

ATTACHMENT 2a

PROPOSED TS CHANGES FOR MCGUIRE

US NRC
December 14, 1995

Attachment 2a

NOTE: On the marked-up TS pages, the numbers in the triangular boxes correspond to the numbering system used in Attachment 3, "Technical Justification."

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LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

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3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCE

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 Essential Auxiliary Power System, and
- b. Two separate and independent diesel generators, each with:
 - 1) A separate day tank containing a minimum volume of 120 gallons of fuel,
 - 2) A separate Fuel Storage System containing a minimum volume of 39,500 gallons of fuel,
 - 3) A separate fuel transfer pump.

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 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; ~~separately demonstrate the operability of two diesel generators by performing Surveillance Requirements 4.8.1.1.2a.4 and 4.8.1.1.2a.5 within 24 hours unless this surveillance was performed within the previous 24 hours, or unless the diesel is operating, restore at least two offsite circuit~~s~~ and two diesel generators to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.~~

b. With 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. source by performing Surveillance Requirement 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; demonstrate the operability of the remaining diesel generator by performing Surveillance Requirements 4.8.1.1.2a.4 and 4.8.1.1.2a.5 within 8 hours, unless this surveillance was performed within the previous 24 hours, or unless the diesel is operating, 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

A2
required offsite circuit

A2
the required offsite

B4
required offsite circuit

Insert #1
B3

A1

B2 *

B1

~~A diesel generator shall be considered to be inoperable from the time of failure until it satisfies the requirements of Surveillance Requirements 4.8.1.1.2a.4) and 4.8.1.1.2a.5).~~ B5

~~This test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status. The provisions of Specification 3.0.2 are not applicable.~~

Insert #2 B2

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Insert #1:

or verifying within 8 hours that no potential common mode failure for the remaining diesel exists;

Insert #2:

- * This action is not required if the inoperability of the diesel was due to an inoperable support system, an independently testable component, or preplanned testing or maintenance. If required, this action is to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status. The provisions of Specification 3.0.2 are not applicable.

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION

ACTION: (Continued)

generator restored to OPERABLE status, follow action statement a; with the offsite circuit restored to OPERABLE status, follow action statement d.

- c. With one diesel generator inoperable in addition to ACTION b. or d. ~~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 with a steam pressure greater than 900 psig, 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.

- d. With a diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter; ~~and unless the inoperability of the diesel was due to preplanned testing or maintenance, demonstrate the OPERABILITY of the remaining diesel generator by performing Surveillance Requirements 4.8.1.1.2a.4) and 4.8.1.1.2a.5) within 24 hours or unless the diesel is operating, restore 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.~~

ca

*

ca

Insert #3

c3

c1

- e. With two of the above required offsite A.C. circuits inoperable, ~~separately demonstrate the OPERABILITY of two diesel generators by performing Surveillance Requirements 4.8.1.1.2a.4) and 4.8.1.1.2a.5) 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 and in COLD SHUTDOWN within the following 30 hours. With only one offsite source restored, follow action statement a.~~
- f. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1a. within 1 hour and at least once

d1

~~A diesel generator shall be considered to be inoperable from the time of failure until it satisfies the requirements of Surveillance Requirements 4.8.1.1.2a.4) and 4.8.1.1.2a.5)~~

c5 e1

~~*This test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status. The provisions of Specification 9.0.2 are not applicable.~~

Insert #4 ca

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Insert #3:

or verifying within 24 hours that no potential common mode failure for the remaining diesel exists;

Insert #4:

- * This action is not required if the inoperability of the diesel was due to an inoperable support system, an independently testable component, or preplanned testing or maintenance. If required, this action is to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status. The provisions of Specification 3.0.2 are not applicable.

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION

ACTION: (Continued)

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. With one diesel generator restored, follow action statement d.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 of the above required independent circuits between the offsite transmission network and the onsite Essential Auxiliary Power 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 shall be demonstrated OPERABLE:



- a. ~~In accordance with the frequency specified in Table 4.8.1~~ *At least once per 31 days* on a STAGGERED TEST BASIS, by:

- 1) Verifying the fuel level in the day tank,

ELECTRICAL POWER SYSTEMS
SURVEILLANCE REQUIREMENTS (Continued)

- 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 488 rpm in less than or equal to 11 seconds*~~. The generator voltage and frequency shall be ~~at least 4160 volts and 57 Hz within 11 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-offsite power by itself, or
 - c) Simulated loss-of-offsite power in conjunction with an ESF Actuation test signal, or
 - d) An ESF Actuation test signal by itself.
- 5) Verifying the generator is synchronized, ~~loaded to greater than or equal to 3000 kW in less than or equal to 60 seconds, and to 4000 kW within 10 minutes and operates for at least 60 minutes and~~
- 6) Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.

b. By removing accumulated water:

- 1) From the day tank at least once per 31 days and after each occasion when the diesel is operated for greater than 1 hour, and
- 2) From the storage tank at least once per 31 days.

c. ~~By sampling new fuel oil in accordance with ASTM D4057-81 prior to addition to the 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 60/60°F, when compared to the supplier's certificate or an absolute specific gravity at 60/60°F of greater than or equal to 0.83 but less than or equal to 0.89 or an API gravity at 60°F of greater than or equal to 27 degrees but less than or equal to 39 degrees.

~~The diesel generator start (11 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.~~

Insert #6 G4

McGUIRE - UNITS 1 and 2

3/4 8-3

Amendment No. 1 (Unit 1)
 Amendment No. 2 (Unit 2)

Insert #7

H3 H1

G4

**

G2

Standby (Pre-lube)

G1

Insert #5

G3

H1

at 3600 - 4000 kW ***

H2

I1

Insert #7a

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Insert #5:

maintains the steady-state generator voltage and frequency at 4160 ± 420 volts and 60 ± 1.2 Hz, respectively.

Insert #6:

** Once per 184 days, start the engine from standby (prelube) condition, and verify generator reaches ≥ 3740 volts and ≥ 57 Hz in 11 seconds.

Insert #7:

*** Diesel generator loadings may be done in accordance with the manufacturer's recommendations. The purpose of the load range is to prevent overloading the engine, and momentary excursions outside of the load range shall not invalidate the test.

Insert #7a:

By sampling and testing new fuel oil in accordance with the Diesel Fuel Oil Testing Program prior to addition to the storage tanks.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 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 (alternatively, Saybolt viscosity, SUS at 100°F of greater than or equal to 32.6, but less than or equal to 40.1), if 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 31 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.

J1
Insert #78

d. ~~At least once every 31 days by obtaining a sample of fuel oil from the storage tanks 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.~~

- e. At least once per 18 months, by:
- 1) Subjecting the diesel to an inspection, during shutdown, in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service;
 - 2) Verifying, during shutdown, the generator capability to reject a load of greater than or equal to 576 kW while maintaining voltage at 4160 ± 420 volts and frequency at 60 ± 1.2 Hz;
 - 3) Verifying, during shutdown, the generator capability to reject a load of ~~4000 kW~~ without tripping. The generator voltage shall not exceed 4784 volts during and following the load rejection;
 - 4) Simulating a loss-of-offsite power by itself, during shutdown, and:
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses, and
 - b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 11 seconds, energizes the auto-connected blackout loads through the load sequencer and operates for greater than or equal to 5 minutes while the generator is loaded with the blackout loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test.

≥ 3600 kW and
 ≤ 4000 kW
L2

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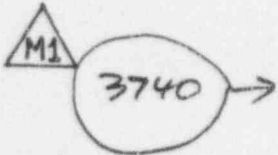
Insert #7b:

At least once every 31 days by sampling and testing fuel oil from the storage tanks in accordance with the Diesel Fuel Oil Testing Program.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

5) Verifying that on an ESF actuation test signal, without loss-of-offsite power, the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be at least ~~4160~~ volts and 57 Hz within 11 seconds after the auto-start signal; the steady-state generator voltage and frequency shall be maintained within 4160 ± 420 volts and 60 ± 1.2 Hz during this test;



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

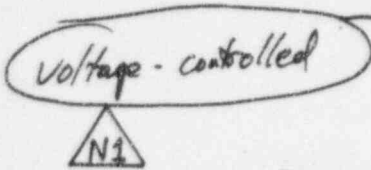
a) Verifying, during shutdown, deenergization of the emergency busses and load shedding from the emergency busses:

b) Verifying, during shutdown, the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 11 seconds, energizes the auto-connected emergency (accident) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test; and

SEE PAGE 8-6



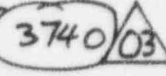
c) Verifying, during shutdown, that all automatic diesel generator trips, except engine overspeed, lube oil pressure, generator time-overcurrent, and generator differential are automatically bypassed upon loss of voltage on the emergency bus concurrent with a Safety Injection Actuation signal.



7) [Deleted, Left Blank]

8) Verifying, during shutdown, the diesel generator operates for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded between 4200 kW and 4400 kW and during the remaining 22 hours of this test, the diesel generator shall be loaded between ~~3800~~ kW and 4000 kW. The generator voltage and frequency shall be at least ~~4160~~ volts and 57 Hz within 11 seconds after the start signal. The steady-state generator voltage and frequency shall be maintained within 4160 ± 420 volts and 60 ± 1.2 Hz during this test. Within 5 minutes of shutting down the diesel generator, restart the diesel generator and verify that the generator voltage and frequency reaches at least ~~4160~~ volts and 57 Hz within 11 seconds.





ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 9) ~~Verifying that the auto-connected loads to each diesel generator do not exceed the 2-hour rating of 4400 kW;~~
- 10) Verifying, during shutdown, 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, during shutdown, 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;
- 12) 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;
- 13) Verifying that the automatic load sequence timer is OPERABLE with the interval between each load block are within the tolerances shown in Table 4.8-2;
- 14) Verifying, during shutdown, that the following diesel generator lockout features prevent diesel generator starting only when required:
 - a) Turning gear engaged, or
 - b) Emergency stop.
- 15) Verifying, during shutdown, that with all diesel generator air start receiver ~~pressurized to less than or equal to 220 psig~~ and the compressors secured, the diesel generator starts at least 2 times from ~~ambient~~ conditions and accelerates to at least 488 rpm in less than or equal to 11 seconds.

(Deleted)
P1

Q3
Standby (prelub)
Q5 57 Hz

Q1
Q4
at least one
210
Q2

This Surveillance Requirement may be performed in conjunction with periodic preplanned preventative maintenance activity that causes the diesel generator to be inoperable provided that performance of the surveillance requirement does not increase the time the diesel generator would be inoperable for the PM activity alone.

*** Diesel generator loadings the manufacturer's for the purpose of this surveillance may be in accordance with ~~vendor~~ recommendations. The purpose of the load range is to prevent overloading the engine and momentary excursions outside of the range shall not invalidate the test. done

~~***If there is a test failure during the 24-hour test run, the hot restart test can be performed prior to completing the 24-hour test provided the diesel generator had operated for at least 2 hours loaded between 3800 and 4000 kW.***~~

Insert # 8 Q2

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Insert #8:

If the hot restart is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead, the diesel generator may be operated at 3600 - 4000 kW *** for 2 hours or until operating temperature has stabilized.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

f. 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 ~~488 rpm~~ in less than or equal to 11 seconds; and

57Hz

g. At least once per 10 years by:

R1

- 1) Draining each fuel oil storage tank, removing the accumulated sediment and cleaning the tank using a sodium hypochlorite solution, and
- 2) Performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection ND of the ASME Code at a test pressure equal to 110% of the system design pressure.

(Not used) U1

~~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 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.~~

4.8.1.1.4 Diesel Generator Batteries - Each diesel generator 125-volt battery bank and charger shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that:

- 1) The electrolyte level of each battery is above the plates, and
- 2) The overall battery voltage is greater than or equal to 125 volts under a float charge.

b. At least once per 18 months by verifying that:

- 1) The batteries, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration;
- 2) The battery-to-battery and terminal connections are clear, tight, free of corrosion and coated with anti-corrosion material; and
- 3) The battery capacity is adequate to supply and maintain in OPERABLE status its emergency loads when subjected to a battery service test.

TABLE 4.8-1

DIESEL GENERATOR TEST SCHEDULE

<u>NUMBER OF FAILURES IN LAST 20 VALID TESTS*</u>	<u>NUMBER OF FAILURES IN LAST 100 VALID TESTS*</u>	<u>TEST FREQUENCY</u>
<u>≤ 1</u>	<u>≤ 4</u>	Once per 31 days
<u>> 2**</u>	<u>≥ 5</u>	Once per 7 days

\triangle
F₂

(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, but determined on a per diesel generator basis.

For the purposes of determining the required test frequency, the previous test failure count may be reduced to zero if a complete diesel overhaul to like-new conditions is completed, provided that the overhaul including appropriate post-maintenance operation and testing, is specifically approved by the manufacturer and if acceptable reliability has been demonstrated. The reliability criterion shall be the successful completion of 14 consecutive tests in a single series. Ten of these tests shall be in accordance with the routine surveillance requirements of Specifications 4.8.1.1.2.a.4 and 4.8.1.1.2.a.5; the remaining four tests in accordance with the 184-day requirements specified in the footnote to Specification 4.8.1.1.2.a.4 and Specification 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 transvalue the failure count to zero requires NRC approval.

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

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 Essential Auxiliary Power System, and
- b. One diesel generator with:
 - 1) A day tank containing a minimum volume of 120 gallons of fuel,
 - 2) A Fuel Storage System containing a minimum volume of 28,000 gallons of fuel, and
 - 3) A fuel transfer pump.

APPLICABILITY: MODES 5 and 6.

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, movement of irradiated fuel, or crane operation with loads over the fuel storage pool, and within 8 hours, depressurize and vent the Reactor Coolant System through a greater than or equal to 4.5 square inch vent. In addition, when in MODE 5 with the reactor coolant loops not filled, or in MODE 6 with the water level less than 23 feet above the reactor vessel flange, immediately initiate corrective action to restore the required sources to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the requirements of Specifications 4.8.1.1.1, 4.8.1.1.2 (except for Specification 4.8.1.1.2a.5), ~~4.8.1.1.3~~, and 4.8.1.1.4.



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
BASES

3/4.8.1, 3/4.8.2 AND 3/4.8.3 A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS

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

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the safety analyses and are based upon maintaining at least one redundant set of onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss-of-offsite power and single failure of the other onsite A.C. source. The A.C. and D.C. source allowable out-of-service times are based on Regulatory Guide 1.93, "Availability of Electrical Power Sources", December 1974. When one diesel generator is inoperable, there is an additional ACTION requirement to verify that all required systems, subsystems, trains, components and devices, that depend on the remaining OPERABLE diesel generator as a source of emergency power, are also OPERABLE, and that the steam-driven auxiliary feedwater pump is OPERABLE. This requirement is intended to provide assurance that a loss-of-offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term verify as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the Surveillance Requirements needed to demonstrate the OPERABILITY of the component. ~~The ACTION requirements for diesel generator testing in the event of the inoperability of other electric power sources also reflect the potential for degradation of the diesel generator due to excessive testing. This concern has developed, concurrently with increased industry experience with diesel generators, and has been acknowledged by the NRC staff in Generic Letter 84-15.~~

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; also, Generic Letter 84-15, which modified the testing frequencies specified in Regulatory Guide 1.108; ~~←~~ Insert #9 

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Insert #9:


Generic Letter 93-05, which reduced the surveillance requirements for testing of Diesel Generators during power operation; also, Generic Letter 94-01, which removed the accelerated testing and special reporting requirements for Emergency Diesel Generators.

ELECTRICAL POWER SYSTEMS

BASES

Some of the Surveillance Requirements for demonstrating the operability of the diesel generators are modified by a footnote. The Specifications state the Surveillance Requirements are to be performed during shutdown, with the unit in mode 3 or higher. The footnote allows the particular surveillance to be performed during preplanned Preventative Maintenance (PM) activities that would result in the diesel generator being inoperable. The surveillance can be performed at that time as long as it does not increase the time the diesel generator is inoperable for the PM activity that is being performed. The footnote is only applicable at that time. The provision of the footnote shall not be utilized for operational convenience.

Insert #10 

Insert #11 

Insert #10:

The purpose of surveillance requirement 4.8.1.1.2.e.15) is to verify that each diesel can start twice off of its available air supply without recharging. This surveillance may be met using either both starting air receiver tanks simultaneously or one tank at a time independently. Although both air receiver tanks are normally available, a single starting air receiver tank may be removed from service for maintenance or testing purposes without making the diesel INOPERABLE provided the starting air receiver tank left in service successfully met the two start requirement during its previous surveillance. If a starting air receiver tank did not meet the two start surveillance, then the diesel is INOPERABLE if that tank pressure drops below that required to meet the surveillance.

Insert #11:

Since the McGuire emergency diesel generator manufacturer (Nordberg) is no longer in business, McGuire engineering is the designer of record. Therefore, the term "manufacturer's (or vendor) recommendations" is taken to mean recommendations as determined by McGuire engineering (with specific industry Nordberg input as available) that were intended for nuclear class diesel service taking into account McGuire diesel generator maintenance and operating history and industry experience where applicable.

ADMINISTRATIVE CONTROLS

PROCEDURES AND PROGRAMS (Continued)

toring program and modeling of environmental exposure pathways. The program shall (1) be contained in FSAR Chapter 16, (2) conform to the guidance of Appendix I to 10 CFR Part 50, and (3) include the following:

- 1) Monitoring, sampling, analysis, and reporting of radiation and radionuclides in the environment in accordance with the methodology and parameters in the ODCM,
- 2) A Land Use Census to ensure that changes in the use of areas at and beyond the SITE BOUNDARY are identified and that modifications to the monitoring program are made if required by the results of this census, and
- 3) Participation in an Interlaboratory Comparison Program to ensure that independent checks on the precision and accuracy of the measurements of radioactive materials in environmental sample matrices are performed as part of the quality assurance program for environmental monitoring.

6.9 REPORTING REQUIREMENTS

ROUTINE REPORTS

6.9.1 In addition to the applicable reporting requirements of Title 10, Code of Federal Regulations, the following reports shall be submitted to the Regional Administrator of the NRC Regional Office unless otherwise noted.

STARTUP REPORT

6.9.1.1 A summary report of plant STARTUP and power escalation testing shall be submitted following: (1) receipt of an Operating License, (2) amendment to the License involving a planned increase in power level, (3) installation of fuel that has a different design or has been manufactured by a different fuel supplier, and (4) modifications that may have significantly altered the nuclear, thermal, or hydraulic performance of the plant.

Insert #12

X1

Insert #12:

h. Diesel Fuel Oil Testing

A program shall be established to implement required testing of number 2 diesel fuel oil. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM Standards. The purpose of the program is to establish the following:

- a. Acceptability of new fuel oil for use, prior to addition to storage tanks, by determining that the fuel oil has:
 1. an API gravity or an absolute specific gravity within specified limits,
 2. a flash point and kinematic viscosity within specified limits, and
 3. a clear and bright appearance with proper color;
- b. Other properties per the applicable ASTM Standards for number 2 diesel fuel oil are within limits, within 30 days following sampling and addition to storage tanks.
- c. Total particulate concentration of the fuel oil is ≤ 10 mg/liter when tested every 31 days in accordance with the applicable ASTM Standards.

ATTACHMENT 2b

PROPOSED TS CHANGES FOR CATAWBA

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December 14, 1995

Attachment 2b

NOTE: On the marked-up TS pages, the numbers in the triangular boxes correspond to the numbering system used in Attachment 3, "Technical Justification."

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

<u>SECTION</u>	<u>PAGE</u>
3/4.7.11 (DELETED)	
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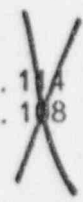
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3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

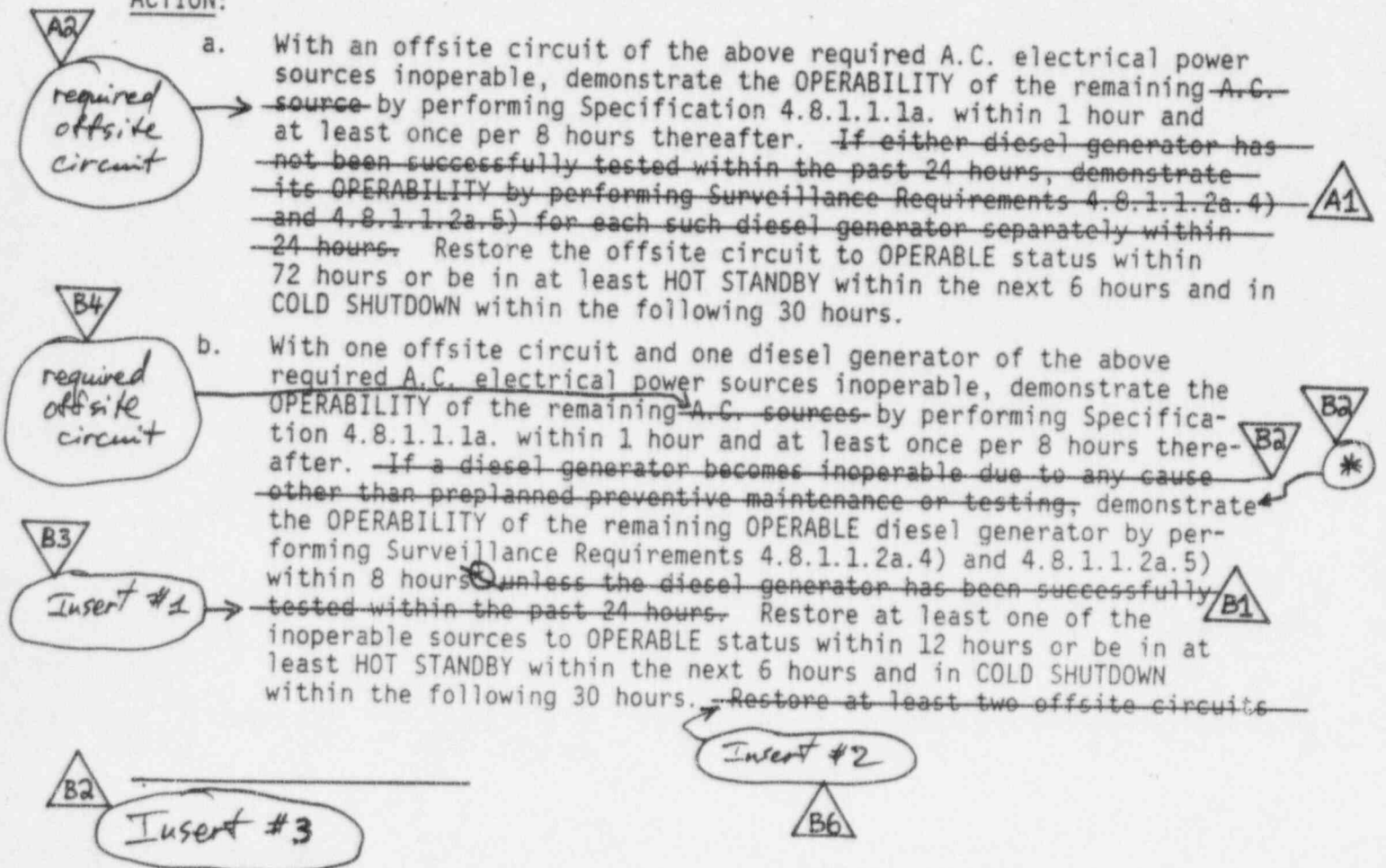
LIMITING CONDITION FOR OPERATION

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 Essential Auxiliary Power System, and
- b. Two separate and independent diesel generators, each with:
 - 1) A separate day tank containing a minimum volume of 470 gallons of fuel,
 - 2) A separate Fuel Storage System containing a minimum volume of 77,100 gallons of fuel,
 - 3) A separate fuel transfer valve, and
 - 4) A separate 125 VDC battery and charger connected to the diesel generator control loads.

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

ACTION:



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Insert #1:

or verifying within 8 hours that no potential common mode failure for the remaining diesel exists;

Insert #2:

with the diesel generator restored to OPERABLE status, follow ACTION a; with the offsite circuit restored to OPERABLE status, follow ACTION d.

Insert #3:

- * This action is not required if the inoperability of the diesel was due to an inoperable support system, an independently testable component, or preplanned testing or maintenance. If required, this action is to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status. The provisions of Specification 3.0.2 are not applicable.

ELECTRICAL POWER SYSTEMS
LIMITING CONDITION FOR OPERATION

ACTION (Continued)

~~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.~~

d.e.

With a diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter; ~~and unless the inoperability of the diesel was due to preplanned testing or maintenance, demonstrate the operability of the remaining diesel generator by performing Surveillance Requirements 4.8.1.1.2a.4 and 4.8.1.1.2a.5 within 24 hours;~~ restore 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.

With one diesel generator inoperable in addition to ACTION b. (if applicable) 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 with a steam pressure greater than 900 psig, 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.d.

With both of the above required offsite A.C. circuits inoperable, ~~demonstrate the OPERABILITY of both diesel generators by performing Specification 4.8.1.1.2a.4) and 4.8.1.1.2a.5) separately for each diesel generator 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. A successful test(s) of diesel generator OPERABILITY per Surveillance Requirements 4.8.1.1.2a.4) and 4.8.1.1.2a.5) performed under this ACTION statement for the OPERABLE diesel generators satisfies the diesel generator test requirements of ACTION statement a.

f.e.

With both 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

~~This test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY. The provisions of Specification 3.02 are not applicable.~~

Insert #6

C2

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December 14, 1995

Attachment 2b

Insert #4:

or verifying within 24 hours that no potential common mode failure for the remaining diesel exists;

Insert #5:

and in COLD SHUTDOWN within the following 30 hours. With only one offsite source restored, follow ACTION a.

Insert #6:

- * This action is not required if the inoperability of the diesel was due to an inoperable support system, an independently testable component, or preplanned testing or maintenance. If required, this action is to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status. The provisions of Specification 3.0.2 are not applicable.

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION

E2
Insert #7

the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore both 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.

g.r.
h.g.

With a diesel generator operating at greater than 5750 kW, within 1 hour reduce the diesel generator output to less than or equal to 5750 kW.

With the Cathodic Protection System inoperable, restore the System to OPERABLE status within 10 days or prepare and submit a Special Report pursuant to Specification 6.9.2 outlining the cause of the inoperability and the plans for restoring the System to OPERABLE.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the Onsite Essential Auxiliary Power System shall be:

- a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments, indicated power availability, and
- b. Demonstrated OPERABLE at least once per 18 months by transferring (manually and automatically) unit power supply from the normal circuit to the alternate circuit.

F1

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

a. ^{at least once per 31 days} ~~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 valve can be operated to allow fuel to be transferred from the storage system to the day tank,
- 4) Verifying the diesel starts from ~~ambient condition and accelerates~~ ^{standby (prelubed)} to at least 441 rpm in less than or equal to 11 seconds. ~~The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± 1.2 Hz within 11 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 offsite power by itself, or

G4
**
Insert # 8
G2

G1
G2

~~The diesel generator start (11 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.~~

~~**STAGGERED TEST BASIS is only applicable when both diesel generators are on the same test frequency.~~ F3

Insert # 9 G4

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Attachment 2b

Insert #7:

With one diesel generator restored, follow ACTION d.

Insert #8:

maintains the steady-state generator voltage and frequency at 4160 ± 420 volts and 60 ± 1.2 Hz, respectively.

Insert #9:

** Once per 184 days, start the engine from standby (prelube) condition, and verify generator reaches ≥ 3740 volts and ≥ 57 Hz in ≤ 11 seconds.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- c) Simulated loss of offsite power in conjunction with an ESF Actuation test signal, or
 - d) An ESF Actuation test signal by itself.
 - 5) Verifying the generator is synchronized, loaded ~~to greater than or equal to 5600 kW but less than or equal to 5750 kW in less than or equal to 60 seconds,~~ and operates for at least 60 minutes, H1
at 5600 - 5750 kW***
 - 6) Verifying the diesel generator is aligned to provide standby power to the associated emergency busses. H2
- 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 tank;
- c. At least once per 31 days by checking for and removing accumulated water from the fuel oil storage tanks;
- d. By verifying that the Cathodic Protection System is OPERABLE by verifying:
- 1) At least once per 60 days that cathodic protection rectifiers are OPERABLE and have been inspected in accordance with the manufacturer's inspection procedures, and
 - 2) At least once per 12 months that adequate protection from corrosion is provided in accordance with manufacturer's inspection procedures.

e. ~~By sampling new fuel oil in accordance with ASTM-D4057 prior to addition to storage tanks and:~~

Insert #9a
I1

- 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 60/60°F, when compared to the supplier's certificate, or an absolute specific gravity at 60/60°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 (alternatively, Saybolt viscosity, SUS at 100°F of greater than or equal to 32.6, but less than or equal to 40.1), if 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~~

CATAWBA - UNITS 1 & 2
Insert #10 H3 H1

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Attachment 2b

Insert #9a:

By sampling and testing new fuel oil in accordance with the Diesel Fuel Oil Testing Program prior to addition to the storage tanks.

Insert #10:

*** Diesel generator loadings may be done in accordance with the manufacturer's recommendations. The purpose of the load range is to prevent overloading the engine, and momentary excursions outside of the load range shall not invalidate the test.

ELECTRICAL POWER SYSTEMS
SURVEILLANCE REQUIREMENTS (Continued)

~~analysis for sulfur may be performed in accordance with
ASTM-D1552-79 or ASTM-D2622-82~~

f. ~~At least once every 31 days by obtaining a sample of fuel oil 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;~~

Insert #10a

g. At least once per 18 months by:

- 1) Subjecting the diesel to an inspection, during shutdown, 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 825 kW while maintaining voltage at 4160 ± 420 volts and frequency at 60 ± 1.2 Hz;
- 3) Verifying the generator capability to reject a load of greater than or equal to 5600 kW but less than or equal to 5750 kW without tripping. The generator speed shall not exceed 500 rpm during and following the load rejection;
- 4) Simulating a loss-of-offsite power by itself, ~~and~~ during shutdown, and:
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses, and
 - b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 11 seconds, energizes the auto-connected emergency (accident) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test.
- 5) Verifying that on an ESF Actuation test signal, without loss-of-offsite power, the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be at 4160 ± 420 volts and 60 ± 1.2 Hz within 11 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 ESF Actuation test signal, during shutdown, and

S1

~~**This surveillance need not be performed until prior to entering HOT SHUTDOWN following the Unit 1 first refueling.
***This surveillance need not be performed on Unit 2 until prior to entering HOT SHUTDOWN following the Unit 2 first refueling~~

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December 14, 1995

Attachment 2b

Insert #10a:

At least once every 31 days by sampling and testing fuel oil from the storage tanks in accordance with the Diesel Fuel Oil Testing Program.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- a) Verifying deenergization of the emergency busses and load shedding from the emergency busses;
 - b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 11 seconds, energizes the auto-connected emergency (accident) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test;
 - c) Verifying that all automatic diesel generator trips, except engine overspeed, low-low lube oil pressure, generator differential, and the 2 out of 3 voltage controlled overcurrent relay scheme, are automatically bypassed upon loss of voltage on the emergency bus concurrent with a Safety Injection Actuation signal.
- 7) Verifying, during shutdown, the diesel generator operates for at least 24 hours. The diesel generator shall be loaded to greater than or equal to 5600 kW but less than or equal to 5750 kW. The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± 1.2 Hz within 11 seconds after the start signal; the steady-state generator voltage and frequency shall be maintained within these limits during this test.
- 8) ~~Verifying, during shutdown, that the auto-connected loads to each diesel generator do not exceed 5750 kW;~~
- 9) Verifying, during shutdown, 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, during shutdown, 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;

P1
(Deleted)

S1

~~**This surveillance need not be performed until prior to entering HOT SHUTDOWN following the Unit 1 first refueling.~~

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 11) Verifying that the fuel transfer valve 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 load sequence timer is OPERABLE with the interval between each load block within the tolerances given in Table 4.8-2;
 - 13) Verifying that the voltage and diesel speed tolerances for the accelerated sequencer permissives are $92.5 \pm 1\%$ and $98 \pm 1\%$, respectively, with a time delay of 2 ± 0.2 s;
 - 14) Verifying that the following diesel generator lockout features prevent diesel generator starting only when required:
 - a) Turning gear engaged, or
 - b) Maintenance mode; and
 - 15) Operating at greater than or equal to 5600 KW but less than or equal to 5750 KW for one hour or until operating temperature has stabilized. Within 5 minutes after completing this test, ~~perform Specification 4.8.1.1.2g.6)b).~~
- h. 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 441 rpm in less than or equal to 11 seconds; and
- i. 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 or its equivalent, and
 - 2) Performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection ND of the ASME Code at a test pressure equal to 110% of the system design pressure.
 - 3) Performing tank wall thickness measurements. The resulting data shall be evaluated and any abnormal degradation will be justified or corrected. Any abnormal degradation will be documented in a report to the Commission.

Insert # 11
T1

(Not Used)

4.8.1.1.3 Reports - All diesel generator failures, valid or non-valid, shall be reported in a Special Report to the Commission pursuant to Specification 6.9.2 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 of any diesel generator 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.

U1

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December 14, 1995

Attachment 2b

Insert #11:

shutting down the diesel generator, restart the diesel generator and verify that the generator voltage and frequency reaches at least 3740 volts and 57 Hz within 11 seconds.

TABLE 4.8-1

DIESEL GENERATOR TEST SCHEDULE

<u>NUMBER OF FAILURES IN LAST 20 VALID TESTS*</u>	<u>NUMBER OF FAILURES IN LAST 100 VALID TESTS*</u>	<u>TEST FREQUENCY</u>
≤ 1	≤ 4	At least once per 31 days
$> 2^{**}$	≥ 5	At least once per 7 days

F2

(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, but determined on a per diesel generator basis. For purposes of this schedule, only valid tests conducted after the completion of the preoperational test requirements of Regulatory Guide 1.108, Revision 1, August 1977, shall be included in the computation of the "last 20/100 valid tests."

For the purposes of determining the required test frequency, the previous test failure count may be reduced to zero if 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 if acceptable reliability has been demonstrated. The reliability criterion shall be the successful completion of 14 consecutive tests in a single series. Ten of these tests shall be in accordance with the routine Surveillance Requirement 4.8.1.1.2a.4) and 4.8.1.1.2a.5), four tests, in accordance with the 184-day testing requirement of Surveillance Requirements 4.8.1.1.2a.4) and 4.8.1.1.2a.5). If this criterion is not satisfied during the first series of tests, any alternate criterion to be used to transvalue the failure count to zero requires NRC approval.

**The associated test frequency shall be maintained until seven consecutive failure-free demands have been performed and the number of failures in the last 20 valid demands has been reduced to less than or equal to one.

#A one-time waiver to the requirement for performance of a complete diesel generator overhaul to like-new condition has been granted in order to rezero four failures of diesel generator 1A which occurred on April 12, 1988, April 19, 1988, April 25, 1988, and May 5, 1988. These failures resulted from faulty pressure sensors in the diesel generator pneumatic control system.

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 Essential Auxiliary Power System, and
- b. One diesel generator with:
 - 1) A day tank containing a minimum volume of 470 gallons of fuel,
 - 2) A fuel storage system containing a minimum volume of 77,100 gallons of fuel,
 - 3) A fuel transfer valve, and
 - 4) A 125 VDC battery and charger connected to the diesel generator control loads.

APPLICABILITY: MODES 5 and 6.

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, movement of irradiated fuel, or crane operation with loads over the fuel storage pool, and within 8 hours, depressurize and vent the Reactor Coolant System through at least a 4.5 square inch vent. In addition, when in MODE 5 with the Reactor Coolant loops not filled, or in MODE 6 with the water level less than 23 feet above the reactor vessel flange, immediately initiate corrective action to restore the required sources to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the requirements of Specifications 4.8.1.1.1, 4.8.1.1.2 (except for Specification 4.8.1.1.2a.5), ~~4.8.1.1.3~~ and 4.8.1.1.4.



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 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 ACTION requirements for diesel generator testing in the event of the inoperability of other electric power sources also reflect the potential for degradation of the diesel generator due to excessive testing. This concern has developed concurrently with increased industry experience with diesel generators and has been acknowledged by the NRC staff in Generic Letter 84-15.

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 Guide 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, Regulatory Guide 1.137, "Fuel-Oil Systems for Standby Diesel Generators," Revision 1, October 1979, the NRC Staff Evaluation Report concerning the Reliability of Diesel Generators at Catawba, August 14, 1984, and Generic

Regulatory Guide

w1

ELECTRICAL POWER SYSTEMS

BASES

A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION (Continued)

W2
Insert #12
> Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability." If any other metallic structures (building, new or modified piping systems, conduits) are placed in the ground near the Fuel Oil Storage System or if the original system is modified, the adequacy and frequency of inspections for the Cathodic Protection System shall be reevaluated and adjusted in accordance with the manufacturer's recommendations.

The Surveillance Requirements for demonstrating the OPERABILITY of the station batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8-3 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and 0.015 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8-3 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

US NRC
December 14, 1995

Attachment 2b

Insert #12:

Generic Letter 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation," and Generic Letter 94-01, "Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators."

g. Radiological Environmental Monitoring Program (Continued)

- 3) Participation in a Interlaboratory Comparison Program to ensure that independent checks on the precision and accuracy of the measurements of radioactive materials in the environmental sample matrices are performed as part of the quality assurance program for environmental monitoring.

X1

INSERT #13

6.9 REPORTING REQUIREMENTS

ROUTINE REPORTS

6.9.1 In addition to the applicable reporting requirements of Title 10, Code of Federal Regulations, the following reports shall be submitted to NRC in accordance with 10 CFR 50.4.

STARTUP REPORT

6.9.1.1 A summary report of plant startup and power escalation testing shall be submitted following (1) receipt of an Operating License, (2) amendment to the license involving a planned increase in power level, (3) installation of fuel that has a different design or has been manufactured by a different fuel supplier, and (4) modifications that may have significantly altered the nuclear, thermal, or hydraulic performance of the unit.

6.9.1.2 The Startup Report shall address each of the tests identified in the Final Safety Analysis Report and shall include a description of the measured values of the operating conditions or characteristics obtained during the test program and a comparison of these values with design predictions and specifications. Any corrective actions that were required to obtain satisfactory operation shall also be described. Any additional specific details required in license conditions based on other commitments shall be included in this report.

6.9.1.3 Startup Reports shall be submitted within: (1) 90 days following completion of the Startup Test Program, (2) 90 days following resumption or commencement of commercial power operation, or (3) 9 months following initial criticality, whichever is earliest. If the Startup Report does not cover all three events (i.e., initial criticality, completion of Startup Test Program, and resumption or commencement of commercial operation), supplementary reports shall be submitted at least every 3 months until all three events have been completed.

Insert #13:

h. Diesel Fuel Oil Testing

A program shall be established to implement required testing of number 2 diesel fuel oil. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM Standards. The purpose of the program is to establish the following:

- a. Acceptability of new fuel oil for use, prior to addition to storage tanks, by determining that the fuel oil has:
 1. an API gravity or an absolute specific gravity within specified limits,
 2. a flash point and kinematic viscosity within specified limits, and
 3. a clear and bright appearance with proper color;
- b. Other properties per the applicable ASTM Standards for number 2 diesel fuel oil are within limits, within 30 days following sampling and addition to storage tanks.
- c. Total particulate concentration of the fuel oil is ≤ 10 mg/liter when tested every 31 days in accordance with the applicable ASTM Standards.

ATTACHMENT 3

TECHNICAL JUSTIFICATION FOR MCGUIRE AND CATAWBA

BACKGROUND:

TS 3.8.1.1 delineates the requirements for electrical power A.C. sources during Modes 1 through 4. It requires, as a minimum, two physically independent offsite circuits between the offsite transmission network and the onsite Essential Auxiliary Power System, and two separate and independent emergency diesel generators (DGs). The ACTIONS associated with this TS require, among other things, the demonstration of the OPERABILITY of the rest of these A.C. sources when one or more of them becomes inoperable. TS 4.8.1.1.1 delineates the surveillance requirements for the two required offsite circuits, and TS 4.8.1.1.2 delineates the surveillance requirements for the two required DGs. TS 4.8.1.1.3 delineates the reporting requirements for DG failures. TS 3.8.1.2 delineates the requirements for electrical power A.C. sources during Modes 5 and 6; it requires, as a minimum, half of that required during Modes 1 through 4. TS 4.8.1.2 references most of the surveillances in TS 4.8.1.1.1 and TS 4.8.1.1.2.

TS 6.8.4 delineates the programs to be established, implemented and maintained. A program being proposed to be added to this TS is the "Diesel Fuel Oil Testing Program."

In December 1992, the NRC issued NUREG-1366, "Improvements to Technical Specifications Surveillance Requirements." Section 10.1 lists the findings and recommendations concerning DG surveillance requirements. Table 14.1, item 10.1 summarizes the recommended changes for DG surveillance requirements.

In September 1992, the NRC issued NUREG-1431, "Revised Standard Technical Specifications for Westinghouse PWRs," which incorporated the recommendations of NUREG-1366. Sections 3.8.1, 3.8.2 and 3.8.3 of NUREG-1431 deal with technical specifications concerning AC Sources-Operating, AC Sources-Shutdown, and Diesel Fuel Oil/Lube Oil/Starting Air, respectively. Section 5.7.2.17 of NUREG-1431 deals with technical specification concerning Diesel Fuel Oil Testing Program. The NRC has encouraged utilities to pursue adoption of NUREG-1431. Where utilities elect not to adopt the entire NUREG-1431, the NRC has indicated it will allow the adoption of selected sections.

On September 27, 1993, the NRC issued GL 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation." This GL provides guidance to assist licensees in preparing license amendment requests to implement the recommendations of NUREG-1366. GL 93-05 has a precaution that any change to extend a surveillance interval in accordance with NUREG-1366 should not be made if this is not compatible with plant operating experience. Section 10.1 of this GL lists the guidance for TS changes for DG surveillance requirements.

On May 31, 1994, the NRC issued GL 94-01, "Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators." GL 94-01 requires licensees who propose to remove the TS provisions for accelerated DG testing and special reporting to implement within 90 days of the issuance of the license amendment a maintenance program for monitoring and maintaining DG performance consistent with the provisions of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," and the guidance (as applicable to DGs) of RG 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Enclosures 1 and 2 of this GL provide guidance for making this proposal. RG 1.160 endorses a Nuclear Utility Management and Resources Council (NUMARC) guideline, NUMARC 93-01, which gives methods acceptable to the NRC staff for complying with the provisions of 10 CFR 50.65.

TECHNICAL JUSTIFICATION:

NOTE: The following Technical Justification is for both McGuire and Catawba. Where there is a difference between McGuire and Catawba, it is so indicated.

The proposed changes included in this submittal can be grouped into 5 categories: 1/ changes in accordance with GL 93-05, 2/ changes in accordance with GL 94-01, 3/ changes in accordance with NUREG-1431 (more stringent, less stringent), 4/ other technical changes, and 5/ pure administrative changes.

In the following item-by-item proposed revision, each item is annotated (in parenthesis at the end) with a document number to show which of the above categories each proposed change is based on. In the case of GL 93-05, the proposed changes in accordance with itself are also in accordance with NUREG-1366 and NUREG-1431; therefore, only GL 93-05 is mentioned in the annotation.

A/ Proposed Revision to TS 3.8.1.1 Action a:

1. Delete the requirement to test the two diesel generators when one offsite circuit is inoperable. (GL 93-05)
2. Editorial changes due to the deletion of the requirement to test the two diesel generators as stated above. (ADMIN.)

A/ Technical Justification:

1. According to NUREG-1366 and Generic Letter 93-05, the requirement to test the two diesel generators when an offsite circuit is inoperable can be deleted. This is prudent since the inoperability of an offsite circuit does not affect the operability or availability of the diesel generators. NUREG-1431 LCO 3.8.1 Action A does not have this requirement.
2. The above change results in other editorial changes in this section including changing "demonstrate the OPERABILITY of the remaining A.C. sources" to "demonstrate the OPERABILITY of the remaining required offsite circuit", and changing "restore at least two offsite circuits and two diesel generators to OPERABLE status" to "restore the required offsite circuit to OPERABLE status".

A/ 3.8.1.1 Action a Format:

After all proposed changes have been made to Action a, Action a is divided into sub-actions (with no effect on its technical content) as shown on the final TS pages in Attachments 5a and 5b.

B/ Proposed Revision to TS 3.8.1.1 Action b:

1. Delete the provision for not testing the remaining diesel generator if it was tested within the previous 24 hours or is operating. (NUREG-1431, more stringent)
2. Add an allowance for not testing the remaining diesel generator if the inoperability of the other diesel was due to an inoperable support system, an independently testable component, or preplanned testing or maintenance. (GL 93-05)
3. Add an allowance for not testing the remaining diesel generator if it can be verified that no potential common mode failure exists for the remaining diesel. (GL 93-05)
4. Editorial change from "A.C. source" to "required offsite circuit". (ADMIN.)
5. McGuire only: Delete existing footnote * concerning definition of operability/inoperability for diesel generators. (ADMIN.)
6. Catawba only: Replace the last sentence in Action b regarding Mode change requirement with a shorter sentence. (ADMIN.)

B/ Technical Justification:

1. Generic Letter 93-05 and NUREG-1431 LCO 3.8.1 Actions B and D do not reflect this provision. Furthermore, being already tested within the previous 24 hours or is operating does not guarantee that the remaining diesel is precluded from a potential common mode failure; therefore, it is prudent to test the diesel generator again even if it was tested within the previous 24 hours or is operating unless it can be verified that no potential common mode failure for the remaining diesel exists. The probability of having the remaining diesel generator operating when the other diesel generator becomes inoperable is so remote that this provision can be deleted without making any actual difference to Action b; and even if it is operating, the proposed change B/3 (to add an allowance for not requiring the remaining diesel to be tested if the absence of any

- potential common mode failure can be verified) can be used to prevent diesel shutdown and subsequent retest.
2. Generic Letter 93-05 reflects this allowance.
 3. Generic Letter 93-05 and NUREG-1431 LCO 3.8.1 Actions B.3.1 and B.3.2 reflect this allowance.
 4. The "remaining required offsite circuit" is a more accurate term than "remaining A.C. source".
 5. McGuire only: This is purely an administrative change. This footnote is deleted due to the fact that the definition of OPERABILITY is included in TS 1.0. Duke Power has policies to ensure that this TS definition is met. (Catawba does not have this footnote).
 6. Catawba only: This is purely an administrative change in that the two sentences basically say the same thing. The change is also consistent with McGuire's TS 3.8.1.1 Action b.

B/ 3.8.1.1 Action b Format:

After all proposed changes have been made to Action b, Action b is divided into sub-actions (with no effect on its technical content) as shown on the final TS pages in Attachments 5a and 5b.

C/ Proposed Revision to TS 3.8.1.1 Action d (McGuire), 3.8.1.1 Action c (Catawba):

1. McGuire only: Delete the provision for not testing the remaining diesel generator if it is operating. (NUREG-1431, more stringent)
2. Add an allowance for not testing the remaining diesel generator if the inoperability of the other diesel was due to an inoperable support system, an independently testable component, or preplanned testing or maintenance. (GL 93-05)
3. Add an allowance for not testing the remaining diesel generator if it can be verified that no potential common mode failure exists for the remaining diesel. (GL 93-05)
4. (Not used)
5. McGuire only: Delete existing footnote * concerning definition of operability/inoperability for diesel generators. (ADMIN.)

C/ Technical Justification:

1. McGuire only: Generic Letter 93-05 and NUREG-1431 LCO 3.8.1 Actions B and D do not reflect this provision. Furthermore, being operating does not guarantee that the remaining diesel is precluded from a potential common mode failure; therefore, it is prudent to test the diesel generator again even if it is operating unless it can be verified that no potential common mode failure for the remaining diesel exists. The probability of having the remaining diesel generator operating when the other diesel generator becomes inoperable is so remote that this provision can be deleted without making any actual difference to Action b; and even if it is operating, the proposed change D/3 (to add an allowance for not requiring the remaining diesel to be tested if the absence of any potential common mode failure can be verified) can be used to prevent diesel shutdown and subsequent retest.
2. Generic Letter 93-05 reflects this allowance.
3. Generic Letter 93-05 and NUREG-1431 LCO 3.8.1 Actions B.3.1 and B.3.2 reflect this allowance.
4. (Not used)
5. McGuire only: This is purely an administrative change. This footnote is deleted due to the fact that the definition of OPERABILITY is included in TS 1.0. Duke Power has policies to ensure that this TS definition is met. (Catawba does not have this footnote).

C/ 3.8.1.1 Action d (McGuire) and 3.8.1.1 Action c (Catawba)
Format:

McGuire: After all proposed changes have been made to Action d, Action d is divided into sub-actions (with no effect on its technical content) as shown on the final TS pages in Attachment 5a.

Catawba: After all proposed changes have been made to Action c, Action c is divided into Actions c and d similar to McGuire's Actions c and d, and then each new action is divided into sub-actions (with no effect on its technical content) as shown on the final TS pages in Attachment 5b.

D/ Proposed Revision to TS 3.8.1.1 Action e (McGuire), 3.8.1.1 Action d (Catawba):

1. Delete the requirement to test the two diesel generators when the two offsite circuits become inoperable. (GL 93-05)
2. Catawba only: Replace the existing sentence regarding Mode change requirement with a shorter sentence. (ADMIN.)

D/ Technical Justification:

1. According to NUREG-1366 and Generic Letter 93-05, the requirement to test the two diesel generators when two offsite circuits become inoperable can be deleted. This is prudent since the inoperability of two offsite circuits does not affect the operability or availability of the two diesel generators. NUREG-1431 LCO 3.8.1 Action C does not have this requirement.
2. Catawba only: This is purely an administrative change in that the two sentences basically say the same thing. the COLD SHUTDOWN requirement has been unknowingly omitted. This change is consistent with McGuire's TS 3.8.1.1 Action e.

E/ Proposed Revision to TS 3.8.1.1 Action f (McGuire), 3.8.1.1 Action e (Catawba):

1. McGuire only: Delete superscript * referring to the footnote * concerning the definition of operability/inoperability for the diesel generators. (ADMIN.)
2. Catawba only: Replace the last sentence regarding Mode change requirement with a shorter sentence. (ADMIN.)

E/ Technical Justification:

1. McGuire only: This is purely an administrative change to be consistent with proposed change C/5 above. Duke Power has policies to ensure that this definition is met.
2. Catawba only: This is purely an administrative change in that the two sentences basically say the same thing. This change is also consistent with McGuire's TS 3.8.1.1 Action f.

E/ 3.8.1.1 Action f (McGuire) and 3.8.1.1 Action e (Catawba)
Format:

McGuire: After all proposed changes have been made to Action f, Action f is divided into sub-actions (with no effect on its technical content) as shown on the final TS pages in Attachment 5a.

Catawba: Action e is divided into sub-actions (with no effect on its technical content) as shown as Action f on the final TS pages in Attachment 5b.

F/ Proposed Revision to TS 4.8.1.1.2.a:

1. Change the testing frequency for the diesel generators from the accelerated testing frequency specified in Table 4.8-1 to "At least once per 31 days". (GL 94-01)
2. Put a note in Table 4.8-1 that it is "Not Used". (GL 94-01)
3. Catawba only: Delete superscript ** and associated footnote ** concerning the explanation of STAGGERED TEST BASIS. (ADMIN.)

F/ Technical Justification:

1. Generic Letter 94-01 reflects this allowance with a condition that a maintenance program for monitoring and maintaining diesel generator performance consistent with the provisions of 10 CFR 50.65 and the guidance of RG 1.160 and NUMARC 93-01 (Maintenance Rule) be implemented within 90 days of the issuance of these license amendments. These maintenance programs are planned to be implemented at McGuire and Catawba at the beginning of 1996, prior to issuance of this amendment.
2. Generic Letter 94-01 reflects this note.
3. Catawba only: With the proposed change F/1 above, this footnote is no longer needed.

G/ Proposed Revision to TS 4.8.1.1.2.a.4:

1. Clarify the term "ambient" to be "standby (prelube)". (ADMIN.)
2. Modify this surveillance to allow a slow start from standby (prelube) condition every 31 days. Modification includes deleting "accelerates to at least ... rpm in \leq 11 seconds *", and changing "The generator voltage and frequency shall

be ... within 11 seconds after the start signal" to "and maintains the steady state generator voltage and frequency at..." (NUREG-1431, less stringent)

3. McGuire only: Change the minimum voltage and frequency to be verified in this surveillance from "4160 volts" and "57 Hz" to a steady-state voltage and frequency ranges of "4160 ± 420 volts" and "60 ± 1.2 Hz". (Catawba already used these proposed ranges). (NUREG-1431, less stringent)
4. Modify footnote * to allow a fast start from standby (prelube) condition for the diesel generator every 184 days which requires that the generator voltage and frequency be ≥ 3740 volts and ≥ 57 Hz within 11 seconds. (ADMIN.)

G/ Technical Justification:

1. The diesel engines at McGuire and Catawba are normally in "standby (prelube)" condition. Diesel engine lube oil and jacket water are warm and circulating.
2. Fast starts (start and maximum acceleration to synchronous speed at full fuel rack position) have the potential to accelerate the degradation of the diesel generators. NUREG-1431 SR 3.8.1.2 reflects the 31-day slow start (more gradual acceleration to synchronous speed) provision. NUREG-1431 SR 3.8.1.2 NOTE 1 states that a fast start, SR 3.8.1.7 (every 184 days), can be used to satisfy the proposed monthly test requirement.
3. NUREG-1431 SR 3.8.1.2 reflects these proposed ranges. The ranges, as opposed to minimum values, are more appropriate for steady state condition. This change is consistent with change G/2 and other surveillances where steady state voltage and frequency are verified.
4. This is purely an administrative change. The intent of the current footnote is not changed. The content of the current footnote is modified to match NUREG-1431 SR 3.8.1.7.

H/ Proposed Revision to TS 4.8.1.1.2.a.5:

1. Replace fast loading of the diesel generators by loading "in accordance with the manufacturer's recommendations". (GL 93-05)
2. Change the loading range from "3000-4000 kW" to "3600-4000 kW" for McGuire. (Catawba's current 5600-5750 kW range is correct). (NUREG-1431, less stringent)

3. Add footnote *** to allow for loading "in accordance with the manufacturer's recommendations" and "momentary excursions outside of the required load range without invalidating the test." (NUREG-1431, less stringent)

H/ Technical Justification:

1. NUREG-1366 states that fast loading (zero to full load in 120 seconds or less) during surveillance testing is the most significant cause of accelerated degradation of diesel generators. NUREG-1366 recommends that the loading of diesel generators be in accordance with the manufacturer's recommendations, except for the refueling outage loss of offsite power (LOOP) tests, which can be 30 minutes or more to reach full load. Generic Letter 93-05 and NUREG-1431 SR 3.8.1.3 NOTE 1 reflect this proposed change.
2. NUREG-1431 SR 3.8.1.3 reflects the 90-100% of the maximum load range. Allowing a load range will prevent testing the diesel generator in an overloaded condition as is currently required at McGuire to maintain 4000 kW.
3. NUREG-1431 SR 3.8.1.3 NOTE 2 reflects this footnote.

I/ Proposed Revision to TS 4.8.1.1.2.c (McGuire), 4.8.1.1.2.e (Catawba):

1. Relocate the properties to be tested for new fuel oil to proposed TS 6.8.4.h, "Diesel Fuel Oil Testing" program. The limits of the properties (test acceptance criteria) will be detailed in a licensee-controlled Diesel Fuel Oil Testing program. (NUREG-1431, less stringent)

I/ Technical Justification:

1. This relocation streamlines the Surveillance Requirement by relocating its lengthy description of the new fuel oil surveillance requirements to the Diesel Fuel Oil Testing Program (similar to NUREG-1431 SR 3.8.3.3). The proposed TS 6.8.4.h is similar to TS 5.7.2.17 of NUREG-1431.

J/ Proposed Revision to TS 4.8.1.1.2.d (McGuire), 4.8.1.1.2.f (Catawba):

1. Relocate the property and limit to be tested for stored fuel oil to proposed TS 6.8.4.h, "Diesel Fuel Oil Testing" program. (NUREG-1431, less stringent.)

J/ Technical Justification:

1. Similar to proposed change I/1, this relocation streamlines the Surveillance Requirement for stored fuel oil by relocating the property and limit to the Diesel Fuel Oil Testing Program (NUREG-1431 SR 3.8.3.3). The proposed TS 6.8.4.h is similar to TS 5.7.2.17 of NUREG-1431.

K/ (Not used)

L/ Proposed Revision to TS 4.8.1.1.2.e.3 (McGuire):

1. (Not used)
2. Change the load from "4000 kW" to " ≥ 3600 kW and ≤ 4000 kW". (Catawba currently has ≥ 5600 kW and ≤ 5750 kW). (NUREG-1431, less stringent)

L/ Technical Justification:

1. (Not used)
2. NUREG-1431 SR 3.8.1.10 reflects a range of 90% - 100% of the maximum load. This proposed change is consistent between Catawba and McGuire.

M/ Proposed Revision to TS 4.8.1.1.2.e.5 (McGuire):

1. Change the minimum voltage from "4160 volts" to "3740 volts". (NUREG-1431, less stringent)

M/ Technical Justification:

1. The minimum voltage, as opposed to the nominal voltage, is verified whenever fast loading (within 11 seconds) is verified. The "3740 volts" minimum value is used in NUREG-1431.

N/ Proposed Revision to TS 4.8.1.1.2.e.6.c (McGuire):

1. Change "generator time overcurrent" to "generator voltage-controlled overcurrent". (ADMIN.)

N/ Technical Justification:

1. This is purely an administrative change. A Self-Initiated Technical Audit of the Electrical Distribution Systems at McGuire identified this editorial error. Catawba's 4.8.1.1.2.g.6.c includes the correct "voltage-controlled" term.

O/ Proposed Revision to TS 4.8.1.1.2.e.8 (McGuire):

1. Change the minimum loading requirement from "3800 kW" to "3600 kW". (NUREG-1431, less stringent)
2. Revise footnote *** to become footnote ## concerning the hot restart test of the diesel to match with the footnote contained in GL 93-05. Both the old and proposed footnotes specify that the diesel hot restart test can be performed even before the 24-hour diesel run is completed provided that the diesel has been run for at least 2 hours or its operating temperature has stabilized. (GL 93-05)
3. Change the minimum voltage to be verified from "4160 volts" to "3740 volts". (NUREG-1431, less stringent)

O/ Technical Justification:

1. This change is consistent with the 90% limit utilized in NUREG-1431 (SR 3.8.1.3, etc.) and other surveillances (McGuire TS 4.8.1.1.2.a.5, etc.).
2. Generic Letter 93-05 reflects the proposed footnote. NUREG-1431 SR 3.8.1.15 reflects a similar note. Not repeating the 24 hour run saves diesel generator wear.
3. This change is consistent with the 90% limit utilized in NUREG-1431 (SR 3.8.1.2, etc.) and other surveillances (McGuire TS 4.8.1.1.2.a.4, etc.).

P/ Proposed Revision to TS 4.8.1.1.2.e.9 (McGuire), 4.8.1.1.2.g.8 (Catawba):

1. Delete this surveillance. (NUREG-1431, less stringent)

P/ Technical Justification:

1. NUREG-1431 Section 3.8.1 does not reflect this surveillance. This surveillance should be deleted because any addition to the DG loads must be an approved modification with a 10CFR 50.59 evaluation which would ensure that the auto-connected

loads to each DG do not exceed the 2-hour rating of 4400 kW (McGuire) and 5750 kW (Catawba).

O/ Proposed Revision to TS 4.8.1.1.2.e.15 (McGuire):

1. Add superscript # to "shutdown" to refer to the footnote # regarding performing this surveillance during DG periodic preplanned preventative maintenance activity. (OTHER)
2. Change maximum starting air receiver test pressure from "220 psig" to "210 psig". (OTHER)
3. Change "ambient" to "standby (prelube)". (ADMIN.)
4. Change the requirement to have "all diesel generator air start receivers pressured" to "at least one air start receiver pressurized". (OTHER)
5. Change "488 rpm" to "57 Hz". (ADMIN.)

O/ Technical Justification:

1. To allow the performance of this surveillance in conjunction with DG periodic preplanned preventative maintenance activity.
2. McGuire's diesel can handle at least two starts with a single air receiver at 210 psig based on testing. The current air receiver low pressure alarm setpoint is 220 psig which provides no warning that the operability limit is being approached; setting it higher than 220 psig would lead to nuisance alarms since the compressor start is set at 225 psig. This proposed change will result in the low pressure alarm setpoint remain at 220 psig and provide 10 psig warning before the diesel generator becomes inoperable.
3. This change is consistent with change G/1.
4. McGuire has two starting air receiver tanks per diesel generator. Testing has proven that each diesel is able to perform at least two starts (accelerating to at least 57 Hz in less than or equal to 11 seconds) off of each of its starting air receiver tanks (pressurized to less than or equal to 210 psig) while the other air receiver tank and both air compressors are isolated. This proposed change allows one starting air receiver tank to be removed from service for maintenance or testing purposes without making the diesel inoperable. These maintenance and testing activities increase the reliability of the starting air system which in turn increases the reliability and

availability of the diesel system. See proposed change W/3 for corresponding change in TS Bases.

5. NUREG-1431 surveillances reflect the frequency in Hz. 488 rpm corresponds to 57 Hz. Existing diesel speed indicator is in Hz.

R/ Proposed Revision to TS 4.8.1.1.2.f (McGuire):

1. Change "488 rpm" to "57 Hz". (ADMIN.)

R/ Technical Justification:

1. NUREG-1431 surveillances reflect the frequency in Hz. 488 rpm corresponds to 57 Hz. Existing diesel speed indicator is in Hz.

S/ Catawba only: Proposed Revision to TS 4.8.1.1.2.g.1,
4.8.1.1.2.g.4, 4.8.1.1.2.g.6.a, 4.8.1.1.2.g.6.b,
4.8.1.1.2.g.8, 4.8.1.1.2.g.9 and 4.8.1.1.2.g.10:

1. Delete superscripts ** and *** and associated footnotes concerning the applicability of these surveillances prior to entering HOT SHUTDOWN following the Catawba Units 1 and 2 first refuelings. (ADMIN.)

S/ Technical Justification:

1. This is purely an administrative change. Catawba's first refuelings have passed.

T/ Proposed Revision to TS 4.8.1.1.2.g.15 (Catawba):

1. Change from "Within 5 minutes after completing this test, perform Specification 4.8.1.1.2g.6)b)" to "Within 5 minutes after shutting down the diesel generator, restart the diesel generator and verify that the generator voltage and frequency reaches at least 3740 volts and 57 Hz within 11 seconds". (GL 93-05)

T/ Technical Justification:

1. This change is consistent with McGuire TS 4.8.1.1.2.e.8. GL 93-05 and NUREG-1431 SR 3.8.1.15 reflect this change.

U/ Proposed Revision to TS 4.8.1.1.3:

1. Specify that this requirement, "Reports", is not used. (GL 94-01)

U/ Technical Justification:

1. GL 94-01 allows the deletion of the special TS reporting requirements for DGs provided that the Maintenance Rule for DGs is implemented. (McGuire and Catawba will continue to comply with the provisions of 10 CFR 50.72 and 50.73 to notify NRC and report other DG failures). Diesel generators (including support systems) are included within the scope of the maintenance rule.

V/ Proposed Revision to TS 4.8.1.2:

1. Delete the reference to TS 4.8.1.1.3. (ADMIN.)

V/ Technical Justification:

1. This deletion is due to the proposed deletion U/1 above.

W/ Proposed Revision to TS Bases 3/4.8.1, 3/4.8.2 and 3/4.8.3:

1. Delete the reference to potential diesel generator degradation due to excessive testing. (ADMIN.)
2. Add the reference to Generic Letters 93-05 and 94-01. (ADMIN.)
3. McGuire only: Add an explanation regarding the operability of a DG based on one operable air start receiver tank or two operable air start receiver tanks. (OTHER)
4. McGuire only: Add an explanation regarding "manufacturer's recommendations" vs. "McGuire Engineering's recommendations". (OTHER)

W/ Technical Justification:

1. With the implementation of the recommendations and guidance in NUREG-1366 and GL 93-05 (as applicable to DGs), the concern of potential diesel generator degradation due to excessive testing is resolved.
2. This proposed change is to reflect the implementation of these GLs.
3. McGuire only: This proposed change is complementary to proposed change Q4.

4. McGuire only: Since the McGuire emergency diesel generator manufacturer (Nordberg) is no longer in business, McGuire engineering is the designer of record. Therefore, the term "manufacturer's (or vendor) recommendations" is taken to mean recommendations as determined by McGuire engineering (with specific industry Nordberg input as available) that were intended for nuclear class diesel service taking into account McGuire diesel generator maintenance and operating history and industry experience where applicable.

X/ Proposed revision to TS 6.8.4:

1. Add new Section 6.8.4.h, "Diesel Fuel Oil Testing" program. (NUREG-1431, less stringent)

X/ Technical Justification:

1. The properties to be tested for new fuel oil and stored fuel oil are listed in this TS. This proposed change is similar to TS 5.7.2.17 of NUREG-1431, and is complementary to proposed changes I/1 and J/1.

ATTACHMENT 4
SAFETY EVALUATION

Safety Evaluation:

The proposed changes provided by this submittal significantly improve the TS surveillance requirements for the diesel generators by incorporating the guidance and recommendations contained in NUREG-1366, "Improvements to Technical Specifications Surveillance Requirements," GL 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operations," GL 94-01, "Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators," and NUREG-1431, "Revised Standard Technical Specifications for Westinghouse PWRs."

McGuire FSAR Section 8.3.1.1.7 and Catawba FSAR Section 8.3.1.1.3 describe in detail the diesel generator system. In general, the diesel generators at McGuire and Catawba provide emergency power to the 4160 Volt Essential Auxiliary Power System in case its 6900 Volt Normal Auxiliary Power System is lost. All plant vital instruments and safety related equipment required for the mitigation and safe shutdown of the reactor in case of accidents are powered from the 4160 Volt Essential Auxiliary Power System either directly or through stepdown transformers. Two diesel generators per unit are provided to respond to basically three major accident situations: a Loss of Coolant Accident (LOCA), a Blackout, and a combination LOCA and Blackout. During a LOCA both diesel generators start and run but if normal power is available they will not connect to the bus. During a Blackout both diesel generators will start, run and connect to the bus. During a Blackout followed by a LOCA the diesel generator will pick up all the LOCA loads not sequenced on by the Blackout Sequencer and trip all non-LOCA loads. If there is a LOCA followed by a Blackout the diesel generator will pick up the LOCA loads that were not being supplied prior to the Blackout. Each diesel generator will be started and loaded automatically during each of the above situations. Each diesel generator also has local and remote manual loading capability.

Each diesel generator at McGuire is rated for continuous operation at 4000 kW, 0.8 PF, and 4160 volts, with added capacity to operate at 4400 kW for a period of 2 hours out of every 24 hours of operation without adversely affecting the life of the unit.

Each diesel generator at Catawba is rated for continuous operation at 7000 kW with added capability to operate at 7700 kW for a period of 2 hours out of every 24 hours of operation without affecting the life of the unit. (The maximum loading on each diesel generator at Catawba has been limited to 5750 kW pending resolution of TDI's Owners' Group concerns and is reflected in both the Technical Specifications and station procedures.)

Improvements to the surveillance requirements for the diesel generators do not adversely affect their capability to provide emergency power to plant vital instruments and safety related equipment. In fact, most of these improvements make the diesel generators more reliable since they significantly reduce the amount of wear and stress due to excessive and unnecessary testing. The requirement to test both diesel generators when one offsite circuit or two offsite circuits become inoperable is unnecessary since the inoperability of the offsite circuits does not affect the availability and capability of the diesel generators to provide emergency power to the 4 kV busses. The lack of an allowance for exempting diesel generator testing when the other diesel generator becomes inoperable due to its inoperable support system, independently testable component or preplanned testing or maintenance, creates unnecessary diesel generator wear. Unnecessary wear of the diesel generator is also caused by the lack of an allowance for exempting diesel generator testing if it can be verified that no potential common mode failure exists between the inoperable and operable diesels. The proposed monthly testing of the diesel generator continues to ensure that the system is ready for service when needed; for that purpose, a proposed change is included for the engine to be started and slowly brought up to full speed, and then slowly load the generator (instead of fast starting and fast loading). The fast starts are still required every 184 days and in most of the starting tests during refueling outages. The fast loadings are still required in the refueling outage LOOP tests. These fast starts and fast loadings continue to ensure that the timing and loading requirements for engineered safety features actuation are met. The proposed changes do not affect any of the design basis accident analyses.

It is concluded that these proposed changes do not compromise the safety of any system, including the diesel generators themselves. These proposed changes do not affect any accident previously analyzed or create any possible new accidents, and do not compromise the safety of the public in any way. The proposed changes are fully consistent with the recommendations and guidance contained in GL 93-05, GL 94-01, NUREG-1366, NUREG-1431, and are compatible with plant operating experience.

ATTACHMENT 5

NO SIGNIFICANT HAZARDS CONSIDERATION

No Significant Hazards Consideration:

As required by 10 CFR 50.91, this analysis is provided concerning whether the requested amendments involve significant hazards considerations, as defined by 10 CFR 50.92. Standards for determination that an amendment request involves no significant hazards considerations are if operation of the facility in accordance with the requested amendment would not: 1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or 2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) Involve a significant reduction in a margin of safety.

In 48 FR 14870, the Commission has set forth examples of amendments that are considered not likely to involve significant hazards considerations. Example i describes a change which is purely administrative in nature; for example a change to achieve consistency throughout the technical specifications, correction of an error, or a change in nomenclature. Example ii describes a change which constitutes an additional limitation, restriction, or control not presently included in the technical specifications; for example, a more stringent surveillance requirement. Example vii describes a change which makes a license conform to changes in the regulations, where the license change results in very minor changes to facility operations clearly in keeping with the regulations.

The proposed administrative changes are similar to example i.

The proposed changes that are more stringent based on NUREG-1431 are similar to example ii.

The proposed changes that are less stringent based on NUREG-1431, and those which are based on the recommendations and guidance of GLs 93-05 and 94-01 are similar to example vii. While the issuance of NUREG-1366, GL 93-05, GL 94-01 and NUREG-1431 does not constitute a change in existing regulations, it nevertheless establishes the NRC's position concerning the acceptability of adopting all or part of the recommendations and guidance contained in these documents.

Criterion 1

Operation of the facilities in accordance with the requested amendments will not involve a significant increase in the probability or consequences of an accident previously evaluated. Improvements to the LCOs and surveillance requirements for the emergency diesel generators do not affect their capability to provide emergency power to plant vital instruments and safety related equipment. In fact, these improvements make the diesel generators more reliable since they significantly reduce the amount of wear and stress due to excessive and unnecessary testing. The proposed monthly testing of the diesel generator continues to ensure that the system is ready for service when needed. The fast starts and fast loadings continue to ensure that the timing and loading requirements for engineered safety features actuation are met. The proposed changes do not affect any of the design basis accident analyses previously evaluated. Therefore, these proposed changes do not involve any increase in the probability or consequences of any accident previously evaluated. The proposed changes are fully consistent with the recommendations and guidance contained in GL 93-05, GL 94-01, NUREG-1366, NUREG-1431, and are compatible with plant operating experience.

Criterion 2

Operation of the facilities in accordance with the requested amendments will not create the possibility of a new or different kind of accident from any accident previously evaluated. The proposed changes in fact improve the reliability of the diesel generators by eliminating unnecessary wear and stress. Improved reliability decreases the failure probability which also decreases the probability of an accident not previously evaluated. None of the requested amendments increase the common mode failure probability thus would not increase the chance of both EDG's for a particular nuclear unit being out of service simultaneously. The proposed changes are fully consistent with the recommendations and guidance contained in GL 93-05, GL 94-01, NUREG-1366, NUREG-1431, and are compatible with plant operating experience.

Criterion 3

Operation of the facilities in accordance with the requested amendments will not involve a significant reduction in a margin of safety. The proposed monthly testing of the diesel generators continues to ensure that the system is ready for service when needed. The fast starts and fast loadings continue to ensure that the timing and loading requirements for engineered safety features actuation are met. The proposed changes improve the reliability of the diesel generators. Implementation of the Maintenance Rule also ensures continued reliability of the diesel generators. No margin of safety is decreased as a result of these TS changes.

Duke Power concludes that the requested amendments do not involve a significant hazards consideration.

Environmental Impact Analysis

The proposed Technical Specification amendment has been reviewed against the criteria of 10 CFR 51.22 for environmental considerations. The proposed amendment does not involve a significant hazards consideration, nor increase the types and amounts of effluents that may be released offsite, nor increase individual or cumulative occupational radiation exposures. Therefore, the proposed amendment meets the criteria given in 10 CFR 51.22(c)(9) for a categorical exclusion from the requirement for an Environmental Impact Review.

ATTACHMENT 6a

FINAL TS PAGES FOR MCGUIRE

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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 Essential Auxiliary Power System, and
- b. Two separate and independent diesel generators, each with:
 - 1) A separate day tank containing a minimum volume of 120 gallons of fuel,
 - 2) A separate Fuel Storage System containing a minimum volume of 39,500 gallons of fuel,
 - 3) A separate fuel transfer pump.

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

ACTION:

- a. With an offsite circuit of the above required A.C. electrical power sources inoperable:
 1. Demonstrate the OPERABILITY of the remaining required offsite circuit by performing Surveillance Requirement 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; and
 2. Restore the required 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.

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION

ACTION: (Continued)

- b. With one offsite circuit and one diesel generator of the above required A.C. electrical power sources inoperable: (also refer to ACTION c)
1. Demonstrate the OPERABILITY of the remaining required offsite circuit by performing Surveillance Requirement 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; and
 2. Demonstrate* the operability of the remaining diesel generator by:
 - a. Performing Surveillance Requirements 4.8.1.1.2a.4 and 4.8.1.1.2a.5 within 8 hours, or
 - b. Verifying within 8 hours that no potential common mode failure for the remaining diesel exists;
 3. 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 d.
- c. With one diesel generator inoperable in addition to ACTION b or d, 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 with a steam pressure greater than 900 psig, 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.

* This action is not required if the inoperability of the diesel was due to an inoperable support system, an independently testable component, or preplanned testing or maintenance. If required, this action is to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status. The provisions of Specification 3.0.2 are not applicable.

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION

ACTION: (Continued)

- d. With a diesel generator of the above required A.C. electrical power sources inoperable: (also refer to ACTION c)
 1. Demonstrate the OPERABILITY of the A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter; and
 2. Demonstrate* the OPERABILITY of the remaining diesel generator by:
 - a. Performing Surveillance Requirements 4.8.1.1.2a.4) and 4.8.1.1.2a.5) within 24 hours, or
 - b. Verifying within 24 hours that no potential common mode failure for the remaining diesel exists;
 3. Restore 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.
- e. With two of the above required offsite A.C. circuits inoperable, 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 and in COLD SHUTDOWN within the following 30 hours. With only one offsite source restored, follow ACTION a.
- f. With two of the above required diesel generators inoperable:
 1. Demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; and
 2. 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. With one diesel generator restored, follow ACTION d.

* This action is not required if the inoperability of the diesel was due to an inoperable support system, an independently testable component, or preplanned testing or maintenance. If required, this action is to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status. The provisions of Specification 3.0.2 are not applicable.

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 Essential Auxiliary Power 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 shall be demonstrated OPERABLE:

- a. At least once per 31 days 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 standby (prelube) condition and maintains the steady-state generator voltage and frequency at 4160 ± 420 volts and 60 ± 1.2 Hz, respectively. The diesel generator shall be started for this test by using one of the following signals:
 - a) Manual, or
 - b) Simulated loss-of-offsite power by itself, or
 - c) Simulated loss-of-offsite power in conjunction with an ESF Actuation test signal, or
 - d) An ESF Actuation test signal by itself.
 - 5) Verifying the generator is synchronized, loaded and operates at 3600 - 4000 kW*** for at least 60 minutes, and

** Once per 184 days, start the engine from standby (prelube) condition, and verify generator reaches ≥ 3740 volts and ≥ 57 Hz in ≤ 11 seconds.

*** Diesel generator loadings may be done in accordance with the manufacturer's recommendations. The purpose of the load range is to prevent overloading the engine, and momentary excursions outside of the load range shall not invalidate the test.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 6) Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.
- b. By removing accumulated water:
 - 1) From the day tank at least once per 31 days and after each occasion when the diesel is operated for greater than 1 hour, and
 - 2) From the storage tank at least once per 31 days.
- c. By sampling and testing new fuel oil in accordance with the Diesel Fuel Oil Testing Program prior to addition to the storage tanks.
- d. At least once every 31 days by sampling and testing fuel oil from the storage tanks in accordance with the Diesel Fuel Oil Testing Program.
- e. At least once per 18 months, by:
 - 1) Subjecting the diesel to an inspection, during shutdown, in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service;
 - 2) Verifying, during shutdown, the generator capability to reject a load of greater than or equal to 576 kW while maintaining voltage at 4160 ± 420 volts and frequency at 60 ± 1.2 Hz;
 - 3) Verifying, during shutdown, the generator capability to reject a load of ≥ 3600 kW and ≤ 4000 kW without tripping. The generator voltage shall not exceed 4784 volts during and following the load rejection;
 - 4) Simulating a loss-of-offsite power by itself, during shutdown, and:
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses, and
 - b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 11 seconds, energizes the auto-connected blackout loads through the load sequencer and operates for greater than or equal to 5 minutes while the generator is loaded with the blackout loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 5) Verifying that on an ESF actuation test signal, without loss-of-offsite power, the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be at least 3740 volts and 57 Hz within 11 seconds after the auto-start signal; the steady-state generator voltage and frequency shall be maintained within 4160 ± 420 volts and 60 ± 1.2 Hz during this test;
- 6) Simulating a loss-of-offsite power in conjunction with an ESF actuation test signal, and
 - a) Verifying, during shutdown, deenergization of the emergency busses and load shedding from the emergency busses;
 - b) Verifying, during shutdown, the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 11 seconds, energizes the auto-connected emergency (accident) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test; and
 - c) Verifying, during shutdown[#], that all automatic diesel generator trips, except engine overspeed, lube oil pressure, generator voltage-controlled overcurrent, and generator differential are automatically bypassed upon loss of voltage on the emergency bus concurrent with a Safety Injection Actuation signal.
- 7) [Deleted, Left Blank]

[#] This Surveillance Requirement may be performed in conjunction with periodic preplanned preventative maintenance activity that causes the diesel generator to be inoperable provided that performance of the surveillance requirement does not increase the time the diesel generator would be inoperable for the PM activity alone.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 8) Verifying, during shutdown, the diesel generator operates for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded between 4200 kW and 4400 kW*** and during the remaining 22 hours of this test, the diesel generator shall be loaded between 3600 kW and 4000 kW***. The generator voltage and frequency shall be at least 3740 volts and 57 Hz within 11 seconds after the start signal. The steady-state generator voltage and frequency shall be maintained within 4160 ± 420 volts and 60 ± 1.2 Hz during this test. Within 5 minutes of shutting down the diesel generator, restart the diesel generator and verify that the generator voltage and frequency reaches at least 3740 volts and 57 Hz within 11 seconds##.
- 9) (Deleted)
- 10) Verifying, during shutdown, 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, during shutdown, 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;
- 12) 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;

*** Diesel generator loadings may be done in accordance with the manufacturer's recommendations. The purpose of the load range is to prevent overloading the engine, and momentary excursions outside of the load range shall not invalidate the test.

If the hot restart is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead, the diesel generator may be operated at 3600 - 4000 kW*** for 2 hours or until operating temperature has stabilized.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 13) Verifying that the automatic load sequence timer is OPERABLE with the interval between each load block are within the tolerances shown in Table 4.8-2;
 - 14) Verifying, during shutdown[#], that the following diesel generator lockout features prevent diesel generator starting only when required:
 - a) Turning gear engaged, or
 - b) Emergency stop.
 - 15) Verifying, during shutdown[#], that with at least one diesel generator air start receiver pressurized to less than or equal to 210 psig and the compressors secured, the diesel generator starts at least 2 times from standby (prelube) conditions and accelerates to at least 57 Hz in less than or equal to 11 seconds.
- f. 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 57 Hz in less than or equal to 11 seconds; and
- g. At least once per 10 years by:
- 1) Draining each fuel oil storage tank, removing the accumulated sediment and cleaning the tank using a sodium hypochlorite solution, and
 - 2) Performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection ND of the ASME Code at a test pressure equal to 110% of the system design pressure.

4.8.1.1.3 Reports - (Not Used)

[#] This Surveillance Requirement may be performed in conjunction with periodic preplanned preventative maintenance activity that causes the diesel generator to be inoperable provided that performance of the surveillance requirement does not increase the time the diesel generator would be inoperable for the PM activity alone.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

4.8.1.1.4 Diesel Generator Batteries - Each diesel generator 125-olt battery bank and charger shall be demonstrated OPERABLE:

- a. At least once per 7 days by verifying that:
 - 1) The electrolyte level of each battery is above the plates, and
 - 2) The overall battery voltage is greater than or equal to 125 volts under a float charge.
- b. At least once per 18 months by verifying that:
 - 1) The batteries, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration;
 - 2) The battery-to-battery and terminal connections are clear, tight, free of corrosion and coated with anti-corrosion material; and
 - 3) The battery capacity is adequate to supply and maintain in OPERABLE status its emergency loads when subjected to a battery service test.

TABLE 4.8-1 - DIESEL GENERATOR TEST SCHEDULE (Not Used)

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 Essential Auxiliary Power System, and
- b. One diesel generator with:
 - 1) A day tank containing a minimum volume of 120 gallons of fuel,
 - 2) A Fuel Storage System containing a minimum volume of 28,000 gallons of fuel, and
 - 3) A fuel transfer pump.

APPLICABILITY: MODES 5 and 6.

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, movement of irradiated fuel, or crane operation with loads over the fuel storage pool, and within 8 hours, depressurize and vent the Reactor Coolant System through a greater than or equal to 4.5 square inch vent. In addition, when in MODE 5 with the reactor coolant loops not filled, or in MODE 6 with the water level less than 23 feet above the reactor vessel flange, immediately initiate corrective action to restore the required sources to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the requirements of Specifications 4.8.1.1.1, 4.8.1.1.2 (except for Specification 4.8.1.1.2a.5), and 4.8.1.1.4.

3/4.8 ELECTRICAL POWER SYSTEMS

BASES

3/4.8.1, 3/4.8.2 AND 3/4.8.3 A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS

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

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the safety analyses and are based upon maintaining at least one redundant set of onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss-of-offsite power and single failure of the other onsite A.C. source. The A.C. and D.C. source allowable out-of-service times are based on Regulatory Guide 1.93, "Availability of Electrical Power Sources", December 1974. When one diesel generator is inoperable, there is an additional ACTION requirement to verify that all required systems, subsystems, trains, components and devices, that depend on the remaining OPERABLE diesel generator as a source of emergency power, are also OPERABLE, and that the steam-driven auxiliary feedwater pump is OPERABLE. This requirement is intended to provide assurance that a loss-of-offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term verify as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the Surveillance Requirements needed to demonstrate the OPERABILITY of the component.

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

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guides 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, 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; Generic Letter 84-15, which modified the testing frequencies specified in Regulatory Guide 1.108; Generic Letter 93-05, which reduced the surveillance requirements for testing of Diesel Generators during power operation; also, Generic Letter 94-01, which removed the accelerated testing and special reporting requirements for Emergency Diesel Generators.

ELECTRICAL POWER SYSTEMS

BASES

A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

Some of the Surveillance Requirements for demonstrating the operability of the diesel generators are modified by a footnote. The Specifications state the Surveillance Requirements are to be performed during shutdown, with the unit in mode 3 or higher. The footnote allows the particular surveillance to be performed during preplanned Preventative Maintenance (PM) activities that would result in the diesel generator being inoperable. The surveillance can be performed at that time as long as it does not increase the time the diesel generator is inoperable for the PM activity that is being performed. The footnote is only applicable at that time. The provision of the footnote shall not be utilized for operational convenience.

The purpose of surveillance requirement 4.8.1.1.2.e.15) is to verify that each diesel can start twice off of its available air supply without recharging. This surveillance may be met using either both starting air receiver tanks simultaneously or one tank at a time independently. Although both air receiver tanks are normally available, a single starting air receiver tank may be removed from service for maintenance or testing purposes without making the diesel INOPERABLE provided the starting air receiver tank left in service successfully met the two start requirement during its previous surveillance. If a starting air receiver tank did not meet the two start surveillance, then the diesel is INOPERABLE if that tank pressure drops below that required to meet the surveillance.

Since the McGuire emergency diesel generator manufacturer (Nordberg) is no longer in business, McGuire engineering is the designer of record. Therefore, the term "manufacturer's (or vendor) recommendations" is taken to mean recommendations as determined by McGuire engineering (with specific industry Nordberg input as available) that were intended for nuclear class diesel service taking into account McGuire diesel generator maintenance and operating history and industry experience where applicable.

The Surveillance Requirement for demonstrating the OPERABILITY of the station batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage onfloat charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8-3 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and 0.015 below the manufacturer's full charge specific

ELECTRICAL POWER SYSTEMS

BASES

A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8-3 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

3/4.8.4 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.

The Surveillance Requirements applicable to lower voltage circuit breakers provide assurance of breaker reliability by testing at least one representative sample of each manufacturer's brand of circuit breaker. Testing of these circuit breakers consists of injecting a current in excess of the breaker's nominal setpoint and measuring the response time. The measured response time is compared to the manufacturer's data to ensure that it is less than or equal to a value specified by the manufacturer. Each manufacturer's molded case and metal case circuit breakers are grouped into representative samples which are then tested on a rotating basis to ensure that all breakers are tested. If a wide variety exists within any manufacturer's brand of circuit breakers, it is necessary to divide that manufacturer's breakers into groups and treat each group as a separate type of breaker for surveillance purposes.

Fuse testing is in accordance with IEEE Standard 242-1975. This program will detect any significant degradation of the fuses or improperly sized fuses. Safety is further assured by the "fail safe" nature of fuses, that is, if the fuse fails, the circuit will deenergize.

ADMINISTRATIVE CONTROLS

PROCEDURES AND PROGRAMS (Continued)

g. Radiological Environmental Monitoring Program

A program shall be provided to monitor the radiation and radionuclides in the environs of the plant. The program shall provide (1) representative measurements of radioactivity in the highest potential exposure pathways, and (2) verification of the accuracy of the effluent monitoring program and modeling of environmental exposure pathways. The program shall (1) be contained in FSAR Chapter 16, (2) conform to the guidance of Appendix I to 10 CFR Part 50, and (3) include the following:

- 1) Monitoring, sampling, analysis, and reporting of radiation and radionuclides in the environment in accordance with the methodology and parameters in the ODCM,
- 2) A Land Use Census to ensure that changes in the use of areas at and beyond the SITE BOUNDARY are identified and that modifications to the monitoring program are made if required by the results of this census, and
- 3) Participation in an Interlaboratory Comparison Program to ensure that independent checks on the precision and accuracy of the measurements of radioactive materials in environmental sample matrices are performed as part of the quality assurance program for environmental monitoring.

h. Diesel Fuel Oil Testing

A program shall be established to implement required testing of number 2 diesel fuel oil. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM Standards. The purpose of the program is to establish the following:

- a. Acceptability of new fuel oil for use, prior to addition to storage tanks, by determining that the fuel oil has:
 1. an API gravity or an absolute specific gravity within specified limits,
 2. a flash point and kinematic viscosity within specified limits, and
 3. a clear and bright appearance with proper color;
- b. Other properties per the applicable ASTM Standards for number 2 diesel fuel oil are within limits, within 30 days following sampling and addition to storage tanks.
- c. Total particulate concentration of the fuel oil is ≤ 10 mg/liter when tested every 31 days in accordance with the applicable ASTM Standards.

ADMINISTRATIVE CONTROLS

6.9 REPORTING REQUIREMENTS

ROUTINE REPORTS

6.9.1 In addition to the applicable reporting requirements of Title 10, Code of Federal Regulations, the following reports shall be submitted to the Regional Administrator of the NRC Regional Office unless otherwise noted.

STARTUP REPORT

6.9.1.1 A summary report of plant STARTUP and power escalation testing shall be submitted following: (1) receipt of an Operating License, (2) amendment to the License involving a planned increase in power level, (3) installation of fuel that has a different design or has been manufactured by a different fuel supplier, and (4) modifications that may have significantly altered the nuclear, thermal, or hydraulic performance of the plant.

6.9.1.2 The Startup Report shall address each of the tests identified in the FSAR and shall include a description of the measured values of the operating conditions or characteristics obtained during the test program and a comparison of these values with design predictions and specifications. Any corrective actions that were required to obtain satisfactory operation shall also be described. Any additional specific details required in License conditions based on other commitments shall be included in this report.

6.9.1.3 Startup Reports shall be submitted within: (1) 90 days following completion of the STARTUP test program, or (2) 90 days following resumption or commencement of commercial POWER OPERATION, or (3) 9 months following initial criticality, whichever is earliest. If the Startup Report does not cover all three events (i.e., initial criticality, completion of STARTUP test program, and resumption or commencement of commercial operation), supplementary reports shall be submitted at least every 3 months until all three events have been completed.

ANNUAL REPORTS ^{1/}

6.9.1.4 Annual Reports covering the activities of the unit as described below for the previous calendar year shall be submitted prior to March 1 of each year. The initial report shall be submitted prior to March 1 of the year following initial criticality.

6.9.1.5 Annual Reports shall include the activities of the unit as described below:

a. Personnel Exposures

Reports required on an annual basis shall include tabulation on an annual basis of the number of station, utility, and other personnel (including contractors) receiving exposures greater than 100 mrem/yr and their associated man-rem exposure according to work and job functions, e.g., reactor operations and surveillance, inservice inspection, routine maintenance, special maintenance (describe maintenance), waste processing, and refueling. The dose assignments to various duty functions may be estimated based on pocket dosimeter, TLD, or film badge measurements. Small exposures totalling less than 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total whole-body dose received from external sources should be assigned to specific major work functions.

^{1/}A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station.

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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 Essential Auxiliary Power System, and
- b. Two separate and independent diesel generators, each with:
 - 1) A separate day tank containing a minimum volume of 120 gallons of fuel,
 - 2) A separate Fuel Storage System containing a minimum volume of 39,500 gallons of fuel,
 - 3) A separate fuel transfer pump.

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

ACTION:

- a. With an offsite circuit of the above required A.C. electrical power sources inoperable:
 1. Demonstrate the OPERABILITY of the remaining required offsite circuit by performing Surveillance Requirement 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; and
 2. Restore the required 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.

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION

ACTION: (Continued)

- b. With one offsite circuit and one diesel generator of the above required A.C. electrical power sources inoperable: (also refer to ACTION c)
 1. Demonstrate the OPERABILITY of the remaining required offsite circuit by performing Surveillance Requirement 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; and
 2. Demonstrate* the operability of the remaining diesel generator by:
 - a. Performing Surveillance Requirements 4.8.1.1.2a.4 and 4.8.1.1.2a.5 within 8 hours, or
 - b. Verifying within 8 hours that no potential common mode failure for the remaining diesel exists;
 3. 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 d.
- c. With one diesel generator inoperable in addition to ACTION b or d, 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 with a steam pressure greater than 900 psig, 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.

* This action is not required if the inoperability of the diesel was due to an inoperable support system, an independently testable component, or preplanned testing or maintenance. If required, this action is to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status. The provisions of Specification 3.0.2 are not applicable.

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION

ACTION: (Continued)

- d. With a diesel generator of the above required A.C. electrical power sources inoperable: (also refer to ACTION c)
 1. Demonstrate the OPERABILITY of the A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter; and
 2. Demonstrate* the OPERABILITY of the remaining diesel generator by:
 - a. Performing Surveillance Requirements 4.8.1.1.2a.4) and 4.8.1.1.2a.5) within 24 hours, or
 - b. Verifying within 24 hours that no potential common mode failure for the remaining diesel exists;
 3. Restore 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.
- e. With two of the above required offsite A.C. circuits inoperable, 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 and in COLD SHUTDOWN within the following 30 hours. With only one offsite source restored, follow ACTION a.
- f. With two of the above required diesel generators inoperable:
 1. Demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; and
 2. 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. With one diesel generator restored, follow ACTION d.

* This action is not required if the inoperability of the diesel was due to an inoperable support system, an independently testable component, or preplanned testing or maintenance. If required, this action is to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status. The provisions of Specification 3.0.2 are not applicable.

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 Essential Auxiliary Power 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 shall be demonstrated OPERABLE:

- a. At least once per 31 days 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 standby (prelube) condition and maintains the steady-state generator voltage and frequency at 4160 ± 420 volts and 60 ± 1.2 Hz, respectively. The diesel generator shall be started for this test by using one of the following signals:
 - a) Manual, or
 - b) Simulated loss-of-offsite power by itself, or
 - c) Simulated loss-of-offsite power in conjunction with an ESF Actuation test signal, or
 - d) An ESF Actuation test signal by itself.
 - 5) Verifying the generator is synchronized, loaded and operates at 3600 - 4000 kW*** for at least 60 minutes, and

** Once per 184 days, start the engine from standby (prelube) condition, and verify generator reaches ≥ 3740 volts and ≥ 57 Hz in ≤ 11 seconds.

*** Diesel generator loadings may be done in accordance with the manufacturer's recommendations. The purpose of the load range is to prevent overloading the engine, and momentary excursions outside of the load range shall not invalidate the test.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 6) Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.
- b. By removing accumulated water:
 - 1) From the day tank at least once per 31 days and after each occasion when the diesel is operated for greater than 1 hour, and
 - 2) From the storage tank at least once per 31 days.
 - c. By sampling and testing new fuel oil in accordance with the Diesel Fuel Oil Testing Program prior to addition to the storage tanks.
 - d. At least once every 31 days by sampling and testing fuel oil from the storage tanks in accordance with the Diesel Fuel Oil Testing Program.
 - e. At least once per 18 months, by:
 - 1) Subjecting the diesel to an inspection, during shutdown, in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service;
 - 2) Verifying, during shutdown, the generator capability to reject a load of greater than or equal to 576 kW while maintaining voltage at 4160 ± 420 volts and frequency at 60 ± 1.2 Hz;
 - 3) Verifying, during shutdown, the generator capability to reject a load of ≥ 3600 kW and ≤ 4000 kW without tripping. The generator voltage shall not exceed 4784 volts during and following the load rejection;
 - 4) Simulating a loss-of-offsite power by itself, during shutdown, and:
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses, and
 - b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 11 seconds, energizes the auto-connected blackout loads through the load sequencer and operates for greater than or equal to 5 minutes while the generator is loaded with the blackout loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 5) Verifying that on an ESF actuation test signal, without loss-of-offsite power, the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be at least 3740 volts and 57 Hz within 11 seconds after the auto-start signal; the steady-state generator voltage and frequency shall be maintained within 4160 ± 420 volts and 60 ± 1.2 Hz during this test;
- 6) Simulating a loss-of-offsite power in conjunction with an ESF actuation test signal, and
 - a) Verifying, during shutdown, deenergization of the emergency busses and load shedding from the emergency busses;
 - b) Verifying, during shutdown, the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 11 seconds, energizes the auto-connected emergency (accident) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test; and
 - c) Verifying, during shutdown[#], that all automatic diesel generator trips, except engine overspeed, lube oil pressure, generator voltage-controlled overcurrent, and generator differential are automatically bypassed upon loss of voltage on the emergency bus concurrent with a Safety Injection Actuation signal.
- 7) [Deleted, Left Blank]

[#] This Surveillance Requirement may be performed in conjunction with periodic preplanned preventative maintenance activity that causes the diesel generator to be inoperable provided that performance of the surveillance requirement does not increase the time the diesel generator would be inoperable for the PM activity alone.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 8) Verifying, during shutdown, the diesel generator operates for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded between 4200 kW and 4400 kW*** and during the remaining 22 hours of this test, the diesel generator shall be loaded between 3600 kW and 4000 kW***. The generator voltage and frequency shall be at least 3740 volts and 57 Hz within 11 seconds after the start signal. The steady-state generator voltage and frequency shall be maintained within 4160 ± 420 volts and 60 ± 1.2 Hz during this test. Within 5 minutes of shutting down the diesel generator, restart the diesel generator and verify that the generator voltage and frequency reaches at least 3740 volts and 57 Hz within 11 seconds##.
- 9) (Deleted)
- 10) Verifying, during shutdown, 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, during shutdown, 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;
- 12) 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;

*** Diesel generator loadings may be done in accordance with the manufacturer's recommendations. The purpose of the load range is to prevent overloading the engine, and momentary excursions outside of the load range shall not invalidate the test.

If the hot restart is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead, the diesel generator may be operated at 3600 - 4000 kW*** for 2 hours or until operating temperature has stabilized.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 13) Verifying that the automatic load sequence timer is OPERABLE with the interval between each load block are within the tolerances shown in Table 4.8-2;
 - 14) Verifying, during shutdown[#], that the following diesel generator lockout features prevent diesel generator starting only when required:
 - a) Turning gear engaged, or
 - b) Emergency stop.
 - 15) Verifying, during shutdown[#], that with at least one diesel generator air start receiver pressurized to less than or equal to 210 psig and the compressors secured, the diesel generator starts at least 2 times from standby (prelube) conditions and accelerates to at least 57 Hz in less than or equal to 11 seconds.
- f. 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 57 Hz in less than or equal to 11 seconds; and
- g. At least once per 10 years by:
- 1) Draining each fuel oil storage tank, removing the accumulated sediment and cleaning the tank using a sodium hypochlorite solution, and
 - 2) Performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection ND of the ASME Code at a test pressure equal to 110% of the system design pressure.

4.8.1.1.3 Reports - (Not Used)

[#] This Surveillance Requirement may be performed in conjunction with periodic preplanned preventative maintenance activity that causes the diesel generator to be inoperable provided that performance of the surveillance requirement does not increase the time the diesel generator would be inoperable for the PM activity alone.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

4.8.1.1.4 Diesel Generator Batteries - Each diesel generator 125-volt battery bank and charger shall be demonstrated OPERABLE:

- a. At least once per 7 days by verifying that:
 - 1) The electrolyte level of each battery is above the plates, and
 - 2) The overall battery voltage is greater than or equal to 125 volts under a float charge.

- b. At least once per 18 months by verifying that:
 - 1) The batteries, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration;
 - 2) The battery-to-battery and terminal connections are clear, tight, free of corrosion and coated with anti-corrosion material; and
 - 3) The battery capacity is adequate to supply and maintain in OPERABLE status its emergency loads when subjected to a battery service test.

TABLE 4.8-1 - DIESEL GENERATOR TEST SCHEDULE (Not Used)

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 Essential Auxiliary Power System, and
- b. One diesel generator with:
 - 1) A day tank containing a minimum volume of 120 gallons of fuel,
 - 2) A Fuel Storage System containing a minimum volume of 28,000 gallons of fuel, and
 - 3) A fuel transfer pump.

APPLICABILITY: MODES 5 and 6.

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, movement of irradiated fuel, or crane operation with loads over the fuel storage pool, and within 8 hours, depressurize and vent the Reactor Coolant System through a greater than or equal to 4.5 square inch vent. In addition, when in MODE 5 with the reactor coolant loops not filled, or in MODE 6 with the water level less than 23 feet above the reactor vessel flange, immediately initiate corrective action to restore the required sources to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the requirements of Specifications 4.8.1.1.1, 4.8.1.1.2 (except for Specification 4.8.1.1.2a.5), and 4.8.1.1.4.

3/4.8 ELECTRICAL POWER SYSTEMS

BASES

3/4.8.1, 3/4.8.2 AND 3/4.8.3 A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS

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

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the safety analyses and are based upon maintaining at least one redundant set of onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss-of-offsite power and single failure of the other onsite A.C. source. The A.C. and D.C. source allowable out-of-service times are based on Regulatory Guide 1.93, "Availability of Electrical Power Sources", December 1974. When one diesel generator is inoperable, there is an additional ACTION requirement to verify that all required systems, subsystems, trains, components and devices, that depend on the remaining OPERABLE diesel generator as a source of emergency power, are also OPERABLE, and that the steam-driven auxiliary feedwater pump is OPERABLE. This requirement is intended to provide assurance that a loss-of-offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term verify as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the Surveillance Requirements needed to demonstrate the OPERABILITY of the component.

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

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guides 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, 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; Generic Letter 84-15, which modified the testing frequencies specified in Regulatory Guide 1.108; Generic Letter 93-05, which reduced the surveillance requirements for testing of Diesel Generators during power operation; also, Generic Letter 94-01, which removed the accelerated testing and special reporting requirements for Emergency Diesel Generators.

ELECTRICAL POWER SYSTEMS

BASES

A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

Some of the Surveillance Requirements for demonstrating the operability of the diesel generators are modified by a footnote. The Specifications state the Surveillance Requirements are to be performed during shutdown, with the unit in mode 3 or higher. The footnote allows the particular surveillance to be performed during preplanned Preventative Maintenance (PM) activities that would result in the diesel generator being inoperable. The surveillance can be performed at that time as long as it does not increase the time the diesel generator is inoperable for the PM activity that is being performed. The footnote is only applicable at that time. The provision of the footnote shall not be utilized for operational convenience.

The purpose of surveillance requirement 4.8.1.1.2.e.15) is to verify that each diesel can start twice off of its available air supply without recharging. This surveillance may be met using either both starting air receiver tanks simultaneously or one tank at a time independently. Although both air receiver tanks are normally available, a single starting air receiver tank may be removed from service for maintenance or testing purposes without making the diesel INOPERABLE provided the starting air receiver tank left in service successfully met the two start requirement during its previous surveillance. If a starting air receiver tank did not meet the two start surveillance, then the diesel is INOPERABLE if that tank pressure drops below that required to meet the surveillance.

Since the McGuire emergency diesel generator manufacturer (Nordberg) is no longer in business, McGuire engineering is the designer of record. Therefore, the term "manufacturer's (or vendor) recommendations" is taken to mean recommendations as determined by McGuire engineering (with specific industry Nordberg input as available) that were intended for nuclear class diesel service taking into account McGuire diesel generator maintenance and operating history and industry experience where applicable.

The Surveillance Requirement for demonstrating the OPERABILITY of the station batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage onfloat charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8-3 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and 0.015 below the manufacturer's full charge specific

ELECTRICAL POWER SYSTEMS

BASES

A.C. SOURCES, D.C. SOURCES AND ONSITE POWER DISTRIBUTION SYSTEMS (Continued)

gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8-3 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

3/4.8.4 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.

The Surveillance Requirements applicable to lower voltage circuit breakers provide assurance of breaker reliability by testing at least one representative sample of each manufacturer's brand of circuit breaker. Testing of these circuit breakers consists of injecting a current in excess of the breaker's nominal setpoint and measuring the response time. The measured response time is compared to the manufacturer's data to ensure that it is less than or equal to a value specified by the manufacturer. Each manufacturer's molded case and metal case circuit breakers are grouped into representative samples which are then tested on a rotating basis to ensure that all breakers are tested. If a wide variety exists within any manufacturer's brand of circuit breakers, it is necessary to divide that manufacturer's breakers into groups and treat each group as a separate type of breaker for surveillance purposes.

Fuse testing is in accordance with IEEE Standard 242-1975. This program will detect any significant degradation of the fuses or improperly sized fuses. Safety is further assured by the "fail safe" nature of fuses, that is, if the fuse fails, the circuit will deenergize.

ADMINISTRATIVE CONTROLS

PROCEDURES AND PROGRAMS (Continued)

g. Radiological Environmental Monitoring Program

A program shall be provided to monitor the radiation and radionuclides in the environs of the plant. The program shall provide (1) representative measurements of radioactivity in the highest potential exposure pathways, and (2) verification of the accuracy of the effluent monitoring program and modeling of environmental exposure pathways. The program shall (1) be contained in FSAR Chapter 16, (2) conform to the guidance of Appendix I to 10 CFR Part 50, and (3) include the following:

- 1) Monitoring, sampling, analysis, and reporting of radiation and radionuclides in the environment in accordance with the methodology and parameters in the ODCM,
- 2) A Land Use Census to ensure that changes in the use of areas at and beyond the SITE BOUNDARY are identified and that modifications to the monitoring program are made if required by the results of this census, and
- 3) Participation in an Interlaboratory Comparison Program to ensure that independent checks on the precision and accuracy of the measurements of radioactive materials in environmental sample matrices are performed as part of the quality assurance program for environmental monitoring.

h. Diesel Fuel Oil Testing

A program shall be established to implement required testing of number 2 diesel fuel oil. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM Standards. The purpose of the program is to establish the following:

- a. Acceptability of new fuel oil for use, prior to addition to storage tanks, by determining that the fuel oil has:
 1. an API gravity or an absolute specific gravity within specified limits,
 2. a flash point and kinematic viscosity within specified limits, and
 3. a clear and bright appearance with proper color;
- b. Other properties per the applicable ASTM Standards for number 2 diesel fuel oil are within limits, within 30 days following sampling and addition to storage tanks.
- c. Total particulate concentration of the fuel oil is ≤ 10 mg/liter when tested every 31 days in accordance with the applicable ASTM Standards.

ADMINISTRATIVE CONTROLS

6.9 REPORTING REQUIREMENTS

ROUTINE REPORTS

6.9.1 In addition to the applicable reporting requirements of Title 10, Code of Federal Regulations, the following reports shall be submitted to the Regional Administrator of the NRC Regional Office unless otherwise noted.

STARTUP REPORT

6.9.1.1 A summary report of plant STARTUP and power escalation testing shall be submitted following: (1) receipt of an Operating License, (2) amendment to the License involving a planned increase in power level, (3) installation of fuel that has a different design or has been manufactured by a different fuel supplier, and (4) modifications that may have significantly altered the nuclear, thermal, or hydraulic performance of the plant.

6.9.1.2 The Startup Report shall address each of the tests identified in the FSAR and shall include a description of the measured values of the operating conditions or characteristics obtained during the test program and a comparison of these values with design predictions and specifications. Any corrective actions that were required to obtain satisfactory operation shall also be described. Any additional specific details required in License conditions based on other commitments shall be included in this report.

6.9.1.3 Startup Reports shall be submitted within: (1) 90 days following completion of the STARTUP test program, or (2) 90 days following resumption or commencement of commercial POWER OPERATION, or (3) 9 months following initial criticality, whichever is earliest. If the Startup Report does not cover all three events (i.e., initial criticality, completion of STARTUP test program, and resumption or commencement of commercial operation), supplementary reports shall be submitted at least every 3 months until all three events have been completed.

ANNUAL REPORTS ^{1/}

6.9.1.4 Annual Reports covering the activities of the unit as described below for the previous calendar year shall be submitted prior to March 1 of each year. The initial report shall be submitted prior to March 1 of the year following initial criticality.

6.9.1.5 Annual Reports shall include the activities of the unit as described below:

a. Personnel Exposures

Reports required on an annual basis shall include tabulation on an annual basis of the number of station, utility, and other personnel (including contractors) receiving exposures greater than 100 mrem/yr and their associated man-rem exposure according to work and job functions, e.g., reactor operations and surveillance, inservice inspection, routine maintenance, special maintenance (describe maintenance), waste processing, and refueling. The dose assignments to various duty functions may be estimated based on pocket dosimeter, TLD, or film badge measurements. Small exposures totalling less than 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total whole-body dose received from external sources should be assigned to specific major work functions.

^{1/}A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station.

ATTACHMENT 6b

FINAL TS PAGES FOR CATAWBA

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ADMINISTRATIVE CONTROLS

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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 Essential Auxiliary Power System, and
- b. Two separate and independent diesel generators, each with:
 - 1) A separate day tank containing a minimum volume of 470 gallons of fuel,
 - 2) A separate Fuel Storage System containing a minimum volume of 77,100 gallons of fuel,
 - 3) A separate fuel transfer valve, and
 - 4) A separate 125 VDC battery and charger connected to the diesel generator control loads.

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

ACTION:

- a. With an offsite circuit of the above required A.C. electrical power sources inoperable:
 1. Demonstrate the OPERABILITY of the remaining required offsite circuit by performing Specification 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; and
 2. Restore the 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.

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

- b. With one offsite circuit and one diesel generator of the above required A.C. electrical power sources inoperable: (also refer to ACTION c)
1. Demonstrate the OPERABILITY of the remaining required offsite circuit by performing Specification 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; and
 2. Demonstrate* the OPERABILITY of the remaining diesel generator by either:
 - a. Performing Surveillance Requirements 4.8.1.1.2a.4 and 4.8.1.1.2a.5 within 8 hours, or
 - b. Verifying within 8 hours that no potential common mode failure for the remaining diesel exists;
 3. 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 d.
- c. With one diesel generator inoperable in addition to ACTION b or d, 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 with a steam pressure greater than 900 psig, 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.

* This action is not required if the inoperability of the diesel was due to an inoperable support system, an independently testable component, or preplanned testing or maintenance. If required, this action is to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status. The provisions of Specification 3.0.2 are not applicable.

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

- d. With a diesel generator of the above required A.C. electrical power sources inoperable: (also refer to ACTION c)
 1. Demonstrate the OPERABILITY of the A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter; and
 2. Demonstrate* the OPERABILITY of the remaining diesel generator by either:
 - a. Performing Surveillance Requirements 4.8.1.1.2a.4 and 4.8.1.1.2a.5 within 24 hours, or
 - b. Verifying within 24 hours that no potential common mode failure for the remaining diesel exists;
 3. Restore 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.
- e. With both of the above required offsite A.C. circuits inoperable, 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 and in COLD SHUTDOWN within the following 30 hours. With only one offsite source restored, follow ACTION a.
- f. With both of the above required diesel generators inoperable:
 1. 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; and
 2. 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. With one diesel generator restored, follow ACTION d.

* This action is not required if the inoperability of the diesel was due to an inoperable support system, an independently testable component, or preplanned testing or maintenance. If required, this action is to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status. The provisions of Specification 3.0.2 are not applicable.

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION

- g. With a diesel generator operating at greater than 5750 kW, within 1 hour reduce the diesel generator output to less than or equal to 5750 kW.
- h. With the Cathodic Protection System inoperable, restore the System to OPERABLE status within 10 days or prepare and submit a Special Report pursuant to Specification 6.9.2 outlining the cause of the inoperability and the plans for restoring the System to OPERABLE.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the Onsite Essential Auxiliary Power System shall be:

- a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments, indicated power availability, and
- b. Demonstrated OPERABLE at least once per 18 months by transferring (manually and automatically) unit power supply from the normal circuit to the alternate circuit.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

- a. At least once per 31 days 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 valve can be operated to allow fuel to be transferred from the storage system to the day tank,
 - 4) Verifying** the diesel starts from standby (prelube) condition and maintains the steady-state generator voltage and frequency at 4160 ± 420 volts and 60 ± 1.2 Hz, respectively. The diesel generator shall be started for this test by using one of the following signals:
 - a) Manual, or
 - b) Simulated loss of offsite power by itself, or
 - c) Simulated loss of offsite power in conjunction with an ESF Actuation test signal, or
 - d) An ESF Actuation test signal by itself.

** Once per 184 days, start the engine from standby (prelube) condition, and verify generator reaches ≥ 3740 volts and ≥ 57 Hz in ≤ 11 seconds.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 5) Verifying the generator is synchronized, loaded and operates at 5600 - 5750 kW*** for at least 60 minutes, and
 - 6) Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.
- b. At least once per 31 days and after each operation of the diesel where the period of operation was greater than or equal to 1 hour by checking for and removing accumulated water from the day tank;
 - c. At least once per 31 days by checking for and removing accumulated water from the fuel oil storage tanks;
 - d. By verifying that the Cathodic Protection System is OPERABLE by verifying:
 - 1) At least once per 60 days that cathodic protection rectifiers are OPERABLE and have been inspected in accordance with the manufacturer's inspection procedures, and
 - 2) At least once per 12 months that adequate protection from corrosion is provided in accordance with manufacturer's inspection procedures.
 - e. By sampling and testing new fuel oil in accordance with the Diesel Fuel Oil Testing Program prior to addition to the storage tanks.
 - f. At least once every 31 days by sampling and testing fuel oil from the storage tanks in accordance with the Diesel Fuel Oil Testing Program.

*** Diesel generator loadings may be done in accordance with the manufacturer's recommendations. The purpose of the load range is to prevent overloading the engine, and momentary excursions outside of the load range shall not invalidate the test.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- g. At least once per 18 months by:
- 1) Subjecting the diesel to an inspection, during shutdown, 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 825 kW while maintaining voltage at 4160 ± 420 volts and frequency at 60 ± 1.2 Hz;
 - 3) Verifying the generator capability to reject a load of greater than or equal to 5600 kW but less than or equal to 5750 kW without tripping. The generator speed shall not exceed 500 rpm during and following the load rejection;
 - 4) Simulating a loss-of-offsite power by itself, during shutdown, and:
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses, and
 - b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 11 seconds, energizes the auto-connected emergency (accident) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test.
 - 5) Verifying that on an ESF Actuation test signal, without loss-of-offsite power, the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be at 4160 ± 420 volts and 60 ± 1.2 Hz within 11 seconds after the auto-start signal; the steady-state generator voltage and frequency shall be maintained within these limits during this test;

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 6) Simulating a loss-of-offsite power in conjunction with an ESF Actuation test signal, during shutdown, and
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses;
 - b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 11 seconds, energizes the auto-connected emergency (accident) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test; and
 - c) Verifying that all automatic diesel generator trips, except engine overspeed, low-low lube oil pressure, generator differential, and the 2 out of 3 voltage controlled overcurrent relay scheme, are automatically bypassed upon loss of voltage on the emergency bus concurrent with a Safety Injection Actuation signal.
- 7) Verifying, during shutdown, the diesel generator operates for at least 24 hours. The diesel generator shall be loaded to greater than or equal to 5600 kW but less than or equal to 5750 kW. The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± 1.2 Hz within 11 seconds after the start signal; the steady-state generator voltage and frequency shall be maintained within these limits during this test.
- 8) (Deleted)
- 9) Verifying, during shutdown, 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.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 10) Verifying, during shutdown, 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 valve 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 load sequence timer is OPERABLE with the interval between each load block within the tolerances given in Table 4.8-2;
 - 13) Verifying that the voltage and diesel speed tolerances for the accelerated sequencer permissives are $92.5 \pm 1\%$ and $98 \pm 1\%$, respectively, with a time delay of 2 ± 0.2 s;
 - 14) Verifying that the following diesel generator lockout features prevent diesel generator starting only when required:
 - a) Turning gear engaged, or
 - b) Maintenance mode; and
 - 15) Operating at greater than or equal to 5600 KW but less than or equal to 5750 KW for one hour or until operating temperature has stabilized. Within 5 minutes after shutting down the diesel generator, restart the diesel generator and verify that the generator voltage and frequency reaches at least 3740 volts and 57 Hz within 11 seconds.
- h. 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 441 rpm in less than or equal to 11 seconds; and

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- i. 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 or its equivalent, and
 - 2) Performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection ND of the ASME Code at a test pressure equal to 110% of the system design pressure.
 - 3) Performing tank wall thickness measurements. The resulting data shall be evaluated and any abnormal degradation will be justified or corrected. Any abnormal degradation will be documented in a report to the Commission.

4.8.1.1.3 Reports - (Not Used)

4.8.1.1.4 Diesel Generator Batteries - Each diesel generator 125-volt battery bank and charger shall be demonstrated OPERABLE:

- a. At least once per 7 days by verifying that:
 - 1) The electrolyte level of each battery is at or above the low mark and at or below the high mark,
 - 2) The overall battery voltage is greater than or equal to 125 volts on float charge, and
 - 3) The individual cell voltage is greater than or equal to 1.36 volts on float charge.*
- b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:
 - 1) There is no visible corrosion at either terminals or connectors, and
 - 2) The average electrolyte temperature of six connected cells is above 60°F.

* Two different cells shall be tested each month.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- c. At least once per 18 months by verifying that:
- 1) The batteries, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration,
 - 2) The cell-to-cell and terminal connections are clean, tight, free of corrosion and coated with anticorrosion material in accordance with manufacturer's recommendations,
 - 3) The cell-to-cell pole screws torque setting is 14.5 ± 0.5 ft-lbs,
 - 4) The battery charger will supply at least 75 amperes at a minimum of 125 volts for at least 8 hours, and
 - 5) The battery capacity is adequate to supply and maintain in OPERABLE status its emergency loads when subjected to a battery service test. The battery shall supply a current of greater than or equal to 171.6 amps for the first minute and a current of greater than or equal to 42.5 amps for the remaining 119 minutes, while maintaining a terminal voltage of greater than or equal to 105 volts.
- d. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. Once per 60 month interval, this performance discharge test may be performed in lieu of the battery service test.
- e. At least once per 18 months, during shutdown, by giving performance discharge tests of battery capacity to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.

TABLE 4.8-1 - DIESEL GENERATOR TEST SCHEDULE - (Not Used)

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 Essential Auxiliary Power System, and
- b. One diesel generator with:
 - 1) A day tank containing a minimum volume of 470 gallons of fuel,
 - 2) A fuel storage system containing a minimum volume of 77,100 gallons of fuel,
 - 3) A fuel transfer valve, and
 - 4) A 125 VDC battery and charger connected to the diesel generator control loads.

APPLICABILITY: MODES 5 and 6.

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, movement of irradiated fuel, or crane operation with loads over the fuel storage pool, and within 8 hours, depressurize and vent the Reactor Coolant System through at least a 4.5 square inch vent. In addition, when in MODE 5 with the Reactor Coolant loops not filled, or in MODE 6 with the water level less than 23 feet above the reactor vessel flange, immediately initiate corrective action to restore the required sources to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the requirements of Specifications 4.8.1.1.1, 4.8.1.1.2 (except for Specification 4.8.1.1.2a.5), and 4.8.1.1.4.

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 steam-driven auxiliary feedwater pump is OPERABLE. This requirement is intended to provide assurance that a loss-of-offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term, verify, as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the Surveillance Requirements needed to demonstrate the OPERABILITY of the component.

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

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guide 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, Regulatory Guide 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977, Regulatory Guide 1.137, "Fuel-Oil Systems for Standby Diesel Generators," Revision 1, October 1979, the NRC Staff Evaluation Report concerning the Reliability of Diesel Generators at Catawba, August 14, 1984, Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel

ELECTRICAL POWER SYSTEMS

BASES

A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION (Continued)

Generator Reliability," Generic Letter 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation," and Generic Letter 94-01, "Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators." If any other metallic structures (building, new or modified piping systems, conduits) are placed in the ground near the Fuel Oil Storage System or if the original system is modified, the adequacy and frequency of inspections for the Cathodic Protection System shall be reevaluated and adjusted in accordance with the manufacturer's recommendations.

The Surveillance Requirements for demonstrating the OPERABILITY of the station batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8-3 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and 0.015 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8-3 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

ADMINISTRATIVE CONTROLS

g. Radiological Environmental Monitoring Program

A program shall be provided to monitor the radiation and radionuclides in the environs of the plant. The program shall provide (1) representative measurements of radioactivity in the highest potential exposure pathways, and (2) verification of the accuracy of the effluent monitoring program and modeling or environmental exposure pathways. The program shall (1) be contained in Chapter 16 of the FSAR, (2) conform to the guidance of Appendix I to 10 CFR Part 50, and (3) include the following:

- 1) Monitoring, sampling, analysis, and reporting of radiation and radionuclides in the environment in accordance with the methodology and parameters in the ODCM,
- 2) A Land Use Census to ensure that changes in the use of areas at and beyond the SITE BOUNDARY are identified and that modifications to the monitoring program are made if required by the results of this census, and
- 3) Participation in a Interlaboratory Comparison Program to ensure that independent checks on the precision and accuracy of the measurements of radioactive materials in the environmental sample matrices are performed as part of the quality assurance program for environmental monitoring.

h. Diesel Fuel Oil Testing

A program shall be established to implement required testing of number 2 diesel fuel oil. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM Standards. The purpose of the program is to establish the following:

- a. Acceptability of new fuel oil for use, prior to addition to storage tanks, by determining that the fuel oil has:
 1. an API gravity or an absolute specific gravity within specified limits,
 2. a flash point and kinematic viscosity within specified limits, and
 3. a clear and bright appearance with proper color;
- b. Other properties per the applicable ASTM Standards for number 2 diesel fuel oil are within limits, within 30 days following sampling and addition to storage tanks.
- c. Total particulate concentration of the fuel oil is ≤ 10 mg/liter when tested every 31 days in accordance with the applicable ASTM Standards.

ADMINISTRATIVE CONTROLS

6.9 REPORTING REQUIREMENTS

ROUTINE REPORTS

6.9.1 In addition to the applicable reporting requirements of Title 10, Code of Federal Regulations, the following reports shall be submitted to NRC in accordance with 10 CFR 50.4.

STARTUP REPORT

6.9.1.1 A summary report of plant startup and power escalation testing shall be submitted following (1) receipt of an Operating License, (2) amendment to the license involving a planned increase in power level, (3) installation of fuel that has a different design or has been manufactured by a different fuel supplier, and (4) modifications that may have significantly altered the nuclear, thermal, or hydraulic performance of the unit.

6.9.1.2 The Startup Report shall address each of the tests identified in the Final Safety Analysis Report and shall include a description of the measured values of the operating conditions or characteristics obtained during the test program and a comparison of these values with design predictions and specifications. Any corrective actions that were required to obtain satisfactory operation shall also be described. Any additional specific details required in license conditions based on other commitments shall be included in this report.

6.9.1.3 Startup Reports shall be submitted within: (1) 90 days following completion of the Startup Test Program, (2) 90 days following resumption or commencement of commercial power operation, or (3) 9 months following initial criticality, whichever is earliest. If the Startup Report does not cover all three events (i.e., initial criticality, completion of Startup Test Program, and resumption or commencement of commercial operation), supplementary reports shall be submitted at least every 3 months until all three events have been completed.

ANNUAL REPORTS ^{1/}

6.9.1.4 Annual Reports covering the activities of the unit as described below for the previous calendar year shall be submitted prior to March 1 of each year. The initial report shall be submitted prior to March 1 of the year following initial criticality.

6.9.1.5 Annual Reports shall include the activities of the unit as described below:

a. Personnel Exposures

Reports required on an annual basis shall include a tabulation on an annual basis of the number of station, utility, and other personnel (including contractors) receiving exposures greater than 100 mrem/yr and their associated man-rem exposure according to work and job functions, e.g., reactor operations and surveillance, inservice inspection, routine

^{1/} A single submittal may be made for the station. The submittal should combine those sections that are common to both units.

ADMINISTRATIVE CONTROLS

maintenance, special maintenance (describe maintenance), waste processing, and refueling. The dose assignments to various duty functions may be estimated based on pocket dosimeter, TLD, or film badge measurements. Small exposures totalling less than 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total wholebody dose received from external sources should be assigned to specific major work functions.

b. Primary Coolant Specific Activity

Reports required on an annual basis shall include the results of specific activity analysis in which the primary coolant exceeded the limits of Specification 3.4.8. The following information shall be included: 1) Reactor power history starting 48 hours prior to the first sample in which the limit was exceeded; 2) Results of the last isotopic analysis for radioiodine performed prior to exceeding the limit, results of analysis while limit was exceeded and results of one analysis after the radioiodine activity was reduced to less than limit. Each result should include date and time of sampling and the radioiodine concentrations; 3) Clean-up system flow history starting 48 hours prior to the first sample in which the limit was exceeded; 4) Graph of the I-131 concentration and one other radioiodine isotope concentration in microcuries per gram as a function of time for the duration of the specific activity above the steady-state level; and 5) The time duration when the specific activity of the primary coolant exceeded the radioiodine limit.

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT*

6.9.1.6 Routine Annual Radiological Environmental Operating Reports covering the operation of the unit during the previous calendar year shall be submitted prior to May 1 of each year. The report shall include summaries, interpretations, and analysis of trends of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided shall be consistent with the objectives outlined in (1) Chapter 16 of the FSAR and (2) Sections IV.B.2, IV.B.3, and IV.C of Appendix I to 10 CFR Part 50.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT*

6.9.1.7 The Annual Radioactive Effluent Release Report covering the operation of the unit during the previous calendar year shall be submitted before May 1 of each year. The Radioactive Effluent Release Report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be (1) consistent with the objectives outlined in Chapter 16 of the FSAR and (2) in conformance with 10 CFR 50.36a and Section IV.B.1 of Appendix I to 10 CFR Part 50.

* A single submittal may be made for the station. The submittal should combine those sections that are common to both units.

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

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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 Essential Auxiliary Power System, and
- b. Two separate and independent diesel generators, each with:
 - 1) A separate day tank containing a minimum volume of 470 gallons of fuel,
 - 2) A separate Fuel Storage System containing a minimum volume of 77,100 gallons of fuel,
 - 3) A separate fuel transfer valve, and
 - 4) A separate 125 VDC battery and charger connected to the diesel generator control loads.

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

ACTION:

- a. With an offsite circuit of the above required A.C. electrical power sources inoperable:
 1. Demonstrate the OPERABILITY of the remaining required offsite circuit by performing Specification 4.8.1.1.a. within 1 hour and at least once per 8 hours thereafter; and
 2. Restore the 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.

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

- b. With one offsite circuit and one diesel generator of the above required A.C. electrical power sources inoperable: (also refer to ACTION c)
1. Demonstrate the OPERABILITY of the remaining required offsite circuit by performing Specification 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter; and
 2. Demonstrate* the OPERABILITY of the remaining diesel generator by either:
 - a. Performing Surveillance Requirements 4.8.1.1.2a.4 and 4.8.1.1.2a.5 within 8 hours, or
 - b. Verifying within 8 hours that no potential common mode failure for the remaining diesel exists;
 3. 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 d.
- c. With one diesel generator inoperable in addition to ACTION b or d, 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 with a steam pressure greater than 900 psig, 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.

* This action is not required if the inoperability of the diesel was due to an inoperable support system, an independently testable component, or preplanned testing or maintenance. If required, this action is to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status. The provisions of Specification 3.0.2 are not applicable.

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION

ACTION (Continued)

- d. With a diesel generator of the above required A.C. electrical power sources inoperable: (also refer to ACTION c)
 1. Demonstrate the OPERABILITY of the A.C. offsite sources by performing Surveillance Requirement 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter; and
 2. Demonstrate* the OPERABILITY of the remaining diesel generator by either:
 - a. Performing Surveillance Requirements 4.8.1.1.2a.4 and 4.8.1.1.2a.5 within 24 hours, or
 - b. Verifying within 24 hours that no potential common mode failure for the remaining diesel exists;
 3. Restore 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.
- e. With both of the above required offsite A.C. circuits inoperable, 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 and in COLD SHUTDOWN within the following 30 hours. With only one offsite source restored, follow ACTION a.
- f. With both of the above required diesel generators inoperable:
 1. 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; and
 2. 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. With one diesel generator restored, follow ACTION d.

* This action is not required if the inoperability of the diesel was due to an inoperable support system, an independently testable component, or preplanned testing or maintenance. If required, this action is to be completed regardless of when the inoperable diesel generator is restored to OPERABLE status. The provisions of Specification 3.0.2 are not applicable.

ELECTRICAL POWER SYSTEMS

LIMITING CONDITION FOR OPERATION

- g. With a diesel generator operating at greater than 5750 kW, within 1 hour reduce the diesel generator output to less than or equal to 5750 kW.
- h. With the Cathodic Protection System inoperable, restore the System to OPERABLE status within 10 days or prepare and submit a Special Report pursuant to Specification 6.9.2 outlining the cause of the inoperability and the plans for restoring the System to OPERABLE.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the Onsite Essential Auxiliary Power System shall be:

- a. Determined OPERABLE at least once per 7 days by verifying correct breaker alignments, indicated power availability, and
- b. Demonstrated OPERABLE at least once per 18 months by transferring (manually and automatically) unit power supply from the normal circuit to the alternate circuit.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

- a. At least once per 31 days 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 valve can be operated to allow fuel to be transferred from the storage system to the day tank,
 - 4) Verifying** the diesel starts from standby (prelube) condition and maintains the steady-state generator voltage and frequency at 4160 ± 420 volts and 60 ± 1.2 Hz, respectively. The diesel generator shall be started for this test by using one of the following signals:
 - a) Manual, or
 - b) Simulated loss of offsite power by itself, or
 - c) Simulated loss of offsite power in conjunction with an ESF Actuation test signal, or
 - d) An ESF Actuation test signal by itself.

** Once per 184 days, start the engine from standby (prelube) condition, and verify generator reaches ≥ 3740 volts and ≥ 57 Hz in ≤ 11 seconds.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 5) Verifying the generator is synchronized, loaded and operates at 5600 - 5750 kW*** for at least 60 minutes, and
 - 6) Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.
- b. At least once per 31 days and after each operation of the diesel where the period of operation was greater than or equal to 1 hour by checking for and removing accumulated water from the day tank;
 - c. At least once per 31 days by checking for and removing accumulated water from the fuel oil storage tanks;
 - d. By verifying that the Cathodic Protection System is OPERABLE by verifying:
 - 1) At least once per 60 days that cathodic protection rectifiers are OPERABLE and have been inspected in accordance with the manufacturer's inspection procedures, and
 - 2) At least once per 12 months that adequate protection from corrosion is provided in accordance with manufacturer's inspection procedures.
 - e. By sampling and testing new fuel oil in accordance with the Diesel Fuel Oil Testing Program prior to addition to the storage tanks.
 - f. At least once every 31 days by sampling and testing fuel oil from the storage tanks in accordance with the Diesel Fuel Oil Testing Program.

*** Diesel generator loadings may be done in accordance with the manufacturer's recommendations. The purpose of the load range is to prevent overloading the engine, and momentary excursions outside of the load range shall not invalidate the test.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- g. At least once per 18 months by:
- 1) Subjecting the diesel to an inspection, during shutdown, 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 825 kW while maintaining voltage at 4160 ± 420 volts and frequency at 60 ± 1.2 Hz;
 - 3) Verifying the generator capability to reject a load of greater than or equal to 5600 kW but less than or equal to 5750 kW without tripping. The generator speed shall not exceed 500 rpm during and following the load rejection;
 - 4) Simulating a loss-of-offsite power by itself, during shutdown, and:
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses, and
 - b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 11 seconds, energizes the auto-connected emergency (accident) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test.
 - 5) Verifying that on an ESF Actuation test signal, without loss-of-offsite power, the diesel generator starts on the auto-start signal and operates on standby for greater than or equal to 5 minutes. The generator voltage and frequency shall be at 4160 ± 420 volts and 60 ± 1.2 Hz within 11 seconds after the auto-start signal; the steady-state generator voltage and frequency shall be maintained within these limits during this test;

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 6) Simulating a loss-of-offsite power in conjunction with an ESF Actuation test signal, during shutdown, and
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses;
 - b) Verifying the diesel starts on the auto-start signal, energizes the emergency busses with permanently connected loads within 11 seconds, energizes the auto-connected emergency (accident) loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the emergency loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 420 volts and 60 ± 1.2 Hz during this test; and
 - c) Verifying that all automatic diesel generator trips, except engine overspeed, low-low lube oil pressure, generator differential, and the 2 out of 3 voltage controlled overcurrent relay scheme, are automatically bypassed upon loss of voltage on the emergency bus concurrent with a Safety Injection Actuation signal.
- 7) Verifying, during shutdown, the diesel generator operates for at least 24 hours. The diesel generator shall be loaded to greater than or equal to 5600 kW but less than or equal to 5750 kW. The generator voltage and frequency shall be 4160 ± 420 volts and 60 ± 1.2 Hz within 11 seconds after the start signal; the steady-state generator voltage and frequency shall be maintained within these limits during this test.
- 8) (Deleted)
- 9) Verifying, during shutdown, 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.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 10) Verifying, during shutdown, 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 valve 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 load sequence timer is OPERABLE with the interval between each load block within the tolerances given in Table 4.8-2;
 - 13) Verifying that the voltage and diesel speed tolerances for the accelerated sequencer permissives are $92.5 \pm 1\%$ and $98 \pm 1\%$, respectively, with a time delay of 2 ± 0.2 s;
 - 14) Verifying that the following diesel generator lockout features prevent diesel generator starting only when required:
 - a) Turning gear engaged, or
 - b) Maintenance mode; and
 - 15) Operating at greater than or equal to 5600 KW but less than or equal to 5750 KW for one hour or until operating temperature has stabilized. Within 5 minutes after shutting down the diesel generator, restart the diesel generator and verify that the generator voltage and frequency reaches at least 3740 volts and 57 Hz within 11 seconds.
- h. 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 441 rpm in less than or equal to 11 seconds; and

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- i. 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 or its equivalent, and
 - 2) Performing a pressure test of those portions of the diesel fuel oil system designed to Section III, subsection ND of the ASME Code at a test pressure equal to 110% of the system design pressure.
 - 3) Performing tank wall thickness measurements. The resulting data shall be evaluated and any abnormal degradation will be justified or corrected. Any abnormal degradation will be documented in a report to the Commission.

4.8.1.1.3 Reports - (Not Used)

4.8.1.1.4 Diesel Generator Batteries - Each diesel generator 125-volt battery bank and charger shall be demonstrated OPERABLE:

- a. At least once per 7 days by verifying that:
 - 1) The electrolyte level of each battery is at or above the low mark and at or below the high mark,
 - 2) The overall battery voltage is greater than or equal to 125 volts on float charge, and
 - 3) The individual cell voltage is greater than or equal to 1.36 volts on float charge.*
- b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 110 volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:
 - 1) There is no visible corrosion at either terminals or connectors, and
 - 2) The average electrolyte temperature of six connected cells is above 60°F.

*Two different cells shall be tested each month.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- c. At least once per 18 months by verifying that:
- 1) The batteries, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration,
 - 2) The cell-to-cell and terminal connections are clean, tight, free of corrosion and coated with anticorrosion material in accordance with manufacturer's recommendations,
 - 3) The cell-to-cell pole screws torque setting is 14.5 ± 0.5 ft-lbs,
 - 4) The battery charger will supply at least 75 amperes at a minimum of 125 volts for at least 8 hours, and
 - 5) The battery capacity is adequate to supply and maintain in OPERABLE status its emergency loads when subjected to a battery service test. The battery shall supply a current of greater than or equal to 171.6 amps for the first minute and a current of greater than or equal to 42.5 amps for the remaining 119 minutes, while maintaining a terminal voltage of greater than or equal to 105 volts.
- d. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. Once per 60 month interval, this performance discharge test may be performed in lieu of the battery service test.
- e. At least once per 18 months, during shutdown, by giving performance discharge tests of battery capacity to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.

TABLE 4.8-1 - DIESEL GENERATOR TEST SCHEDULE - (Not Used)

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 Essential Auxiliary Power System, and
- b. One diesel generator with:
 - 1) A day tank containing a minimum volume of 470 gallons of fuel,
 - 2) A fuel storage system containing a minimum volume of 77,100 gallons of fuel,
 - 3) A fuel transfer valve, and
 - 4) A 125 VDC battery and charger connected to the diesel generator control loads.

APPLICABILITY: MODES 5 and 6.

ACTION:

With less than the above minimum required A.C. electrical power sources OPERABLE, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes, movement of irradiated fuel, or crane operation with loads over the fuel storage pool, and within 8 hours, depressurize and vent the Reactor Coolant System through at least a 4.5 square inch vent. In addition, when in MODE 5 with the Reactor Coolant loops not filled, or in MODE 6 with the water level less than 23 feet above the reactor vessel flange, immediately initiate corrective action to restore the required sources to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.8.1.2 The above required A.C. electrical power sources shall be demonstrated OPERABLE by the performance of each of the requirements of Specifications 4.8.1.1.1, 4.8.1.1.2 (except for Specification 4.8.1.1.2a.5), and 4.8.1.1.4.

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 steam-driven auxiliary feedwater pump is OPERABLE. This requirement is intended to provide assurance that a loss-of-offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term, verify, as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the Surveillance Requirements needed to demonstrate the OPERABILITY of the component.

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

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guide 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, Regulatory Guide 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977, Regulatory Guide 1.137, "Fuel-Oil Systems for Standby Diesel Generators," Revision 1, October 1979, the NRC Staff Evaluation Report concerning the Reliability of Diesel Generators at Catawba, August 14, 1984, Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel

ELECTRICAL POWER SYSTEMS

BASES

A.C. SOURCES, D.C. SOURCES, and ONSITE POWER DISTRIBUTION (Continued)

Generator Reliability," Generic Letter 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation," and Generic Letter 94-01, "Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators." If any other metallic structures (building, new or modified piping systems, conduits) are placed in the ground near the Fuel Oil Storage System or if the original system is modified, the adequacy and frequency of inspections for the Cathodic Protection System shall be reevaluated and adjusted in accordance with the manufacturer's recommendations.

The Surveillance Requirements for demonstrating the OPERABILITY of the station batteries are based on the recommendations of Regulatory Guide 1.129, "Maintenance Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants," February 1978, and IEEE Std 450-1980, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations."

Verifying average electrolyte temperature above the minimum for which the battery was sized, total battery terminal voltage on float charge, connection resistance values and the performance of battery service and discharge tests ensures the effectiveness of the charging system, the ability to handle high discharge rates and compares the battery capacity at that time with the rated capacity.

Table 4.8-3 specifies the normal limits for each designated pilot cell and each connected cell for electrolyte level, float voltage and specific gravity. The limits for the designated pilot cells float voltage and specific gravity, greater than 2.13 volts and 0.015 below the manufacturer's full charge specific gravity or a battery charger current that had stabilized at a low value, is characteristic of a charged cell with adequate capacity. The normal limits for each connected cell for float voltage and specific gravity, greater than 2.13 volts and not more than 0.020 below the manufacturer's full charge specific gravity with an average specific gravity of all the connected cells not more than 0.010 below the manufacturer's full charge specific gravity, ensures the OPERABILITY and capability of the battery.

Operation with a battery cell's parameter outside the normal limit but within the allowable value specified in Table 4.8-3 is permitted for up to 7 days. During this 7-day period: (1) the allowable values for electrolyte level ensures no physical damage to the plates with an adequate electron transfer capability; (2) the allowable value for the average specific gravity of all the cells, not more than 0.020 below the manufacturer's recommended full charge specific gravity, ensures that the decrease in rating will be less than the safety margin provided in sizing; (3) the allowable value for an individual cell's specific gravity, ensures that an individual cell's specific gravity will not be more than 0.040 below the manufacturer's full charge specific gravity and that the overall capability of the battery will be maintained within an acceptable limit; and (4) the allowable value for an individual cell's float voltage, greater than 2.07 volts, ensures the battery's capability to perform its design function.

ADMINISTRATIVE CONTROLS

g. Radiological Environmental Monitoring Program

A program shall be provided to monitor the radiation and radionuclides in the environs of the plant. The program shall provide (1) representative measurements of radioactivity in the highest potential exposure pathways, and (2) verification of the accuracy of the effluent monitoring program and modeling or environmental exposure pathways. The program shall (1) be contained in Chapter 16 of the FSAR, (2) conform to the guidance of Appendix I to 10 CFR Part 50, and (3) include the following:

- 1) Monitoring, sampling, analysis, and reporting of radiation and radionuclides in the environment in accordance with the methodology and parameters in the ODCM,
- 2) A Land Use Census to ensure that changes in the use of areas at and beyond the SITE BOUNDARY are identified and that modifications to the monitoring program are made if required by the results of this census, and
- 3) Participation in a Interlaboratory Comparison Program to ensure that independent checks on the precision and accuracy of the measurements of radioactive materials in the environmental sample matrices are performed as part of the quality assurance program for environmental monitoring.

h. Diesel Fuel Oil Testing

A program shall be established to implement required testing of number 2 diesel fuel oil. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM Standards. The purpose of the program is to establish the following:

- a. Acceptability of new fuel oil for use, prior to addition to storage tanks, by determining that the fuel oil has:
 1. an API gravity or an absolute specific gravity within specified limits,
 2. a flash point and kinematic viscosity within specified limits, and
 3. a clear and bright appearance with proper color;
- b. Other properties per the applicable ASTM Standards for number 2 diesel fuel oil are within limits, within 30 days following sampling and addition to storage tanks.
- c. Total particulate concentration of the fuel oil is ≤ 10 mg/liter when tested every 31 days in accordance with the applicable ASTM Standards.

ADMINISTRATIVE CONTROLS

6.9 REPORTING REQUIREMENTS

ROUTINE REPORTS

6.9.1 In addition to the applicable reporting requirements of Title 10, Code of Federal Regulations, the following reports shall be submitted to NRC in accordance with 10 CFR 50.4.

STARTUP REPORT

6.9.1.1 A summary report of plant startup and power escalation testing shall be submitted following (1) receipt of an Operating License, (2) amendment to the license involving a planned increase in power level, (3) installation of fuel that has a different design or has been manufactured by a different fuel supplier, and (4) modifications that may have significantly altered the nuclear, thermal, or hydraulic performance of the unit.

6.9.1.2 The Startup Report shall address each of the tests identified in the Final Safety Analysis Report and shall include a description of the measured values of the operating conditions or characteristics obtained during the test program and a comparison of these values with design predictions and specifications. Any corrective actions that were required to obtain satisfactory operation shall also be described. Any additional specific details required in license conditions based on other commitments shall be included in this report.

6.9.1.3 Startup Reports shall be submitted within: (1) 90 days following completion of the Startup Test Program, (2) 90 days following resumption or commencement of commercial power operation, or (3) 9 months following initial criticality, whichever is earliest. If the Startup Report does not cover all three events (i.e., initial criticality, completion of Startup Test Program, and resumption or commencement of commercial operation), supplementary reports shall be submitted at least every 3 months until all three events have been completed.

ANNUAL REPORTS ^{1/}

6.9.1.4 Annual Reports covering the activities of the unit as described below for the previous calendar year shall be submitted prior to March 1 of each year. The initial report shall be submitted prior to March 1 of the year following initial criticality.

6.9.1.5 Annual Reports shall include the activities of the unit as described below:

a. Personnel Exposures

Reports required on an annual basis shall include a tabulation on an annual basis of the number of station, utility, and other personnel (including contractors) receiving exposures greater than 100 mrem/yr and their associated man-rem exposure according to work and job functions, e.g., reactor operations and surveillance, inservice inspection, routine

^{1/} A single submittal may be made for the station. The submittal should combine those sections that are common to both units.

ADMINISTRATIVE CONTROLS

maintenance, special maintenance (describe maintenance), waste processing, and refueling. The dose assignments to various duty functions may be estimated based on pocket dosimeter, TLD, or film badge measurements. Small exposures totalling less than 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total wholebody dose received from external sources should be assigned to specific major work functions.

b. Primary Coolant Specific Activity

Reports required on an annual basis shall include the results of specific activity analysis in which the primary coolant exceeded the limits of Specification 3.4.8. The following information shall be included: 1) Reactor power history starting 48 hours prior to the first sample in which the limit was exceeded; 2) Results of the last isotopic analysis for radioiodine performed prior to exceeding the limit, results of analysis while limit was exceeded and results of one analysis after the radioiodine activity was reduced to less than limit. Each result should include date and time of sampling and the radioiodine concentrations; 3) Clean-up system flow history starting 48 hours prior to the first sample in which the limit was exceeded; 4) Graph of the I-131 concentration and one other radioiodine isotope concentration in microcuries per gram as a function of time for the duration of the specific activity above the steady-state level; and 5) The time duration when the specific activity of the primary coolant exceeded the radioiodine limit.

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT*

6.9.1.6 Routine Annual Radiological Environmental Operating Reports covering the operation of the unit during the previous calendar year shall be submitted prior to May 1 of each year. The report shall include summaries, interpretations, and analysis of trends of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided shall be consistent with the objectives outlined in (1) Chapter 16 of the FSAR and (2) Sections IV.B.2, IV.B.3, and IV.C of Appendix I to 10 CFR Part 50.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT*

6.9.1.7 The Annual Radioactive Effluent Release Report covering the operation of the unit during the previous calendar year shall be submitted before May 1 of each year. The Radioactive Effluent Release Report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be (1) consistent with the objectives outlined in Chapter 16 of the FSAR and (2) in conformance with 10 CFR 50.36a and Section IV.B.1 of Appendix I to 10 CFR Part 50.

* A single submittal may be made for the station. The submittal should combine those sections that are common to both units.