REVISED PAGES - UNIT NO. 1

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 (vital bus system), and

b. Three separate and independent diesel generators with:

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

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

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With an 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; and Surveillance Requirement 4.8.1.1.2.a.2 within 24 hours; restore at least two offsite circuits and three diesel generators to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With a diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and Surveillance Requirement 4.8.1.1.2.a.2 within 24 hours; restore the 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.

ACTION (Continued)

c. With one offsite circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 2 hours and at least once per 8 hours thereafter and Surveillance Requirement 4.8.1.1.2.a.2 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. With the diesel generator restored to OPERABLE status, follow Action a. With the offsite circuit restored to OPERABLE status follow Action b. In either case, time constraints apply from the time of initial loss.

d. With two of the above required offsite circuits inoperable, demonstrate the OPERABILITY of the three diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.2 within 8 hours unless the diesel generators are already operating; restore at least one of the inoperable offsite circuits to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. With only one offsite circuit restored, follow Action a. The time constraint applies from the time of initial loss.

e. With two or more of the required diesel generators inoperable, demonstrate the OPERABILITY of the two offsite circuits by performing Surveillance Requirement 4.8.1.1.1.a within 2 hours and at least once per 8 hours thereafter; have at least two diesel generators OPERABLE within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. With two diesel generators OPERABLE, follow Action b. The time constraint applies from the time of initial loss.

f. With the number of diesel generator failures meeting or exceeding the criteria specified in Table 4.8-2, take the Additional Reliability Actions specified in that table.

g. With 1 fuel transfer pump and/or 1 storage tank for the above required diesel generators inoperable, restore the fuel transfer pump and/or storage tank to OPERABLE status within 72 hours or declare 1 diesel generator inoperable and enter Action b.

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the onsite Class 1E distribution system (vital bus system) shall be:

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

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

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

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

1. Verifying the fuel level in its day tank.

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

3. Verifying the generator is synchronized, loaded to greater than or equal to 2600 kw in less than or equal to 60 seconds, and operates at this load for at least 60 minutes.

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

b. At least once per 31 days and after each operation of the diesel where the period of operation was greater than or equal to one hour by checking for and removing accumulated water from the day tank.

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

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

*Starting the diesel from the ambient condition is required only when testing is being performed to comply with the test schedule of Table 4.8-1. If Surveillance Requirement 4.8.1.1.2.a.2 is performed for other reasons (e.g., post-maintenance diesel testing) and credit is not being taken for compliance with the Table 4.8-1 test schedule, the diesel need not be started from the ambient condition.

2. Verifying that:

   a) On rejection of a load of greater than or equal to 785 kw, the voltage and frequency are restored to within 4160 ± 420 volts and 60 ± 1.2 Hz within 4 seconds.

   b) On rejection of a load of greater than or equal to 2600 kw, the voltage does not exceed 4784 volts and the diesel does not trip.

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

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

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

4. Verifying that on an ESF actuation test signal, without loss of offsite power, the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± 1.2 Hz within 13 seconds after the auto-start signal and shall be maintained within these limits during this test.

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

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

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

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

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

7. Verifying the diesel generator operates for at least 24 hours. During the first two 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 greater than or equal to 2600 kw. The steady state voltage and frequency shall be maintained at 4160 $\pm$ 420 volts and 60 $\pm$ 1.2 Hz during this test. Within 10 minutes after completing this 24 hour test, perform Surveillance Requirement 4.8.1.1.2.c.6.b.

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

9. Verifying that with the diesel generator operating in a test mode (connected to its bus), a simulated safety injection signal overrides the test mode by (1) returning the diesel generator to standby operation and (2) automatically energizing the emergency loads with offsite power.

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

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

a. At least once per 31 days by:

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

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

b. At least once per 92 days by verifying that a fuel sample obtained in accordance with ASTM-D270-1975 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 when tested in accordance with ASTM-D975-77, and an impurity level of less than 2 mg of insolubles per 100 ml when tested in accordance with ASTM-D2274-70.

TABLE 4.8-1

DIESEL GENERATOR TEST SCHEDULE

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

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

TABLE 4.8-2

ADDITIONAL RELIABILITY ACTIONS

No. of failures in last 20 valid tests	No. of failures in last 100 valid tests	Action
3	6	Within 14 days, prepare and maintain a report for NRC audit describing the diesel generator reliability improvement program implemented at the site. Minimum requirements for the report are indicated in Attachment 1 to this table.
5	11	Declare the diesel generator inoperable. Perform two consecutive tests without a failure within 72 hours in order to return the diesel generator to OPERABLE status. Perform a requalification test program for the affected diesel generator. Requalification test program requirements are indicated in Attachment 2 to this table. (The 2 tests performed to return the diesel to operable shall be credited to the first 7 tests performed in Item 1 of Attachment 2.)

ATTACHMENT 1 TO TABLE 4.8-2

REPORTING REQUIREMENT

As a minimum, the Reliability Improvement Program report for NRC audit shall include:

1. A summary of all tests (valid and invalid) that occurred within the time period over which the last 20/100 valid tests were performed

2. An analysis of failures and determination of root causes of failures

3. An evaluation of each of the recommendations of NUREG/CR-0660, "Enhancement of Onsite Emergency Diesel Generator Reliability in Operating Reactors," with respect to their application to the plant

4. Identification of all actions taken or to be taken to (a) correct the root causes of the failures defined above and (b) achieved a general improvement of diesel generator reliability

5. The schedule for implementation of each action from Item 4 above

6. An assessment of the existing reliability of electric power to engineered safety feature equipment

A supplemental report shall be prepared within 30 days after each failure during a valid demand for so long as the affected diesel generator unit continues to violate the criteria (3/20 or 6/100) for the reliability improvement program remedial action. The supplemental report shall update the failure/demand history for the affected diesel generator unit since the last report for that diesel generator. The supplemental report shall also present an analysis of the failure(s) with a root cause determination, if possible, and shall delineate any further procedural, hardware, or operational changes to be incorporated into the site diesel generator improvement program and the schedule for implementation of those changes.

In addition to the above, submit a yearly data report on the diesel generator reliability.

ATTACHMENT 2 TO TABLE 4.8-2

DIESEL GENERATOR REQUALIFICATION PROGRAM

1. Perform seven consecutive successful demands without a failure within 30 days of the diesel generator being restored to operable status and fourteen consecutive successful demands without a failure within 75 days of the diesel generator being restored to operable status.

2. If a failure occurs during the first seven tests in the requalification test program, perform seven successful demands without an additional failure within 30 days of the diesel generator being restored to operable status and fourteen consecutive successful demands without a failure within 75 days of being restored to operable status.

3. If a failure occurs during the second seven tests (tests 8 through 14) of Item 1 above, perform fourteen consecutive successful demands without an additional failure within 75 days of the failure which occurred during the requalification testing.

4. Following the second failure during the requalification test program, be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

5. During requalification testing, the diesel generator should not be tested more frequently than at 24 hour intervals.

After a diesel generator has been successfully requalified, subsequent repeated requalification tests will not be required for that diesel generator under the following conditions:

a) The number of failures in the last 20 valid demands is less than 5.

b) The number of failures in the last 100 valid demands is less than 11.

c) In the event that following successful requalification of a diesel generator, the number of failures is still in excess of the remedial action criteria (a and/or b above), the following exception will be allowed until the diesel generator is no longer in violation of the remedial action criteria (a and/or b above).

Requalification testing will not be required provided that after each valid demand, the number of failures in the last 20 and/or 100 valid demands has not increased. Once the diesel generator is no longer in violation of the remedial action criteria above, the provisions of those criteria alone will prevail.

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 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 (vital bus system), and

b. Two separate and independent diesel generators with:

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

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

3. A common fuel transfer pump.

APPLICABILITY: MODES 5 and 6

ACTION:

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

b. With the number of diesel generator failures, for the above required diesel generators, meeting or exceeding the criteria specified in Table 4.8-2, take the Additional Reliability Actions specified in that table. The tests performed in accordance with this table shall comply with the requirements of 4.8.1.1.2.a.2 and 4.8.1.1.2.a.3.

SURVEILLANCE REQUIREMENTS

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

*(See NOTE on page 3/4 8-5a)

NOTE: The demonstration of diesel generator operability is not considered a valid test for the purpose of reducing testing frequency in accordance with Tables 4.8-1 and 4.8-2. However, should the diesel fail to start, it shall be considered a valid test and failure and the additional actions prescribed by Tables 4.8-1 and 4.8-2 shall apply. In order for any test to be considered a valid success, the requirements of surveillance 4.8.1.1.2.a.2 and 4.8.1.1.2.a.3 must be satisfied.

3/4.8.1 and 3.4.8.2 A.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS

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

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least one redundant set 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 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 based upon the recommendations of Regulatory Guide 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, and meeting the reliability goals discussed in Regulatory Guide 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977.

REVISED PAGES - UNIT NO. 2

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 (vital bus system), and

b. Three separate and independent diesel generators with:

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

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

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With an 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; and Surveillance Requirement 4.8.1.1.2.a.2 within 24 hours; restore at least two offsite circuits and three diesel generators to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With a diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hours and at least once per 8 hours thereafter; and Surveillance Requirement 4.8.1.1.2.a.2 within 24 hours; restore the 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.

ACTION (Continued)

c. With one offsite circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 2 hours and at least once per 8 hours thereafter and Surveillance Requirement 4.8.1.1.2.a.2 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. With the diesel generator restored to OPERABLE status, follow Action a. With the offsite circuit restored to OPERABLE status follow Action b. In either case, time constraints apply from the time of initial loss.

d. With two of the above required offsite circuits inoperable, demonstrate the OPERABILITY of the three diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.2 within 8 hours unless the diesel generators are already operating; restore at least one of the inoperable offsite circuits to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. With only one offsite circuit restored, follow Action a. The time constraint applies from the time of initial loss.

e. With two or more of the required diesel generators inoperable, demonstrate the OPERABILITY of the two offsite circuits by performing Surveillance Requirement 4.8.1.1.1.a within 2 hours and at least once per 8 hours thereafter; have at least two diesel generators OPERABLE within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. With two diesel generators OPERABLE, follow Action b. The time constraint applies from the time of initial loss.

f. With the number of diesel generator failures meeting or exceeding the criteria specified in Table 4.8-2, take the Additional Reliability Actions specified in that table.

g. With 1 fuel transfer pump and/or 1 storage tank for the above required diesel generators inoperable, restore the fuel transfer pump and/or storage tank to OPERABLE status within 72 hours or declare 1 diesel generator inoperable and enter Action b.

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the onsite Class 1E distribution system (vital bus system) shall be:

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

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

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

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

1. Verifying the fuel level in its day tank.

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

3. Verifying the generator is synchronized, loaded to greater than or equal to 2600 kw in less than or equal to 60 seconds, and operates at this load for at least 60 minutes.

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

b. At least once per 31 days and after each operation of the diesel where the period of operation was greater than or equal to one hour by checking for and removing accumulated water from the day tank.

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

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

*Starting the diesel from the ambient condition is required only when testing is being performed to comply with the test schedule of Table 4.8-1. If Surveillance Requirement 4.8.1.1.2.a.2 is performed for other reasons (e.g., post-maintenance diesel testing), and credit is not being taken for compliance with the Table 4.8-1 test schedule, the diesel need not be started from the ambient condition.

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying that:

   a) On rejection of a load of greater than or equal to 785 kw, the voltage and frequency are restored to within 4160 ± 420 volts and 60 ± 1.2 Hz within 4 seconds.

   b) On rejection of a load of greater than or equal to 2600 kw, the voltage does not exceed 4784 volts and the diesel does not trip.

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

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

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

4. Verifying that on an ESF actuation test signal, without loss of offsite power, the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± 1.2 Hz within 13 seconds after the auto-start signal and shall be maintained within these limits during this test.

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

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

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

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

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

7. Verifying the diesel generator operates for at least 24 hours. During the first two 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 greater than or equal to 2600 kw. The steady state voltage and frequency shall be maintained at 4160 $\pm$ 420 volts and 60 $\pm$ 1.2 Hz during this test. Within 10 minutes after completing this 24 hour test, perform Surveillance Requirement 4.8.1.1.2.c.6.b.

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

9. Verifying that with the diesel generator operating in a test mode (connected to its bus), a simulated safety injection signal overrides the test mode by (1) returning the diesel generator to standby operation and (2) automatically energizing the emergency loads with offsite power.

SURVEILLANCE REQUIREMENTS (Continued)

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

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

a. At least once per 31 days by:

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

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

b. At least once per 92 days by verifying that a fuel sample obtained in accordance with ASTM-D270-1975 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 when tested in accordance with ASTM-D975-77, and an impurity level of less than 2 mg of insolubles per 100 ml when tested in accordance with ASTM-D2274-70.

TABLE 4.8-1

DIESEL GENERATOR TEST SCHEDULE

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

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

SURVEILLANCE REQUIREMENTS (Continued)

TABLE 4.8-2

ADDITIONAL RELIABILITY ACTIONS

No. of failures in last 20 valid tests	No. of failures in last 100 valid tests	Action
3	6	Within 14 days, prepare and maintain a report for NRC audit describing the diesel generator reliability improvement program implemented at the site. Minimum requirements for the report are indicated in Attachment 1 to this table.
5	11	Declare the diesel generator inoperable. Perform two consecutive tests without a failure within 72 hours in order to return the diesel generator to OPERABLE status. Perform a requalification test program for the affected diesel generator. Requalification test program requirements are indicated in Attachment 2 to this table. (The 2 tests performed to return the diesel to operable shall be credited to the first 7 tests performed in Item 1 of Attachment 2.)

SURVEILLANCE REQUIREMENTS (Continued)

ATTACHMENT 1 TO TABLE 4.8-2

REPORTING REQUIREMENT

As a minimum, the Reliability Improvement Program report for NRC audit shall include:

1. A summary of all tests (valid and invalid) that occurred within the time period over which the last 20/100 valid tests were performed

2. An analysis of failures and determination of root causes of failures

3. An evaluation of each of the recommendations of NUREG/CR-0660, "Enhancement of Onsite Emergency Diesel Generator Reliability in Operating Reactors," with respect to their application to the plant

4. Identification of all actions taken or to be taken to (a) correct the root causes of the failures defined above and (b) achieved a general improvement of diesel generator reliability

5. The schedule for implementation of each action from Item 4 above

6. An assessment of the existing reliability of electric power to engineered safety feature equipment

A supplemental report shall be prepared within 30 days after each failure during a valid demand for so long as the affected diesel generator unit continues to violate the criteria (3/20 or 6/100) for the reliability improvement program remedial action. The supplemental report shall update the failure/demand history for the affected diesel generator unit since the last report for that diesel generator. The supplemental report shall also present an analysis of the failure(s) with a root cause determination, if possible, and shall delineate any further procedural, hardware, or operational changes to be incorporated into the site diesel generator improvement program and the schedule for implementation of those changes.

In addition to the above, submit a yearly data report on the diesel generator reliability.

ATTACHMENT 2 TO TABLE 4.8-2

DIESEL GENERATOR REQUALIFICATION PROGRAM

1. Perform seven consecutive successful demands without a failure within 30 days of the diesel generator being restored to operable status and fourteen consecutive successful demands without a failure within 75 days of the diesel generator being restored to operable status.

2. If a failure occurs during the first seven tests in the requalification test program, perform seven successful demands without an additional failure within 30 days of the diesel generator being restored to operable status and fourteen consecutive successful demands without a failure within 75 days of being restored to operable status.

3. If a failure occurs during the second seven tests (tests 8 through 14) Item 1 above, perform fourteen consecutive successful demands without an additional failure within 75 days of the failure which occurred during the requalification testing.

4. Following the second failure during the requalification test program, be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

5. During requalification testing, the diesel generator should not be tested more frequently than at 24 hour intervals.

After a diesel generator has been successfully requalified, subsequent repeated requalification tests will not be required for that diesel generator under the following conditions:

a) The number of failures in the last 20 valid demands is less than 5.

b) The number of failures in the last 100 valid demands is less than 11.

c) In the event that following successful requalification of a diesel generator, the number of failures is still in excess of the remedial action criteria (a and/or b above), the following exception will be allowed until the diesel generator is no longer in violation of the remedial action criteria (a and/or b above).

Requalification testing will not be required provided that after each valid demand, the number of failures in the last 20 and/or 100 valid demands has not increased. Once the diesel generator is no longer in violation of the remedial action criteria above, the provisions of those criteria alone will prevail.

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 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 (vital bus system), and

b. Two separate and independent diesel generators with:

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

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

3. A common fuel transfer pump.

APPLICABILITY: MODES 5 and 6

ACTION:

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

b. With the number of diesel generator failures, for the above required diesel generators, meeting or exceeding the criteria specified in Table 4.8-2, take the Additional Reliability Actions specified in that table. The tests performed in accordance with this table shall comply with the requirements of 4.8.1.1.2.a.2 and 4.8.1.1.2.a.3.

SURVEILLANCE REQUIREMENTS

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

*(See NOTE on page 3/4 8-7a)

NOTE: The demonstration of diesel generator operability is not considered a valid test for the purpose of reducing testing frequency in accordance with Tables 4.8-1 and 4.8-2. However, should the diesel fail to start, it shall be considered a valid test and failure and the additional actions prescribed by Tables 4.8-1 and 4.8-2 shall apply. In order for any test to be considered a valid success, the requirements of surveillance 4.8.1.1.2.a.2 and 4.8.1.1.2.a.3 must be satisfied.

3/4.8 ELECTRICAL POWER SYSTEMS

BASES

3/4.8.1 and 3.4.8.2 A.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS

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

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least one redundant set 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 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 based upon the recommendations of Regulatory Guide 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, and meeting the reliability goals discussed in Regulatory Guide 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977.

3/4.8.3 ELECTRICAL EQUIPMENT PROTECTIVE DEVICES

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