

Mr. Charles M. Dugger  
Vice President Operations  
Entergy Operations, Inc.  
P. O. Box B  
Killona, LA 70066

April 21, 1997

SUBJECT: ISSUANCE OF AMENDMENT NO. 126 TO FACILITY OPERATING LICENSE  
NPF-38 - WATERFORD STEAM ELECTRIC STATION, UNIT 3 (TAC NO. M94052)

Dear Mr. Dugger:

The Commission has issued the enclosed Amendment No. 126 to Facility Operating License No. NPF-38 for the Waterford Steam Electric Station, Unit 3. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated November 7, 1995, as supplemented by letters dated July 17, and December 26, 1996, and February 27, March 14, April 7, and April 17, 1997.

The amendment changes the Appendix A TSs by revising TS 3/4.8.1, "Electrical Power Systems - A.C. Sources," to incorporate recommendations and suggestions from (1) Generic Letter (GL) 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operations;" (2) GL 94-01, "Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators from Plant Technical Specifications;" and (3) NUREG 1432, "Standard Technical Specifications Combustion Engineering Plants."

A copy of our related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

ORIGINAL SIGNED BY:  
Chandu P. Patel, Project Manager  
Project Directorate IV-1  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosures: 1. Amendment No. 126 to NPF-38  
2. Safety Evaluation

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Document Name: WAT94052.AMD SEE PREVIOUS CONCURRENCE\*

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

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*Chandu P. Patel*

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Project Directorate IV-1  
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Docket No. 50-382

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Entergy Operations, Inc.

Waterford 3

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

ENERGY OPERATIONS, INC.

DOCKET NO. 50-382

WATERFORD STEAM ELECTRIC STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 126  
License No. NPF-38

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Entergy Operations, Inc. (the licensee) dated November 7, 1995, as supplemented by letter dated July 17, and December 26, 1996, and February 27, March 14, April 7, and April 17, 1997, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, 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;
  - 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 amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility Operating License No. NPF-38 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 126, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in 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 to be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

*Chandu P. Patel*

Chandu P. Patel, Project Manager  
Project Directorate IV-1  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: April 21, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 126

TO FACILITY OPERATING LICENSE NO. NPF-38

DOCKET NO. 50-382

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain vertical lines indicating the areas of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE PAGES

3/4 8-1  
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INSERT PAGES

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B 3/4 8-2a

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

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3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

- a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and
- b. Two separate and independent diesel generators, each with:
  1. Diesel oil feed tanks containing a minimum volume of 339 gallons of fuel, and
  2. A separate diesel generator fuel oil storage tank containing:
    - a. A minimum volume of 38,760 gallons of fuel, or
    - b. A fuel oil volume less than 38,760 gallons and greater than 38,000 gallons of fuel for a period not to exceed 5 days (provided replacement fuel oil is onsite within the first 48 hours), and
  3. A separate fuel transfer pump.

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

ACTION:

- a. With one offsite circuit of 3.8.1.1a inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter. Restore the offsite A.C. circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With one diesel generator of 3.8.1.1b inoperable, demonstrate the OPERABILITY of the offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1a (separately for each offsite A.C. circuit) within 1 hour and at least once per 8 hours thereafter. If the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator (unless it has been successfully tested in the last 24 hours) by performing Surveillance Requirement 4.8.1.1.2a.4 within 8 hours unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated. Restore the diesel generator to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- c. With one offsite A.C. circuit and one diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining offsite A.C. circuit by performing Surveillance Requirement 4.8.1.1.1a within 1 hour and at least once per 8 hours thereafter; and, if the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventive maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE diesel generator by performing Surveillance Requirement 4.8.1.1.2a.4 within 8 hours (unless it is already operating) unless the absence of any potential common mode failure for the remaining diesel generator

ACTION (Continued)

is demonstrated. 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. Restore the other A.C. power source (offsite A.C. circuit or diesel generator) to OPERABLE status in accordance with the provisions of ACTION statement a or b, as appropriate, with the time requirement of that ACTION statement based on the time of initial loss of the remaining inoperable A.C. power source. A successful test of diesel generator OPERABILITY per Surveillance Requirement 4.8.1.1.2a.4 performed under this ACTION statement satisfies the diesel generator test requirement of ACTION statement a or b.

d. With one diesel generator inoperable, in addition to ACTION b. or c. 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, the steam-driven emergency feed pump is OPERABLE.

If these conditions are not satisfied within 2 hours be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

e. With two of the above required offsite A.C. circuits inoperable, restore one of the inoperable offsite A.C. circuits to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. Following restoration of one offsite A.C. circuit, follow ACTION statement a with the time requirement of that ACTION statement based on the time of initial loss of the remaining inoperable offsite A.C. circuit. A successful test of diesel generator OPERABILITY per Surveillance Requirement 4.8.1.1.2a.4 performed under this ACTION statement satisfies the diesel generator test requirement of 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 per 8 hours thereafter; restore 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. Following restoration of one diesel generator, follow ACTION statement b with the time requirement of that ACTION statement based on the time of initial loss of the remaining inoperable diesel generator.

SURVEILLANCE REQUIREMENTS

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

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

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE\*:

- a. At least once per 31 days on a STAGGERED TEST BASIS by:
  1. Verifying the fuel level in the diesel oil feed tank,
  2. Verifying the fuel level in the diesel generator fuel oil storage tank,
  3. Verifying the fuel transfer pump can be started and transfers fuel from the storage system to the diesel oil feed tank,
  4. Verifying the diesel starts\*\*. The generator voltage and frequency shall be at least 3920 volts and 58.8 Hz in  $\leq 10$  seconds after the start signal. The steady state voltage and frequency shall be maintained at  $4160 + 420, -240$  volts and  $60 \pm 1.2$  Hz. The diesel generator shall be started for this test by using one of the following signals:
    - a) Manual.
    - b) Simulated loss-of-offsite power by itself.
    - c) Simulated loss-of-offsite power in conjunction with an ESF actuation test signal.
    - d) An ESF actuation test signal by itself.

\*All planned starts for the purpose of surveillance in this section may be preceded by a prelube period as recommended by the manufacturer.

\*\*A modified diesel generator start involving idling and gradual acceleration to synchronous speed may be used for this surveillance requirement as recommended by the manufacturer. When modified start procedures are not used, the time, speed, voltage, and frequency tolerances of this surveillance requirement must be met.

## ELECTRICAL POWER SYSTEM

### SURVEILLANCE REQUIREMENTS (Continued)

5. Verifying the generator is synchronized, loaded to an indicated 4000-4400 Kw\* in accordance with the manufacturer's recommendation and operates for at least an additional 60 minutes#, and
  6. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.
- b. At least once per 31 days and after each operation of the diesel where the period of operation was greater than or equal to 1 hour by checking for and removing accumulated water from the diesel oil feed tanks.
  - c. At least once per 92 days and from new fuel oil prior to addition to the storage tanks, by obtaining a sample of fuel oil in accordance with ASTM-D270-1975, and by verifying that the sample meets the following minimum requirements and is tested within the specified time limits:
    1. As soon as sample is taken (or prior to adding new fuel to the storage tank) verify in accordance with the test specified in ASTM-D975-77 that the sample has:
      - a) A water and sediment content of less or equal to 0.05 volume percent.
      - b) A kinematic viscosity @ 40°C of greater than or equal to 1.9 centistokes, but less than or equal to 4.1 centistokes.
      - c) A specific gravity as specified by the manufacturer @ 60/60°F of greater than or equal to 0.85 but less than or equal to 0.99 or an API gravity @ 60°F of greater than or equal to 11 degrees but less than or equal to 35 degrees.
    2. Verify an impurity level of less than 2 mg of insolubles per 100 ml when tested in accordance with ASTM-D2274-70; analysis shall be completed within 7 days after obtaining the sample but may be performed after the addition of new fuel oil; and

\*This band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing under direct monitoring of the manufacturer or momentary variation due to changing bus loads shall not invalidate the test.

#This surveillance requirement shall be preceded by and immediately follow without shutdown a successful performance of 4.8.1.1.2a.4 or 4.8.1.1.2d.

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

3. Verify the other properties specified in Table 1 of ASTM-D975-1977 and Regulatory Guide 1.137, Revision 1, October 1979, Position 2.a., when tested in accordance with ASTM-D975-1977; analysis shall be completed within 14 days after obtaining the sample but may be performed after the addition of new fuel oil. Failure to meet this requirement shall not affect diesel generator OPERABILITY; however, corrective action shall be initiated within 72 hours to return the fuel oil supply to within acceptable limits.
- d. At least once per 184 days a diesel generator fast start test shall be performed in accordance with TS 4.8.1.1.2a.4. Performance of the 184 day fast start test satisfies the 31 day testing requirements specified in TS 4.8.1.1.2a.4.
- e. At least once per 18 months during shutdown by:
  1. Verifying the generator capability to reject a load of greater than or equal to 498 kW while maintaining voltage at  $4160 + 420, -240$  volts and frequency at  $60 + 4.5, -1.2$  Hz.
  2. Verifying the generator capability to reject a load of an indicated 4000-4400 kW without tripping. The generator voltage shall not exceed 5023 volts during and following the load rejection.
  3. Simulating a loss-of-offsite power by itself, 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 and the permanently connected loads within 10 seconds after the auto-start signal, energizes the auto-connected shutdown loads through the load sequencer and operates for greater than or equal to 5 minutes while its generator is loaded with the shutdown loads. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at  $4160 + 420, -240$  volts and  $60 + 1.2, -0.3$  Hz during this test.
  4. Verifying that on an SIAS 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 steady-state generator voltage and frequency shall be  $4160 + 420, -240$  volts and  $60 \pm 1.2$  Hz within 10 seconds after the auto-start signal; the generator voltage and frequency shall be maintained within these limits during this test.

SURVEILLANCE REQUIREMENTS (Continued)

5. Simulating a loss-of-offsite power in conjunction with an SIAS 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 and the permanently connected loads within 10 seconds after the auto-start signal, energizes the auto-connected emergency loads through the load sequencer and operates for greater than or equal to 5 minutes. After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at  $4160 + 420, -240$  volts and  $60 + 1.2, -0.3$  Hz during this test.
  - c) Verifying that all automatic diesel generator trips, except engine overspeed and generator differential, are automatically bypassed upon loss of voltage on the emergency bus concurrent with a safety injection actuation signal.
6. Verifying the diesel generator operates for an interval of not less than 24 hours. During 2 hours of this test, the diesel generator shall be loaded to an indicated 4700 to 4900 Kw\* and during 22 hours of this test, the diesel generator shall be loaded to an indicated 4000 to 4400 Kw.\* The generator voltage and frequency shall be  $4160 + 420, -240$  volts and  $60 \pm 1.2$  Hz within 10 seconds after the start signal; the steady-state generator voltage and frequency shall be  $4160 \pm 420$  volts and  $60 + 1.2, -0.3$  Hz during this test. Within 5 minutes after completing this 24-hour test, perform Surveillance Requirement 4.8.1.1.2.a.4.\*\*
7. Verifying that the auto-connected loads and permanently connected loads to each diesel generator do not exceed the 2000-hour rating of 4400 kW.

\*This band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing under direct monitoring of the manufacturer or momentary variation due to changing bus loads shall not invalidate the test.

\*\*If Surveillance Requirement 4.8.1.1.2.a.4 is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead, the diesel generator may be operated at an indicated 4000-4400 kw\* for 2 hours or until internal operating temperatures have stabilized.

SURVEILLANCE REQUIREMENTS (Continued)

8. Verifying 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.
9. Verifying that with the diesel generator operating in a test mode (connected to its bus), a simulated safety injection signal overrides the test mode by (1) returning the diesel generator to standby operation and (2) automatically energizes the emergency loads with offsite power.
10. Verifying that each fuel transfer pump transfers fuel to its associated diesel oil feed tank by taking suction from the opposite train fuel oil storage tank via the installed cross connect.
11. Verifying that the automatic load sequence timer is OPERABLE with the time of each load block within  $\pm 10\%$  of the sequenced load block time.
12. Verifying that the following diesel generator lockout features prevent diesel generator starting only when required:
  - a) turning gear engaged
  - b) emergency stop
  - c) loss of D.C. control power
  - d) governor fuel oil linkage tripped
- f. At the first refueling outage, and thereafter, at intervals not to exceed 24 months, subject the diesels to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service.
- g. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting the diesel generators simultaneously, during shutdown, and verifying that the diesel generators accelerate to at least 600 rpm ( $60 \pm 1.2$  Hz) in less than or equal to 10 seconds.
- h. At least once per 10 years by:
  1. Draining each diesel generator fuel oil storage tank, removing the accumulated sediment, and cleaning the tank using a sodium hypochlorite solution or equivalent, and

SURVEILLANCE REQUIREMENTS (Continued)

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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.
  - i. By performing a visual inspection of the interior of the diesel generator fuel oil storage tanks each time the tank is drained and, if necessary, clean the tank with a sodium hypochlorite solution, or equivalent.

4.8.1.1.3 Reports - (Not Used)

## 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 Part 50.

The Limiting Condition for Operation (LCO) ensures that each diesel generator storage tank contains fuel oil of a sufficient volume to operate each diesel generator for a period of 7 days. The minimum required volume is based on the time-dependent loads of the diesel generator following a loss of offsite power and a design bases accident and includes the capacity to power the engineered safety features in conformance with Regulatory Guide 1.137 October 1979. The minimum onsite stored fuel oil is sufficient to operate the diesel generator for a period longer than the time to replenish the onsite supply from the outside sources discussed in FSAR 9.5.4.2.

An additional provision is included in the LCO which allow the diesel generators to remain operable when their 7 day fuel oil supply is not available. This provision is acceptable on the basis that replacement fuel oil is onsite within the first 48 hours after falling below the 7 day supply.

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

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

## ELECTRICAL POWER SYSTEMS

### BASES

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

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are consistent with the recommendations of Regulatory Guides 1.9 "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, and 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. Other provisions are derived from Generic Letter 93-05 "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operation" 94-01 "Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators," and NUREG 1432 Standard Technical Specifications Combustion Engineering Plants.

The minimum voltage and frequency stated in the Surveillance Requirement are those necessary to ensure the diesel generator can accept the Design Basis Accident loading while maintaining acceptable voltage and frequency levels. Stable operation at the nominal voltage and frequency values is also essential to establishing diesel generator OPERABILITY, but a time constraint is not imposed. This is because a typical diesel generator will experience a period of voltage and frequency oscillations prior to reaching steady state operation if these oscillations are not dampened out by load application. This period may extend beyond the 10 second acceptance criteria and could be a cause for failing the Surveillance Requirement. In lieu of a time constraint in the Surveillance Requirement, the actual time to reach steady state operation is monitored and trended. This is to ensure there is no voltage regulator or governor degradation which could cause a diesel generator to become inoperable. The 10 seconds in the Surveillance Requirement is met when the diesel generator first reaches the specified voltage and frequency, at which time the output breaker would close if an automatic actuation had occurred.

The diesel generator Surveillance testing performed once per 18 months during shutdown is in accordance with Regulatory Guide 1.108, Regulatory Position C.2.

The maximum voltage limit in Surveillance test 4.8.1.1.2.e.2 was increased to 5023 volts in response to NRC Information Notice 91-13; Inadequate Testing of Emergency Diesel Generators. A maximum voltage limit is provided to ensure that components electrically connected to the diesel generator are not damaged as a result of the momentary voltage excursion experienced during this test.

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

## ELECTRICAL POWER SYSTEM

### BASES

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

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 4.8-2 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.

The Onsite Power System includes three 4.16 kV ESF buses (3A3-S, 3B3-S, and 3AB3-2). Power for safety related loads is normally supplied by the non-safety related 4.16 kV buses (3A2 and 3B2) of the Offsite Power System. Should offsite power from either of these be lost, the Onsite Power System will receive power automatically from the appropriate diesel generator. Non-safety related loads will be automatically disconnected from the safety Onsite Power System. Each ESF bus (3A3-S or 3B3-S) is redundant to the other; each can supply sufficient power to its safety related loads to enable safe shutdown, or to mitigate the consequences of a design basis accident. The third bus, 3AB3-S, may be connected to either 3A3-S or 3B3-S, but never to both. Therefore 3AB3-S is not considered as a third, separate source of ESF power. The three ESF buses and their loads are tested as specified in Surveillance Requirements 4.8.1.1.2.e.3 and 4.8.1.1.2.e.5.

Surveillance requirement 4.8.1.1.2.e.1 requires the verification at least once per 18 months of the diesel generator's ability to reject a load of greater than or equal to 498 Kw while specific voltage and frequency constraints are maintained. The intent of this Surveillance requirement is to require the diesel generator to reject the largest single load. The largest single load on the diesel generator is the Essential Chiller which requires 430 Kw under tornado/missile conditions. The difference between the specified 498 Kw load in the Surveillance requirement and the 430 Kw required by the actual largest single load is a margin of conservatism. A method of rejecting a load greater than or equal to 498 Kw utilizing the wet and dry cooling tower fans has been developed and will satisfy the Surveillance requirement.

The loading range for the diesel generators (4000-4400 Kw) as specified in surveillance requirements is equal to approximately 90 to 100 percent of its continuous rating. This provides for a range to conduct testing without inadvertently overloading of the diesel generators. Inadvertent overloading creates unnecessary wear and mechanical stress that may adversely affect the reliability and longevity of the diesel generators.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 126TO

FACILITY OPERATING LICENSE NO. NPF-38

ENTERGY OPERATIONS, INC.

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

1.0 INTRODUCTION

By application dated November 7, 1995, as supplemented by letters dated July 17, and December 26, 1996, and February 27, March 14, April 7, and April 17, 1997, Entergy Operations, Inc. (the licensee), submitted a request for changes to the Waterford Steam Electric Station, Unit 3, Technical Specifications (TSs). The requested changes would revise TS 3/4.8.1, "Electrical Power Systems - A.C. Sources." The purpose of the proposed changes is to incorporate recommendations and suggestions from (1) Generic Letter (GL) 93-05, "Line-Item Technical Specifications Improvements to Reduce Surveillance Requirements for Testing During Power Operations;" (2) GL 94-01, "Removal of Accelerated Testing and Special Reporting Requirements for Emergency Diesel Generators from Plant Technical Specifications;" and (3) NUREG-1432, "Standard Technical Specifications Combustion Engineering Plants."

The July 17, and December 26, 1996, and April 7, and April 17, 1997, letters provided clarifying information that did not change the initial proposed no significant hazards consideration determination. February 27, and March 14, 1997, letters withdrew some of the changes requested concerning emergency diesel generator fuel discussed in previous submittals.

2.0 BACKGROUND

On September 27, 1993, NRC issued GL 93-05. In this letter, NRC identified changes to TS 3/4.8.1 that would allow licensees to reduce the amount of surveillance testing required during power operations. NRC found that by reducing the amount of TS required surveillance testing during power operations, safety could be improved, equipment degradation decreased, and an unnecessary burden on personnel resources eliminated.

GL 94-01 was issued on May 31, 1994, in response to the Commission decision on SECY-93-044, "Resolution of Generic Safety Issue B-56, 'Diesel Generator Reliability'." This GL advised licensees that they could request a license amendment to remove accelerated testing and special reporting requirements for emergency diesel generators from plant TS.

NUREG-1432 documents the positions of NRC on Standard Technical Specifications for Combustion Engineering plants proposed by the Combustion Engineering Owners Group.

### 3.0 DISCUSSION AND EVALUATION

Change 1 (TS 3.8.1.1, Action a): The licensee proposes to delete "If either diesel generator has not been successfully tested within the past 24 hours, demonstrate its OPERABILITY by performing Surveillance Requirement 4.8.1.1.2a.4 separately for each diesel generator (unless it is already operating) within 24 hours."

This proposed change is in accordance with the recommendations provided in GL 93-05 and NUREG-1432. The recommendations contained in these documents allow the deletion of requirements to test emergency diesel generators (EDGs) and other related support systems not associated with an inoperable offsite ac power circuit. Because the inoperability of an offsite ac power circuit does not affect the reliability or performance of the EDGs, deleting this requirement is acceptable.

Change 2 (TS 3.8.1.1, Action b): The licensee proposes to (1) add "an inoperable support system, an independently testable component, or"; (2) change "24 hours" to "8 hours"; and (3) add "unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated."

These proposed changes are in accordance with the recommendations provided in GL 93-05 and NUREG-1432. The recommendations contained in these documents allow the addition of testing exclusions that eliminate the need to test an EDG when the source of its inoperability originated in a support system or an independently testable component. The inoperability of a support system or an independently testable component does not reduce the reliability of an EDG to start once the effected support system or independently testable component is declared operable. The proposed changes would also eliminate the requirement to test an operable EDG as long as it can be demonstrated that there is no potential for a common mode failure of the operable EDG, its support system, or its independently testable components. The changes proposed by the licensee are acceptable because they will not affect the reliability of the EDGs. Reducing the time the licensee has to perform SR 4.8.1.1.2a.4 from 24 hours to 8 hours if the potential for a common failure mode does exist is a conservative change to the TS and is therefore, acceptable.

Change 3 (TS 3.8.1.1, Action c): The licensee proposes to (1) add "an inoperable support system, an independently testable component, or"; and (2) add "unless the absence of any potential common mode failure for the remaining diesel generator is demonstrated."

These proposed changes are in accordance with the recommendations provided in GL 93-05 and NUREG-1432. The recommendations contained in these documents allow the addition of testing exclusions that eliminate the need to test an

EDG when the source of its inoperability originated in a support system or an independently testable component. The inoperability of a support system or an independently testable component does not reduce the reliability of an EDG to start once the effected support system or independently testable component is declared operable. The proposed changes would also eliminate the requirement to test an operable EDG as long as it can be demonstrated that there is no potential for a common mode failure of the operable EDG, its support system, or its independently testable components. The changes proposed by the licensee are acceptable because they will not affect the reliability of the EDGs.

Change 4 (TS 3.8.1.1, Action e): The licensee proposes to delete "demonstrate the operability of two diesel generators by performing Surveillance Requirement 4.8.1.1.2a.4 separately for each diesel generator within 8 hours unless the diesel generators are already operating;".

This proposed change is in accordance with the recommendations provided in GL 93-05 and NUREG-1432. The recommendations contained in these documents allow the deletion of requirements to test emergency diesel generators (EDGs) and other related support systems not associated with an inoperable offsite ac power circuit. Because the inoperability of an offsite ac power circuit does not affect the reliability or performance of the EDGs, deleting this requirement is acceptable.

Change 5 (TS 4.8.1.1.2a): The licensee proposes to (1) add "At least once per 31 days," and delete "In accordance with the frequency specified in Table 4.8.1."

These proposed changes are in accordance with the recommendations provided in GL 94-01 and are acceptable. The recommendations in this document allow the deletion of specific reporting requirements for EDG failures and accelerated testing requirements due to EDG failures. Because the licensee is required to monitor and maintain EDG performance in accordance with the provisions of 10 CFR 50.65, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," there is no longer a need to maintain these requirements in TS.

Change 6 (TS 4.8.1.1.2a.4): The licensee proposes to (1) delete "and accelerates to at least 600 rpm ( $60 \pm 1.2$ ) in less than or equal to 10 seconds"; (2) add ".\*"; (3) add "at least 3920"; (4) delete "4160 + 420, - 240"; (5) add "58.8"; (6) delete " $60 \pm 1.2$ "; (7) add "The steady state voltage and frequency shall be maintained at 4160 + 420, -240 volts and  $60 \pm 1.2$  Hz."; and (8) add the following note to the bottom of page 3/4 8-3: ".\*A modified diesel generator start involving idling and gradual acceleration to synchronous speed may be used for this surveillance requirement as recommended by the manufacturer. When modified start procedures are not used, the time, speed, voltage, and frequency tolerances of this surveillance must be met."

The licensee has proposed changes to clarify when the timed start required by this TS is satisfied (generator voltage and frequency at least 3920 volts and 58.8 Hz within 10 seconds) and to allow the EDGs to be tested using slow starts during monthly surveillance testing. These proposed changes are in accordance with NUREG-1432. The use of slow starts during monthly surveillance testing is intended to improve the reliability and availability of the EDGs by reducing the unnecessary stress and wear caused by fast starts. In lieu of a time constraint in the surveillance requirement, the licensee will monitor and trend the actual time needed to reach steady state operation in order to ensure there is no voltage regulator or governor degradation which could cause the diesel generator to become inoperable. Deleting the 600 rpm reference is acceptable because it is redundant to the frequency reference, and the existing steady state voltage and frequency requirements have been moved to a new sentence. These proposed changes are acceptable because they are intended to clarify the requirements of the TS and to improve the reliability and availability of the EDGs.

Change 7 (TS 4.8.1.1.2a.5): The licensee proposes to (1) replace "synchronized (10 seconds), subsequently loaded to an indicated 4200-4400 Kw\* in less than or equal to 176 seconds, \*\*" with "synchronized, loaded to an indicated 4000-4400 Kw\* in accordance with the manufacturer's recommendations"; (2) delete the following note at the bottom of TS page 3/4 8-4: "\*\*\*The diesel generator fast loading requirement (176 sec) shall be performed at least once per 184 days in these surveillance tests. For all other surveillance tests, load the diesel generator at a rate consistent with the manufacturer's recommendations."; (3) add the following note at the bottom of the page 3/4 8-4: "This surveillance requirement shall be preceded by and immediately follow without shutdown a successful performance of 4.8.1.1.2a.4 or 4.8.1.1.2d and (4) add new surveillance requirement, TS 4.8.1.1.2d, which reads "At least once per 184 days a diesel generator fast start test shall be performed in accordance with TS 4.8.1.1.2a.4. Performance of the 184 day fast start test satisfies the 31 day testing requirements specified in TS 4.8.1.1.2a.4."

These proposed changes are in accordance with the recommendations in GL 93-05 and NUREG-1432. These proposed changes will revise the loading range of the EDGs, delete the requirement to perform a fast loading test, and add a requirement to perform a fast start test of the EDGs once every 184 days in a new TS 4.8.1.1.2d. The revised loading range of the EDGs is intended to avoid inadvertent overloading of the EDGs. Because industry experience has shown that EDGs that operate properly when tested at 90 percent of their continuous design ratings will also operate properly at 100 percent of their design ratings, and because avoiding inadvertent overloads increases the reliability of EDGs, these proposed changes are acceptable. Deletion of the fast loading requirement is acceptable because NRC has determined that this test did not provide useful information about the ability of an EDG to perform its safety function. Performance of fast start test of EDG once per every 184 days is recommended by the staff.

Change 8 (TS 4.8.1.1.2c): This request was withdrawn by February 27, 1997 letter.

Change 9 (TS 4.8.1.1.2d.1): The licensee proposes to delete "(HPSI pump)."

The licensee has proposed to eliminate the words "(HPSI pump)" so that alternate methods of rejecting a load  $\geq 498$  kW may be used to satisfy the requirements of this TS surveillance. Because there is no decrease in the amount of load (real or reactive) to be rejected by the alternate testing methods proposed by the licensee, this change is acceptable.

Change 10 (TS 4.8.1.1.2d.2): The licensee proposes to add "an indicated 4000-."

This proposed change is in accordance with the recommendations in GL 93-05 and NUREG-1432. This proposed change will revise the loading range of the EDGs and is intended to avoid inadvertent overloading of the EDGs. Because industry experience has shown that EDGs that operate properly when tested at 90 percent of their continues design ratings will also operate properly at 100 percent of their design ratings, and because avoiding inadvertent overloads increases the reliability of EDGs, the proposed change is acceptable.

Change 11 (TS 4.8.1.1.2d.3a): The licensee proposes to delete "# SEE NOTE" related to startup until refuel 7.

This proposed change is acceptable because the note is no longer applicable.

Change 12 (TS 4.8.1.1.2d.3b): The licensee proposes (1) to replace "with" with "and the"; and (2) to delete "# SEE NOTE" related to startup until refuel 7.

These proposed changes are acceptable because they are editorial and the note is no longer applicable.

Change 13 (TS 4.8.1.1.2d.5a): The licensee proposes to delete "# SEE NOTE" related to startup until refuel 7.

This proposed change is acceptable because the note is no longer applicable.

Change 14 (TS 4.8.1.1.2d.5b): The licensee proposes (1) to replace "with" with "and the"; (2) to delete "# SEE NOTE"; and (3) to delete the following note at the bottom of page 3/4 8-6: "#NOTE: UNTIL STARTUP FOLLOWING REFUEL 7 In lieu of the prescribed integrated tests (i.e., actual demonstration of shedding, connection, and loading of loads) testing and analysis that shows the capability of the diesel generator to perform these functions will be considered acceptable for train AB A.C. ESF busses. This provision will apply to the associated train AB ESF loads with the exception of Motor Control Center 3AB311 S that has been verified acceptable via analysis."

These proposed changes are acceptable because they are editorial and the note is no longer applicable.

Change 15 (TS 4.8.1.1.2d.6): The licensee proposes (1) to delete "at least"; (2) to add "an interval of not less than"; (3) to delete "the first"; (4) to delete "the remaining"; (5) to replace "4200" with "4000"; (6) to replace "4.8.1.1.2.d.3b" with "4.8.1.1.2.a.4"; and (7) to replace in the "\*\*\*\*" note at the bottom of page 3/4 8-6 "4.8.1.1.2d.3b" with "4.8.1.1.2.a.4", "4200" with "4000", and "1 hour" with "2 hours".

These proposed changes are consistent with the recommendations in GL 93-05 and NUREG-1432. Deleting the requirement to perform the 2-hour loading test at the beginning of the 24-hour run test is acceptable because the current industry practice of pre-warming and slowly loading diesel generators to reduce diesel generator stress and wear and to increase machine reliability has eliminated the rationale for performing the 2-hour loading test during the first 2 hours of the run test. Operating the diesel generator for 2 hours instead of 1 hour if SR 4.8.1.1.2.a.4 is not satisfactorily completed is intended to ensure machine internal operating temperatures have stabilized. These proposed changes are acceptable because they are either (1) administrative and intended to clarify the TS or (2) intended to increase the reliability of the EDGs by eliminating unnecessary stress and wear of the EDGs during surveillance testing.

Change 16 (TS 4.8.1.1.2d.7): The licensee proposes to add "and permanently connected loads."

This proposed change is acceptable because it is an administrative change intended to clarify the requirement of this TS.

Change 17 (TS 4.8.1.1.2f): The licensee proposes to delete "\*" and to add "±."

This change is acceptable because it will correct an administrative error inadvertently incorporated into an earlier licensing amendment.

Change 18 (TS 4.8.1.1.2g.1): Licensee withdrew this change by March 14, 1997, letter.

Change 19 (TS 4.8.1.1.2g.2): Licensee withdrew this change by March 14, 1997, letter.

Change 20 (TS 4.8.1.1.2h): Licensee withdrew this change by March 14, 1997, letter.

Change 21 (TS 4.8.1.1.3): The licensee proposes (1) to add "(Not Used)"; (2) to delete "All diesel generator failures, valid or nonvalid, shall be reported in a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days. Reports of diesel generator failures shall include the information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108,

Revision 1, August 1977. If the number of failures in the last 20 or 100 starts (on a per diesel generator basis) exceeds the criteria in Table 4.8-1, take the appropriate action specified in Table 4.8-1a and attachments thereto."; (3) to delete all the information in Table 4.8-1 and the attachments to this table; and (4) to add the notation "Not Used" in this table.

These proposed changes are in accordance with the recommendations provided in GL 94-01 and are acceptable. The recommendations in this document allow the deletion of specific reporting requirements for EDG failures and accelerated testing requirements due to EDG failures. Because the licensee is required to monitor and maintain EDG performance in accordance with the provisions of 10 CFR 50.65, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," there is no longer a need to maintain these requirements in TS.

Change 22 (Proposed TS 6.8.4.h): Licensee withdrew this change by February 27, 1997, letter.

Change 23 (Bases Section): The licensee has proposed changes to the Bases Section (Page B 3/4 8-2) to clarify the changes evaluated above. The proposed changes in Bases Section were reviewed and are acceptable.

Change 24 (Editorial Changes): Addition of SR 4.8.1.1.2d required renumbering the subsequent requirements. These are strictly editorial changes and they are acceptable.

Based on the above evaluation the staff concludes that the changes proposed by the licensee are acceptable because (1) they are intended to improve the reliability and availability of the EDGs or (2) they are administrative and intended to clarify the TS.

#### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Louisiana State official was notified of the proposed issuance of the amendment. The State official had no comments.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendment involves 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 radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (61 FR 180). Accordingly, the amendment meets 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 the amendment.

#### 6.0 CONCLUSION

The Commission has 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: V. Beaston

Date: April 21, 1997