

October 14, 1992

Docket No. 50-382

Mr. Ross P. Barkhurst
Vice President Operations
Entergy Operations, Inc.
Post Office Box B
Killona, Louisiana 70066

Dear Mr. Barkhurst:

SUBJECT: ISSUANCE OF AMENDMENT NO. 77 TO FACILITY OPERATING LICENSE
NPF-38 - WATERFORD STEAM ELECTRIC STATION, UNIT 3 (TAC NO. M82751)

The Commission has issued the enclosed Amendment No. 77 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 January 30, 1992.

The amendment changes the Appendix A Technical Specifications by raising the average electrolyte temperature of a sample of battery cells from 60°F to 70°F and adjusting the limits for specific gravity accordingly.

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:

David L. Wigginton, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Amendment No. 77 to NPF-38
- 2. Safety Evaluation

cc w/enclosures:
See next page

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OFC	LA:PD4-1	PM:PD4-1	OGC	D:PD4-1
NAME	PNoonan	DWigginton:pk		JLarkins
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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Sincerely,

A handwritten signature in dark ink, appearing to read "D. Wigginton".

David L. Wigginton, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:

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2. Safety Evaluation

cc w/enclosures:
See next page

Mr. Ross P. Barkhurst
Entergy Operations, Inc.

Waterford 3

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

ENERGY OPERATIONS, INC.

DOCKET NO. 50-382

WATERFORD STEAM ELECTRIC STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 77
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 January 30, 1992, 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.

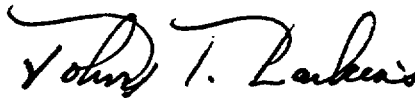
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility Operating License No. NPF-38 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 77 , 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.

FOR THE NUCLEAR REGULATORY COMMISSION



John T. Larkins, Director
Project Directorate IV-1
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: October 14, 1992

ATTACHMENT TO LICENSE AMENDMENT NO. 77
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 8-10

3/4 8-11

INSERT PAGES

3/4 8-10

3/4 8-11

ELECTRICAL POWER SYSTEMS

3/4.8.2 D.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.1 As a minimum the following D.C. electrical sources shall be OPERABLE:

- a. 125-volt Battery Bank No. 3A-S and one associated full capacity charger (3A1-S or 3A2-S).
- b. 125-volt Battery Bank No. 3B-S and one associated full capacity charger (3B1-S or 3B2-S).
- c. 125-volt battery Bank No. 3AB-S and one associated full capacity charger (3AB1-S or 3AB2-S).

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

ACTION:

- a. With one of the required battery banks inoperable, restore the inoperable battery bank 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.
- b. With one of the required full capacity chargers inoperable, demonstrate the OPERABILITY of its associated battery bank by performing Surveillance Requirement 4.8.2.1a.1 within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

SURVEILLANCE REQUIREMENTS

4.8.2.1 Each 125-volt battery bank and at least one associated charger shall be demonstrated OPERABLE:

- a. At least once per 7 days by verifying that:
 1. The parameters in Table 4.8-2 meet the Category A limits, and
 2. The total battery terminal voltage is greater than or equal to 125 volts on float charge.

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- b. At least once per 92 days and within 7 days after a battery discharge with battery terminal voltage below 110-volts, or battery overcharge with battery terminal voltage above 150 volts, by verifying that:
 - 1. The parameters in Table 4.8-2 meet the Category B limits,
 - 2. There is no visible corrosion at either terminals or connectors, or the connection resistance of these items is less than 150×10^{-6} ohms, and
 - 3. The average electrolyte temperature of a random sample of at least ten of the connected cells is above 70°F.
- c. At least once per 18 months by verifying that:
 - 1. The cells, cell plates, and battery racks show no visual indication of physical damage or abnormal deterioration,
 - 2. The cell-to-cell and terminal connections are clean, tight, and coated with anticorrosion material,
 - 3. The resistance of each cell-to-cell and terminal connection is less than or equal to 150×10^{-6} ohms, and
 - 4. The battery charger will supply at least 150 amperes for 3A1-S, 3A2-S, 3B1-S and 3B2-S and 200 amperes for 3AB1-S and 3AB2-S at greater than or equal to 132 volts for at least 8 hours.
- d. At least once per 18 months, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status all of the actual or simulated emergency loads for the design duty cycle when the battery is subjected to a battery service test.
- e. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test may be performed in lieu of the battery service test required by Surveillance Requirement 4.8.2.1d.
- f. Annual performance discharge tests of battery capacity shall be given to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 10% of rated capacity from its average on previous performance tests, or is below 90% of the manufacturer's rating.

TABLE 4.8-2

BATTERY SURVEILLANCE REQUIREMENTS

Parameter	CATEGORY A ⁽¹⁾		CATEGORY B ⁽²⁾	
	Limits for each designated pilot cell	Limits for each connected cell	Limits for each connected cell	Allowable ⁽³⁾ value for each connected cell
Electrolyte Level	>Minimum level indication mark, and $\leq \frac{1}{4}$ " above maximum level indication mark	>Minimum level indication mark, and $\leq \frac{1}{4}$ " above maximum level indication mark	>Minimum level indication mark, and $\leq \frac{1}{4}$ " above maximum level indication mark	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 volts	≥ 2.13 volts ^(c)	≥ 2.13 volts ^(c)	> 2.07 volts
Specific Gravity ^(a)	≥ 1.200 ^(b)	≥ 1.195 Average of all connected cells > 1.205	≥ 1.195 Average of all connected cells > 1.205	Not more than 0.020 below the average of all connected cells Average of all connected cells ≥ 1.195 ^(b)

- (1) For any Category A parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that within 24 hours all the Category B measurements are taken and found to be within their allowable values, and provided all Category A and B parameter(s) are restored to within limits within the next 6 days.
- (2) For any Category B parameter(s) outside the limit(s) shown, the battery may be considered OPERABLE provided that the Category B parameters are within their allowable values and provided the Category B parameter(s) are restored to within limits within 7 days.
- (3) Any Category B parameter not within its allowable value, declare the battery inoperable.
 - (a) Corrected for electrolyte temperature and level.
 - (b) Or battery charging current is less than 2 amps when on charge.
 - (c) Corrected for average electrolyte temperature.

ELECTRICAL POWER SYSTEMS

D.C. SOURCES

SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.2.2 As a minimum, one 125-volt battery bank (3A-S or 3B-S) and one associated full capacity charger shall be OPERABLE.

APPLICABILITY: MODES 5 and 6.

ACTION:

- a. With the required battery bank inoperable, immediately suspend all operations involving CORE ALTERATIONS, positive reactivity changes or movement of irradiated fuel; initiate corrective action to restore the required battery bank to OPERABLE status as soon as possible.
- b. With the required full capacity charger inoperable, demonstrate the OPERABILITY of its associated battery bank by performing Surveillance Requirement 4.8.2.1a.1. within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

SURVEILLANCE REQUIREMENTS

4.8.2.2 The above required 125-volt battery bank and charger shall be demonstrated OPERABLE per Surveillance Requirement 4.8.2.1.



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

October 14, 1992

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 77 TO

FACILITY OPERATING LICENSE NO. NPF-38

ENERGY OPERATIONS, INC.

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

1.0 INTRODUCTION

By application dated January 30, 1992, Entergy Operations, Inc. (the licensee) submitted a request for changes to the Waterford Steam Electric Station, Unit 3 (Waterford 3), Technical Specifications (TS). The requested changes would modify TS Section 3/4.8.2, "D.C. Sources-Operating," and Table 4.8-2, "Battery Surveillance Requirements," to raise the average electrolyte temperature of a sample of battery cells from 60°F to 70°F and adjust the limits for specific gravity accordingly.

2.0 EVALUATION

The Waterford 3 direct current (dc) power system consists of three (60-cell) 125 volts dc batteries, each with its own battery charger, load center, and distribution panel. These three banks of batteries, designated 3A-S, 3B-S, and 3AB-S, and their associated load centers and distribution panels, are arranged to feed the safety-related redundant dc loads and non-safety-related loads associated with Division A, B, and AB. Batteries 3A-S and 3B-S are rated at 1200 ampere-hours for an 8-hour rate of discharge or 600 ampere-hours for a 1-hour rate of discharge to 1.75 volts per cell at 25°C (77°F). The 3AB-S battery is rated at 2400 ampere-hours for an 8-hour rate of discharge to 1.75 volts per cell at 25°C.

During the electrical distribution system functional inspection (EDSFI) conducted by the NRC at Waterford 3, the inspection team reviewed some battery-sizing worksheets. The team noticed that the worksheets identified a temperature correction factor of 1.0, which implied a minimum battery electrolyte temperature of 77°F. The team was concerned with the use of 77°F as a minimum electrolyte temperature because it did not correspond to the minimum electrolyte temperature of 60°F identified in the Waterford 3 TS Section 4.8.2.1.b.3. This discrepancy would require either a new calculation supporting the 60°F value or a change in the TS. Unable to support the 60°F temperature, the licensee established a new minimum TS limit for the battery electrolyte temperature. The licensee completed the analysis using the following worst-case operating conditions for the battery electrolyte temperature:

- (1) A worse-case design basis accident.
- (2) The plant operating at 100% power.
- (3) Heating coils in the battery room are not available.
- (4) The air conditioning system delivering 55°F air to the battery room.

The analysis also assumed that the battery room temperature had not been monitored for a period of 24 hours. The battery room temperature is normally monitored every 12 hours and is equivalent to the battery electrolyte temperature. The results of the analysis showed that the electrolyte temperature for the station batteries should be 73.3°F in a 24-hour period based on the above assumptions and not 60°F as specified in Surveillance Requirement 4.8.2.1.b.3. For conservatism, the licensee used 70°F instead of 73.3°F for the battery capacity calculation, and the results showed that the battery had sufficient capacity to carry the rated loads. Using the lower temperature in the battery capacity calculation provides a larger margin of safety because at a lower temperature the battery has less capacity available to carry the rated loads. As a result of the above calculation, the licensee is requesting a change of the minimum average electrolyte temperature from 60°F to 70°F in Surveillance Requirement 4.8.2.1.b.3. Changing the minimum electrolyte temperature from 60°F to 70°F in the Waterford 3 TS and resizing the Waterford 3 batteries based upon the new 70°F value, provides the necessary consistency between the battery-sizing assumptions and the TS surveillance tests performed to verify operation within these assumptions. Therefore, the staff finds this TS change to be acceptable.

The inspection team also identified a discrepancy involving the TS surveillance requirements for the battery electrolyte specific gravity. The team found the specific gravity surveillance requirements specified in Table 4.8.2 of the TS to be inconsistent with manufacturer's recommendations documented in the vendor technical manual. In Table 4.8-2, the maximum difference permitted from the manufacturer's recommended full-charge specific gravity is specified. Generally, the table specifies that the average specific gravity of all the connected cells be no more than .010 below the manufacturer's recommended full charge-specific gravity to ensure the operability and capability of the battery. This is the criteria in the Combustion Engineering (CE) Standard TS, which assume a manufacturer's recommended full capacity-charge-specific gravity of 1.215. Consistent with the CE Standard TS, the batteries at Waterford 3 have a nominal fully charged specific gravity of 1.215 (at 77°F); however, the limits in Waterford 3 TS Table 4.8-2 are incorrect and are low by .005. The licensee could not justify any supporting basis for the discrepancy. The licensee has proposed to correct these limits to be consistent with the CE Standard TS and with the actual nominal fully charged specific gravity of the batteries at Waterford 3. The staff finds the proposed TS change to be more conservative and in line with the Waterford 3 design and therefore acceptable.

3.0 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.

4.0 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 in 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 (57 FR 7811). 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.

5.0 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: M. Pratt, SELB

Date: October 14, 1992