August 25, 2005

Mr. Paul D. Hinnenkamp
Vice President - 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: END-OF-CYCLE RECIRCULATION PUMP TRIP INSTRUMENTATION (TAC NO. MC4582)

Dear Mr. Hinnenkamp:

The Commission has issued the enclosed Amendment No. 146 to Facility Operating License No. NPF-47 for the River Bend Station (RBS), Unit 1. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated September 23, 2004, as supplemented by letter dated April 19, 2005.

The amendment revises the TSs to allow revision of reactor operational limits, as specified in the RBS Core Operating Limits Report, to compensate for the inoperability of the End of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation. This will provide an alternative to the existing Limiting Condition for Operation for the EOC-RPT instrumentation.

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/

N. Kalyanam, Project Manager, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-458

Enclosures:
1. Amendment No. 146 to NPF-47
2. Safety Evaluation

cc w/encls: See next page

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OFFICIAL RECORD COPY

ENTERGY GULF STATES, INC. **

AND

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-458

RIVER BEND STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 146
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 September 23, 2004, as supplemented by letter dated April 19, 2005, 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

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* 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. 146 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 60 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

David Terao, Chief, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: August 25, 2005

ATTACHMENT TO LICENSE AMENDMENT NO. 146

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
3.3-25	3.3-25
3.3-26	3.3-26

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 146 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 September 23, 2004 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML042780493), as supplemented by letter dated April 19, 2005 (ADAMS Accession No. ML051300241), Entergy Operations, Inc. (the licensee), requested changes to the Technical Specifications (TSs) for the River Bend Station, Unit 1 (RBS). The supplement dated April 19, 2005, 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 May 10, 2005 (70 FR 24650).

The proposed changes would revise the TSs to allow revision of reactor operational limits, as specified in the RBS Core Operating Limits Report, to compensate for the inoperability of the End of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation. This will provide an alternative to the existing limiting condition for operation (LCO) for the EOC-RPT instrumentation.

The EOC-RPT is intended to supplement the negative reactivity provided by the control rods at the end of a fuel cycle when rod worths are reduced due to core characteristics. Closure of the turbine stop valves (indicative of a turbine trip) or a fast closure of the turbine control valves (indicative of a load rejection) initiates a reactor scram and an EOC-RPT. The EOC-RPT is designed to trip the reactor recirculation pumps from main power supply and to initiate the low frequency motor generator automatic transfer sequence. This results in a downshift in speed of the pumps. This inserts negative reactivity and assists the control rods to keep the core within the thermal-hydraulic safety limits during operational transients. The Recirculation Flow Control System is described in Section 7.7.1.2 of the RBS UFSAR and the associated instrumentation is discussed in Section 7.6.1.1.

2.0 REGULATORY EVALUATION

NUREG-1434, "Standard Technical Specifications [STS] General Electric Plants, BWR/6," Revision 3, Section 3.3.4.1, includes two LCO statements associated with the EOC-RPT Instrumentation. In addition to the condition included in the RBS TS, the STS contains an alternative LCO which states that, if the EOC-RPT function is inoperable, in TS section LCO 3.3.4.1b, LCO 3.2.2 states, "MCPR [Minimum Critical Power Ratio] limits for inoperable EOC-RPT as specified in the Core Operating Limits Report (COLR) are made applicable." In addition, the licensee also proposed to add LCO 3.2.3, Linear Heat Generation Rate (LHGR), "All LHGRs shall be less than or equal to the limits specified in the COLR." These LCOs recognize that the margin to fuel thermal limits that is provided by the EOC-RPT can be ensured in another way, i.e., by imposing an additional MCPR and LHGR operating penalty on the reactor, with the penalty calculated using approved analytical methods, and documented in the plant COLR.

When RBS converted to the STS format, the analysis necessary to adopt this option was not completed, and the decision was made not to adopt the MCPR option because the licensee believed that the need for STS LCO 3.3.4.1b was remote. However, Grand Gulf Nuclear Power Station (GGNS) experienced an unplanned shutdown and was prohibited from returning to full power due to EOC-RPT LCO restrictions. The emergency TS change at the GGNS demonstrated the need for a TS change for RBS to prevent a similar situation. The proposed TS changes would now incorporate the STS LCO 3.3.4.1b and LHGR into the RBS TS, and therefore provide the licensee with an alternative method of ensuring adequate thermal margin for the fuel at the end of cycle, and would allow normal operation at 100 percent of rated thermal power.

3.0 TECHNICAL EVALUATION

The licensee has proposed to change the TS LCO, "EOC-RPT Instrumentation" (LCO 3.3.4.1). The change includes references to MCPR (LCO 3.2.2) and LHGR (LCO 3.2.3) limits for inoperable EOC-RPT as specified in the COLR. An additional action that addresses the new provision in the LCO is also being added to condition B, as required action B.2. The new action invokes requirements to adjust the MCPR and LHGR limit within 2 hours of finding the instrumentation inoperable. The licensee has also revised the Bases section of the TS to reflect the new LCOs.

The MCPR and LHGR limits that are referred to in this new LCO would be incorporated into a new version of the RBS COLR, which the licensee will complete after issuance of this amendment.

The purpose of the EOC-RPT is to provide additional MCPR and LHGR operating margins. At the end of a normal operating cycle, the neutron flux shape in the reactor is such that the effectiveness (worth) of the control rods when they are initially inserted during a scram is lower than it is earlier in the operating cycle. During a postulated pressurization transient such as a generator load rejection event, the control rod worth during the first few feet of insertion may not be sufficient to reduce reactor power quickly enough to ensure that the fuel meets the specified acceptable fuel design limits. The EOC-RPT anticipates the pressure transient that will result from a generator load rejection event, and it causes the reactor recirculation pumps to trip as well, so that the forced circulation of water through the reactor core stops. When this

occurs, the coolant void fraction (the relative amount of steam versus liquid water) in the core rises, reducing neutron moderation and therefore reducing reactor power. The combined effects of the EOC-RPT and the scram reduce fuel bundle power more rapidly than a scram alone, resulting in an increased margin to the MCPR safety limit (SL) and LHGR. Natural circulation of water through the core continues at a lower rate, which is sufficient to remove energy from the fuel. The EOC-RPT therefore reduces the severity of the transient with regard to the fuel thermal limits. The EOC-RPT reduces the severity of these transients at all times during the fuel cycle, but it was intended to have its greatest effect at the end-of-cycle. RBS analyses of this event were done by the fuel vendor (Framatome) using an approved Nuclear Regulatory Commission (NRC) method, CONTRANSA2. The vendor has analyzed the plant behavior for the limiting transients with the EOC-RPT out of service and developed new, more limiting operating limit MCPR and LHGR values that will be incorporated into the COLR and into the core monitoring software in the plant process computer.

In its submittal, the licensee stated that Framatome has evaluated the impact of the EOC-RPT out-of-service condition, and has identified several adjustments to the operating MCPR and LHGR limits that are necessary to support operation with no EOC-RPT from the beginning of cycle until mid-cycle. These adjustments will be entered into the COLR and into the core monitoring software in the plant process computer, and they effectively change the initial conditions for the transients under consideration. With the new initial conditions, which are more restrictive than the case with the EOC-RPT in operation, the margin to reactor fuel thermal limits during these transients would be restored to acceptable values. Framatome also completed the analyses for the Feedwater Heater out-of-service condition. These adjustments will be entered into the COLR and into the core monitoring software in the plant process computer.

3.1 Summary

The NRC staff has concluded that the licensee proposal to change LCO 3.3.4.1 and the associated Action Statement and Bases to the RBS TS is acceptable because the addition of margin through adjustments to the MCPR and LHGR operating limits is an acceptable alternative to providing the margin through the operation of the EOC-RPT.

The EOC-RPT functions to insert negative reactivity in response to certain anticipated transients. The EOC-RPT has a mitigation function and is not the initiator of any evaluated accident or transient. Operation with inoperable EOC-RPT instrumentation and compliance with new restrictive MCPR operating limits and LHGR limits establishes the same margin to core thermal MCPR SL and LHGR limits as would be the case with operable EOC-RPT instrumentation and existing MCPR and LHGR operating limits. The requested change will not create any new modes of plant or equipment operation. The proposed change allows the option to apply an additional penalty factor to the MCPR and LHGR when the EOC-RPT is inoperable. By establishing a new restrictive MCPR and LHGR operating limit, there are no changes to the plant design and safety analysis. There are no changes to the reactor core design instrument set points. The margin of safety assumed in the safety analysis is not affected. The proposed TS changes 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 Title 10 of the *Code of Federal Regulations* (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 May 10, 2005 (70 FR 24650). 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 amendments.

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. Thomas

Date: August 25, 2005

cc:

Winston & Strawn
1700 K Street, N.W.
Washington, DC 20006-3817

Manager - Licensing
Entergy Operations, Inc.
River Bend Station
5485 US Highway 61N
St. Francisville, LA 70775

Senior Resident Inspector
P. O. Box 1050
St. Francisville, LA 70775

President of West Feliciana
Police Jury
P. O. Box 1921
St. Francisville, LA 70775

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

Ms. H. Anne Plettinger
3456 Villa Rose Drive
Baton Rouge, LA 70806

Mr. Michael E. Henry, State Liaison Officer
Department of Environmental Quality
Permits Division
P.O. Box 4313
Baton Rouge, Louisiana 70821-4313

Wise, Carter, Child & Caraway
P. O. Box 651
Jackson, MS 39205

Executive Vice President and
Chief Operating Officer
Entergy Operations, Inc.
P. O. Box 31995
Jackson, MS 39286-1995

General Manager - Plant Operations
Entergy Operations, Inc.
River Bend Station
5485 US Highway 61N
St. Francisville, LA 70775

Director - Nuclear Safety
Entergy Operations, Inc.
River Bend Station
5485 US Highway 61N
St. Francisville, LA 70775

Vice President - Operations Support
Entergy Operations, Inc.
P. O. Box 31995
Jackson, MS 39286-1995

Attorney General
State of Louisiana
P. O. Box 94095
Baton Rouge, LA 70804-9095

Brian Almon
Public Utility Commission
William B. Travis Building
P. O. Box 13326
1701 North Congress Avenue
Austin, Texas 78701-3326