November 1, 1991

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. 71 TO FACILITY OPERATING LICENSE NPF-38 - WATERFORD STEAM ELECTRIC STATION, UNIT 3 (TAC NO. 81355)

The Commission has issued the enclosed Amendment No. 71 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 September 25, 1991.

The amendment changes the Appendix A Technical Specifications by adding a note to the emergency diesel generator test frequency table to not require the test failure on August 20, 1991, to count for adjustment of test frequency of the "A" diesel.

A Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

ORIGINAL SIGNED BY

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

Enclosures:
1. Amendment No. 71 to NPF-38
2. Safety Evaluation

cc w/enclosures:
See next page

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

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cc w/enclosures:
See next page

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

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-382

WATERFORD STEAM ELECTRIC STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 71
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 September 25, 1991, 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. 71 , 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, and V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: November 1, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 71

TO FACILITY OPERATING LICENSE NO. NPF-38

DOCKET NO. 50-382

Replace the following page of the Appendix A Technical Specifications with the attached page. The revised page is identified by Amendment number and contains a vertical line indicating the area of change. The corresponding overleaf page is also provided to maintain document completeness.

REMOVE PAGE	INSERT PAGE
3/4 8-7	3/4 8-7

TABLE 4.8-1

DIESEL GENERATOR TEST SCHEDULE

NUMBER OF FAILURES IN LAST 20 VALID TESTS.*,#	NUMBER OF FAILURES IN LAST 100 VALID TESTS*	TEST FREQUENCY***
≤ 1	≤ 4	At least once per 31 days
≥ 2	≥ 5	At least 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, Revision 1, August 1977, where the last 20 and 100 tests are determined on a per diesel generator basis. For the purposes of this test schedule, only valid tests conducted after the Operating License issuance date shall be included in the computation of the "last 100 valid tests". Entry into this test schedule shall be made at the 31 day test frequency. Increased test frequency for one diesel generator shall not affect the test frequency for the remaining diesel generator, even under the STAGGERED TEST BASIS criteria.

**This 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.

***For 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 successful completion of 14 consecutive tests in a single series; 10 of these tests shall be in accordance with Surveillance Requirement 4.8.1.1.2a.4,5 and 4 of these tests shall include the fast loading requirement described in the double-asterisked (**) note to surveillance requirement 4.8.1.1.2a.5. If this criterion is not satisfied during the first series of tests, any alternate criterion used to trans-value the failure count to zero may only be implemented with prior approval by the NRC.

#The valid failure to start the "A" Train Diesel Generator on 08/20/91 due to the loss of the power dropping resistor in the governor circuitry is not to be counted toward the adjustment of test frequency for the "A" Train EDG. If the first 14 valid tests on the "A" Train EDG following the 08/20/91 failure do not result in a failure caused by the new power dropping resistor, the valid 08/20/91 failure is trans-valued to zero and this provision no longer applies.

TABLE 4.8-1a

ADDITIONAL RELIABILITY ACTIONS

No. of failures in last 20 valid tests	No. of failures in last 100 valid tests	Action
3	6	Within 14 days prepare and maintain a report for NRC audit describing the diesel generator reliability improvement program implemented at the site (see Note 1).
5	11	Declare the diesel generator inoperable. Perform a requalification test program for the affected diesel generator (see Note 2).

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 NO. NPF-38

ENTERGY OPERATIONS, INC.

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

1.0 INTRODUCTION

By application dated September 25, 1991, 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 not require the valid test failure of the "A" emergency diesel generator (EDG) on August 20, 1991, to count in the adjustment of test frequency for that diesel.

2.0 EVALUATION

On August 20, 1991, Waterford 3 EDG "A" failed to maintain rated speed after it was started for periodic surveillance testing. The diesel reached full speed only to drop in speed to a low value and then increase in speed again. After several oscillations in speed, the diesel was stopped. Troubleshooting revealed that the malfunction of the engine speed control was caused by the failure of one of two parallel voltage dropping resistors in the power supply for the electronic speed control circuit of the Woodward Governor. This constituted a second valid failure in the last 20 tests. In accordance with TS Table 4.8-1, Diesel Generator Test Schedule, this required the test frequency of EDG "A" to be increased from once every 31 days to once every seven days. A footnote in Table 4.8-1, explains that for two or more failures in the last 20 valid demands, an increased 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. Under the current circumstances, the licensee must perform one test every seven days for 14 weeks in order to exit from the increased test frequency.

Waterford 3 has two EDGs that are manufactured by the Cooper Bessemer Company. These EDGs use Woodward Governors for controlling the speed of the generators. There are two methods of controlling the speed of these generators; one electrical and one mechanical. In the event that the electrical governor fails, the backup mechanical governor assumes the function of speed control. In the power supply circuit for the electrical governor, a resistor assembly functions to reduce the 125 Vdc system voltage to 24 Vdc. This resistor assembly has two parallel, 300 ohm, 70 watt resistors. The August 20, 1991, failure was due to the opening of one of the above two resistors. There have been several occurrences at other plants identical to the Waterford 3 failure where one of these parallel resistors has failed. The licensee had established

preventive maintenance, based on known failures of these resistors, to replace the resistors every 18 months and had replaced them in EDG "A" in June 1990, and EDG "B" in July 1990. Waterford 3 had experienced a previously resistor failure in 1986.

The licensee's preventive maintenance program was in agreement with the NRC Information Notice 90-15 which recognizes that replacing the resistors with like resistors was sufficient for at least 18 months. However, the licensee and the Woodward Governor Company have since brought to light the misapplication of the particular design by nuclear plants. The control power for the governors comes from the 125 Vdc station systems which remain in a float charge mode most, if not all of the time. The increased voltage in the float mode can overload the heat dissipation capacity of the resistors causing one to fail at any time, i.e., the licensee should not be on a replacement schedule every 18 months but should be correcting this problem as now recommended by Woodward Governor. This correction is to replace the two resistors with a single larger resistor with greater total heat dissipation ability.

Failure of this improved resistor assembly causes the electronic governor to speed up rather than slow down. In this situation, the mechanical governor will be able to assume control and regulate the speed. The licensee replaced the resistors on EDG "A" with the new single resistor and successfully tested and returned the EDG to service. Subsequently, the licensee expedited the delivery of a new resistor for EDG "B" and that modification is also complete.

Based on the above, the staff concludes that the cause of the August 20, 1991, EDG "A" failure may not have been clearly understood by the Waterford operators, however, appropriate corrective actions have now been implemented by the licensee. The newly designed component now in both EDGs appears to offer certain advantages over the original design. Thus, the failure mechanism associated with the previous failure is no longer present.

TS Table 4.8-1 presents a logical corrective action to increase the testing frequency should a diesel generator system fall below the selected target reliability of 0.95 chosen to determine the station blackout duration. The reliability of the diesels is influenced greatly by neglected or otherwise unrecognized problems with the diesel and to the extent failures occur unexpectedly, the increased testing should reveal any other similar failures. In the case of the Waterford 3 event on August 20, 1991, the failure potential was recognized before the event, the licensee was responding in agreement with the Information Notice 90-51, and the licensee has been recognized as having one of the better diesel programs which should assure high reliability. The problem has been corrected expeditiously on both EDGs and the increased frequency of testing is not supported by the rational by which the TS actions were developed. The proposal to not count the failure for frequency adjustment is acceptable. In light of the current EDG testing practices (slow, starting, prelubing, and prewarming), additional testing is not a major concern, however, the need for the testing should be consistent with the intent of the TS. The licensee actions to replace the two resistors with one with greater heat dissipation capacity is equivalent to the overhaul of the speed control. The

last footnote on Table 4.8-1 provides a general approach to diesel overhaul by requiring 14 starts to reestablish reliability and trans-valve the failure to zero. The licensee has taken the same approach with the proposed footnote to Table 4.8-1 in that the August 20, 1991, failure will be trans-valved to zero following 14 subsequent starts of the diesel with no failures of the power dropping resistor. This allows the footnote to be removed and is 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. 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 (56 FR 49802). 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: D. Wigginton

Date: November 1, 1991