August 30, 2007

Mr. Joseph E. Venable
Vice President of Operations
Entergy Operations, Inc.
River Bend Station
5485 US Highway 61N
St. Francisville, LA 70775

SUBJECT: RIVER BEND STATION, UNIT 1 - ISSUANCE OF AMENDMENT RE: CHANGES TO THE ANALYTICAL METHODS REFERENCED IN TECHNICAL SPECIFICATION 5.6.5, "CORE OPERATING LIMITS REPORT (COLR)" (TAC NO. MD3293)

Dear Mr. Venable:

The Commission has issued the enclosed Amendment No. 153 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 October 16, 2006, as supplemented by letter dated July 30, 2007.

The TS change added a topical report to the analytical methods referenced in TS Section 5.6.5.b, "Core Operating Limits Report (COLR)," previously approved by U.S. Nuclear Regulatory Commission. The current method of performing the loss-of-coolant accident analyses was replaced by an updated method described in AREVA NP (formerly known as Framatome or Siemens) topical report, "EXEM BWR-2000 [Boiling-Water Reactor-2000] ECCS [Emergency Core Cooling System] Evaluation Model."

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,

/RA/

Bhalchandra Vaidya, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-458

Enclosures: 1. Amendment No. 153 to NPF-47
2. Safety Evaluation

cc w/encls: See next page

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ADAMS Accession Nos.: PKG ML072220020 (Amendment/License ML072220022, TS ML072220026)
(**) NLO w/comments (*) No substantial change to SE Input Memorandum.

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ENTERGY GULF STATES, INC. **

AND

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-458

RIVER BEND STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 153
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 October 16, 2006, as supplemented by letter dated July 30, 2007, 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

---

* Entergy Operations, Inc. 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.

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. 153 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 prior to Cycle 15 operation.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Thomas G. Hiltz, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Changes to the Facility
Operating License No. NPF-47
and Technical Specifications

Date of Issuance:

ATTACHMENT TO LICENSE AMENDMENT NO. 153

FACILITY OPERATING LICENSE NO. NPF-47

DOCKET NO. 50-458

Replace the following pages of the Facility Operating License No. NPF-47 and 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.

Facility Operating License

Remove	Insert
3	3

Technical Specifications

Remove	Insert
5.0-18b	5.0-18b

(3) EOI, pursuant to the Act and 10 CFR Part 70, to receive, possess and to use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;

(4) EOI, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

(5) EOI, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

(6) EOI, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter 1 and is subject to all applicable provisions of the Act and to the rules, regulations and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

EOI is authorized to operate the facility at reactor core power levels not in excess of 3091 megawatts thermal (100% rated power) in accordance with the conditions specified herein. The items identified in Attachment 1 to this license shall be completed as specified. Attachment 1 is hereby incorporated into this license.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 153 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.

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 153 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 October 16, 2006 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML062960299), as supplemented by letter dated July 30, 2007 (ADAMS Accession No. ML072190208), Entergy Operations, Inc. (the licensee), requested changes to the Technical Specifications (TSs) for the River Bend Station, Unit 1 (RBS). The supplement dated July 30, 2007, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on November 7, 2006 (71 FR 65141).

The proposed TS change will add a U.S. Nuclear Regulatory Commission (NRC)-approved topical report to the analytical methods referenced in TS Section 5.6.5.b, "Core Operating Limits Report (COLR)." The current method of performing the loss-of-coolant accident (LOCA) analysis is replaced by an updated method described in AREVA NP (formerly known as Framatome or Siemens) topical report, EMF-2361(P)(A), "EXEM BWR-2000 [Boiling-Water Reactor-2000] ECCS [Emergency Core Cooling System] Evaluation Model." The NRC found the topical report acceptable for referencing in license applications and issued its safety evaluation providing the basis for its acceptance by letter dated May 29, 2001.

Specifically, the proposed change to TS 5.6.5.b revises the References 18 through 21 to (1) delete current References 18, 19, 20, and 21 and (2) add Reference 18, an NRC-approved methodology, EMF-2361(P)(A), "EXEM BWR [Boiling-Water Reactor]-2000 ECCS Evaluation Model," Framatome ANP Richland, Inc.

2.0 REGULATORY EVALUATION

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to include TSs as part of the license. These TSs are derived from the plant safety analyses.

The staff reviewed the proposed changes in accordance with Section 50.36 of Title 10 of the *Code of Federal Regulations* (10 CFR) and with guidance established in NUREG-1434.

In general, licensees cannot justify technical specification changes solely on the basis of adopting the model STS. To ensure this, the staff makes a determination that proposed changes maintain adequate safety. Changes that result in relaxation (less restrictive condition) of current TS requirements require detailed justification.

In general, there are two classes of changes to technical specifications: (1) changes needed to reflect contents of the design basis (technical specifications are derived from the design basis), and (2) voluntary changes to take advantage of the evolution in policy and guidance as to the required content and preferred format of technical specifications over time. This amendment deals with the second class of change; namely, administrative changes that reflect the current configuration of the plant.

Licensees may revise the TSs to adopt improved STS format and content provided that plant-specific review supports a finding of continued adequate safety because: (1) the change is editorial, administrative or provides clarification (i.e., no requirements are materially altered), (2) the change is more restrictive than the licensee's current requirement, or (3) the change is less restrictive than the licensee's current requirement, but nonetheless still affords adequate assurance of safety when judged against current regulatory standards. The detailed application of this general framework, and additional specialized guidance, are discussed in Section 3.0 in the context of specific proposed changes.

The regulatory requirements that the NRC staff considered in its review of the application are in 10 CFR 50.36, "Technical Specifications," which provides the regulatory requirements for the content required in a licensee's TS. TS 5.6.5.b lists the NRC-approved analytical methods used at RBS to determine core operating limits. The listed NRC-approved analytical methods provide the necessary administrative controls to ensure operation of the facility in a safe manner and thus are required for inclusion in the RBS TS in accordance with 10 CFR 50.36.

3.0 TECHNICAL EVALUATION

The licensee proposed changes to TS 5.6.5.b: (1) to delete three references (i.e., References 19, 20, and 21) used in the current LOCA analyses, which will no longer be used for RBS operating Cycle 15; and (2) to revise currently listed methodology, Exxon EXEM BWR Evaluation Model in Reference 18 with new Reference 18, EXEM BWR-2000 ECCS Evaluation Model, which will be used to establish the Average Planer Linear Heat Generation Rate (APLHGR) operating limits imposed by TS 3.2.1. The licensee also, provided the information regarding its LOCA analysis using the proposed new methodology and using the current methodology for the NRC review because the LOCA analysis using the new methodology showed the increase of 94 degrees Fahrenheit (°F) in peak cladding temperature (PCT).

3.1 Evaluation of Changes to TS 5.6.5.b

TS Section 5.6.5 requires that core operating limits be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, using the analytical methods previously

approved by the NRC and referenced in Section 5.6.5.b. Certain core operating limits are established based upon design-basis LOCA analyses.

Core operating limits are established for each operating cycle in accordance with TS 3.2, "Power Distribution" and TS 5.6.5, "Core Operating Limits Report (COLR)." The core operating limits assure fuel design limits are not exceeded during normal operating conditions and Anticipated Operational Occurrences (AOO). Additionally, the Average Planer Linear Heat Generation Rate (APLHGR) operating limits also ensure that the PCT during the postulated design-basis LOCA does not exceed the 2200 °F limit specified in 10 CFR 50.46. The LOCA analyses will be used to establish the APLHGR operating limits, imposed by TS 3.2.1.

The methods used to determine the operating limits are those previously found acceptable by the NRC and listed in TS Section 5.6.5.b. The analytical methods currently listed in TS 5.6.5.b determine the core operating limits by using methods applicable to fuel supplied by General Electric (GE, currently known as Global Nuclear Fuels) or Framatome Advanced Nuclear Power (FRA-ANP, formerly known as Siemens). RBS has employed fuel supplied by Exxon, GE or FRA-ANP since it began commercial operation. RBS uses ATRIUM-10 fuel in its current operating cycle (Cycle 14) and plans to continue using ATRIUM-10 fuel in the next operating cycle, Cycle 15. The licensee proposes to replace the current method of performing the LOCA analyses, TS 5.6.5.b, Reference 19, with an updated method described in FRA-ANP topical report, "EXEM BWR-2000 ECCS Evaluation Model," new Reference 18. By letter dated May 29, 2001, the NRC issued its safety evaluation providing the basis for acceptance of the updated method and found it acceptable for referencing in license applications.

RBS currently performs LOCA analyses using the EXEM BWR Evaluation Model in conjunction with the RELAX and HUXY codes (References 19, 20, and 21 in TS 5.6.5.b). Also, the licensee does not foresee any need to use the currently listed method in Reference 18, Exxon EXEM BWR Evaluation Model beginning with RBS operating Cycle 15. Therefore, Reference 18 is revised to show the new updated method described in FRA-ANP topical report, "EXEM BWR-2000 ECCS Evaluation Model," (new Reference 18). References to the topical reports for the RELAX and HUXY codes (References 20 and 21 in TS 5.6.5.b) no longer need to be listed because they are incorporated by reference into new Reference 18.

Based on the above discussion, the NRC staff finds that these changes are administrative changes, they do not alter the TS requirements, and the use of the methodology in new Reference 18, would more accurately predict the core operating limits for the use of AREVA NP ATRIUM-10 fuel and provide an adequate assurance of safety.

3.2 Evaluation of LOCA Analysis

The APLHGR limits required by TS 3.2.1 are specified in the COLR and are the result of fuel design, design-basis accident, and transient analyses. The APLHGR is a measure of the average linear heat generation rate of all the fuel rods in a fuel assembly at any axial location. Limits on the APLHGR are specified to ensure that the fuel design limits are not exceeded during AOOs and that the PCT during the postulated design-basis LOCA does not exceed the 2200 °F limit specified in 10 CFR 50.46.

An RBS plant-specific LOCA analysis was performed by FRA-ANP using the EXEM BWR-2000 evaluation model. The analysis assumed a full core of ATRIUM-10 fuel and used a generic ATRIUM-10 neutronic design that is expected to be conservative relative to actual cycle-specific designs. A cycle-specific evaluation is performed for each cycle to confirm that the generic fuel design remains bounding.

The results of the new RBS LOCA analysis using the EXEM BWR-2000 evaluation model, were compared with the current licensing-basis analysis, using the older EXEM BWR evaluation model. Tables 1 through 5 included in the attachment to the licensee's October 16, 2006, application, provide the key input parameters used in both the current licensing-basis analysis and the new analysis. As such, there is an increase in PCT of 94 °F associated with the new LOCA analysis, which is more than the 50 ◦F allowed by 10 CFR 50.46.

The licensee's application dated October 16, 2006, and the response to the NRC staff Request for Additional Information (RAI) dated July 30, 2007, explained that the new analysis conservatively assumed that the low-pressure injection permissive was 350 psia (pounds per square inch absolute) rather than the 450 psia assumed in the current analysis. This reduced pressure permissive assumption is conservative since the TS requires the permissive setpoint to be at or above 472 psig (pounds per square inch gauge, or approximately 487 psia). The new analysis also assumes that only four of seven required Automatic Depressurization System (ADS) valves are available; whereas the current analysis assumes five are available. The assumption is also conservative since the TS do not allow plant operation with less than six operable ADS valves.

The NRC staff finds that the licensee's justification for the PCT increase beyond 50 ◦F is acceptable because conservative assumptions are used such as the reactor vessel low pressure ECCS permissive was changed from 450 to 350 psia, and the assumed initial maximum critical power ratio (MCPR) of the RBS LOCA analyses of 1.16 provides sufficient margin to the operating limit MCPR and remains non-limiting.

In summary, the EXEM BWR-2000 evaluation methodology is an improved method of evaluating ECCS performance with LOCA analyses. The methodology has been reviewed and approved by the NRC and is applicable to the RBS plant design and the fuel being used at RBS. The application of the EXEM BWR-2000 evaluation methodology for the LOCA analysis will continue to ensure that the APLHGR operating limits are established to protect the fuel cladding integrity during normal operation, AOOs, and the design-basis LOCA.

3.3 Conclusion - Technical Evaluation

The NRC staff has reviewed the proposed changes to TS 5.6.5.b and based on the information provided by the licensee, finds that: the changes are acceptable because the EXEM BWR-2000 evaluation methodology which will be used in RBS operating Cycle 15 to support TS 3.2.1 for establishing APLHGR operating limits is the NRC-approved methodology. Furthermore, the proposed changes do not alter the TS requirements for the core operating limits.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of Louisiana official was notified of the proposed issuance of the amendment. The State of Louisiana 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 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 published on November 7, 2006 (71 FR 65141). 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: T. Huang, NRR/SRXB
P. Hearn, NRR/ITSB

Date: August 30, 2007