October 10, 1997

Mr. John R. McGaha, Jr.
Vice President - Operations
Entergy Operations, Inc.
River Bend Station
P. O. Box 220
St. Francisville, LA 70775

SUBJECT: RIVER BEND STATION, UNIT 1 - AMENDMENT NO.100 TO FACILITY OPERATING LICENSE NO. NPF-47 (TAC NO. M96509)

Dear Mr. McGaha:

The Commission has issued the enclosed Amendment No.100 to Facility Operating License No. NPF-47 for the River Bend Station, Unit 1. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated August 29, 1996, as supplemented by letters dated August 29 (proprietary), September 5 and October 8, 1997.

The amendment revises the technical specifications in support of Average Power Range Monitor (APRM) setpoint T-factor elimination and reactivity anomaly calculation improvement. The request in the August 29, 1996, application to decrease the local power range monitor (LPRM) calibration frequency will be handled by separate review and action.

A copy of our related Safety Evaluation is enclosed. The 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
Office of Nuclear Reactor Regulation

Docket No. 50-458

Enclosures: 1. Amendment No. 100 to NPF-47
2. Safety Evaluation

cc w/encls: See next page

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

October 10, 1997

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

ENTERGY GULF STATES, INC. **

CAJUN ELECTRIC POWER COOPERATIVE AND

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-458

RIVER BEND STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 100
License No. NPF-47

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Entergy Gulf States, Inc.* (the licensee) dated August 29, 1996, as supplemented by letters dated August 29 (proprietary), September 5 and October 8, 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, as amended, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and

---

* EOI is authorized to act as agent for Entergy Gulf States, Inc, which has been authorized to act as agent for Cajun Electric Power Cooperative, and has exclusive responsibility and control over the physical construction, operation and maintenance of the facility.

**Entergy Gulf States, Inc., which owns a 70 percent undivided interest in RBS, has merged with a wholly owned subsidiary of Entergy Corporation. Entergy Gulf States, Inc. was the surviving company in the merger.

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-47 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.100 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. EOI shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

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

FOR THE NUCLEAR REGULATORY COMMISSION

David L. Wigginton, Senior 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: October 10, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 100

FACILITY OPERATING LICENSE NO. NPF-47

DOCKET NO. 50-458

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

REMOVE	INSERT
3.1-4	3.1-4
3.1-5	3.1-5
3.2-4	-
3.2-5	-
3.3-3	3.3-3
5.0-18	5.0-18
5.0-19	5.0-19

3.1 REACTIVITY CONTROL SYSTEMS

3.1.2 Reactivity Anomalies

LCO 3.1.2 The reactivity difference between the monitored core k-eff and the predicted core k-eff shall be within ± 1% $\Delta k/k$.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Core reactivity difference not within limit.	A.1 Restore core reactivity difference to within limit.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	Verify core reactivity difference between the actual and the predicted reactivity is within ± 1% Δk/k.	Once within 24 hours after reaching equilibrium conditions following startup after fuel movement within the reactor pressure vessel or control rod replacement AND 1000 MWD/T thereafter during operation in MODE 1

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

	SURVEILLANCE	FREQUENCY
SR 3.3.1.1.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.1.1.2	----------NOTE---------- Not required to be performed until 12 hours after THERMAL POWER ≥ 25% RTP. ---------- Verify the absolute difference between the average power range monitor (APRM) channels and the calculated power ≤ 2% RTP.	7 days
SR 3.3.1.1.3	Adjust the channel to conform to a calibrated flow signal.	7 days
SR 3.3.1.1.4	----------NOTE---------- Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ---------- Perform CHANNEL FUNCTIONAL TEST.	7 days

(continued)

5.6 Reporting Requirements

5.6.2 Annual Radiological Environmental Operating Report (continued)

results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted in a supplementary report as soon as possible.

5.6.3 Radioactive Effluent Release Report

The Radioactive Effluent Release Report covering the operation of the unit during the previous calendar year shall be submitted by May 1 of each year. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be consistent with the objectives outlined in the ODCM and process control program and in conformance with 10 CFR 50.36a and 10 CFR 50, Appendix I, Section IV.B.1.

5.6.4 Monthly Operating Reports

Routine reports of operating statistics and shutdown experience, including documentation of all challenges to the main steam safety/relief valves, shall be submitted on a monthly basis no later than the 15th of each month following the calendar month covered by the report.

5.6.5 CORE OPERATING LIMITS REPORT (COLR)

a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:

   1) LCO 3.2.1, Average Planar Linear Heat Generation Rate (APLHGR),
   2) LCO 3.2.2, Minimum Critical Power Ratio (MCPR) (including power and flow dependent limits),
   3) LCO 3.2.3, Linear Heat Generation Rate (LHGR) (including power and flow dependent limits),

b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents.

(continued)

5.6 Reporting Requirements

5.6.5 CORE OPERATING LIMITS REPORT (COLR) (continued)

1) NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel" (latest approved version);*

2) NEDC-32489P (April 1996), "T-Factor Setdown Elimination Analysis for River Bend Station" (for power and flow dependent limits methodology only as evaluated and approved by Safety Evaluation and License Amendment 100 dated October 10 , 1997).

c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.

d. The COLR, including any midcycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

*For Cycle 8, specific documents were approved in the Safety Evaluation dated October 6, 1997, to support License Amendment No. 99.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 100 TO FACILITY OPERATING LICENSE NO. NPF-47

ENTERGY OPERATIONS, INC.

RIVER BEND STATION, UNIT 1

DOCKET NO. 50-458

1.0 INTRODUCTION

By letter dated August 29, 1996, Entergy Operations Inc. submitted a request for NRC review and approval to amend the Technical Specifications (TSs) of River Bend Station (RBS), Unit 1. The TS changes proposed are in support of the Average Power Range Monitor (APRM) setpoint T-Factor elimination and reactivity anomaly calculation improvement. By letter dated August 29, 1996, the licensee submitted the proprietary General Electric (GE) report to support the T-factor elimination; this letter contains proprietary information to support the licensee's request and does not alter the staff's initial no significant hazards determination.

Also by letter dated September 5, 1997, the licensee provided additional information regarding the APRM setpoint T-factor elimination and identified two additional changes to the TS to delete reference to the APRM TS being deleted. By letter dated October 8, 1997, the licensee provided the details to support their T-factor elimination proposal; relocation of operating limits to the Core Operating Limits Report is to be accompanied by a reference in the TS to the methodology described in NEDC-32489P, "T-factor Setdown Elimination Analysis for River Bend Station," dated April 1996, for development of the limits and to this amendment providing results of the NRC review of NEDC-32489P for application to River Bend Station. The September 5 and October 8, 1997, letters provided clarification and did not change the staff's initial no significant hazards determination.

2.0 BACKGROUND

Currently, Linear Heat Generation Rate (LHGR) protection for off-rated operations is provided by the APRM setpoint T-factor as defined in the licensee's August 29, 1996, letter. For T-factors greater than 1.0, the APRM flow-biased scram and control block setpoints are setdown (reduced) by the factor T. This setdown limits the initial power condition permitted and therefore, the severity of events associated with power increases. The licensee is proposing to replace the APRM T-factor setdown (TS 3.2.4) with more meaningful power and flow dependent Maximum Critical Power Ratio (MCPR) and LHGR limits and to include these power and flow dependent curves in the

Core Operating Limits Report (TS 5.6.5). This change will eliminate the need for manual setpoint adjustments and allows more direct thermal limit control. The licensee states that the proposed change will increase plant operating efficiency and improve the human/machine interface by reducing the need for manual adjustments.

The River Bend Technical Specification Bases define Reactivity Anomaly as "a measure of the predicted versus measured core reactivity during power operation." Currently this Technical Specification Requirement, 3.1.2, is met by comparing the actual control rod density to the predicted control rod density. The licensee is requesting to modify this TS to allow the use of an equivalent method for determining a reactivity anomaly. The k-effective would be calculated with the physics design code and compared with measured steady state (Keff=1) operating conditions.

3.0 EVALUATION

APRM SETPOINT T-FACTOR ELIMINATION

The RBS T-Factor Setdown Elimination program utilizes results of Anticipated Operational Occurrences (AOOs) analyses to define initial condition operating limits which conservatively assure that all licensing criteria are satisfied without setdown of the flow-referenced APRM scram and rod block trips. In support of T-Factor elimination, the licensee submitted NEDC-32489P which describes the methodology used to develop the power- and flow-dependent MCPR and Linear Heat Generation Rate (LHGR) limits which replace T-Factor setdown. As a means to demonstrate the application of the methodology to River Bend Station, NEDC-32489P also provides plant specific power- and flow-dependent thermal limits based on RBS Cycle 6 core configuration and plant operating parameters. The staff used these Cycle 6 analyses to evaluate the methodology for development of the power- and flow-dependent LHGR and MCPR limits (curves).

Transient analyses were performed at a variety of power and flow conditions during original BWR Maximum Extended Operating Domain (MEOD) evaluations. Plant-specific, power- and flow-dependent MCPR and LHGR limits were developed by the licensee for RBS. The licensee has implemented and will continue a program to verify the applicability of these limits for future application to include conservative margins to the limits calculated during the initial MEOD application. Between 40% rated thermal power (RTP) and 25% RTP, RBS-specific evaluations were performed to establish the plant-unique limits in the low power range. These plant-specific limits include sufficient conservatism such that they will remain valid for future RBS reloads of GE fuel, utilizing the GEXL-PLUS correlation and the GEMINI analysis methods.

The impact of the APRM setdown elimination on the LOCA and fuel thermal-mechanical integrity analyses was evaluated in GE report NEDC-32489P. The core wide Anticipated Operational Occurrences (AOOs) were analyzed to support the generic GE Maximum Extended Load Line Limit Analysis (MELLLA) region

during the original development of the analysis. For operation in the generic GE MELLLA region, the analyses include evaluations to determine the limiting MCPR requirement and the peak vessel pressures, both of which are evaluated based on Cycle 6 fuel. To support implementation, the analyses determine the off-rated power- and flow-dependent MCPR and LHGR curves associated with the removal of the APRM setpoint T-factor. The staff has reviewed the methodology for determining these power- and flow-dependent MCPR and LHGR limits and finds it acceptable for RBS.

The licensee will perform a cycle-specific validation for Cycle 7 prior to implementation and the plant-specific limits for future reloads cores by including these limits in the Core Operating Limits Report (COLR). The existing COLR will be revised to reflect the deletion of the T-factor limits and the addition of power- and flow-dependent limits for both MCPR and LHGR. Consistent with the requirements of 10 CFR 50.36, the TSs regarding the COLR (TS 5.6.5) must include a reference to the NRC-approved methodology for development of the curves related to the relocated operating limits (power- and flow-dependent curves). By letter dated October 8, 1997, the licensee proposed to include NEDC-32489P which, among other things, sets forth the methodology for determining the power- and flow-dependent limits) with the notation that the methodology was acceptable only as evaluated and approved by this Safety Evaluation and license amendment in the COLR TS 5.6.5 list of references to satisfy this requirement. The licensee's proposal and the notation that the COLR will document MCPR and LHGR (including power- and flow-dependent limits) to TS 5.6.5 are acceptable. The proposed revision to the list of approved methodologies will ensure that values for cycle-specific parameters are determined such that all applicable limits (e.g., nuclear limits, transient analysis limits, and accident limits) are met. Based on the above, the licensee proposal to eliminate APRM setdown and the deleting of TS 3.2.4 ("APRM Gain and Setpoints") in its entirety is acceptable.

The licensee's letter dated September 5, 1997, also included changes to TS Surveillance Requirement 3.3.1.1.2 and to Administrative Controls 5.6.5 to remove reference to the APRM Gain and Setpoints TS which is being eliminated. These changes were overlooked in the licensee's original submittal. With the elimination of APRM Setpoints TS 3.2.4, continued reference in other technical specifications would be in error. The staff finds the revisions to these sections to be acceptable.

The licensee's October 8, 1997, letter included proposed wording for the COLR (Administrative Controls 5.6.5) to address the staff's concerns on T-factor elimination. The proposed wording also included wording related to section 5.6.5.b.1) that would require the "latest version" of NEDE-240112-A to be "as specified in the COLR". The staff has not yet acted on this proposal, which was included in a earlier license amendment request and has not provided the requisite prior notice to the public. In discussions with the licensee on October 10, 1997, the licensee agreed, the staff will handle the licensee's request by separate action. Therefore, the proposed wording is not being authorized in this license amendment.

REACTIVITY ANOMALIES

The licensee's proposed change to the method of calculating the reactivity anomaly as specified in the TS 3.1.2 Limiting Condition of Operation and Surveillance Requirement 3.1.2.1 has been reviewed by the staff. The basic concept of the TS has not been changed by the licensee's proposal. There is still a comparison of a calculated and an observed reactor reactivity state. This change will allow more detailed analytic methods to replace the relatively crude analysis of control rod reactivity status. This is an acceptable change. The Bases for TS 3.1.2 have been changed slightly to provide a clearer statement of the reason for the comparison addressed in the TS. The change is acceptable.

REVIEW SUMMARY

Based on the staff review of the T-factor elimination in conjunction with the licensee's proposed additions to TS 5.6.5 to reference the methodology used to develop the power and flow dependent limits included in the COLR and to reference this safety evaluation approving the plant-specific application of the methodology to River Bend Station, and on the staff review of the reactivity anomaly calculation improvement, the staff concludes that the changes proposed by the licensee to the RBS TSs and bases are acceptable.

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. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluent 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 55032). The amendment also changes record keeping and reporting requirements. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and (c)(10). 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: G. Schwenk

Date: October 10, 1997