

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

- J1  
Insert # 76
- 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.
- 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  $4160 \pm 420$  volts and frequency at  $60 \pm 1.2$  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  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz during this test.

## 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.

# ELECTRICAL POWER SYSTEMS

## SURVEILLANCE REQUIREMENTS (Continued)

(Deleted)

P1

- 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:
- Synchronize with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power,
  - Transfer its loads to the offsite power source, and
  - 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:
- Turning gear engaged, or
  - Emergency stop.
- 15) Verifying, during shutdown, that with all diesel generator air start receivers 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 1488 rpm in less than or equal to 11 seconds.

Q3

stand by (prelube)

Q5

57 Hz

\*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.

The manufacturer's

done

\*\*\* Diesel generator loadings 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.

\*\*\* 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.

McGUIRE - UNITS 1 and 2

3/4 8-6

Amendment No. 135 (Unit 1)

Amendment No. 117 (Unit 2)

Insert # 8

Q2

Insert # 88

Q4

## 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  $4160 \pm 420$  volts and  $60 \pm 1.2$  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  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz during this test; and
  - 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  $4160 \pm 420$  volts and  $60 \pm 1.2$  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.\*\*\*

US NRC  
May 16, 1996

Attachment 2a

Insert #8:

" If the hot start 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.

Insert #8a:

### One air start receiver may be removed from service for maintenance or testing for up to 48 hours without declaring the associated diesel generator INOPERABLE.

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 for up to 48 hours 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, in the absence of manufacturer recommendations, McGuire engineering will determine the appropriate actions required for nuclear class diesel service taking into account McGuire diesel generator maintenance and operating history and industry experience where applicable.



NUREG-1431, LESS STRINGENT	PROPOSED CHANGE (ATTACH. 3)	MNS SPEC (ATTACH. 2a)	CNS SPEC (ATTACH. 2b)	NEW STS
Allow slow start of DG	G2	4.8.1.1.2.a.4	4.8.1.1.2.a.4	3.8.1.2
Allow a steady-state voltage and frequency to be verified instead of a minimum voltage and frequency within 11 seconds	G3 (MNS only)	4.8.1.1.2.a.4	4.8.1.1.2.a.4	3.8.1.2
Allow a power range instead of an absolute power for testing DG	H2 (MNS only) O1 (MNS only)	4.8.1.1.2.a.5 4.8.1.1.2.e.8	4.8.1.1.2.a.5 4.8.1.1.2.g.7 4.8.1.1.2.g.15	3.8.1.3 3.8.1.14
Allow momentary excursions outside of the required load range without invalidating the DG test	H3	4.8.1.1.2.a.5	4.8.1.1.2.a.5	3.8.1.3 Note 2
Allow relocation of Diesel Fuel Oil properties to TS 6.8, Programs, and limits to licensee-controlled Diesel Fuel Oil Testing Program.	I1 J1 X1	4.8.1.1.2.c 4.8.1.1.2.d 6.8.4.h	4.8.1.1.2.e 4.8.1.1.2.f 6.8.4.h	3.8.3.3 3.8.3.3 5.7.2.17
Allow a minimum voltage instead of the nominal voltage to be verified within 11 seconds of an ESF actuation test signal	M1 (MNS only) O3 (MNS only)	4.8.1.1.2.e.5 4.8.1.1.2.e.8	4.8.1.1.2.g.5 4.8.1.1.2.g.7 4.8.1.1.2.g.15	3.8.1.12 3.8.1.14
Allow deletion of verification during RFO of auto-connected loads to each DG do not exceed 2-hour rating	P1	4.8.1.1.2.e.9	4.8.1.1.2.g.8	NONE

OTHER (TECHNICAL)	PROPOSED CHANGE (ATTACH. 3)	MNS SPEC (ATTACH. 2a)	CNS SPEC (ATTACH. 2b)	NEW STS
Allow air start testing to be done during PM activities	Q1 (MNS only)	4.8.1.1.2.e.15	NONE	NONE
Lower air tank pressure for DG start testing	Q2 (MNS only)	4.8.1.1.2.e.15	NONE	NONE
Allow one air tank out of service up to 48 hours before declaring diesel INOPERABLE	Q4 (MNS only) W3 (MNS only)	4.8.1.1.2.e.15 B 3/4.8.1,2,3	NONE B 3/4.8.1,2,3	NONE
Allow "manufacturer's recommendations" to be "McGuire Engineering's recommendations"	W4 (MNS only)	B 3/4.8.1,2,3	B 3/4.8.1,2,3	

ADMINISTRATIVE	PROPOSED CHANGE (ATTACH. 3)	MNS SPEC (ATTACH. 2a)	CNS SPEC (ATTACH. 2b)	NEW STS
Changes due to deletion of DG testing when one or two offsite circuits are inoperable	A2	3.8.1.1 Action a	3.8.1.1. Action a	3.8.1 Action A
Change "A.C. Source" to "required offsite circuit"	B4	3.8.1.1 Action b	3.8.1.1 Action b	3.8.1 Action D
Delete footnote concerning definition of operability for DG	B5 (MNS only) C5 (MNS only) E1 (MNS only)	3.8.1.1 Action b 3.8.1.1 Action d 3.8.1.1 Action f	3.8.1.1 Action b 3.8.1.1 Action c 3.8.1.1 Action e	3.8.1 Action D 3.8.1 Action B 3.8.1 Action E
Refine Mode change requirement statement	B6 (CNS only) D2 (CNS only) E2 (CNS only)	3.8.1.1 Action b 3.8.1.1 Action e 3.8.1.1 Action f	3.8.1.1 Action b 3.8.1.1 Action d 3.8.1.1 Action e	3.8.1 Action D 3.8.1 Action C 3.8.1 Action E
Delete footnote concerning explanation of STAGGERED TEST BASIS	F3 (CNS only)	4.8.1.1.2.a	4.8.1.1.2.a	3.8.1.2 3.8.1.3 3.8.1.4 3.8.1.6 3.8.1.7
Change "ambient" to "standby (prelube)"	G1 Q3 (MNS only)	4.8.1.1.2.a.4 4.8.1.1.2.e.15	4.8.1.1.2.a.4 NONE	3.8.1.3 3.8.1.7 NONE



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 " $\geq 3600$  kW and  $\leq 4000$  kW". (Catawba currently has  $\geq 5600$  kW and  $\leq 5750$  kW). (NUREG-1431, less stringent)

L/ Technical Justification:

1. (Not used)
2. (Not used)

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.)

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. Add superscript ### to "all" to refer to the footnote ### to say "One starting air receiver tank may be removed from service for maintenance or testing for up to 48 hours without making the associated diesel INOPERABLE. (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 for up to 48 hours without making the diesel inoperable. These maintenance and testing activities increase the reliability

Attachment 3

Revised Final Technical Specification  
Pages

## 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  $4160 \pm 420$  volts and frequency at  $60 \pm 1.2$  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  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz during this test.

## 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<sup>#</sup>, 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<sup>#</sup>, that with all<sup>###</sup> diesel generator air start receivers 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)

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<sup>#</sup> 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.

<sup>###</sup> One air start receiver may be removed from service for maintenance or testing for up to 48 hours without declaring the associated diesel generator INOPERABLE.

## 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 for up to 48 hours 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, in the absence of manufacturer recommendations, McGuire engineering will determine the appropriate actions required 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 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



## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

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- 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  $4160 \pm 420$  volts and frequency at  $60 \pm 1.2$  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  $4160 \pm 420$  volts and  $60 \pm 1.2$  Hz during this test.

## 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<sup>#</sup>, 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<sup>#</sup>, that with all<sup>###</sup> diesel generator air start receivers 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)

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<sup>#</sup> 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.

<sup>###</sup> One air start receiver may be removed from service for maintenance or testing for up to 48 hours without declaring the associated diesel generator INOPERABLE.

## 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 for up to 48 hours 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, in the absence of manufacturer recommendations, McGuire engineering will determine the appropriate actions required 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