load for at least 60 minutes.
- In accordance with the manufacturer's recommendations,

\*All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period, as recommended by the manufacturer.

\*\*Surveillance testing to verify the diesel generator start (13 second) and load (60 second) times from ambient conditions shall be performed at least once per 184 days. All other engine starts performed for the purpose of meeting these surveillance requirements may be conducted in accordance with warmup and loading procedures, as recommended by the manufacturer, in order to minimize mechanical stress and wear on the diesel generator caused by fast starting and loading of the diesel generator.

\*\*\*Transients, outside of this load band, do not invalidate the surveillance tests.



## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS

6. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.
7. Verifying the pressure in required diesel generator air start receivers to be greater than or equal to 200 psig.
- 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 day fuel tanks.
- c. By sampling and analyzing stored and new fuel oil in accordance with the following:
  1. At least once per 92 days, and for new fuel oil prior to addition to the storage tanks, that a sample obtained and tested in accordance with the applicable ASTM Standards has:
    - a) A water and sediment content within applicable ASTM limits.
    - b) A kinematic viscosity at 40°C within applicable ASTM limits.
  2. At least every 31 days, and for new fuel oil prior to addition to the storage tanks, that a sample obtained in accordance with the applicable ASTM Standard has a total particulate contamination of less than 10 mg/l when tested in accordance with the applicable ASTM Standard.
- d. At least once per 18 months during shutdown by:
  1. (Not Used) 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 diesel generator capability\* to reject a load of greater than or equal to 1190 kW for diesel generator 0, greater than or equal to 638 kW for diesel generators 1A and 2A, and greater than or equal to 2421 kW for diesel generator 2B while maintaining engine speed less than or equal to 75% of the difference between nominal speed and the overspeed trip setpoint or 15% above nominal, whichever is less.
  3. Verifying the diesel generator capability\* to reject a load of 2600 kW without tripping. The generator voltage shall not exceed 5000 volts during and following the load rejection.
  4. Simulating a loss of offsite power\* by itself, and:

\*All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period, as recommended by the manufacturer.

# No changes to this page

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- a) For Divisions 1 and 2 and for Unit 1 Division 2:
  - 1) Verifying de-energization of the emergency busses and load shedding from the emergency busses.
  - 2) Verifying the diesel generator starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 13 seconds, energizes the auto-connected loads and operates for greater than or equal to 5 minutes while its generator is so loaded. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at  $4160 \pm 150$  volts and  $60 \pm 1.2$  Hz during this test.
- b) For Division 3:
  - 1) Verifying de-energization of the emergency bus.
  - 2) Verifying the diesel generator starts on the auto-start signal, energizes the emergency bus with its loads within 13 seconds and operates for greater than or equal to 5 minutes while its generator is so loaded. After energization, the steady-state voltage and frequency of the emergency bus shall be maintained at  $4160 \pm 150$  volts and  $60 \pm 1.2$  Hz during this test.
5. Verifying that on an ECCS actuation test signal, without loss of offsite power, diesel generators 0, 2A, and 2B start on the auto-start signal and operate on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be  $4160 \pm 416$ ,  $-150$  volts and  $60 \pm 3.0$ ,  $-1.2$  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.
6. Simulating a loss of offsite power in conjunction with an ECCS actuation test signal,\* and:
  - a) For Divisions 1 and 2:
    - 1) Verifying de-energization of the emergency busses and load shedding from the emergency busses.

\*All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period, as recommended by the manufacturer.



No change to this page

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 2) Verifying the diesel generator starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 13 seconds, energizes the auto-connected emergency 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  $4160 \pm 416$  volts and  $60 \pm 1.2$  Hz during this test.
- b) For Division 3:
  - 1) Verifying de-energization of the emergency bus.
  - 2) Verifying the diesel generator starts on the auto-start signal, energizes the emergency bus with its loads within 13 seconds 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 bus shall be maintained at  $4160 \pm 416$  volts and  $60 \pm 1.2$  Hz during this test.
7. Verifying that all diesel generator 0, 2A, and 2B automatic trips except the following are automatically bypassed on an ECCS actuation signal:
  - a) For Divisions 1 and 2 - engine overspeed, generator differential current, and emergency manual stop.
  - b) For Division 3 - engine overspeed, generator differential current, and emergency manual stop.
8. 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 2860 kW and during the remaining 22 hours of this test, the diesel generator shall be loaded to 2400 kW to 2600 kW.\*\*\* The generator voltage and frequency shall be  $4160 \pm 420$ ,  $-150$  volts and  $60 \pm 3.0$ ,  $-1.2$  Hz within 13 seconds after the start signal; the steady-state

\*All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period, as recommended by the manufacturer.

\*\*\*Transients, outside of this load band, do not invalidate the surveillance tests.

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

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 (4.8.1.1.2.d.4.a).2) and b).2). \*\*

4.8.1.1.2.a.4

9. Verifying\* that the auto-connected loads to each diesel generator do not exceed the 2000-hour rating of 2860 kW.
10. 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.
11. Verifying that with diesel generator 0, 2A, and 2B operating\* in a test mode and connected to its bus:
  - a) For Divisions 1 and 2, that a simulated ECCS actuation signal overrides the test mode by returning the diesel generator to standby operation.
  - b) For Division 3, that a simulated trip of the diesel generator overcurrent relay trips the SAT feed breaker to bus 243 and that the diesel generator continues to supply normal bus loads.
12. Verifying that the automatic load sequence timer is OPERABLE with the interval between each load block within  $\pm 10\%$  of its design interval for diesel generators 0 and 2A.
13. Verifying that the following diesel generator lockout features prevent diesel generator operation only when required:

\*All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelude period, as recommended by the manufacturer.

4.8.1.1.2.a.4 is

\*\*If Surveillance Requirement (4.8.1.1.2.d.4.a)2) and/or b)2) are not satisfactorily completed, it is not necessary to repeat the preceding 24 hour test. Instead, the diesel generator may be operated at 2600 kW for 1 hour or until operating temperature has stabilized.

2 hours

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- a) Generator underfrequency.
  - b) Low lube oil pressure.
  - c) High jacket cooling temperature.
  - d) Generator reverse power.
  - e) Generator overcurrent.
  - f) Generator loss of field.
  - g) Engine cranking lockout.
- e. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting diesel generators 0, 2A, and 2B simultaneously\*, during shutdown, and verifying that all three diesel generators accelerate to 900 rpm  $\pm$  5, -2% in less than or equal to 13 seconds.
- f. 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 or equivalent 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 in accordance with ASME Code Section II, Article IWD-5000.

4.8.1.1.3 Reports - All diesel generator failures, valid or non-valid, shall be reported to the Commission pursuant to Specification 6.6.C 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.

(Not Used)

\*All planned diesel generator starts performed for the purpose of meeting these surveillance requirements may be preceded by an engine prelube period, as recommended by the manufacturer.

# DELETE THIS PAGE

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

TABLE 4.8.1.1.2-1

#### DIESEL GENERATOR TEST SCHEDULE

| NUMBER OF FAILURES IN<br>LAST 20 VALID TESTS* | NUMBER OF FAILURES IN<br>LAST 100 VALID TESTS* | TEST FREQUENCY               |
|---|--|------------------------------|
| $\leq 1$                                      | $\leq 4$                                       | At least once per<br>31 days |
| $\geq 2$ **                                   | $\geq 5$                                       | At least once per<br>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, but determined on a per diesel generator basis. With the exception of the semi-annual fast start, no starting time requirements are required to meet the valid test requirements of Regulatory Guide 1.108.

For the purposes of determining the required test frequency, the previous test failure count may be reduced to zero if:

- 1) a complete diesel overhaul to like-new condition is completed (provided that the overhaul, including appropriate post-maintenance operation and testing, is specifically approved by the manufacturer), and
- 2) if acceptable reliability has been demonstrated. The reliability criterion shall include the successful completion of 14 consecutive tests in a single series structured as follows:
  - a. ten of these tests shall be performed in accordance with the routine Surveillance requirements 4.8.1.1.2.a.4 and 4.8.1.1.2.a.5, and
  - b. four tests shall be performed in accordance with the 184-day testing requirement of Surveillance Requirements 4.8.1.1.2.a.4 and 4.8.1.1.2.a.5.

If this criterion is not satisfied during the first series of tests, any alternate criterion to be used to reset the failure count to zero requires NRC approval.

\*\* The associated test frequency shall be maintained until 7 consecutive failure free demands have been performed AND the number of failures in the last 20 valid demands has been reduced to one.



No change to this page

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. Diesel generator 0 or 2A, and diesel generator 2B when the HPCS system is required to be OPERABLE, and diesel generator 1A when the offsite power source for standby gas treatment system subsystem A or control room and auxiliary electric equipment room emergency filtration system train A is inoperable and either or both systems are required to be OPERABLE, with each diesel generator having:
  1. For diesel generator 0, 1A, and 2A:
    - a) A separate day fuel tank containing a minimum of 250 gallons of fuel.
    - b) A separate fuel storage system containing a minimum of 31,000 gallons of fuel.
  2. For diesel generator 2B, a separate fuel storage tank/day tank containing a minimum of 29,750 gallons of fuel.
  3. A fuel transfer pump.

APPLICABILITY: OPERATIONAL CONDITIONS 4, 5, and \*.

ACTION:

- a. With all offsite circuits inoperable and/or with diesel generators 0 or 2A inoperable, suspend CORE ALTERATIONS, handling of irradiated fuel in the secondary containment and operations with a potential for draining the reactor vessel.
- b. With diesel generator 2B inoperable, restore the inoperable diesel generator 2B to OPERABLE status within 72 hours or declare the HPCS system inoperable and take the ACTION required by Specifications 3.5.2 and 3.5.3.
- c. With diesel generator 1A inoperable, declare standby gas treatment system subsystem A and control room and auxiliary electric equipment room emergency filtration system train A inoperable and take the ACTION required by Specifications 3.6.5.3 and 3.7.2.
- d. The provisions of Specification 3.0.3 are not applicable.

\*When handling irradiated fuel in the secondary containment.



No change to this page

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS

---

4.8.1.2 At least the above required A.C. electrical power sources shall be demonstrated OPERABLE per Surveillance Requirements 4.8.1.1.1; 4.8.1.1.2, and 4.8.1.1.3, except for the requirement of 4.8.1.1.2.a.5.

BASES3/4.8.1 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 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. ACTION statements have been included in the specification to cover all situations where either one A.C. source or a combination of two A.C. sources are inoperable. ACTION statements c, e, and f are intended to be followed to completion once entered and should not be exited until both A.C. sources are restored. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least Division I or II 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 one of the two onsite A.C. sources. Division III supplies the high pressure core spray (HPCS) system only.

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.

INSERT  
2F

The surveillance requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guide 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, with the exception noted in Appendix B to the FSAR, 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.

The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion/operation. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. The tests, limits, and applicable American Society for Testing Materials (ASTM) standards are as follows:

- a. Sample the new fuel oil in accordance with ASTM-D4057-88;
- b. Verify in accordance with the tests specified in ASTM-D975-88 that the sample has a water and sediment content of less than or equal to 0.05 volume percent and a kinematic viscosity at 40 °C of greater than or equal to 1.9 but less than or equal to 4.1.

**Insert 2F**

**The surveillance requirements for demonstrating the OPERABILITY of the diesel generators are based on the recommendations of Regulatory Guide 1.9, Revision 3, "Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants", July 1993, with the exception noted in Appendix B to the UFSAR.**

## ATTACHMENT B-2

### PROPOSED CHANGES TO APPENDIX A, TECHNICAL SPECIFICATIONS, OF FACILITY OPERATING LICENSES NPF-37 AND NPF-66, BYRON STATION UNITS 1 & 2

Revision to: XI  
3/4 8-1  
3/4 8-2  
3/4 8-3  
3/4 8-4  
3/4 8-5\*  
3/4 8-6  
3/4 8-7  
3/4 8-8  
B 3/4 8-1

\* This page is provided for information only; there are no changes.

## LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

| <u>SECTION</u>   | <u>PAGE</u> |
|--|-------------|
| 3/4.7.12 AREA TEMPERATURE MONITORING.....  | 3/4 7-30    |
| TABLE 3.7-6 AREA TEMPERATURE MONITORING.....                                     | 3/4 7-31    |
| <br><u>3/4.8 ELECTRICAL POWER SYSTEMS</u>  |             |
| •  |             |
| 3/4.8.1 A.C. SOURCES   |             |
| Operating.....   | 3/4 8-1     |
| TABLE 4.8-1 <del>DIESEL GENERATOR TEST SCHEDULE</del> (THIS TABLE 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    |
| TABLE 3.8-1a CONTAINMENT PENETRATION CONDUCTOR                                   |             |
| OVERCURRENT PROTECTIVE DEVICES (UNIT 1).....                                     | 3/4 8-19    |
| TABLE 3.8-1b CONTAINMENT PENETRATION CONDUCTOR                                   |             |
| OVERCURRENT PROTECTIVE DEVICE (UNIT 2).....                                      | 3/4 8-29    |



### 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. Each Class 1E 4160 volt bus capable of being powered from:
  - 1) Either transformer of a given units normal System Auxiliary Transformer bank, and
  - 2) Either transformer of the other units System Auxiliary Transformers bank, with

Each units System Auxiliary Transformer bank energized from an independent transmission circuit.

- b. Two separate and independent diesel generators, each with:
  - 1) A separate day tank containing a minimum volume of 450 gallons of fuel,
  - 2) A separate Fuel Oil Storage System containing a minimum volume of 44,000 gallons of fuel, and
  - 3) A separate fuel transfer pump.

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 Specification 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter; ~~and Specification 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.~~

Insert A

- 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 Specifications 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter, ~~and Specification 4.8.1.1.2.a.4 within 8 hours; 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.~~

Insert A

#### Insert A-1

If the inoperable component is the diesel generator and the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated.

#### Insert A-2

If the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated.

## ELECTRICAL POWER SYSTEMS

### LIMITING CONDITION FOR OPERATION

#### ACTION (Continued)

- c. With one diesel generator inoperable in addition to ACTION a. or b. above, verify that:
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 in MODE 1, 2, or 3, the diesel-driven auxiliary feedwater pump is OPERABLE and the other Unit's A Diesel Generator is OPERABLE. <sup>(\*)</sup> If the inoperable diesel generator is the emergency power supply for the motor-driven auxiliary feedwater pump.

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.

- d. With two of the above required offsite A.C. circuits inoperable; ~~demonstrate the OPERABILITY of two diesel generators by performing Specification 4.8.1.1.2a.4) within 8 hours, 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.
- e. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Specification 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.

~~\*Until 2 years after issuance of an operating license for Unit 1 the Unit 2, A diesel generator must be capable of providing power to bus 141, and the LCO, ACTION and SURVEILLANCE requirements of Specifications 3/4.8.1.3 shall be applicable. Subsequently, LCO 3.8.1.1.b.1), 2), and 3), and Surveillance Requirements 4.8.1.1.2 shall be applicable to the Unit 2, A diesel as applicable for demonstrating that the Unit 2, A diesel is OPERABLE as an emergency power supply for the Unit 1 motor-driven auxiliary feedwater pump.~~

## 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 manually unit power supply from the normal circuit to the alternate circuit.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

- At least once per 31 days*  
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 day tank,
- 2) Verifying the fuel level in the fuel storage tank,
- 3) Verifying the fuel transfer pump starts and transfers fuel from the storage system to the day tank,
- 4) Verifying the diesel starts from ambient condition and accelerates to at least 600 rpm in less than or equal to 10 seconds.\* The generator voltage and frequency shall be  $4160 \pm 420$  volts and  $60 \pm 1.2$  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, or
  - b) Simulated loss of ESF bus voltage by itself, or
  - c) Simulated loss of ESF bus voltage in conjunction with an ESF actuation test signal, or
  - d) An ESF actuation test signal by itself.
- 5) *accordance with the manufacturer's recommendations* Verifying the generator is synchronized, loaded to greater than or equal to 5500 kW in ~~less than or equal to 60 seconds\*~~, operates with a load greater than or equal to 5500 kW for at least 60 minutes, and
- 6) Verifying the diesel generator is aligned to provide standby power to the associated ESF 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 day tanks;

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



## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- c. At least once per 31 days by checking for and removing accumulated water from the fuel oil storage tanks;
- d. By sampling new fuel oil in accordance with ASTM-D4057 prior to addition to storage tanks and:
  - 1) By verifying in accordance with the tests specified in ASTM-D975-81 prior to addition to the storage tanks that the sample has:
    - a) An API Gravity of within 0.3 degrees at 60°F, or a specific gravity of within 0.0016 at 60°F, when compared to the supplier's certificate, or an absolute specific gravity at 60°F of greater than or equal to 0.83 but less than or equal to 0.89, or an API gravity of greater than or equal to 27 degrees but less than or equal to 39 degrees;
    - b) A kinematic viscosity at 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes, if the gravity was not determined by comparison with the supplier's certification;
    - c) A flash point equal to or greater than 125°F; and
    - d) A clear and bright appearance with proper color when tested in accordance with ASTM-D4176-82.
  - 2) By verifying within 30 days of obtaining the sample that the other properties specified in Table 1 of ASTM-D975-81 are met when tested in accordance with ASTM-D975-81 except that the analysis for sulfur may be performed in accordance with ASTM-D1552-79 or ASTM-D2622-82.
- e. At least once every 31 days by obtaining a sample of fuel oil from the storage tank, in accordance with ASTM-D2276-78, and verifying that total particulate contamination is less than 10 mg/liter when checked in accordance with ASTM-D2276-78, Method A.
- f. At least once per 18 months, <sup>80</sup> during shutdown, by:
  - (Not used)
  - 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 1034 kW while maintaining voltage at  $4160 \pm 420$  volts and frequency at  $60 \pm 4.5$  Hz, (transient state),  $60 \pm 1.2$  Hz (steady state).

~~\*The specified 18 month interval may be extended to 31 months for Cycle 1 only.~~



## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- 3) Verifying the diesel generator capability to reject a load of 5500 kW without tripping. The generator voltage shall not exceed 4784 volts during and following the load rejection,
- 4) Simulating a loss of ESF bus voltage by itself, and:
  - a) Verifying de-energization of the ESF busses and load shedding from the ESF busses, and
  - b) Verifying the diesel starts on the auto-start signal, energizes the ESF busses with permanently connected loads within 10 seconds, energizes the auto-connected safe shutdown loads through the load sequencing timer 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 ESF busses shall be maintained at  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz during this test.
- 5) Verifying that on an ESF Actuation test signal without loss of ESF bus voltages, 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  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz within 10 seconds after the auto-start signal; the generator steady state generator voltage and frequency shall be maintained within these limits during this test;
- 6) Simulating a loss of ESF bus voltage in conjunction with an ESF Actuation test signal, and
  - a) Verifying deenergization of the ESF busses and load shedding from the ESF busses;
  - b) Verifying the diesel starts on the auto-start signal, energizes the ESF busses with permanently connected loads within 10 seconds, energizes the auto-connected emergency (accident) loads through the LOCA sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with emergency loads. After energization, the steady-state voltage and frequency of the ESF busses shall be maintained at  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz during this test; and
  - 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 loading shall be equivalent to the 2-hour rating of 6050 kW\* and during the remaining 22 hours of this test, the diesel generator shall be loaded to greater than or equal to 5500 kW. The generator voltage and frequency shall be  $4160 \pm 420$  volts and  $60 \pm 1.2$  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 Specification 4.8.1.1.2f.6b);\*\*
- 4.8.1.1.2.a.4
- 8) Verifying that the auto-connected loads to each diesel generator do not exceed the 2000-hour rating of 5935 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 energizing the emergency loads with offsite power;
- 11) Verifying that the fuel transfer pump transfers fuel from each fuel storage tank to the day tank of each diesel via the installed cross-connection lines;
- 12) Verifying that the automatic LOCA and Shutdown sequence timer is OPERABLE with the interval between each load block within  $\pm 10\%$  of its design interval; and

4.8.1.1.2.a.4

\*Instantaneous loads of 6050 kW (+0, -150) are acceptable as equivalent to the 2-hour rating provided voltage and frequency requirements and cooling system functioning requirements are verified to be within design limits at 6050 kW.

\*\*If Specification 4.8.1.1.2f.6b) is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead, the diesel generator may be operated at 5500 kW for 1 hour or until operating temperature has stabilized.

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- 13) Verifying that the following diesel generator lockout features prevent diesel generator starting only when required:
- Turning gear engaged, and
  - Emergency stop.
- g. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting both diesel generators simultaneously, during shutdown, and verifying that both diesel generators accelerate to at least 600 rpm in less than or equal to 10 seconds;
- h. At least once per 10 years by:
- Draining each fuel oil storage tank, removing the accumulated sediment and cleaning the tank using a sodium hypochlorite solution, and
  - 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 percent of the system design pressure.
- i. <sup>gr</sup>At least once per 31 days by:
- #1) Verifying the capability of crosstieing the Unit 2 <sup>gr</sup>A diesel generator to Bus 141 by independently performing the following:
    - Synchronizing the Unit 2, A diesel generator to Bus 241.
    - Closing breaker 1414, and
    - Closing breaker 2414.
  - #2) Verifying the capability of crosstieing the Unit 1 A diesel generator to Bus 241 by independently performing the following:
    - Synchronizing the Unit 1, A diesel generator to Bus 141,
    - Closing breaker 1414, and
    - Closing breaker 2414.
- j. <sup>gr</sup>At least once per 18 months by:
- #1) Crosstieing the 2A diesel generator to Bus 141.
  - #2) Crosstieing the 1A diesel generator to Bus 241.
- 4.8.1.1.3 ~~Reports - All diesel generator failures, valid or non-valid, shall be reported to the Commission pursuant to Specification 6.9.2. 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. (Not Used)~~
- ~~\*This surveillance only applies to MODES 1, 2, and 3 and is not applicable until 2 years after issuance of an operating license for Unit 1.~~
- ~~#Only required for Unit 1 operation in MODES 1, 2, or 3.~~
- ~~##Only required for Unit 2 operation in MODES 1, 2, or 3.~~

Table 4.8-1

~~DIESEL GENERATOR TEST SCHEDULE~~

~~NUMBER OF FAILURES IN  
LAST 20 VALID TESTS\*~~

~~TEST FREQUENCY~~

~~≤1~~

~~At least once per 31 days~~

~~≥2~~

~~At least once per 7 days\*\*~~

(THIS TABLE NOT USED)

~~\*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. For the purposes of this test schedule, only valid tests conducted after the completion of the preoperational test requirements of Regulatory Guide 1.108, Rev 1, Aug 1977, shall be included in the computation of the "last 20 valid tests."~~

~~\*\*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 one or less.~~



### 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

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 safety analysis 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 diesel-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, 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.

The station chose its largest emergency load to be the SX pump. The maximum BHP of the SX pump is 1247 per SAR Table 8.3-1. A BHP of 1247 corresponds to a load of 1034 kW.



## Insert B

The surveillance requirements for demonstrating the OPERABILITY of the diesel generators are based on the recommendations in Revision 3 of Regulatory Guide 1.9, "Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants," with the exceptions noted in Appendix A to the UFSAR, and in Revision 1 of Regulatory Guide 1.137, "Fuel-Oil Systems for Standby Diesel Generators."

## ATTACHMENT B-3

### PROPOSED CHANGES TO APPENDIX A, TECHNICAL SPECIFICATIONS, OF FACILITY OPERATING LICENSES NPF-72 AND NPF-77, BRAIDWOOD STATION UNITS 1 & 2

Revision to: XI  
3/4 8-1  
3/4 8-2  
3/4 8-3  
3/4 8-4  
3/4 8-5\*  
3/4 8-6  
3/4 8-7  
3/4 8-8  
B 3/4 8-1

\* This page is provided for information only; there are no changes.

## LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

| <u>SECTION</u>   | <u>PAGE</u> |
|--|-------------|
| 3/4.7.10 (This specification number is not used.).....   | 3/4 7-28    |
| TABLE 3.7-5 (This table number is not used.).....  | 3/4 7-29    |
| 3/4.7.11 (This specification number is not used.).....   | 3/4 7-30    |
| 3/4.7.12 AREA TEMPERATURE MONITORING.....  | 3/4 7-31    |
| TABLE 3.7-6 AREA TEMPERATURE MONITORING.....   | 3/4 7-32    |
| <br><u>3/4.8 ELECTRICAL POWER SYSTEMS</u>  |             |
| 3/4.8.1 A.C. SOURCES   |             |
| Operating.....   | 3/4 8-1     |
| TABLE 4.8-1 <del>DIESEL GENERATOR TEST SCHEDULE</del> ..... <i>(This table not used)</i>       | 3/4 8-8     |
| Shutdown.....  | 3/4 8-9     |
| Operating.....   | 3/4 8-9a    |
| 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<br>Protective Devices.....                       | 3/4 8-17    |
| TABLE 3.8-1a CONTAINMENT PENETRATION CONDUCTOR<br>OVERCURRENT PROTECTIVE DEVICES (UNIT 1)..... | 3/4 8-19    |
| TABLE 3.8-1b CONTAINMENT PENETRATION CONDUCTOR<br>OVERCURRENT PROTECTIVE DEVICES (UNIT 2)..... | 3/4 8-29    |
| Motor-Operated Valves Thermal Overload Protection<br>Devices.....                              | 3/4 8-39    |

### 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. Each Class 1E 4160 volt bus capable of being powered from:
  - 1) Either transformer of a given units normal System Auxiliary Transformer bank, and
  - 2) Either transformer of the other units System Auxiliary Transformers bank, with

Each units System Auxiliary Transformer bank energized from an independent transmission circuit.

- b. Two separate and independent diesel generators, each with:
  - 1) A separate day tank containing a minimum volume of 450 gallons of fuel,
  - 2) A separate Fuel Oil Storage System containing a minimum volume of 44,000 gallons of fuel, and
  - 3) A separate fuel transfer pump.

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 Specification 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter; ~~and Specification 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.

Insert A-1 →

- 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 Specifications 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter, ~~and Specification 4.8.1.1.2.a.4 within 8 hours.~~ 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.

Insert A-2 →

#### Insert A-1

If the inoperable component is the diesel generator and the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated.

#### Insert A-2

If the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated.



## ELECTRICAL POWER SYSTEMS

### LIMITING CONDITION FOR OPERATION

#### ACTION (Continued)

- c. With one diesel generator inoperable in addition to ACTION a. or b. above, verify that:
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 in MODE 1, 2, or 3, the diesel-driven auxiliary feedwater pump is OPERABLE and the other Unit's A Diesel Generator is OPERABLE, if the inoperable diesel generator is the emergency power supply for the motor-driven auxiliary feedwater pump.

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.

- d. With two of the above required offsite A.C. circuits inoperable; ~~demonstrate the OPERABILITY of two diesel generators by performing Specification 4.8.1.1.2a.4) within 8 hours, 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.
- e. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Specification 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.

## 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 manually unit power supply from the normal circuit to the alternate circuit.

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~~ <sup>At least once per 31 days</sup> STAGGERED TEST BASIS by:
  - 1) Verifying the fuel level in the day tank,
  - 2) Verifying the fuel level in the fuel storage tank,
  - 3) Verifying the fuel transfer pump starts and transfers fuel from the storage system to the day tank,
  - 4) Verifying the diesel starts from ambient condition and accelerates to at least 600 rpm in less than or equal to 10 seconds.\* The generator voltage and frequency shall be  $4160 \pm 420$  volts and  $60 \pm 1.2$  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, or
    - b) Simulated loss of ESF bus voltage by itself, or
    - c) Simulated loss of ESF bus voltage in conjunction with an ESF actuation test signal, or
    - d) An ESF actuation test signal by itself.
  - 5) <sup>accordance with the manufacturer's recommendations\*</sup> Verifying the generator is synchronized, loaded to greater than or equal to 5500 kW in ~~less than or equal to 60 seconds\*~~, operates with a load greater than or equal to 5500 kW for at least 60 minutes, and
  - 6) Verifying the diesel generator is aligned to provide standby power to the associated ESF 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 day tanks;

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

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- c. At least once per 31 days by checking for and removing accumulated water from the fuel oil storage tanks;
- d. By sampling new fuel oil in accordance with ASTM-D4057 prior to addition to storage tanks and:
  - 1) By verifying in accordance with the tests specified in ASTM-D975-81 prior to addition to the storage tanks that the sample has:
    - a) An API Gravity of within 0.3 degrees at 60°F, or a specific gravity of within 0.0016 at 60°F, when compared to the supplier's certificate, or an absolute specific gravity at 60°F of greater than or equal to 0.83 but less than or equal to 0.89, or an API gravity of greater than or equal to 27 degrees but less than or equal to 39 degrees;
    - b) A kinematic viscosity at 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes, if the gravity was not determined by comparison with the supplier's certification;
    - c) A flash point equal to or greater than 125°F; and
    - d) A clear and bright appearance with proper color when tested in accordance with ASTM-D4176-82.
  - 2) By verifying within 30 days of obtaining the sample that the other properties specified in Table 1 of ASTM-D975-81 are met when tested in accordance with ASTM-D975-81 except that the analysis for sulfur may be performed in accordance with ASTM-D1552-79 or ASTM-D2622-82.
- e. At least once every 31 days by obtaining a sample of fuel oil from the storage tank, in accordance with ASTM-D2276-78, and verifying that total particulate contamination is less than 10 mg/liter when checked in accordance with ASTM-D2276-78, Method A.
- f. At least once per 18 months, <sup>(Not used)</sup> 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, delete
  - 2) Verifying the generator capability to reject a load of greater than or equal to 1034 kW while maintaining voltage at  $4160 \pm 420$  volts and frequency at  $60 \pm 4.5$  Hz, (transient state),  $60 \pm 1.2$  Hz (steady state).

~~\*The specified 18 month interval may be extended to 38 months for Cycle 1 only.~~

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

---

- 3) Verifying the diesel generator capability to reject a load of 5500 kW without tripping. The generator voltage shall not exceed 4784 volts during and following the load rejection,
- 4) Simulating a loss of ESF bus voltage by itself, and:
  - a) Verifying de-energization of the ESF busses and load shedding from the ESF busses, and
  - b) Verifying the diesel starts on the auto-start signal, energizes the ESF busses with permanently connected loads within 10 seconds, energizes the auto-connected safe shutdown loads through the load sequencing timer 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 ESF busses shall be maintained at  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz during this test.
- 5) Verifying that on an ESF Actuation test signal without loss of ESF bus voltages, 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  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz within 10 seconds after the auto-start signal; the generator steady state generator voltage and frequency shall be maintained within these limits during this test;
- 6) Simulating a loss of ESF bus voltage in conjunction with an ESF Actuation test signal, and
  - a) Verifying deenergization of the ESF busses and load shedding from the ESF busses;
  - b) Verifying the diesel starts on the auto-start signal, energizes the ESF busses with permanently connected loads within 10 seconds, energizes the auto-connected emergency (accident) loads through the LOCA sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with emergency loads. After energization, the steady-state voltage and frequency of the ESF busses shall be maintained at  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz during this test; and
  - 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)

4.8.1.1.2.a.4

- 7) Verifying the diesel generator operates for at least 24 hours. During the first 2 hours of this test, the diesel generator loading shall be equivalent to the 2-hour rating of 6050 kW\* and during the remaining 22 hours of this test, the diesel generator shall be loaded to greater than or equal to 5500 kW. The generator voltage and frequency shall be  $4160 \pm 420$  volts and  $60 \pm 1.2$  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 Specification 4.8.1.1.2f.6)b);\*\*
- 8) Verifying that the auto-connected loads to each diesel generator do not exceed the 2000-hour rating of 5935 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 energizing the emergency loads with offsite power;
- 11) Verifying that the fuel transfer pump transfers fuel from each fuel storage tank to the day tank of each diesel via the installed cross-connection lines;
- 12) Verifying that the automatic LOCA and Shutdown sequence timer is OPERABLE with the interval between each load block within  $\pm 10\%$  of its design interval; and

\*Instantaneous loads of 6050 kW (+0, -150) are acceptable as equivalent to the 2-hour rating provided voltage and frequency requirements and cooling system functioning requirements are verified to be within design limits at 6050 kW.

4.8.1.1.2.a.4

\*\*If Specification 4.8.1.1.2f.6)b) is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead, the diesel generator may be operated at 5500 kW for  $\frac{1}{2}$  hours or until operating temperature has stabilized.

*Amendment No.*



## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- 13) Verifying that the following diesel generator lockout features prevent diesel generator starting only when required:
- a) Turning gear engaged, and
  - b) Emergency stop.
- g. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting both diesel generators simultaneously, during shutdown, and verifying that both diesel generators accelerate to at least 600 rpm in less than or equal to 10 seconds;
- h. 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 percent of the system design pressure.
- i. At least once per 31 days by:
- #1) Verifying the capability of crosstieing the Unit 2, A diesel generator to Bus 141 by independently performing the following:
    - a) Synchronizing the Unit 2, A diesel generator to Bus 241.
    - b) Closing breaker 1414, and.
    - c) Closing breaker 2414.
  - ##2) Verifying the capability of crosstieing the Unit 1 A diesel generator to Bus 241 by independently performing the following:
    - a) Synchronizing the Unit 1, A diesel generator to Bus 141,
    - b) Closing breaker 1414, and
    - c) Closing breaker 2414.
- j. At least once per 18 months by:
- #1) Crosstieing the 2A diesel generator to Bus 141.
  - ##2) Crosstieing the 1A diesel generator to Bus 241.

4.8.1.1.3 ~~Reports - All diesel generator failures, valid or non-valid, shall be reported to the Commission pursuant to Specification 6.9.2. 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.~~ (Not Used)

#Only required for Unit 1 operation in MODES 1, 2, or 3.

##Only required for Unit 2 operation in MODES 1, 2, or 3.

Table 4.8-1

DIESEL GENERATOR TEST SCHEDULE

| <u>NUMBER OF FAILURES IN<br/>LAST 20 VALID TESTS*</u> | <u>TEST FREQUENCY</u>             |
|---|-----------------------------------|
| <u>≤1</u>   | <u>At least once per 31 days</u>  |
| <u>≥2</u>   | <u>At least once per 7 days**</u> |

( This Table Not Used )

~~\*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. For the purposes of this test schedule, only valid tests conducted after the completion of the preoperational test requirements of Regulatory Guide 1.108, Rev 1, Aug 1977, shall be included in the computation of the "last 20 valid tests."~~

~~\*\*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 one or less.~~

### 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

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 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 diesel-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.

Insert B

~~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, 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.~~

The station chose its largest emergency load to be the SX pump. The maximum BHP of the SX pump is 1247 per UFSAR Table 8.3-1. A BHP of 1247 corresponds to a load of 1034 kW.

BRAIDWOOD - UNITS 1 & 2

B 3/4 8-1

Amendment No.

## Insert B

The surveillance requirements for demonstrating the OPERABILITY of the diesel generators are based on the recommendations in Revision 3 of Regulatory Guide 1.9, "Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants," with the exceptions noted in Appendix A to the UFSAR, and in Revision 1 of Regulatory Guide 1.137, "Fuel-Oil Systems for Standby Diesel Generators."

## ATTACHMENT C

### EVALUATION OF SIGNIFICANT HAZARDS CONSIDERATION

Commonwealth Edison (ComEd) proposes to revise Technical Specifications Section 3/4.8, Electrical Power Systems and the associated Bases for LaSalle County, Byron, and Braidwood Stations. The proposed changes revise surveillance and administrative requirements associated with emergency diesel generators (EDGs) in accordance with the guidance of NRC Generic Letter 94-01, "Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators," Generic Letter 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation," and Regulatory Guide 1.9, "Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants." The proposed changes include:

1. Eliminating increased testing requirements for EDGs,
2. Eliminating special reporting requirements for EDGs,
3. Eliminating the semi-annual fast load test and replacing it with a requirement to load EDG semi-annually in accordance with the vendor recommendations for all test purposes other than the refueling outage Loss of Offsite Power (LOOP) tests,
4. De-coupling the 24-hour endurance run and the LOOP/LOCA (LOOP only for LaSalle) sequencing requirements for the hot start test,
5. Removing Regulatory Guide 1.108 references to testing requirements,
6. Eliminating testing requirements when an EDG becomes inoperable due to an inoperable support system, an independently testable component, or preplanned maintenance or testing, or if there is not a potential common mode failure for the remaining diesel generator,
7. Deleting the requirement for inspecting the EDGs in accordance with procedures prepared in conjunction with its manufacturer's recommendations, and
8. Making editorial changes.

ComEd has evaluated the proposed Technical Specification Amendment. Based upon the criteria for defining a Significant Hazards Consideration established in 10 CFR 50.92(c), operation of LaSalle County, Byron, and Braidwood Stations in accordance with the proposed amendment will not:



**1) Involve a significant increase in the probability or consequences of an accident previously evaluated:**

The proposed changes do not affect accident initiators or precursors and do not alter the design assumptions affecting the ability of the EDGs to mitigate the consequences of an accident.

Deleting the special reporting requirements from the Technical Specifications is administrative. ComEd will continue to notify the Commission of significant EDG failures in accordance with 10 CFR 50.72 and 50.73 criteria.

Excessive testing requirements have proven to be a contributor to increased equipment degradation. Removing inappropriate and redundant requirements increases EDG reliability and enhances the ability of EDGs to mitigate the consequences of an accident. Implementing ComEd's alternative to the maintenance rule for the EDGs provides additional assurance that high EDG performance will be maintained.

EDG equipment degradation will be reduced by eliminating the semi-annual fast load test for EDGs in accordance with the vendor recommendations for test purposes other than the refueling outage Loss of Offsite Power (LOOP) tests. This improves EDG reliability and availability and further enhances their ability to mitigate the consequences of an accident. The LOOP test would still be performed to provide assurance that the EDG is capable of responding to a LOOP as assumed in the accident analyses.

De-coupling the 24 hour endurance test and the LOOP/LOCA (for LaSalle, LOOP) sequencing test requirements for the hot start test has no effect on accident mitigation. Demonstrating diesel generator hot restart capability without loading the engine does not invalidate or reduce the effectiveness of the hot restart test. The hot restart test can be conducted in any plant condition since its performance at power will have no adverse effect on plant operations.

The proposed editorial changes are administrative in nature. They improve readability and provide consistency with current industry guidance.

Therefore, the proposed changes do not involve an increase in the probability or consequences of an accident previously evaluated.

**2) Create the possibility of a new or different kind of accident from any accident previously evaluated:**

The proposed changes do not alter the ability of the EDGs to perform their intended function to mitigate the consequences of an initiating event within the acceptance limits assumed in plant safety analyses. The proposed changes have no impact on component or system interactions, or the plant design basis.

Instrumentation setpoints, starting, sequencing, and loading functions associated with EDGs are not affected by the proposed changes. Furthermore, combining the alternate EDG system maintenance rule implementation program with the proposed amendment will enhance both the availability and the performance of the EDGs.

Therefore, there is not a potential for creating the possibility of a new or different type of accident from any accident previously evaluated.

**3) Involve a significant reduction in a margin of safety:**

The proposed changes do not increase the probability or consequences of an accident, and there is no impact on equipment design or operation. The proposed changes do not affect the results of accident and transient analyses. Plant and system response to an initiating event will remain in compliance within the assumptions of safety analyses. There is no associated change to the type, amount, or control of radioactive effluents, nor is there an associated increase in individual or cumulative occupational radiation exposure. There is no effect upon the capabilities of the associated systems to perform their intended functions within the allowed response times assumed in safety analyses.

The proposed changes are compatible with plant operating experience and are consistent with the guidance provided in NUREG-1366, Generic Letters 93-05 and 94-01, and Regulatory Guide 1.9. In two instances ComEd's proposed changes deviate from these guidance documents. However, the changes are consistent with the intent of the documents or other NRC guidance documents. Eliminating excessive testing requirements can improve safety by reducing challenges to plant systems and reducing equipment wear and degradation. While the proposed changes affect surveillance intervals; there are no changes to the methods used to perform the surveillances.

EDG reliability and availability will be improved by the proposed changes. The surveillances will continue to demonstrate the ability of the EDGs to perform their intended function of providing electrical power to the emergency safety systems needed to mitigate design basis transients. No margin of safety is reduced.

Guidance has been provided in "Final Procedures and Standards on No Significant Hazards Considerations," Final Rule, 51 FR 7744, for the application of standards to license change requests for determination of the existence of significant hazards considerations. This document provides examples of amendments which are and are not considered likely to involve significant hazards considerations. These proposed amendments most closely fit the example of a change which may either result in some increase to the probability or consequences of a previously analyzed accident or may reduce in some way a safety margin, but where the results of the change are clearly

within all acceptance criteria with respect to the system or component specified in the standard review plan.

This proposed amendment does not involve a significant relaxation of the criteria used to establish safety limits, a significant relaxation of the bases for the limiting safety system settings, or a significant relaxation of the bases for the limiting conditions for operations. The proposed change does not reduce the margin of safety as defined in the basis for any Technical Specification.

Therefore, based on the guidance provided in the Federal Register and the criteria established in 10 CFR 50.92(c), ComEd has concluded that the proposed change does not constitute a significant hazards consideration.

## ATTACHMENT D

### ENVIRONMENTAL ASSESSMENT

Commonwealth Edison has evaluated the proposed amendment against the criteria for and identification of licensing and regulatory actions requiring environmental assessment in accordance with 10CFR51.21. It has been determined that the proposed change meets the criteria for a categorical exclusion as provided for under 10CFR51.22(c)(9). This determination is based on the fact that this change is being proposed as an amendment to a license issued pursuant to 10CFR50 that changes a surveillance requirement, and the amendment meets the following specific criteria:

- (i) the amendment involves no significant hazards considerations

As demonstrated in Attachment C, this proposed amendment does not involve any significant hazards considerations.

- (ii) there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite

As documented in Attachment A, there will be no change in the types or significant increase in the amounts of any effluents released offsite.

- (iii) there is no significant increase in individual or cumulative occupational radiation exposure

The proposed change will not result in changes in the operation or configuration of the facility. Core design will continue to meet all core design criteria, and reactor operation will not be impacted. There will be no change in the level of controls or methodology used for processing of radioactive effluents or handling of solid radioactive waste, nor will the proposal result in any change in the normal radiation levels within the plant. Therefore there will be no increase in individual or cumulative occupational radiation exposure resulting from this change.

**ATTACHMENT E**  
**CHANGE SUMMARY**

| <u>Technical Specification</u>               | <u>Change Description</u>   | <u>Described in item # Attachment A</u> |
|--|---|---|
| Table of Contents                            | Indicate that Table 4.8.1.1.2-1 (LaSalle) and Table 4.8-1 (Byron and Braidwood) are deleted.  | 4                                       |
| Table of Contents                            | Add reference to a table that was added in Amendment 10 and show that the page applies to Byron Units 1 and 2. (Byron only)   | 4                                       |
| 3.8.1.1<br>Action a<br>(LaSalle)             | Delete the requirement to demonstrate the operability of the remaining diesel generators that have not been successfully tested within the previous 24 hours by performing the hot start test surveillance within 24 hours.   | 2a                                      |
| 3.8.1.1<br>Action a<br>(Byron and Braidwood) | Delete requirement to demonstrate the operability of the EDGs by performing surveillance requirement 4.8.1.1.2.a.4 within 24 hours if only an offsite circuit becomes inoperable. Eliminate testing requirements if a single EDG becomes inoperable due to an inoperable support system, an independently testable component, or preplanned maintenance or testing. Perform surveillance requirement 4.8.1.1.2.a.4 if the EDG became inoperable due to any cause other than those previously listed, unless the absence of any potential common mode failure for the remaining EDG is demonstrated. | 2b                                      |



| <u>Technical Specification</u>  | <u>Change Description</u>   | <u>Described in item # Attachment A</u> |
|---|---|---|
| 3.8.1.1<br>Action b<br>(LaSalle)                                      | Eliminate testing requirements when a diesel generator becomes inoperable due to an inoperable support system, independently testable component, or preplanned maintenance or testing. Perform surveillance requirement 4.8.1.1.2.a.4 if the EDG became inoperable due to any cause other than those previously listed. Demonstrate the operability of the remaining operable EDG separately by performing surveillance requirement 4.8.1.1.2.a.4 within 24 hours, unless the absence of any potential common mode failure for the remaining EDG is demonstrated. | 2b                                      |
| 3.8.1.1<br>Action c<br>(LaSalle)<br>Action b<br>(Byron and Braidwood) | Eliminate testing requirements when an Emergency Diesel Generator becomes inoperable due to an inoperable support system, an independently testable component, or preplanned maintenance or testing. Perform Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated.   | 2c                                      |
| 3.8.1.1<br>Action c.2<br>(Byron only)                                 | Delete obsolete note.   | 4                                       |
| 3.8.1.1<br>Action d<br>(LaSalle)                                      | Eliminate testing requirements when an Emergency Diesel Generator becomes inoperable due to an inoperable support system, an independently testable component, or preplanned maintenance or testing. Perform Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours, unless the absence of any potential common mode failure for the remaining EDGs is demonstrated.  | 2d                                      |

| <u>Technical Specification</u>                          | <u>Change Description</u>   | <u>Described in item # Attachment A</u> |
|---|---|---|
| 3.8.1.1<br>Action e<br>(LaSalle)<br>Action d<br>(By/Bw) | Delete the requirement to perform the Emergency Diesel Generator surveillance 4.8.1.1.2.a.4 within 8 hours.   | 2e                                      |
| 3.8.1.1<br>Action g<br>(LaSalle)                        | Eliminate testing requirements when an EDG becomes inoperable due to an inoperable support system, an independently testable component, or preplanned maintenance or testing. Perform Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours, unless the absence of any potential common mode failure for the remaining EDGs is demonstrated. | 2f                                      |
| 4.8.1.1.2.a   | Delete reference to the Diesel Generator Test Schedule located in Table 4.8.1.1.2-1 (LaSalle) or Table 4.8-1 (Byron and Braidwood). Specify a surveillance interval of 31 days.   | 1                                       |
| 4.8.1.1.2.a.5   | Change time requirement of "within 60 seconds" to "in accordance with the manufacturer's recommendations." Revise LaSalle's footnote to correspond.   | 2g                                      |
| 4.8.1.1.2.f<br>(By/Bw only)                             | Delete obsolete note  | 4                                       |
| 4.8.1.1.2.d.1<br>(LaSalle)<br>4.8.1.1.2.f.1<br>(By/Bw)  | Delete requirement to inspect EDGs in accordance with procedures prepared in conjunction with the manufacturer's recommendations. Relocate to EDG Reliability Program.  | 1                                       |

| <u>Technical Specification</u>                               | <u>Change Description</u>  | <u>Described in item # Attachment A</u> |
|--|--|---|
| 4.8.1.1.2.d.8 (LaSalle)<br>4.8.1.1.2.f.7 (By/Bw)             | Perform a hot start test within 5 minutes after completing the 24 hour run instead of simulating a loss of offsite power. Revise footnote to reflect the hot start test surveillance. Allow the Emergency Diesel Generator to operate for 2 hours at the continuous rating, rather than 1 hour, or until operating temperature has stabilized. | 2h                                      |
| 4.8.1.1.2.i and 4.8.1.1.2.j (Byron only)                     | Delete obsolete note.  | 4                                       |
| 4.8.1.1.3  | Delete requirements for reporting Emergency Diesel Generator failures.   | 1                                       |
| Tables 4.8.1.1.2-1 (LaSalle) and 4.8-1 (Byron and Braidwood) | Delete Table 4.8.1.1.2-1 (LaSalle) and Table 4.8-1 (Byron and Braidwood)   | 1                                       |
| Bases 3/4.8  | Revise bases to state that the surveillance requirements for demonstrating the operability of the diesel generators are based on the recommendations of Regulatory Guide 1.9, Revision 3, with exceptions noted in the UFSAR. Delete references to Regulatory Guide 1.108 and 1.9, Revision 2. Change FSAR to UFSAR.                           | 3                                       |
| p. 3/4 8-2 (LaSalle Unit 2)                                  | Correct spelling of "electrical"   | 4                                       |
| p. 3/4 8-4 (Byron)   | Correct spelling of "requirements"   | 4                                       |