

June 11, 1999

Mr. Randall K. Edington  
Vice President - Operations  
Entergy Operations, Inc.  
River Bend Station  
P. O. Box 220  
St. Francisville, LA 70775

SUBJECT: RIVER BEND STATION, UNIT 1 - ISSUANCE OF AMENDMENT RE:  
CHANGES TO LOCAL POWER RANGE MONITOR (LPRM) CALIBRATION  
FREQUENCY (TAC NO. M98883)

Dear Mr. Edington:

The Commission has issued the enclosed Amendment No. 107 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 letter dated January 8, 1998. The original application had also included the elimination of T-factor adjustments in the Average Power Range Monitors and improvement in the calculation of Reactivity Anomalies, which have been addressed under TAC No. M96509 and License Amendment No. 100.

The amendment revises the Local Power Range Monitor calibration frequency requirements stipulated in TS Section 3.3.1.1, "RPS [reactor protection system] Instrumentation," Surveillance Requirement 3.3.1.1.8.

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,

ORIG. SIGNED BY

Robert J. Fretz, Project Manager, Section 1  
Project Directorate IV & Decommissioning  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

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Docket No. 50-458

Enclosures: 1. Amendment No. 107 to NPF-47  
2. Safety Evaluation

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

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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,

A handwritten signature in black ink, appearing to read "Robert J. Fretz", is written over a circular stamp.

Robert J. Fretz, Project Manager, Section 1  
Project Directorate IV & Decommissioning  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-458

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2. Safety Evaluation

cc w/encls: See next page

**River Bend Station**

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**May 1999**



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

ENTERGY GULF STATES, INC. \*\*

AND

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-458

RIVER BEND STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 107  
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, and supplemented on January 8, 1998, 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

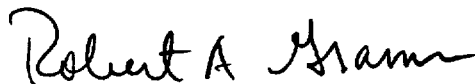
\* EOI is authorized to act as agent for Entergy Gulf States, Inc, and has exclusive responsibility and control over the physical construction, operation and maintenance of the facility.

\*\*Entergy Gulf States, Inc., has merged with a wholly owned subsidiary of Entergy Corporation. Entergy Gulf States, Inc. was the surviving company in the merger.

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- 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. 107 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 and shall be implemented within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Robert A. Gramm, Chief, Section 1  
Project Directorate IV & Decommissioning  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: June 11, 1999

ATTACHMENT TO LICENSE AMENDMENT NO.107

FACILITY OPERATING LICENSE NO. NPF-47

DOCKET NO. 50-458

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

Remove

Insert

3.3-4

3.3-4

B 3.3-27

B 3.3-27

B 3.3-29

B 3.3-29

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.5	Perform CHANNEL FUNCTIONAL TEST.	7 days
SR 3.3.1.1.6	Verify the source range monitor (SRM) and intermediate range monitor (IRM) channels overlap.	Prior to withdrawing SRMs from the fully inserted position
SR 3.3.1.1.7	<p>-----NOTE----- Only required to be met during entry into MODE 2 from MODE 1. -----</p> <p>Verify the IRM and APRM channels overlap.</p>	7 days
SR 3.3.1.1.8	Calibrate the local power range monitors.	2000 MWD/T average core exposure
SR 3.3.1.1.9	Perform CHANNEL FUNCTIONAL TEST.	92 days
SR 3.3.1.1.10	Calibrate the trip units.	92 days

(continued)

BASES

SURVEILLANCE  
REQUIREMENTS

SR 3.3.1.1.6 and SR 3.3.1.1.7 (continued)

required prior to withdrawing SRMs from the fully inserted position since indication is being transitioned from the SRMs to the IRMs.

The overlap between IRMs and APRMs is of concern when reducing power into the IRM range. On power increases, the system design will prevent further increases (initiate a rod block) if adequate overlap is not maintained.

Overlap between IRMs and APRMs exists when sufficient IRMs and APRMs concurrently have onscale readings such that the transition between MODE 1 and MODE 2 can be made without either APRM downscale rod block, or IRM upscale rod block. Overlap between SRMs and IRMs similarly exists when, prior to withdrawing the SRMs from the fully inserted position, IRMs are above 2/40 on Range 1 before SRMs have reached the upscale rod block.

As noted, SR 3.3.1.1.7 is only required to be met during entry into MODE 2 from MODE 1. That is, after the overlap requirement has been met and indication has transitioned to the IRMs, maintaining overlap is not required (APRMs may be reading downscale once in MODE 2).

If overlap for a group of channels is not demonstrated (e.g., IRM/APRM overlap), the reason for the failure of the Surveillance should be determined and the appropriate channel(s) declared inoperable. Only those appropriate channel(s) that are required in the current MODE or condition should be declared inoperable.

A Frequency of 7 days is reasonable based on engineering judgment and the reliability of the IRMs and APRMs.

SR 3.3.1.1.8

LPRM gain settings are determined from the local flux profiles measured by the Traversing Incore Probe (TIP) System. This establishes the relative local flux profile for appropriate representative input to the APRM System. The 2000 MWD/T Frequency is based on NA200 and NA300 LPRM operating experience and that the resulting nodal power uncertainty, combined with the other identified uncertainties, remains less than the uncertainty allowed by the GETAB Safety Limit (8.7%).

(continued)



BASES

SURVEILLANCE  
REQUIREMENTS  
(continued)

SR 3.3.1.1.11, SR 3.3.1.1.13, and SR 3.3.1.1.17

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

For Functions 9 and 10 the CHANNEL CALIBRATION shall include the turbine first stage pressure instruments.

Note 1 states that neutron detectors and flow reference transmitters are excluded from CHANNEL CALIBRATION because of the difficulty of simulating a meaningful signal. Changes in neutron detector sensitivity are compensated for by performing the 7 day calorimetric calibration (SR 3.3.1.1.2) and the 2000 MWD/T LPRM calibration against the TIPS (SR 3.3.1.1.8). Calibration of the flow reference transmitters is performed on an 18 month Frequency (SR 3.3.1.1.17). A second Note is provided that requires the APRM and IRM SRs to be performed within 12 hours of entering MODE 2 from MODE 1. Testing of the MODE 2 APRM and IRM Functions cannot be performed in MODE 1 without utilizing jumpers, lifted leads or movable links. This Note allows entry into MODE 2 from MODE 1 if the associated Frequency is not met per SR 3.0.2. Twelve hours is based on operating experience and in consideration of providing a reasonable time in which to complete the SR. The Frequency of SR 3.3.1.1.11, SR 3.3.1.1.13, and SR 3.3.1.1.17 is based upon the assumption of the magnitude of equipment drift in the setpoint analysis.

Note 3 states that the digital components of the flow control trip reference card are excluded from CHANNEL CALIBRATION of Function 2.b, Average Power Range Monitor Flow Biased Simulated Thermal Power-High. The analog output potentiometers of the flow control trip reference card are not excluded. The flow control trip reference card has an automatic self-test feature which periodically tests the hardware which performs the digital algorithm. Exclusion of the digital components of the flow control trip reference card from CHANNEL CALIBRATION of Function 2.b is based on the conditions required to perform the test and the likelihood of a change in the status of these components not being detected.

(continued)



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

**SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION**  
**RELATED TO AMENDMENT NO. 107 TO FACILITY OPERATING LICENSE NO. NPF-47**

**ENTERGY OPERATIONS, INC.**

**RIVER BEND STATION, UNIT 1**

**DOCKET NO. 50-458**

**1.0 INTRODUCTION**

By application dated August 29, 1996 (Reference 1), as supplemented by letter dated January 8, 1998 (Reference 2), Entergy Operations, Inc. (the licensee), requested changes to the Technical Specifications (TSs) for the River Bend Station, Unit 1 (RBS). The proposed changes would revise requirements prescribed in TS Surveillance Requirement (SR) 3.3.1.1.8 and allow RBS to increase the interval between whole core traversing in-core probe (TIP) to Local Power Range Monitor (LPRM) calibrations from 1,000 megawatt days per ton (MWD/T) to 2,000 MWD/T. The original application had also included the elimination of T-factor adjustments in the Average Power Range Monitors (APRM) and improvement in the calculation of Reactivity Anomalies. These issues were previously evaluated and addressed under TAC No. M96509 and License Amendment No. 100. The January 8, 1998, letter provided additional information that did not change the scope of the original application and the initial proposed no significant hazards consideration determination.

**2.0 BACKGROUND**

The proposed change was supported by reference to General Electric (GE) Licensing Topical Report NEDC-32694P, "Power Distribution Uncertainties for Safety Limit MCPR [minimum critical power ratio] Evaluations," submitted June 10, 1997, which was under staff review. The staff review of the Licensing Topical Report NEDC-32694P has been completed, in conjunction with reviews of Licensing Topical Report NEDC-32601P, "Methodology and Uncertainties for Safety Limit MCPR Evaluation," and the "Proposed Amendment 25 to GE Licensing Topical Report NEDE-24011-P-A (GESTAR). The review found these licensing topical reports to be acceptable for referencing in license applications as stated in the staff's Safety Evaluation (Reference 3) on March 11, 1999.

**3.0 EVALUATION**

The licensee requested a change to the RBS TS in accordance with 10 CFR 50.90. The TS change request was to revise TS SR 3.3.1.1.8, "RPS [reactor protection system] Instrumentation, LPRM Calibration," and the associated BASES to increase the interval between whole core LPRM calibrations from 1,000 MWD/T to 2,000 MWD/T.

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The revised TS would allow the licensee to increase the interval between LPRM calibrations from 1,000 MWD/T to 2,000 MWD/T on the basis that the uncertainty in the power distribution will remain below the previous limits contained in NEDO-10958-P-A, "General Electric BWR [boiling water reactor] Thermal Analysis Basis (GETAB) Data, Correlation and Design Application," January 1977. The current requirement was based on using the older P-1 core monitoring process and older design LPRM chambers, which experienced drift between calibrations. The basis for the requirement was that the added uncertainty in the nodal power distribution due to LPRM based operation between the whole core TIP and LPRM calibration should not increase the uncertainty allowed by the original GETAB standard deviation limit of 8.7 percent.

To assist the staff in its evaluation of the proposed TS change, a request for additional information was transmitted to the licensee (Reference 4). The licensee's response was received (Reference 5) and referenced the June 10, 1997, submittal of NEDC-32694P, "General Electric Licensing Topical for Power Distribution Uncertainties for Safety Limit MCPR Evaluations" as the generic reference for plants using the GE 3D MONICORE core monitoring systems.

Recent detailed statistical evaluations of the uncertainty in LPRM-based monitoring cases run at exposure intervals in excess of 2,000 equivalent full power hours, as reviewed and accepted in Reference 3, have shown that the GETAB equivalent safety limit of 8.7 percent would not be exceeded. This is due to improved LPRM chambers (the NA200 and NA300 series) that exhibit consistent LPRM sensitivity throughout their useful nuclear life (up to 40,000 MWD/T), and to the improved core monitoring systems (GE MONICORE) that utilizes nodal diffusion theory coupled with plant data including the nuclear instrumentation. These evaluations have shown that the equivalent total nodal uncertainty for the increased calibration interval of 2,000 MWD/T would be 7.6 percent compared to the original GETAB requirement of 8.7 percent.

Therefore, it is acceptable to operate for 2,000 MWD/T between whole core LPRM calibrations for plants using the NA200 and NA300 series LPRM chambers in conjunction with the GE MONICORE core monitoring system.

On the basis of its review, the staff concludes that the proposed amendment to TS SR 3.3.1.1.8, "Calibrate the Local Power Range Monitors," to change the calibration frequency from 1,000 MWD/T average core exposure to 2,000 MWD/T average core exposure and to revise the associated BASES discussion is acceptable for incorporation. The staff has determined that the use of improved LPRM chambers NA200 and NA300 series and the improved GE MONICORE core monitoring system are still within the original GETAB requirements, as validated by the staff's review and approval of the recent GE licensing topical reports in Reference 3.

#### 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 surveillance requirement. 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 55032 dated October 23, 1996). 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: E. Kendrick

Date: June 11, 1999

## REFERENCES

1. Letter from J. R. McGaha, Jr., Entergy Operations, Inc. (EOI), to USNRC, "License Amendment Request (LAR) 96-23, Change to Technical Specifications Concerning Reactivity Anomalies, APRM setpoints and RPS Instrumentation," dated August 29, 1996.
2. Letter from R. J. King (EOI), to USNRC, "Response to NRC Staff Inquiries Regarding License Amendment Request (LAR) 96-23, Change to Technical Specifications Concerning LPRM Calibration," dated January 8, 1998.
3. Letter from F. Akstulewicz (NRR) to G. A. Watford (GE), "Acceptance for Referencing of Licensing Topical Reports NEDC-32601P, 'Methodology and Uncertainties for Safety Limit MCPR Evaluations'; NEDC-32694P, 'Power Distribution Uncertainties for Safety Limit MCPR Evaluation'; and 'Amendment 25 to NEDE-24011-P-A on Cycle-Specific Safety Limit MCPR' (TAC Nos. M97490, M99069 and M97491)," dated March 11, 1999.
4. Letter from D. L. Wigginton (NRR) to J. R. McGaha, Jr. (EOI), "River Bend Station, Unit 1 - Request for Additional Information: LPRM Calibration (TAC No. M98883)," dated September 9, 1997.
5. Letter from R. J. King (EOI) to USNRC, "Response to NRC Staff Inquiries Regarding License Amendment Request (LAR) 96-23, Change to Technical Specifications Concerning LPRM Calibration," dated January 8, 1998.