

ATTACHMENT 1

DUKE POWER COMPANY  
MCGUIRE NUCLEAR STATION

PROPOSED TECHNICAL SPECIFICATION CHANGES

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.
- 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, ~~during shutdown~~ by: during shutdown
- 1) Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service;
  - 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, and: during shutdown
    - 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 its 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 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 that all automatic diesel generator trips, except engine overspeed, lube oil pressure, generator time over-current and generator differential are automatically bypassed upon loss of voltage on the emergency bus concurrent with a Safety Injection Actuation signal.
- 7) Operating for one hour at 3800 to 4000 kW\* to achieve temperature stability. ~~Within 5 minutes. Restart and perform Surveillance Requirement 4.8.1.1.2a.4.~~ 4.8.1.1.2a.4.
- 8) Verifying, during Shutdown the diesel generator operates for at least 24 hours. between 4200 and During the first 2 hours of this test, the diesel generator shall be loaded ~~to greater than or equal to~~ 4400 kW\* and during the remaining 22 hours of this test, the diesel generator shall be loaded ~~to greater than or equal to~~ 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.

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ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 9) Verifying <sup>during shutdown</sup> that the auto-connected loads to each diesel generator do not exceed the 2-hour rating of 4400 kW;
  - 10) Verifying <sup>during shutdown,</sup> 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 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,~~ <sup>during shutdown,</sup>
  - 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 that the following diesel generator lockout features prevent diesel generator starting only when required:
    - a) Turning gear engaged, and
    - b) Emergency stop.
  - 15) Verifying 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 488 rpm 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 488 rpm in less than or equal to 11 seconds; and
- g. At least once per 10 years by:

Station \_\_\_\_\_ Unit \_\_\_\_\_ Rev. \_\_\_\_\_ File No. \_\_\_\_\_ Sheet \_\_\_\_\_ Of \_\_\_\_\_

Subject \_\_\_\_\_

By \_\_\_\_\_ Date \_\_\_\_\_

Prob No \_\_\_\_\_ Checked By \_\_\_\_\_ Date \_\_\_\_\_

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Diesel generator loading 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.



ATTACHMENT 2

DUKE POWER COMPANY  
MCGUIRE NUCLEAR STATION

DESCRIPTION OF CHANGES AND JUSTIFICATION

## INTRODUCTION

By a February 10, 1989 letter, Duke Power Company submitted a proposed license amendments to Facility Operating Licenses NPF-9 and NPF-17 for McGuire Nuclear Station Units 1 and 2 respectively, pursuant to 10 CFR 50.90. The proposed amendment would allow certain 18 month diesel generator (D/G) Technical Specification (TS) surveillance tests currently required to be performed during unit shutdown only, to be able to conduct these surveillance tests during unit operation as well (i.e. not restricted to a specific mode). These changes were requested to provide additional flexibility in scheduling surveillances.

Specifically, the requested changes involved TS 4.8.1.1.2.e, which lists 15 surveillance to be performed on an 18-month basis, during shutdown to demonstrate the operability of each D/G. The proposed changes would have deleted the "During Shutdown" provision from the opening general requirements and add them only to the specific individual surveillance that either actually technically required or desired to be performed during a shutdown. This would have allowed certain individual surveillances for which the words "During Shutdown" were not added to be performed regardless of the unit's mode of operation, including power operation.

Subsequent to the February 10, 1989 submittal, conference calls were held on August 15 and 20, 1989 between representatives of Duke Power Company and the NRC staff. The NRC staff discussed the concerns that they had regarding the performance of certain surveillance requirements while at power. Other concerns regarding TS 3/4.8 (Electric Power Systems) were also discussed. Specific enhancements to TS section 3/4.8 was discussed. Based on these discussions, the TS amendment request submitted by the February 10, 1989 Duke Power letter is supplemented by this submittal.

To assure clarity and to simplify NRC's review, The revisions provided by this submittal (attachment 1) supersede in its entirety the proposed TS amendments provided by the February 10, 1989 Duke Power letter. The changes provided by this submittal fall into three categories:

- 1) The change is similar to what was provided by the February 10, 1989 submittal and no additional justification is required

- 2) The change is similar to what was provided by the February 10, 1989 submittal, and additional justification is required
- 3) The February 10, 1989 change has been withdrawn and is not included with this submittal

#### DISCUSSION OF CHANGES

##### TS 4.8.1.1.2e.

Proposed Change: Deletes the phrase "during shutdown" from the opening general requirement statement. As discussed in the previous submittal, each specific individual surveillance will identify if the specific test is to be done during shutdown or could be done while the unit is operating at power.

Category: This is a category 1 change, in that this change was previously provided and no additional justification is required.

##### TS 4.8.1.1.2e.1)

Proposed Change: This surveillance requirement will continue to be performed during a shutdown.

Category: This is a category 1 change, in that this change was previously provided and no additional justification is required.

##### TS 4.8.1.1.2e.2) and 3)

Proposed Change: These surveillance requirements will continue to be performed during a shutdown.

Category: They are category 3 changes, in that the previous change request is withdrawn.



TS 4.8.1.1.2e.4)

Proposed Change: This surveillance requirement will continue to be performed during a shutdown.

Category: This is a category 1 change, in that this change was previously provided and no additional justification is required.

TS 4.8.1.1.2e.5)

Proposed Change: The surveillance requirement will not specify that the test be performed during a shutdown.

Category: This is a category 2 change, in that the change was previously provided but additional justification is required.

Justification: The primary purpose of this surveillance requirement is to verify that the D/G will auto-start on an ESF actuation test signal with off-site power available. The D/G Load Sequencer Test Procedure (PT/1,2/A/4350/04A,B) is the implementing procedure for this TS surveillance requirement. Briefly, the D/G Load Sequencer is placed in a test mode. An ESF signal is simulated to commence sequencing and to start the D/G. The D/G is allowed to run for at least 5 minutes. The D/G parameters are monitored and sequencer times are recorded. At no time during this test is the D/G connected to the 230 KV switchyard or to the 4160 V emergency busses (1,2 ETA or ETB). In addition, all protective trips associated with the D/G (see section 8.3.1.1.7 of the FSAR) remain functional during this test. As discussed in the previous submittal, the D/G remains fully functional and any valid actuation signal received would override the test mode enabling the D/G to carry out its intended safety function.

TS 4.8.1.1.2e.6)a) & b)

Proposed Change: These surveillance requirements will continue to be performed during a shutdown.

Category: This is a category 1 change, in that this change was previously provided and no additional justification is required.

TS 4.8.1.1.2e.6)c)

Proposed Change: The surveillance requirement will not specify that the test be performed during a shutdown.

Category: This is a category 2 change, in that the change was previously provided but additional information is required.

Justification: The primary purpose of this surveillance requirement is to verify that all automatic trips associated with the D/G are bypassed on an ESF actuation signal in conjunction with a loss-of-offsite power, except engine overspeed, low lube oil pressure, generator time overcurrent and generator differential. The D/G Periodic Test procedure (PT/1,2/A/4350/15A,B) is the implementing procedure for this technical specification surveillance requirement. Briefly, the automatic start circuitry of a D/G is verified to be unaffected by the normal/bypassed trips. The verification is done by simulating each trip and checking for proper voltages and resistance associated with the bypassed trip. In addition, non-bypassed trips are also verified to interrupt the auto-start circuit. The verification is also done by simulating the trip and checking for appropriate voltage readings. The D/G is not operated at any time during the performance of this section of the test. However; to assure that the D/G is not inadvertently started during the circuit checks, the D/G is rendered inoperable. The estimated time required to perform this test is 2 hours. The overall impact to the D/G reliability and availability in the performance of this test with the unit operating would be minimal (2 hours every 18 months).

TS 4.8.1.1.2e.7)

Proposed Change: A range (3800 to 4000 KW) for operating the D/G is specified. The time in which the D/G had to be restarted is deleted and the specified TS surveillance requirement to be performed is revised. Further, the surveillance requirement will not specify that the test be performed during a shutdown and a footnote is added. The footnote states that the loading of the D/G may be in accordance with vendor recommendations and that the purpose of the load range is to prevent overloading the engine.

Category: This is a category 2 change, in that the change was previously provided but additional information is required.

Justification: By following the loading recommendations of the vendor, the D/G will not be subjected to testing conditions that may be contributing to the premature degradation of the engine, and thus improving the overall reliability and availability of the D/G. By specifying a load range, the possibility of inadvertently overloading the D/G is minimized, while still providing reasonable assurance that the D/G can carry all necessary safety-related loads.

The current TS states that following the one hour run, the D/G is to be restarted within 5 minutes and that SR 4.8.1.1.2e.6)b) be performed. The proposed change deletes the time requirement for restarting the D/G and specifies that SR 4.8.1.1.2a.4 be performed. By performing this surveillance requirement and with the deletion of the time requirement, this will assure that the D/G is not subjected to unnecessary fast start tests and will allow time for an orderly start of the D/G which should minimize mechanical stress and wear on the engine.

TS 4.8.1.1.2e.8)

Proposed change: The surveillance requirement will continue to be performed during a shutdown. A range to which the D/G is to be loaded during the test is specified. Further a new footnote is added. The footnote states that the loading of the D/G may be in accordance with the vendor recommendations and that the purpose of the load range is to prevent overloading the engine.

Category: This is a category 2 change, in that the change was previously provided but additional information is required.

Justification: By following the loading recommendations of the vendor, the D/G will not be subjected to testing conditions that may be contributing to the premature degradation of the engine, and thus improving the overall reliability and availability of the D/G. By specifying a load range, the possibility of inadvertently overloading the D/G is minimized, while still providing reasonable assurance that the D/G can carry all necessary safety-related loads.

TS 4.8.1.1.2e.9)

Proposed Change: This surveillance requirement will continue to be performed during a shutdown.

Category: This is a category 1 change, in that this change was previously provided and no additional justification is required.

TS 4.8.1.1.2e.10)

Proposed Change: This surveillance requirement will continue to be performed during a shutdown.

Category: this is a category 1 change, in that this change was previously provided and no additional justification is required.

TS 4.8.1.1.2e.11)

Proposed Change: This surveillance requirement will continue to be performed during a shutdown.

Category: This is a category 3 change, in that the previous change request is withdrawn.

TS 4.8.1.1.2e.12)

Proposed Change: The surveillance requirement will not specify that the test be performed during a shutdown.

Category: This is a category 1 change, in that this change was previously provided and no additional justification is required.

TS 4.8.1.1.2e.13)

Proposed Change: The surveillance requirement will not specify that the test be performed during a shutdown.

Category: This is a category 2 change, in that the change was previously provided but additional justification is required.

Justification: The primary purpose of this surveillance requirement is to verify the operability of the automatic load sequence timer. The D/G Load Sequencer Test Procedure (PT/1,2/A/4350/04A,B) is the implementing procedure for this technical specification surveillance requirement. Briefly, the D/G Load Sequencer is placed in a test mode. An ESF signal is simulated to commence sequencing and to start D/G. The D/G is allowed to run for at least 5 minutes. The D/G parameters are monitored and the sequencer times are recorded. At no time during this test is the D/G connected to the 230 KV switchyard or to the 4160 V emergency busses (1,2 ETA or ETB). In addition, all protective trips associated with the D/G (see section 8.3.1.1.7 of the FSAR) remain functional during this test. As discussed in the previous submittal, the D/G remains fully functional and any valid actuation signal received would override the test mode enabling the D/G to carry out its intended safety function.

TS 4.8.1.1.2e.14)

Proposed Change: The surveillance requirement will not specify that the test be performed during a shutdown.

Category: This is a category 2 change, in that the change was previously provided but additional justification is required.

Justification: The primary purpose of this surveillance requirement is to verify that the lockout features of the turning gear engaged and the emergency stop relays will prevent the starting of the D/G. The D/G Load Periodic Test Procedure (PT/1,2/a/4350/015A,B) is the implementing procedure for this technical specification surveillance requirement. The verification is done by simulating the turning gear engaged signal and the emergency stop signal. After the signal is simulated, voltages are verified to be correct and the D/G is verified that it does not start. At no time during the performance of this TS required surveillance test section does the D/G start.

TS 4.8.1.1.2e.15)

Proposed Change: The surveillance requirement will not specify that the test be performed during a shutdown.

Category: This is a category 2 change in that the change was previously provided but additional justification is required.



Justification: The primary purpose of this surveillance requirement is to verify that the D/G has the capability of starting at least two times and accelerating to at least 488 rpm within 11 seconds with all receivers pressurized to 220 psig and their respective compressors isolated. The D/G Periodic Test procedure (PT/1,2/A/4350/15A) is the implementing procedure for this surveillance requirement. Briefly, the D/G is started twice with the starting air tanks at 220 psig or less and with the VG compressor makeup isolated. For both times the D/G is started, it is verified that the D/G reaches 95% of its speed within 11 seconds or less. At no time during the performance of this test is the D/G loaded and as discussed in the previous submittal, the D/G, although it is declared inoperable, is fully capable of performing its safety function.