

April 14, 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. 93 TO FACILITY  
OPERATING LICENSE NO. NPF-47 (TAC NO. M97834)

Dear Mr. McGaha:

The Commission has issued the enclosed Amendment No. 93 to Facility Operating License No. NPF-47 for the River Bend Station, Unit 1. The amendment consists of changes to the Technical Specifications in response to your application dated January 10, 1997.

The amendment revises the reactor pressure vessel pressure and temperature limits by providing new limits that are valid to 12 effective full power years.

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. 93 to NPF-47  
2. Safety Evaluation

cc w/encls: See next page

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Document Name: RB97834.AMD

OFC	PM/PD4-1 <i>W</i>	LA/PD4-1	OGC <i>W</i>
NAME	DWigginton/vw	CHawes <i>MMH</i>	<i>R Bachmann</i>
DATE	4/7/97	4/7/97	4/7/97
COPY	YES/NO	YES/NO	YES/NO

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

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Sincerely,

A handwritten signature in dark ink, appearing to read "D. Wigginton", is written above the typed name.

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

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cc w/encs: See next page

Mr. John R. McGaha  
Entergy Operations, Inc.

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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. 93  
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 January 10, 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 River Bend, 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. 93 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: April 14, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 93

FACILITY OPERATING LICENSE NO. NPF-47

DOCKET NO. 50-458

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

REMOVE

3.4-32

INSERT

3.4-32

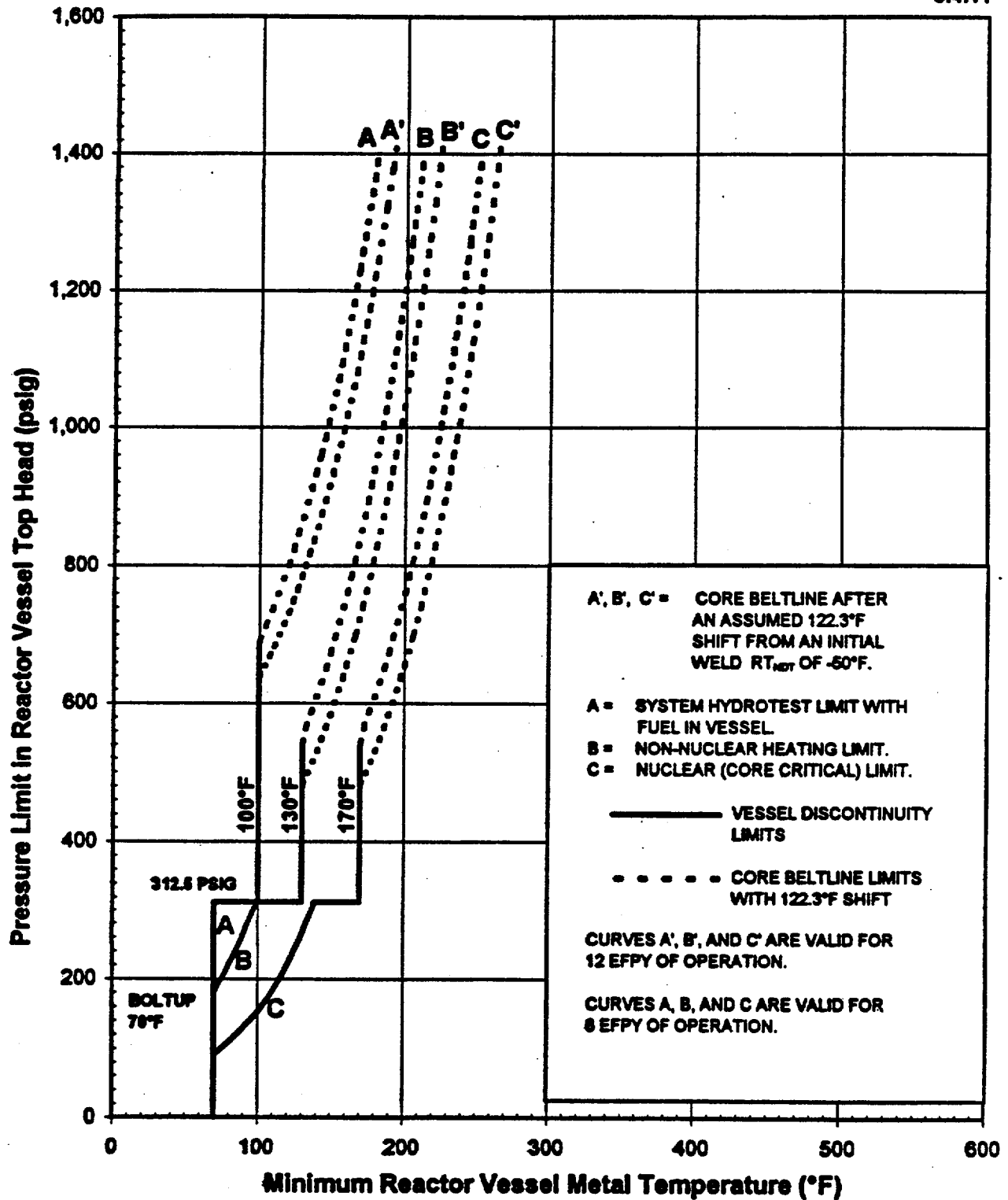


Figure 3.4.11-1 (page 1 of 1)  
Minimum Temperature Required vs. RCS Pressure



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 93 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 January 10, 1997, Entergy Operations, Inc. (the licensee) requested changes to the Technical Specifications (TSs) (Appendix A to Facility Operating License No. NPF-47) for the River Bend Station, Unit 1. The proposed changes would revise the pressure-temperature (P-T) limits for heatup, cooldown, and inservice leak and hydrostatic testing to provide new limits that are valid to 12 effective full power years (EFPY).

2.0 BACKGROUND

The staff evaluates the P-T limits based on the following NRC regulations and guidance: Appendix G to 10 CFR Part 50; Generic Letters (GL) 88-11 and 92-01; Regulatory Guide (RG) 1.99, Rev. 2; and Standard Review Plan (SRP) Section 5.3.2. Appendix G to 10 CFR Part 50 requires that P-T limits for the reactor vessel must be at least as conservative as those obtained by Appendix G to Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. GL 88-11 requires that licensees use the methods in RG 1.99, Rev. 2, to predict the effect of neutron irradiation on the adjusted reference temperature (ART) of reactor vessel materials. The ART is defined as the sum of initial nil-ductility transition reference temperature ( $RT_{NDT}$ ) of the material, the increase in  $RT_{NDT}$  caused by neutron irradiation, and a margin to account for uncertainties in the prediction method. The increase in  $RT_{NDT}$  is calculated from the product of a chemistry factor and a fluence factor.

The chemistry factor may be calculated using credible surveillance data, obtained by the licensee's surveillance program, as directed by Position 2 of RG 1.99, Rev. 2. If credible surveillance data are not available, the chemistry factor is calculated dependent upon the amount of copper and nickel in the vessel material as specified in Table 1 of RG 1.99, Rev. 2. GL 92-01 requires licensees to submit reactor vessel materials data, which the staff uses in the review of the P-T limits submittals.

SRP 5.3.2 provides guidance on calculation of the P-T limits using linear elastic fracture mechanics methodology specified in Appendix G to Section III of the ASME Code. The linear elastic fracture mechanics methodology postulates sharp surface defects that are normal to the direction of maximum



stress and have a depth of one-fourth of the reactor vessel beltline thickness (1/4T) and a length of 1-1/2 times the beltline thickness. The critical locations in the vessel for this methodology are the 1/4T and 3/4T locations, which correspond to the maximum depth of the postulated inside surface and outside surface defects, respectively.

### 3.0 EVALUATION

For the River Bend Station reactor vessel, the licensee determined that the most limiting material at the 1/4T and 3/4T locations is the axial weld that was fabricated using tandem electrodes. This weld was fabricated using weld wire heat 5P6756. The licensee calculated an ART of 72.3°F at the 1/4T location and 55.2°F at the 3/4T location at 12 EFPY. The neutron fluence used in the ART calculation was  $1.79 \times 10^{18}$  n/cm<sup>2</sup> at the 1/4T location and  $0.93 \times 10^{18}$  n/cm<sup>2</sup> at the 3/4T location. The initial RT<sub>NDT</sub> for the limiting weld was -50°F. The margin term used in calculating the ART for the limiting weld was 56°F.

The staff performed an independent calculation of the ART values for the limiting material using the methodology in RG 1.99, Rev. 2. Based on these calculations, the staff verified that the licensee's limiting material for the River Bend Station reactor vessel is the axial weld that was fabricated using tandem electrodes (heat 5P6756). The staff's calculated ART value for the limiting material agreed with the licensee's calculated ART value.

Substituting the ART values for River Bend Station into equations in SRP 5.3.2, the staff verified that the proposed P-T limits satisfy the requirements in Paragraph IV.A.2 of Appendix G of 10 CFR Part 50.

In addition to beltline materials, Appendix G of 10 CFR Part 50 also imposes a minimum temperature at the closure head flange based on the reference when the pressure exceeds 20% of the preservice system hydrostatic test pressure, the temperature of the closure flange regions highly stressed by the bolt preload must exceed the reference temperature of the material in those regions by at least 120°F for normal operation and by 90°F for hydrostatic pressure tests and leak tests. Based on the flange RT<sub>NDT</sub> of 10°F for River Bend Station, the staff has determined that the proposed P-T limits have satisfied the requirement for the closure flange region during normal operation and inservice leak and hydrostatic testing.

The staff has performed an independent analysis to verify the licensee's proposed P-T limits. The staff concludes that the proposed P-T limits for heatup, cooldown, inservice leak and hydrostatic testing and core criticality are acceptable to 12 EFPY since the limits conform to the requirements of Appendix G of 10 CFR Part 50 and GL 88-11. Based on the above, the proposed P-T limits and proposed TSs 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 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 8798). 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.

#### 7.0 REFERENCES

1. Regulatory Guide 1.99, Radiation Embrittlement of Reactor Vessel Materials, Revision 2, May 1988
2. NUREG-0800, Standard Review Plan, Section 5.3.2: Pressure-Temperature Limits
3. Code of Federal Regulations, Title 10, Part 50, Appendix G, Fracture Toughness Requirements
4. Generic Letter 88-11, NRC Position on Radiation Embrittlement of Reactor Vessel Materials and its Impact on Plant Operations, July 12, 1988
5. ASME Boiler and Pressure Vessel Code, Section III, Appendix G for Nuclear Power Plant Components, Division 1, "Protection Against Nonductile Failure"

6. January 10, 1997, Letter from J. R. McGaha, Jr. to USNRC Document Control Desk, Subject: River Bend Station Unit 1 Licensee Amendment Request 96-09. change to Technical Specifications 3.4.11, "RCS Pressure and Temperature (P-T) Limits," Figure 3.4.11-1, "Minimum Temperature Required vs. RCS Pressure"
7. October 22, 1996, Letter from G. Stevens (Structural Integrity Associates) to E. J. Zoch (Entergy Operations, Inc.) Subject: Revised (12 EFPY) P-T Curves for River Bend Station.

Principal Contributor: A. D. Lee

Date: April 14, 1997