

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

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

- a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and
- b. Four separate and independent diesel generator sets each with:
  1. Two diesels driving a common generator
  2. Two engine-mounted fuel tanks containing a minimum volume of 250 gallons of fuel, per tank
  3. A separate fuel storage system containing a minimum volume of 62,000 gallons of fuel,
  4. A separate fuel transfer pump, and
  5. A separate 125-volt D.C. distribution panel, 125-volt D.C. battery bank and associated charger.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

- a. With either an offsite circuit or diesel generator set of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1.a ~~and 4.8.1.1.2.a.4~~ within one hour and at least once per 8 hours thereafter; restore at least two offsite circuits and four diesel generator sets to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.  
*and Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours;*
- b. With one offsite circuit and one diesel generator set of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1.a ~~and 4.8.1.1.2.a.4~~ within one hour and at least once per 8 hours thereafter; restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore at least two offsite circuits and four diesel generator sets 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.

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*and Surveillance Requirement 4.8.1.1.2.a.4 within 8 hrs;*

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### ACTION (Continued)

- c. With two of the above required offsite A.C. circuits inoperable, demonstrate the OPERABILITY of 4 diesel generator sets by performing Surveillance Requirement 4.8.1.1.2.a.4 within ~~one hour and at least once per 8 hours thereafter~~, unless the diesel generator sets 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.
- d. With either diesel generator sets 1A-A and/or 2 A-A inoperable simultaneous with 1B-B and/or 2B-B, demonstrate the OPEPARILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter; restore at least 1) 1A-A and 2A-A or 2) 1B-B and 2B-B to OPEPARLE 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 four diesel generator sets to OPERABLE status within 72 hours from time of initial loss or be in least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

### SUPVEILLANCE PEQUIREMENTS

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 and automatically) unit power supply from the normal circuit to the alternate circuit.

4.8.1.1.2 Each diesel generator set shall be demonstrated OPEPARLE:

- a. In accordance with the frequency specified in Table 4.8-1 on a STAGGED TEST BASIS by:
  1. Verifying the fuel level in the engine-mounted day tanks.
  2. Verifying the fuel level in the 7 day tank.
  3. Verifying the fuel transfer pump can be started and transfers fuel from the storage system to the engine mounted fuel tanks.

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OPERATING

LIMITING CONDITION FOR OPERATION

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- a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and
- b. Four separate and independent diesel generator sets each with:
  1. Two diesels driving a common generator
  2. Two engine-mounted fuel tanks containing a minimum volume of 250 gallons of fuel, per tank
  3. A separate fuel storage system containing a minimum volume of 62,000 gallons of fuel,
  4. A separate fuel transfer pump, and
  5. A separate 125-volt D.C. distribution panel, 125-volt D.C. battery bank and associated charger.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

- a. With either an offsite circuit or diesel generator set of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1.a and ~~4.8.1.1.2.a.4~~ within one hour and at least once per 8 hours thereafter; restore at least two offsite circuits and four diesel generator sets to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With one offsite circuit and one diesel generator set of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1.a and ~~4.8.1.1.2.a.4~~ within one hour and at least once per 8 hours thereafter; restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore at least two offsite circuits and four diesel generator sets 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.

*and Surveillance Requirement 4.8.1.1.2.a.4  
within 24 hours;*

*and Surveillance Requirement 4.8.1.1.2.a.4  
within 8 hours;*

## ELECTRICAL POWER SYSTEMS

### ACTION (Continued)

- c. With two of the above required offsite A.C. circuits inoperable, demonstrate the OPERABILITY of 4 diesel generator sets by performing Surveillance Requirement 4.8.1.1.2.a.4 within ~~one hour and at least once per 8 hours thereafter~~, unless the diesel generator sets 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.
- d. With either diesel generator sets 1A-A and/or 2 A-A inoperable simultaneous with 1B-B and/or 2B-B, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter; restore at least 1) 1A-A and 2A-A or 2) 1B-B and 2B-B 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 four diesel generator sets to OPERABLE status within 72 hours from time of initial loss or be in least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

### 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 and automatically) unit power supply from the normal circuit to the alternate circuit.

4.8.1.1.2 Each diesel generator set shall be demonstrated OPERABLE:

- a. In accordance with the frequency specified in Table 4.8-1 on a STAGGERED TEST BASIS by:
  1. Verifying the fuel level in the engine-mounted day tanks.
  2. Verifying the fuel level in the 7 day tank.
  3. Verifying the fuel transfer pump starts and transfers fuel from the storage system to the engine mounted fuel tanks.

ENCLOSURE 2

PROPOSED TECHNICAL SPECIFICATION CHANGE

SEQUOYAH NUCLEAR PLANT UNITS 1 AND 2

DOCKET NOS. 50-327 AND 50-328

(TVA-SQN-TS-88-04)

DESCRIPTION AND JUSTIFICATION FOR  
PROPOSED REVISION TO THE ACTION REQUIREMENTS OF  
TECHNICAL SPECIFICATION 3.8.1.1

## ENCLOSURE 2

### Description of Change

Tennessee Valley Authority proposes to modify the Sequoyah Nuclear Plant units 1 and 2 technical specifications to revise specification 3.8.1.1 to extend the action timeframe for performing diesel generator surveillance tests. Technical specification 3.8.1.1 requires a minimum of two alternating current (ac) electrical offsite power sources and four onsite ac power sources (diesel generator sets). In the event ac power sources are lost, compliance with one of four (a, b, c, or d) actions is required depending on the number of power sources lost. Each action requires performance of surveillances to demonstrate the operability of the remaining ac power sources. SQN's current technical specification 3.8.1.1 requires that two surveillance requirements (SRs) (4.8.1.1.1.a and 4.8.1.1.2.a.4) be performed within one hour and at least once every eight hours thereafter. SR 4.8.1.1.1.a demonstrates operability of the offsite ac power sources by verifying correct breaker alignments and indicated power availability. SR 4.8.1.1.2.a.4 demonstrates operability of each diesel generator by verifying that the diesel starts from ambient condition and accelerates to at least 900 revolutions per minute (r/min) in less than or equal to ten seconds. The generator voltage and frequency ( $6900 \pm 690$  volts and  $60 \pm 1.2$  Hz) are also verified after the start signal. In lieu of the current timeframe for performance of SR 4.8.1.1.2.a.4, the proposed change would extend the timeframe for the following three cases. For the first case where either an offsite circuit or a diesel generator set is inoperable (action a), SR 4.8.1.1.2.a.4 would be extended to 24 hours. For the second case where one offsite circuit and one diesel generator set are inoperable (action b), SR 4.8.1.1.2.a.4 would be extended to eight hours. For the third case where two offsite circuits are inoperable (action c), SR 4.8.1.1.2.a.4 would be extended to eight hours.

### Reason for Change

The proposed change improves diesel generator reliability and availability and affords the following benefits:

- (1) The expanded timeframe for performing SR 4.8.1.1.2.a.4 allows Operations sufficient time to prewarm the operable diesel engines before starting. This reduces the excessive number of diesel generator cold, fast starts. For example, if one of SQN's four diesel generators was declared inoperable because of a low fuel tank level, the Operations staff would initiate work to have the tank refilled. If the tank is not refilled within 1-hour, under the current action requirement the other three diesel generators must be started within 1-hour and at least once every 8-hours thereafter. Because of these time constraints, there normally is not sufficient time to prewarm the three operable diesel generators. Consequently, these diesel engines are required to undergo cold, fast starts. The proposed change would, for this example, extend the corrective action timeframe to 24-hours before requiring diesel generator start tests. This would allow Operations time to prewarm the three operable diesel generators and thereby eliminate subjecting the diesels to an excessive number of cold, fast starts.

- (2) The proposed change also provides a more reasonable timeframe for performing corrective action to meet the Limiting Condition for Operation (LCO) before requiring diesel generator start tests. In the example given in item 1, refilling the fuel tank on the inoperable diesel generator would normally not be completed within the current 1-hour timeframe, especially if fuel oil analyses are required to release fuel from the yard storage tanks. The proposed change would provide a more realistic schedule for taking corrective action for the purpose of returning an inoperable diesel generator to service.
- (3) The proposed change provides a human factor benefit by allowing the Operations staff time to focus on returning the inoperable ac power source to service rather than directing the attention toward prompt diesel generator surveillance testing. By extending the timeframe for requiring diesel generator surveillance tests, the Operations staff is afforded time to conduct the surveillance tests in a more orderly fashion.

#### Justification for Change

As part of the resolution to Unresolved Safety Issue A-44, "Station Blackout," NRC staff issued GL 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability." One of the items contained in the GL was directed toward reducing the number of cold, fast-start surveillance tests for diesel generators. The GL provided an example of a modified standard technical specification that would reduce the number of fast starts on the diesel generators. The proposed change to SQN's technical specification is consistent with the modified technical specification provided in GL 84-15 and is also consistent with NUMARC Station Blackout Initiative 3 that recommended that utilities reduce, as much as possible, cold starting of emergency diesel generators during test conditions.

ENCLOSURE 3

PROPOSED TECHNICAL SPECIFICATION CHANGE

SEQUOYAH NUCLEAR PLANT UNITS 1 AND 2

DOCKET NOS. 50-327 AND 50-328

(TVA-SQN-TS-88-04)

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATIONS



## ENCLOSURE 3

### Significant Hazards Evaluation

TVA has evaluated the proposed technical specification change and determined that it does not represent a significant hazards consideration based on criteria established in 10 CFR 50.92(c). Operation of SQN in accordance with the proposed amendment will not:

- (1) involve a significant increase in the probability or consequences of an accident previously evaluated. The purpose of the proposed change is to reduce the number of cold, fast-start surveillance tests from ambient conditions for SQN's diesel generators. The goal is not to totally eliminate the cold, fast-start surveillance test because the design basis for the plant (i.e., large loss of coolant accident coincident with a loss of offsite power) requires this capability. The goal is to reduce the undue wear and stress on the diesel engine parts caused by frequent cold, fast starts. This is accomplished by extending the timeframe for performing diesel generator surveillance testing. Under SQN's current action requirement, if onsite/offsite ac power sources are determined to be inoperable, the intact diesel generators must be verified to be operable by starting the diesels from ambient conditions (cold, fast start). This must be performed within 1-hour and at least once every 8-hours thereafter. In lieu of this short timeframe, the proposed change would delay the diesel generator start requirement for up to 24-hours (8-hours if two ac power sources are inoperable). This delay in testing is offset by SQN's diesel generator reliability program as contained in Table 4.8-1 of SQN's technical specifications. Based on NRC staff's technical judgement and the concerns expressed by Nuclear Management and Resources Council and other nuclear power industry groups (Institute of Nuclear Power Operations and American Nuclear Insurers), the reduction in the number of cold, fast starts results in an overall improvement in diesel engine reliability and availability of SQN's diesel engines. By improving the reliability and availability of SQN's diesel engines, the probability or consequences of an accident previously evaluated may be decreased.
- (2) create the possibility of a new or different kind of accident from any previously analyzed. No new accident scenarios are created by this change because this change only affects the time interval for performing diesel generator surveillance testing when offsite/onsite power sources are determined to be inoperable and does not alter the diesel generator design parameters, the plant equipment, or the facility. Under SQN's current action requirement, if offsite/onsite ac power sources are determined to be inoperable, the intact diesel generators must be verified to be operable by starting the diesel

generators within one hour and at least once every eight hours thereafter. Under the proposed change, the start requirement would be required within 24-hours (8-hours if two offsite/onsite power sources are inoperable). This reduces the number of required cold, fast starts and results in an overall improvement in diesel engine reliability and availability. Because the proposed change does not physically affect the diesel equipment or the onsite/offsite ac electrical power sources, there is no possibility for creating a new or different kind of accident from any previously analyzed.

- (3) involve a significant reduction in a margin of safety. The proposed change will accomplish a reduction in the number of cold, fast-start surveillance tests for SQN's diesel generators. This is accomplished by delaying the diesel generator start test for up to 24-hours when an (offsite/onsite) ac power source is found to be inoperable (8- hours if two ac power sources are inoperable). Under the current requirement, diesel generator start tests are required on the intact diesel generators within 1-hour and at least once every eight hours thereafter until the inoperable ac power sources are restored. Lengthening this surveillance time requirement will allow the Operations staff sufficient time to prewarm the operable diesel engines before starting and thereby reduce the number of diesel generator cold, fast starts. Additionally, the Operations staff would have more time to focus on returning the inoperable ac power source to service rather than directing attention toward prompt diesel generator surveillance testing. The proposed change improves diesel engine reliability and availability by reducing the number of cold, fast starts, i.e., subjects the diesel engines to less mechanical stress and wear and creates a safer operational environment by reducing the surveillance test burden on the Operations staff. This results in a overall increase in the margin of safety.