

May 6, 1987

Docket Nos.: 50-369
and 50-370

Mr. H. B. Tucker, Vice President
Nuclear Production Department
Duke Power Company
422 South Church Street
Charlotte, North Carolina 28242

Dear Mr. Tucker:

Subject: Issuance of Amendment No. 71 to Facility Operating License NPF-9 and
Amendment No. 52 to Facility Operating License NPF-17 - McGuire
Nuclear Station, Units 1 and 2 (TACS 55874/55875, 59263/59264)

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 71 to Facility Operating License NPF-9 and Amendment No. 52 to Facility Operating License NPF-17 for the McGuire Nuclear Station, Units 1 and 2. These amendments consist of changes to the Technical Specifications in response to your letter dated July 10, 1985, revised April 15, 1986 and supplemented and clarified October 30 and November 21, 1986.

The amendments change the Technical Specifications (TS) regarding diesel generator testing and surveillance.

A copy of the related safety evaluation supporting Amendment No. 71 to Facility Operating License NPF-9 and Amendment No. 52 to Facility Operating License NPF-17 is enclosed.

Notice of issuance of amendments will be included in the Commission's next bi-weekly Federal Register notice.

Sincerely,

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Darl Hood, Project Manager
Project Directorate II-3
Division of Reactor Projects I/II

Enclosures:

1. Amendment No. 71 to NPF-9
2. Amendment No. 52 to NPF-17
3. Safety Evaluation

cc w/enclosures: See next page

DISTRIBUTION:

See attached page

*SEE PREVIOUS CONCURRENCE

PWR#4/DPWR-A
*MDuncan/rad
03/06/87

PWR#4/DPWR-A
*DHood
02/23/87

PWR#4/DPWR-A
BJYoung/DHood
05/16/87

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Mr. H. B. Tucker
Duke Power Company

McGuire Nuclear Station

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DATED: May 6, 1987

AMENDMENT NO.71 TO FACILITY OPERATING LICENSE NPF-9 - McGuire Nuclear Station, Unit 1
AMENDMENT NO.52 TO FACILITY OPERATING LICENSE NPF-17 - McGuire Nuclear Station, Unit 2

DISTRIBUTION:

Docket File 50-369/370

NRC PDR

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PWR#4 R/F

BJYoungblood R/F

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DHood

HThompson

OGC-Bethesda

JPartlow

BGrimes

EJordan

LHarmon

WJones

TBarnhart (8)

ACRS (10)

OPA

LFMB

NThompson

JLazevnick

RGiardina



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

DUKE POWER COMPANY

DOCKET NO. 50-369

McGUIRE NUCLEAR STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 71
License No. NPF-9

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment to the McGuire Nuclear Station, Unit 1 (the facility) Facility Operating License No. NPF-9 filed by the Duke Power Company (the licensee) dated July 10, 1985, revised April 15, 1986 and supplemented October 30, and November 21, 1986, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations as set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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P PDR

2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachments to this license amendment, and Paragraph 2.C.(2) of Facility Operating License No. NPF-9 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 71, are hereby incorporated into the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

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B.J. Youngblood, Director
Project Directorate II-3
Division of Reactor Projects I/II

Attachment:
Technical Specification
Changes

Date of Issuance: May 6, 1987

*SEE PREVIOUS CONCURRENCE

PWR#4/DPWR-A
*MDuncan/rad
03/06/87

PWR#4/DPWR-A
*DHood
02/23/87

DA

OGC/BETH
*
03/11/87

PWR#4/DPWR-A
BJYoungblood
05/6/87



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

DUKE POWER COMPANY

DOCKET NO. 50-370

McGUIRE NUCLEAR STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.52
License No. NPF-17

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment to the McGuire Nuclear Station, Unit 2 (the facility) Facility Operating License No. NPF-17 filed by the Duke Power Company (the licensee) dated July 10, 1985, revised April 15, 1986 and supplemented October 30, and November 21, 1986, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations as set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachments to this license amendment, and Paragraph 2.C.(2) of Facility Operating License No. NPF-17 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No.52, are hereby incorporated into the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

151
B.J. Youngblood, Director
Project Directorate II-3
Division of Reactor Projects I/II

Attachment:
Technical Specification
Changes

Date of Issuance:

*SEE PREVIOUS CONCURRENCE

PWR#4/DPWR-A
*MDuncan:mac
03/06/87

PWR#4/DPWR-A
*DHood
02/23/87
DH

OGC/BETH
*
03/11/87

PWR#4/DPWR-A
BJYoungblood
05/16/87

ATTACHMENT TO LICENSE AMENDMENT NO. 71

FACILITY OPERATING LICENSE NO. NPF-9

DOCKET NO. 50-369

AND

TO LICENSE AMENDMENT NO. 52

FACILITY OPERATING LICENSE NO. NPF-17

DOCKET NO. 50-370

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the areas of change.

Amended
Page

3/4 8-1
3/4 8-2a
3/4 8-2
3/4 8-3
3/4 8-4
3/4 8-5
B 3/4 8-1
B 3/4 8-2
3/4 8-8

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	Once per 31 days
$\geq 2^{**}$	≥ 5	Once per 7 days

*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 Surveillance Requirement 4.8.1.1.2.a.4; four tests, in accordance with Surveillance Requirement 4.8.1.1.2.c. 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 one.

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 28,000 gallons of fuel, and
 - 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 circuits 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

*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).

**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.

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.
- 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

*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).

**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.

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 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. 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,

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)

- 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:
 - 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 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 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:
 - 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 ± 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 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, lube oil pressure, and generator differential are automatically bypassed upon loss of voltage on the emergency bus concurrent with a Safety Injection Actuation signal. Additionally, all diesel generator breaker trips, except generator time overcurrent, are verified to be automatically bypassed upon concurrent loss of voltage on the emergency bus and a Safety Injection Actuation signal.
- 7) Operating for one hour at 4000 kW to achieve temperature stability. Within 5 minutes, restart and perform Surveillance Requirement 4.8.1.1.2e.6)b).
- 8) Verifying the diesel generator operates for at least 24 hours. 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 ± 420 volts and 60 ± 1.2 Hz during this test.

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 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.

ELECTRIC POWER SYSTEMS

BASES

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

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 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.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 71 TO FACILITY OPERATING LICENSE NPF-9
AND AMENDMENT NO. 52 TO FACILITY OPERATING LICENSE NPF-17

DUKE POWER COMPANY

DOCKET NOS. 50-369 AND 50-370

McGUIRE NUCLEAR STATION, UNITS 1 AND 2

INTRODUCTION

By letter dated July 10, 1985, as revised April 15, 1986 and supplemented and clarified October 30 and November 21, 1986, Duke Power Company (the licensee) requested changes to the Technical Specifications (TSs) regarding testing and surveillance of diesel generators (D/Gs) and diesel fuel oil at McGuire Nuclear Station, Units 1 and 2. The requested changes are associated with four separate aspects: (1) changes pursuant to NRC Generic Letter (GL) 84-15; (2) changes pursuant to GL 83-30; (3) a change to separate the 24-hour run test and the Engineered Safety Features (ESF) actuation test; and (4) addition of an alternate diesel fuel oil viscosity measuring unit.

EVALUATION

A. Changes Pursuant to GL 84-15

On July 2, 1984, the Commission issued GL 84-15, "Proposed Staff actions to Improve and Monitor Diesel Generator Reliability." In GL 84-15 the Commission noted its finding that excessive D/G testing contributed to premature engine degradation and that an overall improvement in reliability and availability can be gained by eliminating excessive fast starts. Typical TSs were included in GL 84-15. The licensee has in general used the staff's guidance outlined in GL 84-15 and the associated TSs as previously approved by the Commission for the North Anna Power Station as a basis for the proposed changes to the McGuire D/G Action Statements and Surveillance Requirements.

Action Statements 3.8.1.1a.b.d, and e are changed to require that the operability of a D/G be demonstrated by both starting it and running it loaded on the offsite power system. Prior to this amendment, the TSs required that the D/G only be started. The requirement to load the machine is made to reduce the amount of D/G operating time under detrimental no-load or light-load conditions. We find these changes to be in the interest of reducing operation of the D/G under conditions which are known to produce detrimental effects. These changes are, therefore, acceptable. These changes are also in accordance with previously approved TSs on North Anna.

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Action statement 3.8.1.1a is changed to delete the requirement to demonstrate the D/Gs operable for loss of an offsite circuit, provided they have been successfully tested within the past 24 hours. This change reduces unnecessary testing and, thereby, the associated detrimental effects of frequent starts and is, therefore, acceptable. This change is also in accordance with previously approved TSS on North Anna.

Action statements 3.8.1.1a,b,d and e are changed to expand the length of time allowed to demonstrate a diesel generator operable. The time is changed from 1 hour in all cases, to 8 hours in the case of loss of two power sources (off-site and onsite), and to 24 hours for the case of loss of one power source. The previous requirement to retest at least once per 8 hours is also eliminated. We find these changes provide sufficient time to perform an orderly start and loading test on the D/Gs, and reduce unnecessary testing and thereby the associated detrimental effects of frequent starts. These changes are, therefore, acceptable. These changes are also in accordance with previously approved TSS on North Anna.

Action statements 3.8.1.1b and d are changed to eliminate the need to demonstrate the operability of a D/G when its redundant counterpart is inoperable due to preplanned testing or maintenance. We find these changes reduce unnecessary testing and, thereby, the associated detrimental effects of frequent starts. These changes are, therefore, acceptable. These changes are also in accordance with previously approved TSS on North Anna.

Action statements 3.8.1.1b, d and f are supplemented with a footnote stating that a D/G 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. We find that this footnote clarifies OPERABILITY of the D/Gs and is, therefore, acceptable.

Action statements 3.8.1.1b, and d are supplemented with a footnote requiring that surveillance testing on a redundant D/G be completed regardless of when the inoperable D/G is restored to operability. We find these changes ensure that both D/Gs are tested for common-mode failures which may have caused the initial operability of the first D/G. These changes are, therefore, acceptable. These changes are also in accordance with previously approved TSS on North Anna.

These amendments also add a footnote to Surveillance Requirement 4.8.1.1.2a.4 whose purpose is to reduce the number of cold fast start surveillance tests on the D/Gs from at least once per 31 days to at least once per 184 days. All other engine starts and loadings for the purpose of the surveillance testing may be preceded by an engine prelube period and/or other warmup procedures recommended by the manufacturer so that mechanical stress and wear on the diesel engine is minimized. This change is in response to the staff conclusion in GL 84-15 that the frequency of fast start tests from ambient conditions of D/Gs should be reduced. This proposed TS change follows that guidance and is, therefore, acceptable.

The amendments make several changes to Table 4.8-1, "Diesel Generator Test Schedule." First, the basis for the testing schedule is changed from a "per nuclear unit" basis to a "per diesel generator" basis. From past experience we have found that TSs requiring licensees to test on a "per nuclear unit" basis has resulted in licensees testing the "good" D/Gs (i.e., D/Gs with favorable test results) to an unnecessary excess. Excessive testing of good D/Gs does not improve their reliability; rather as noted in GL 84-15, it tends to degrade them and to shorten their overall expected lives. These amendments eliminate the excessive testing of the good D/G by establishing that the frequency of testing of a D/G is to be based upon its own failures. The revised TS is, therefore, more appropriate and is consistent with GL 84-15 guidelines on improving D/G reliability. Therefore, this change is acceptable.

A second change to Table 4.8-1 by these amendments is that the test frequency is reduced for an individual D/G based on its number of failures in prior tests. The staff has for some time been evaluating the frequency of D/G testing and the associated potential for severe degradation of engine parts due to frequent fast-start testing. From these studies, we have concluded that the test frequency can be reduced to minimize this potential without adversely affecting the overall D/G reliability. We find that the reduction in test frequency is consistent with GL 84-15 guidelines on improving D/G reliability and, therefore, is acceptable.

A third change in Table 4.8-1 provides an explicit direct incentive for the licensee to take major corrective action on the D/G. If the licensee performs a thorough and comprehensive complete overhaul of the D/G that is approved by the D/G manufacturer, the D/G would be rebuilt to like-new conditions. Following such an overhaul, the D/G would become operable after it successfully passed the appropriate surveillance tests once. However, in return for the overhaul, the utility receives the benefit of not being required to count previous failures on the D/G if an acceptable reliability can be demonstrated. With "no previous failures" in the past 20 or 100 tests, the change permits the D/G to re-enter the test schedule at the monthly test frequency. Accelerated testing (weekly) would not become required until either 2 failures in 20 tests or 5 failures in 100 tests occur. In that major repair action for a D/G that has experienced excessive failures has long been the goal, this concept is acceptable.

A reliability criterion for the rebuilt D/G is added to Table 4.8-1. This criterion is the successful completion of 14 consecutive tests, at least 4 of which would be "fast cold" starts. Statistically, the probability that a D/G with an actual reliability of less than 0.90/ demand will satisfy this 14-test criterion is no greater than 20% and this probability decreases rapidly with the actual reliability. The probability that a D/G with an actual reliability of less than 0.95 will satisfy the 14-test criterion is 42% or less. We, therefore, find the proposed 14-test criterion to be acceptable. One should be careful, however, about repeated attempts to satisfy the 14-test criterion. In such a case the statistical situation changes. If a D/G passes the criterion on a second attempt, the probability that the actual reliability is 0.95 would be reduced to only about 25%. Therefore, if the 14-test criterion is not passed on the first attempt, the previous test failures could not be disposed of until some new criterion is negotiated with the NRC. This is specifically required as part of the reliability test criterion in Table 4.8-1 and is, therefore, acceptable.

B. Changes Pursuant to GL 83-30

Prior to these amendments, McGuire surveillance Requirement 4.8.1.1.2e.6) required periodic verification that on a simulated loss of the diesel generator, with offsite power not available, the D/G loads are shed from the emergency busses and that subsequent loading of the diesel generator occurred in accordance with design requirements. By GL 83-30, dated July 21, 1983, the Commission concluded generically that such load shedding/loading was not consistent with the provisions of General Design Criterion (GDC) 17, Regulatory Guide 1.108, and Standard Review Plan Sections 8.2 and 8.3.1 and that TSs with such surveillance requirements for this D/G testing should be modified to delete this requirement which is in excess of the scope of GDC-17. The deletion of this surveillance is therefore, consistent with the staff request in GL 83-30 and is acceptable.

Because of the deletion of Surveillance Requirement 4.8.1.1.2e.6), previous surveillance Requirement 4.8.1.1.2e.7) is renumbered as 4.8.1.1.2e.6). Additionally, previous Surveillance Requirement 4.8.1.1.2e.6)c) which addresses the bypassing of all but certain diesel generator trips and certain diesel generator breaker trips, is reworded for clarity. This is strictly an editorial change that involves no change in requirements and is, therefore, acceptable.

C. Separation of 24 Hour Run Test and Engineered Safety Features Actuation Test

The amendments add a new Surveillance Requirement 4.8.1.1.2e.7) which requires that the D/G be operated for one hour at 4000KW (the continuous rating) to achieve temperature stability, and then within 5 minutes, that the D/G be re-started and accident loads be sequenced on it in accordance with newly-numbered Surveillance Requirement 4.8.1.1.2e.6)b). This replaces the previous requirement that the start and sequence be conducted within 5 minutes of the 24 hour load test specified in Surveillance Requirement 4.8.1.1.2e.8). The licensee states that performing these tests in quick succession, as previously required by Surveillance Requirement 4.8.1.1.2e.8), creates a potential for causing "critical path" complications and delays during an outage. The staff finds that conducting the start and sequencing test after the machine has been operated for one hour at its continuous rating fulfills the intent of conducting the test following the 24 hour load test and is, therefore, acceptable. (We also note that the Standard Technical Specifications offers this test as an option if the diesel generator initially fails the start and sequence test following the 24 hour load test.)

D. Alternate Measuring Unit for Diesel Fuel Oil Viscosity

The amendments change Surveillance Requirement 4.8.1.1.2c.1) b) to allow the licensee to verify the new diesel fuel oil viscosity by using either Kinematic Viscosity at 40°C (104°F) or Saybolt Universal Viscosity at 100°F (38°C). Prior to these amendments, the Surveillance Requirement addressed only Kinematic Viscosity expressed in units of centistokes.

ASTM-D975, "Standard Specification for Diesel Fuel Oils," allows fuel oil viscosity to be expressed in the units for Kinematic Viscosity (centistokes) or Saybolt Universal Viscosity (SUS). Even though the temperatures at which

the viscosities are determined are different (104°F for Kinematic and 100°F for Saybolt), the viscosity limits stated in Table 1 of ASTM-D975 are equivalent; i.e., 1.9 to 4.1 centistokes and 32.6 to 40.1 SUS. The licensee's proposed change does not exceed these limits. Therefore, since the viscosity acceptance criterion is not changed, the staff finds the proposed change to Surveillance Requirement 4.8.1.1.2c.1) b) acceptable.

ENVIRONMENTAL CONSIDERATION

These amendments involve changes to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and changes in surveillance requirements. The staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational exposure. The NRC staff has made a determination that the amendments involve no significant hazards consideration, and there has been no public comment on such finding. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of these amendments.

CONCLUSION

The Commission made a proposed determination that the amendments involve no significant hazards consideration which was published in the Federal Register (51 FR 30567) on August 27, 1986 and consulted with the state of North Carolina. No public comments were received, and the state of North Carolina did not have any comments. Licensee submittals since publication of 51 FR 30567, dated October 30 and November 21, 1986, supplement and clarify the licensee's request by providing increased conformance of the requested changes with the NRC generic TS model and with previously approved (North Anna) TSs, and do not substantively alter the proposed changes as identified in 51 FR 30567 or alter the staff's proposed no significant hazards consideration determination.

We have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

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