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

April 11, 1997

SUBJECT: ISSUANCE OF AMENDMENT NO. 125 TO FACILITY OPERATING LICENSE NPF-38 - WATERFORD STEAM ELECTRIC STATION, UNIT 3 (TAC NO. M96986)

Dear Mr. Dugger:

The Commission has issued the enclosed Amendment No. 125 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 October 16, 1996.

The amendment changes the Appendix A TSs by revising Table 4.3-1 to expand the applicability for Core Protection Calculator (CPC) operability and to allow the use of a cycle independent shape annealing matrix in the CPCs.

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. 125 to NPF-38
2. Safety Evaluation

cc w/encls: See next page

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

April 11, 1997

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P. O. Box B
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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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cc w/encls: See next page

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

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-382

WATERFORD STEAM ELECTRIC STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 125
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 October 16, 1996, 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. 125, 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 11, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 125

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	INSERT PAGES
3/4 3-12	3/4 3-12
--	3/4 3-12a

TABLE 4.3-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES FOR WHICH SURVEILLANCE IS REQUIRED
13. Reactor Trip Breakers	N.A.	N.A.	M(10), S/U(1)	1, 2, 3*, 4*, 5*
14. Core Protection Calculators	S	D(2,4),R(4,5)	Q(9),R(6)	1, 2
15. CEA Calculators	S	R	Q,R(6)	1, 2
16. Reactor Coolant Flow - Low	S	R	Q	1, 2

TABLE 4.3-1 (Continued)

TABLE NOTATIONS

*With the reactor trip breakers in the closed position, the CEA drive system capable of CEA withdrawal, and fuel in the reactor vessel.

#The provisions of Specification 4.0.4 are not applicable when reducing reactor power to less than 10-4% of RATED THERMAL POWER from a reactor power level greater than 10-4% of RATED THERMAL POWER. Upon reducing power below 10-4% of RATED THERMAL POWER, a CHANNEL FUNCTIONAL TEST shall be performed within 2 hours if not performed during the previous 31 days. This requirement does not apply with the reactor trip breakers open.

(1) Each startup or when required with the reactor trip breakers closed and the CEA drive system capable of rod withdrawal, if not performed in the previous 7 days.

(2) Heat balance only (CHANNEL FUNCTIONAL TEST not included):

a. Between 15% and 80% of RATED THERMAL POWER, compare the Linear Power Level, the CPC at ΔT power, and CPC nuclear power signals to the calorimetric calculation.

If any signal is within -0.5% to +10% of the calorimetric calculation, then do not calibrate except as required during initial power ascension following refueling.

If any signal is less than the calorimetric calculation by more than 0.5%, then adjust the affected signal(s) to within 0.0% to +10.0% of the calorimetric caluclation.

If any signal is greater than the calorimetric calculation by more than 10%, then adjust the affected signal(s) to within 0.0% to 10% of the calorimetric.

b. At or above 80% of RATED THERMAL POWER, compare the Linear Power Level, the CPC ΔT power, and CPC nuclear power signals to the calorimetric calculation. If any signal differs from the calorimetric calculation by an absolute difference of more than 2%, then adjust the affected signal(s) to agree with the calorimetric calculation within -2% to +2%.

During PHYSICS TESTS, these daily calibrations may be suspended provided these calibrations are performed upon reaching each major test power plateau and prior to proceeding to the next major test power plateau.

(3) Above 15% of RATED THERMAL POWER, verify that the linear power sub-channel gains of the excore detectors are consistent with the values used to establish the shape annealing matrix elements in the Core Protection Calculators.

(4) Neutron detectors may be excluded from CHANNEL CALIBRATION.

(5) After each fuel loading and prior to exceeding 70% of RATED THERMAL POWER, the incore detectors shall be used to determine or verify acceptable values for the shape annealing matrix elements used in the Core Protection Calculators.

TABLE 4.3-1 (Continued)

TABLE NOTATIONS (Continued)

(6) This CHANNEL FUNCTIONAL TEST shall include the injection of simulated process signals into the channel as close to the sensors as practicable to verify OPERABILITY including alarm and/or trip functions.

(7) Above 70% of RATED THERMAL POWER, verify that the total RCS flow rate as indicated by each CPC is less than or equal to the actual RCS total flow rate determined by either using the reactor coolant pump differential pressure instrumentation or by calorimetric calculations and if necessary, adjust the CPC addressable constant flow coefficients such that each CPC indicated flow is less than or equal to the actual flow rate. The flow measurement uncertainty is included in the BERR1 term in the CPC and is equal to or greater than 4%.

(8) Above 70% of RATED THERMAL POWER, verify that the total RCS flow rate as indicated by each CPC is less than or equal to the actual RCS total flow rate determined by calorimetric calculations.

(9) The quarterly CHANNEL FUNCTIONAL TEST shall include verification that the correct values of addressable constants are installed in each OPERABLE CPC.

(10) At least once per 18 months and following maintenance or adjustment of the reactor trip breakers, the CHANNEL FUNCTIONAL TEST shall include independent verification of the undervoltage trip function and the shunt trip function.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 125 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 October 16, 1996, 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 change Notation 2 of TS Table 4.3-1 to require adjustment of the linear power level, the core protection calculator (CPC) ΔT power, and CPC nuclear power signals to match or be greater than the calorimetric calculation if, from 15% to 80% of rated thermal power (RTP), the difference is less than -0.5% or greater than 10%. At or above 80% RTP, adjustment would be required if the absolute difference is greater than 2%. The other proposed change to Notation 5 of TS Table 4.3-1 would allow a determination of a cycle-dependent shape annealing matrix (SAM) or the use of a cycle-independent SAM in the CPCs. The staff's evaluation of the proposed request follows.

2.0 EVALUATION

A daily calibration (heat balance) is currently performed when thermal power is greater than 15% of RTP. In accordance with Note 2 of TS Table 4.3-1, the calibration consists of adjusting the linear power level signals and the CPC addressable constant multipliers to make the CPC ΔT power and the CPC nuclear power calculations agree with the calorimetric calculation if the absolute difference is greater than 2%. These checks and, if necessary, the adjustment of the linear power level signal and the CPC addressable constant coefficients, are made to ensure that the accuracy of these CPC calculations is maintained within the analyzed error margins. The power level must be greater than 15% RTP to obtain accurate data since the accuracy of the calorimetric data is questionable at lower power levels.

In order to reduce the number of adjustments required as the power level increases, the licensee has proposed to change Note 2 of Table 4.3-1 to require the CPC calculations to agree within ±2% of the calorimetric calculation when thermal power is greater than or equal to 80% of RTP, and to agree within -0.5% to +10% when thermal power is between 15% and 80% of RTP, based on the reduced accuracy of the calorimetric data inputs at low power levels.

Performing a calorimetric calibration when CPC power is less than the calorimetric by more than 0.5% would allow a small tolerance for operator convenience and would gain thermal margin relative to the current value of 2.0%. The wider tolerance of +10% when CPC power is conservatively indicating a higher than actual power would minimize the number of required adjustments and yet would allow the CPC to conservatively determine linear power density and departure from nucleate boiling ratio (DNBR).

The staff has determined that these proposed changes to Note 2 of TS Table 4.3-1 are acceptable because they ensure that the power indications are conservative relative to the plant safety analyses while reducing the required number of adjustments to these power indications at power levels below 80% of RTP.

The CPCs rely upon the excore detector signals to trip the reactor in the event of an anticipated operational occurrence (AOO) to ensure that the specified acceptable fuel design limits on minimum DNBR and peak linear heat rate are not violated. To do this, each CPC channel synthesizes the core average axial power shape based on three levels of excore detector signals. The relative excore detector readings are subsequently adjusted within the CPCs by a set of channel dependent shape annealing constants. These SAM constants are typically measured during the reload startup power ascension and installed into the CPC channels. Incore and excore signal data are taken at regular intervals during the initial startup power ascension and the incore data is subsequently processed through a computer code to determine the relative power at the core periphery. An automated data reduction code is then used to verify the data, calculate the SAM constants and determine whether the measured SAM meets a set of review and acceptance criteria to justify its implementation into the CPC channels.

The licensee has proposed to change Note 5 of TS Table 4.3-1 to allow either a determination of a cycle-dependent SAM or verification of the acceptability of a generic SAM to be used in the CPCs. Currently, since the cycle-specific SAM is only measured once during reload startup, the representation has been observed to be less accurate as the cycle progresses and the power shape evolves from a flattened cosine to a saddle shape. The generic SAM would be based on middle-of-cycle data and, therefore, would be more representative of the entire cycle. If a generic SAM is used, the matrix elements will be validated each cycle during startup testing and must meet the same acceptance criteria as the cycle-specific SAM elements. This ensures that the axial power shapes generated by the CPCs will still remain within the required uncertainties and that the CPCs will trip the reactor so that minimum DNBR and peak linear heat rate are not violated in the event of an AOO. If these criteria are not met, EOI would calculate a cycle-specific SAM to be used in the CPCs. In response to a staff question, EOI has stated that they normally monitor the CPC synthesized axial shapes quarterly during each cycle to verify the continued acceptability of the CPC axial shape synthesis. Based on the above facts, the staff finds the use of a generic SAM acceptable.

Based on the review described above, the staff concludes that the proposed TS changes to revise the tolerance range between the CPC signals and the calorimetric calculation to -0.5% to +10% between 15% and 80% RTP and to provide the option to use a generic SAM in the CPCs are 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 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 (62 FR 6575). 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: L. Kopp

Date: April 11, 1997