3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

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

a. Two physically independent circuits connected between the offsite transmission network and the onsite Class 1E Distribution System, each with an automatic load sequencer, and

b. Two separate and independent diesel generators, each with:

1) A day tank containing a minimum volume of 650 gallons of fuel (52% of instrument span) (LI-9018, LI-9019),

2) A separate Fuel Storage System containing a minimum volume of 68,000 gallons of fuel (76% of instrument span) (LI-9024, LI-9025),

3) A separate fuel transfer pump, and

4) An automatic load sequencer.

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

ACTION:

a. With one ~~offsite circuit of the above-required A.C. electrical power sources inoperable~~ less than the above minimum required offsite A.C. circuits OPERABLE, due to other than an inoperable automatic load sequencer, demonstrate the OPERABILITY of the remaining ~~A.C. sources~~ required A.C. offsite circuit by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. Restore ~~the~~ a second A.C. offsite circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With either diesel generator inoperable due to other than an inoperable automatic load sequencer, demonstrate the OPERABILITY of the above required A.C. offsite ~~sources~~ circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. If the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirements 4.8.1.1.2.g.1 and 4.8.1.1.2.a.5 within 8 hours*#, unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated. Restore the inoperable diesel generator to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

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*This test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY.

#The diesel shall not be rendered inoperable by activities performed to support testing pursuant to the ACTION Statement (e.g., an air roll).

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

c. With ~~one offsite circuit~~ only one A.C. offsite circuit OPERABLE and one diesel generator of the above required A.C. electrical power sources inoperable due to other than an inoperable automatic load sequencer, demonstrate the OPERABILITY of the remaining ~~A.C. offsite source~~ Connected A.C. offsite circuit by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter, and, if the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirements 4.8.1.1.2.g.1 and 4.8.1.1.2.a.5 within 8 hours*, unless the OPERABLE diesel generator is already operating#, or the absence of any potential common mode failure for the remaining diesel generator is demonstrated. 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 the other A.C. power source (offsite circuit or diesel generator) to OPERABLE status in accordance with the provisions of 3.8.1.1, ACTION Statement a or b, as appropriate, with the time requirement of that ACTION Statement based on the time of initial loss of the remaining inoperable A.C. power source. A successful test of diesel generator OPERABILITY per Surveillance Requirements 4.8.1.1.2.g.1 and 4.8.1.1.2.a.5 performed under the ACTION Statement for an OPERABLE diesel generator or a restored to OPERABLE diesel generator satisfies the diesel generator test requirement of ACTION Statement b. any connected

d. With one diesel generator inoperable in addition to ACTION b. or c. 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 steam-driven auxiliary feedwater pump is OPERABLE.

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

e. With ~~two~~ none of the above required offsite A.C. circuits ~~inoperable~~ OPERABLE, 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. Following restoration of one offsite ~~source~~, follow ACTION Statement a with the time requirement of that ACTION Statement based A.C. circuit A.C. circuit

*This test is required to be completed regardless of when the inoperable EDG is restored to OPERABILITY.

#The diesel shall not be rendered inoperable by activities performed to support testing pursuant to the ACTION Statement (e.g., an air roll).

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

on the time of the initial loss of the ~~remaining inoperable~~ second offsite a.c. circuit.

f. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing the requirements of Specification 4.8.1.1.1.a. 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. Following restoration of one diesel generator unit, follow ACTION Statement b with the time requirement of that ACTION Statement based on the time of initial loss of the remaining inoperable diesel generator. A successful test of diesel OPERABILITY per Surveillance Requirements 4.8.1.1.2.g.1 and 4.8.1.1.2.a.5 performed under this ACTION Statement for a restored to OPERABLE diesel satisfies the diesel generator test requirements of ACTION Statement b.

g. With less than the above minimum required A.C. electrical power sources OPERABLE due to an inoperable automatic load sequencer, restore the inoperable automatic load sequencer 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.

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 connected:

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

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

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

1) Verifying the fuel level in the day tank (LI-9018, LI-9019),

2) Verifying the fuel level in the fuel storage tank (LI-9024, LI-9025),

3) Verifying the fuel transfer pump starts and transfers fuel from the storage system to the day tank,

4) Verifying the diesel starts* and accelerates to at least 440 RPM with generator voltage and frequency at 4160 + 170, -135 volts and 60 $\pm$ 1.2 Hz. The diesel generator shall be started for this test by using one of the following signals:

*All diesel generator starts for the purpose of surveillance testing as required by Specification 4.8.1.1.2 may be preceded by an engine prelube period as recommended by the manufacturer so that the mechanical stress and wear on the diesel engine is minimized.

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:

connected

a. One circuit between the offsite transmission network and the Onsite Class 1E Distribution System, including the loss of power and undervoltage function of the associated automatic load sequencer, and

b. One diesel generator with:

1) A day tank containing a minimum volume of 650 gallons (52% of instrument span) (LI-9018, LI-9019) of fuel,

2) A fuel storage system containing a minimum volume of 68,000 gallons of fuel (76% of instrument span) (LI-9024, LI-9025),

3) A fuel transfer pump, and

4) The loss of power and undervoltage function of the associated automatic load sequencer.

APPLICABILITY: MODES 5 and 6.

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, movement of irradiated fuel, or crane operation with loads over the fuel storage pool, and provide relief capability for the Reactor Coolant System in accordance with Specification 3.4.9.3. In addition, when in MODE 5 with the reactor coolant loops not filled, or in MODE 6 with the water level less than 23 feet above the reactor vessel flange, immediately initiate corrective action to restore the required sources to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.8.1.2.1 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the requirements of Specifications 4.8.1.1.1, 4.8.1.1.2 (except for Specification 4.8.1.1.2.h, i, and j), and 4.8.1.1.3.

4.8.1.2.2 At least once per 18 months during shutdown, verify the loss of power and undervoltage function of the associated automatic load sequencer OPERABILITY upon LOSP signal by verifying deenergization of the emergency bus, load shedding of the operating loads from the emergency bus, and verifying the diesel starts and energizes the emergency bus with the available auto-connected shutdown loads.

3/4.8.3 ONSITE POWER DISTRIBUTION

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.3.1 The following electrical busses shall be energized in the specified manner with tie breakers open between redundant busses within the unit:

a. A.C. Emergency Busses consisting of:
   1. Train A
      a) 4160 volt switchgear 1/2AA02**
      b) 480 volt switchgear 1/2AB04
         1) MCC 1/2ABE
      c) 480 volt switchgear 1/2AB05
         1) MCC 1/2ABA
         2) MCC 1/2ABC
         3) MCC 1/2ABF
      d) 480 volt switchgear 1/2AB15
         1) MCC 1/2ABB
         2) MCC 1/2ABD
   2. Train B
      a) 4160 volt switchgear 1/2BA03**
      b) 480 volt switchgear 1/2BB06
         1) MCC 1/2BBE
      c) 480 volt switchgear 1/2BB07
         1) MCC 1/2BBA
         2) MCC 1/2BBC
         3) MCC 1/2BBF
      d) 480 volt switchgear 1/2BB16
         1) MCC 1/2BBB
         2) MCC 1/2BBD

b. 120 volt A.C. vital Busses
   1. Associated with Train A
      a) Channel I
         1) Panel 1/2AY1A energized from inverter 1/2AD1I1 connected to switchgear 1/2AD1*
         2) Panel 1/2AY2A energized from inverter 1/2AD1I11 connected to switchgear 1/2AD1*
      b) Channel III
         1) Panel 1/2CY1A energized from inverter 1/2CD1I3 connected to switchgear 1/2CD1*
   2. Associated with Train B
      a) Channel II
         1) Panel 1/2BY1B energized from inverter 1/2BD1I2 connected to switchgear 1/2BD1*

*Two inverters in a single train may be disconnected from their associated switchgear for up to 24 hours as necessary, for the purpose of performing an equalizing charge on their associated battery bank provided: (1) their associated panels are energized from their regulated transformers, and (2) the panels associated with the other battery bank powered from that AC train are energized in the specified manner.

** *See Attachment for proposed footnote addition.*

Proposed Footnote Addition to TS Section 3.8.3.1, page 3/4 8-15.

** The redundant emergency busses of 4160 volt switchgear 1/2AA02 and 1/2BA03 may be manually connected within the unit by tie breakers in order to allow transfer of preferred offsite power sources provided surveillance requirements of 4.8.1.1.1(a) are successfully performed within 12 hours prior to the interconnection.

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.

Insert

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 and Appendix A to Generic Letter 84-15, "Proposed Staff Position to Improve and Maintain Diesel Generator Reliability." When one diesel generator is inoperable, there is an additional ACTION requirement to verify that all required systems, subsystems, trains, components and devices, that depend on the remaining OPERABLE diesel generator as a source of emergency power, are also OPERABLE, and that the steam-driven auxiliary feedwater pump is OPERABLE. This requirement is intended to provide assurance that a loss-of-offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term, verify, as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the Surveillance Requirements needed to demonstrate the OPERABILITY of the component.

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

The ACTION times specified for an inoperable automatic load sequencer are based on the times allowed when a combination of one diesel generator and one offsite circuit is inoperable. Under this condition the 4.16 kV Class 1E bus would remain energized. The ACTION conservatively addresses any consequential effects of an inoperable load sequencer on other engineered safety features.

Revised Insert to
Bases 3/4.8 Electrical Power Systems

Normally, the two required offsite power source circuits are connected to the onsite Class 1E Distribution System through their respective reserve auxiliary transformers, (RATs). These transformers are utilized as the final point of transmission grid voltage reduction to the onsite Class 1E electrical distribution system. When a RAT is unavailable, the standby auxiliary transformer (an additional 10 CFR 50 Appendix A, GDC 17 power source) may be placed into service and connected to the onsite Class 1E Distribution System, in order to meet the TS requirements as an OPERABLE A.C. electrical offsite power circuit.