

March 5, 2003

Mr. Paul D. Hinnenkamp
Vice President - Operations
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River Bend Station
P. O. Box 220
t. Francisville, LA 70775

SUBJECT: RIVER BEND STATION, UNIT 1 - ISSUANCE OF AMENDMENT
RE: ONE-TIME EXTENSION OF THE INTEGRATED LEAK RATE TEST (ILRT)
INTERVAL (TAC NO. MB5092)

Dear Mr. Hinnenkamp:

The Commission has issued the enclosed Amendment No. 131 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 May 14, 2002, as supplemented by letter dated December 20, 2002.

The amendment changes administrative TS 5.5.13 regarding the Containment ILRT to allow a one-time extension of the interval (to 15 years) for performance of the next ILRT.

A copy of our related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/

Michael Webb, 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. 131 to NPF-47
2. Safety Evaluation

cc w/encls: See next page

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* No substantial change
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NRR-058

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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. 131
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 May 14, 2002, as supplemented by letter dated December 20, 2002, 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. 131 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

/RA/

Robert A. Gramm, 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: March 5, 2003

ATTACHMENT TO LICENSE AMENDMENT NO. 131

FACILITY OPERATING LICENSE NO. NPF-47

DOCKET NO. 50-458

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

Remove

Insert

5.0-16

5.0-16

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 131 TO
FACILITY OPERATING LICENSE NO. NPF-47
ENERGY OPERATIONS, INC.
RIVER BEND STATION, UNIT 1
DOCKET NO. 50-458

1.0 INTRODUCTION

By application dated May 14, 2002, as supplemented by letter dated December 20, 2002, Entergy Operations, Inc. (the licensee), requested a Technical Specification (TS) change for River Bend Station, Unit 1 (RBS). The supplement dated December 20, 2002, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on June 25, 2002, (67 FR 42823).

The proposed change would revise TS 5.5.13, "Primary Containment Leakage Rate Testing Program." Specifically, the change would allow a one-time extension of the licensee's Type A Containment Integrated Leakage Rate Testing (ILRT) interval from the required 10 years to a test interval of 15 years. The licensee states that the approval of the amendment request will save critical path time in the RF11 outage starting in March 2003.

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix J, Option B requires that a Type A test be conducted at a periodic interval based on historical performance of the overall containment system. TS 5.5.13 requires that leakage rate testing be performed as required by 10 CFR Part 50, Appendix J, Option B, as modified by approved exemptions, and in accordance with the guidelines contained in Regulatory Guide (RG) 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995. This RG endorses, with certain exceptions, Nuclear Energy Institute (NEI) report 94-01, Revision 0, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated July 26, 1995.

A Type A test is an overall (integrated) leakage rate test of the containment structure. NEI 94-01 specifies an initial test interval of 48 months, but allows an extended interval of 10 years, based upon two consecutive successful tests. There is also a provision for extending

the test interval an additional 15 months in certain circumstances. The most recent two Type A tests at RBS have been successful, so the current interval requirement is 10 years.

The licensee is requesting an addition to TS 5.5.13, which would indicate that they are allowed to take an exception from the guidelines of RG 1.163 regarding the Type A test interval. Specifically, the proposed TS states that the first RBS Type A test performed after the August 14, 1992, Type A test shall be performed no later than August 14, 2007.

The NRC staff finds that the licensee in Section 5.0 of its submittal identified the applicable regulatory requirements. The regulatory requirements on which the NRC staff based its acceptance are Appendix J of 10 CFR Part 50, 10 CFR 50.55a(g), and RG 1.174 "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis."

3.0 TECHNICAL EVALUATION

The staff has reviewed the licensee's regulatory and technical analyses in support of its proposed license amendment which is described in Sections 4.0 and 5.0 of the licensee's submittal. The detailed evaluation below will support the conclusion 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. The following evaluation addresses the acceptability of issuing amendments pursuant to 10 CFR 50.92.

3.1 Inservice Inspection (ISI) for Primary Containment Integrity

RBS utilizes a General Electric Company boiling water reactor with Mark III type primary containment. The containment vessel consists of a continuous and essentially leak-tight steel membrane which includes the cylindrical portion, the torispherical portion, and the floor liner plate on the top of the basemat. The cylindrical portion is backed by hoop and vertical stiffeners in the lower 20 ft (6.3 m), and structural concrete fill in the lower 24 ft 8 in (7.4 m) above the top of the basemat. The containment design incorporates a cylindrical drywell, and a cylindrical weir wall concentric with the containment cylindrical wall, forming a suppression pool. The containment vessel is penetrated by access penetrations, process piping, and electrical penetrations. The integrity of the penetrations and isolation valves are verified through Type B and Type C local leak rate tests (LLRTs) as required by 10 CFR Part 50, Appendix J. The overall leak-tight integrity of the primary containment is verified through ILRTs. These tests are performed to verify the essentially leak-tight characteristics of the containment at the design basis accident pressure. The last ILRT was performed in August 1992. The next ILRTs are scheduled during the outage in March 2003. With the extension of the ILRT interval, the next overall verification will be performed no later than August 2007. The licensee provided information related to the ISI of the containment and discussed potential areas of degradation in the containment that might not be apparent in the risk assessment. In addition, in its supplemental letter dated December 20, 2002, the licensee provided responses to the NRC staff's request for additional information (RAI) to explicitly address issues related to the containment degradation.

The licensee is using the 1992 Edition and the 1992 Addenda of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, Subsection IWE, "Requirements for Class MC and Metallic Liners of Class CC Components of Light-Water Cooled Plants," for ISI of the steel containment. The licensee states it performs Appendix J visual inspections three times in every 10 year interval. Based on the summary of the examination procedures provided in the December 20, 2002, supplemental letter, the NRC staff finds the licensee's program for examining the accessible portions of the containment steel surfaces adequate for detecting flaws and degradation.

In response to the NRC staff's RAI on examination and testing of seals, gaskets, and pressure retaining bolts, the licensee indicates the following:

- For penetrations, in general, the Type B testing will be performed once during each containment inspection interval.
- Type B testing of containment equipment hatch, control rod drive removal hatch, and inclined fuel transfer tube will be performed every refueling cycle.
- Type B testing of containment air-locks will be performed every 30 months.

The NRC staff finds the schedule for testing penetration seals, gaskets, and pressure retaining bolting consistent with the regulations and, therefore, acceptable for the period of extended ILRT interval.

In the May 14, 2002, application, the licensee states that RBS utilizes expansion bellows on 20 containment penetrations. These bellows are subject to LLRT by pressurizing the space between the plies of the bellows, and leakage across the bellows is detectable by Type B testing. In earlier testing of bellows, the licensee identified 2 of the 20 bellows as not meeting the administrative leakage limit of 20 standard cubic centimeter minutes (sccm). Considering the restrictive administrative limits, the licensee increased the administrative limits for these two bellows to 65 sccm and 88 sccm. In response to the NRC staff's RAI on performance of these two bellows, the licensee states in its December 20, 2002, supplemental letter, that in two consecutive LLRTs performed during refueling outages 7 and 8, the leakage rates were within the established administrative limits. These two bellows and a number of other bellows will be tested during the refueling outage starting in March 2003. The NRC staff finds that the licensee is actively pursuing the issue of bellows degradation and will be taking appropriate actions (i.e., repair, replace) if the leakage rates are found to be unacceptable.

Based on the above discussion, the NRC staff finds that the implementation of the licensee's containment ISI program, including the areas subjected to subsequent inspections and testing, provides reasonable assurance that the identified degradation occurring in the accessible areas of the containment will be adequately monitored during the ILRT interval extension.

The licensee's response to the question on incorporating the potential degradation in uninspectable areas of the containment will be addressed in Section 3.2 below.

Based on its review of the information provided in the licensee's amendment request and the RAI response, the NRC staff finds that (1) the structural degradation of the accessible areas of the RBS containment will be adequately monitored through the periodic ISIs conducted as required by Subsection IWE of Section XI of the ASME Code, and (2) the integrity of the penetrations and containment isolation valves will be periodically verified through Type B and

Type C tests as required by 10 CFR Part 50, Appendix J. In addition, the system pressure tests for containment pressure boundary (i.e., Appendix J tests, as applicable) are required to be performed following repair and replacement activities in accordance with Subarticle IWE-5000 of Section XI of the ASME Code. Significant degradation of the primary containment pressure boundary is required to be reported under 10 CFR 50.72 or 10 CFR 50.73.

3.2 Risk Assessment

The licensee performed a risk impact assessment of extending the Type A test interval to 15 years. In performing the risk assessment, the licensee considered the guidelines of NEI 94-01, RG 1.174, and the methodology used in Electric Power Research Institute (EPRI) report TR-104285, "Risk Impact Assessment of Revised Containment Leak Rate Testing Intervals."

The basis for the current 10 year test interval is provided in Section 11.0 of NEI 94-01 and was established in 1995 during development of the performance-based Option B of Appendix J. Section 11.0 of NEI 94-01 states that NUREG-1493, "Performance-Based Containment Leak-Test Program," September 1995, provided the technical basis to support rulemaking to revise leakage rate testing requirements contained in Option B of Appendix J. The basis consisted of qualitative and quantitative assessments of the risk impact (in terms of increased public dose) associated with a range of extended leakage rate test intervals. To supplement the NRC's rulemaking basis, NEI undertook a similar study. The results of that study are documented in EPRI report TR-104285.

The EPRI study used an analytical approach similar to that presented in NUREG-1493 for evaluating the incremental risk associated with increasing the interval for Type A tests. The EPRI study estimated that relaxing the test frequency from 3 in 10 years to 1 in 10 years will increase the average time that a leak detectable only by a Type A test goes undetected from 18 to 60 months. Since Type A tests only detect about 3 percent of leaks (the rest are identified during LLRTs based on industry leakage rate data gathered from 1987 to 1993), this results in a 10 percent increase in the overall probability of leakage. The risk contribution of pre-existing leakage for the pressurized water reactor and boiling water reactor representative plants in the EPRI study confirmed the NUREG-1493 conclusion that a reduction in the frequency of Type A tests from 3 in 10 years to as infrequently as 1 in 20 years leads to an "imperceptible" increase in risk on the order of 0.2 percent and a fraction of 1 person-rem per year.

Building upon the methodology of the EPRI study, the licensee assessed the change in the predicted person-rem/year frequency. The licensee quantified the risk from sequences that have the potential to result in large releases if a pre-existing leak were present. Since the Option B rulemaking in 1995, the NRC staff has issued RG 1.174 on the use of probabilistic risk assessment in risk-informed changes to a plant's licensing basis. The licensee has proposed using RG 1.174 to assess the acceptability of extending the Type A test interval beyond that established during the Option B rulemaking. RG 1.174 defines very small changes in the risk-acceptance guidelines as increases in core damage frequency (CDF) less than 10^{-6} /year and increases in large early release frequency (LERF) less than 10^{-7} /year. Since the Type A test does not impact CDF, the relevant criterion is the change in LERF. The licensee has estimated the change in LERF for the proposed change and the cumulative change from the original 3 in 10 year interval. RG 1.174 also discusses defense-in-depth and encourages the

use of risk analysis techniques to help ensure and show that key principles, such as the defense-in-depth philosophy, are met. The licensee estimated the change in the conditional containment failure probability for the proposed change to demonstrate that the defense-in-depth philosophy is met.

The licensee provided an analysis which estimated all of these risk metrics and whose methodology is consistent with previously approved submittals. The following conclusions can be drawn from the analysis associated with extending the Type A test frequency:

1. A slight increase in risk is predicted when compared to that estimated from current requirements. Given the change from a 3 in 10 year test interval to a 1 in 15 year test interval, the increase in the total integrated plant risk, in person-rem/year, is estimated to be 0.3 percent. This increase is comparable to that estimated in NUREG-1493, in which it was concluded that a reduction in the frequency of tests from 3 in 10 years to 1 in 20 years leads to an "imperceptible" increase in risk. Therefore, the increase in the total integrated plant risk for the proposed change is considered small and supportive of the proposed change.
2. The increase in LERF resulting from a change in the Type A test interval from the original 3 in 10 years to 1 in 15 years is estimated to be 3.0×10^{-8} /year. However, there is some likelihood that the flaws in the containment estimated as part of the Class 3b frequency would be detected as part of the IWE visual examination of the containment surfaces (as identified in ASME Code, Section XI, Subsection IWE). The containment was visually inspected in 1989 and 1992. The next scheduled IWE containment inspection is during the March 2003 refueling outage. Visual inspections are expected to be effective in detecting large flaws in the visible regions of the containment, and would reduce the impact of the extended test interval on LERF.

The licensee performed additional risk analysis to consider the potential impact of corrosion in inaccessible areas of the containment shell on the proposed change. The risk analysis considered the likelihood of an age-adjusted flaw that would lead to a breach of the containment. The risk analysis also considered the likelihood that the flaw was not visually detected but could be detected by a Type A test. When possible corrosion of the containment surfaces is considered, the increase in LERF resulting from a change in the Type A test interval from the original 3 in 10 years to 1 in 15 years is estimated to be 3.2×10^{-8} /year. The NRC staff concludes that increasing the Type A interval to 15 years results in only a small change in LERF and is consistent with the acceptance guidelines of RG 1.174.

3. RG 1.174 also encourages the use of risk analysis techniques to help ensure and show that the proposed change is consistent with the defense-in-depth philosophy. Consistency with the defense-in-depth philosophy is maintained if a reasonable balance is preserved among prevention of core damage, prevention of containment failure, and consequence mitigation. The licensee estimates the change in the conditional containment failure probability to be an increase of 0.3 percentage points for the cumulative change of going from a test interval of 3 in 10 years to 1 in 15 years. The NRC staff finds that the defense-in-depth philosophy is maintained based on the change in the conditional containment failure probability for the proposed amendment.

Based on these conclusions, the NRC staff finds that the increase in predicted risk due to the proposed change is within the acceptance guidelines while maintaining the defense-in-depth philosophy of RG 1.174 and, therefore, is acceptable.

3.3 Evaluation Summary

Based on the above evaluation, the NRC staff finds that the licensee has adequate procedures to examine and monitor potential age-related and environmental degradations of the pressure-retaining components of the RBS containment and that the increase in predicted risk due to the proposed change is within the acceptance guidelines. The NRC staff finds that the proposed changes to TS 5.5.13 are acceptable; therefore, the next Type A test at RBS may be extended to 15 years.

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 amendments change 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 amendments involve 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 amendments involve no significant hazards consideration, and there has been no public comment on such finding (67 FR 42823, dated June 25, 2002). Accordingly, the amendments meet 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: Hans Ashar
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Date: March 5, 2003

River Bend Station

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