

July 24, 2003

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

SUBJECT: RIVER BEND STATION, UNIT 1 - ISSUANCE OF AMENDMENT
RE: REACTOR VESSEL MATERIAL SURVEILLANCE PROGRAM
(TAC NO. MB6140)

Dear Mr. Hinnenkamp:

The U. S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 136 to Facility Operating License No. NPF-47 for the River Bend Station, Unit 1 (RBS). The amendment consists of approved changes to the Updated Safety Analysis Report (USAR) in response to your application dated August 15, 2002, as supplemented by letter dated May 9, 2003.

The amendment revises the reactor vessel surveillance program required by Title 10 of the *Code of Federal Regulations*, Part 50, Appendix H, Section III.B.3, allowing RBS to incorporate the Boiling Water Reactor Vessel Internals Project Integrated Surveillance Program into the licensing basis (USAR Section 5.3.1.6.1, "Compliance with Reactor Vessel Material Surveillance Program Requirements").

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/

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. 136 to NPF-47
2. Safety Evaluation

cc w/encls: See next page

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* SE input provided - no major changes made

** NLO w/changes

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. 136
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 15, 2002, as supplemented by letter dated May 9, 2003, 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, by Amendment No. 136, the license is amended to revise the Updated Safety Analysis Report (USAR) to reflect incorporation of the Boiling Water Reactor Vessel Internals Project Integrated Surveillance Program into the licensing basis as set forth in the application for amendment dated August 15, 2002, as supplemented by letter dated May 9, 2003. The licensee shall submit to NRC the revised description authorized by this amendment with the next update of the USAR in accordance with 10 CFR 50.71(e).
3. The license amendment is effective as of its date of issuance and shall be implemented within 60 days from the date of issuance. Implementation of the amendment is the incorporation into the USAR the changes to the reactor vessel surveillance program described in the licensee's application dated August 15, 2002, as supplemented by letter dated May 9, 2003, and evaluated in the staff's Safety Evaluation attached to this amendment.

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

Date of Issuance: July 24, 2003

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 136 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 15, 2002 (Reference 1), as supplemented by letter dated May 9, 2003 (Reference 2), Entergy Operations, Inc. (EOI or the licensee), submitted a request for U.S. Nuclear Regulatory Commission (NRC or the Commission) review and approval of a license amendment to modify the basis for their compliance with the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix H, "Reactor Vessel Material Surveillance Program Requirements" for River Bend Station, Unit 1 (RBS). In their submittal, EOI requested that they be approved to implement the Boiling Water Reactor (BWR) Vessel and Internals Project (BWRVIP) reactor pressure vessel (RPV) integrated surveillance program (ISP) as the basis for demonstrating that RBS complies with the requirements of Appendix H to 10 CFR Part 50. Reference 2 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 October 1, 2002 (67 FR 61679).

The BWRVIP submitted the RPV ISP for NRC staff review and approval in topical reports BWRVIP-78 (Reference 3) and BWRVIP-86 (Reference 4). Additional information necessary to establish the technical basis for, and proposed implementation of, the BWRVIP ISP was provided in letters from the BWRVIP to the NRC dated December 15, 2000 (Reference 5), and May 30, 2001 (Reference 6). The NRC staff approved the proposed BWRVIP ISP in a safety evaluation (SE) that was provided to the BWRVIP by letter dated February 1, 2002, (Reference 7). However, the NRC staff's SE required that plant-specific information be provided by BWR licensees who wish to implement the BWRVIP ISP for their facilities. References 1 and 2 addressed the plant-specific information required in Reference 7. Although the submittals do not propose to change the license, per se, consistent with the process established between the NRC and the BWRVIP, EOI submitted its request as a license amendment.

2.0 REGULATORY EVALUATION

Nuclear power plant licensees are required by Appendix H to 10 CFR Part 50 to implement RPV surveillance programs to "monitor changes in the fracture toughness properties of

ferritic materials in the reactor vessel beltline region...which result from exposure of these materials to neutron irradiation and the thermal environment.” Two specific alternatives are provided with regard to the design of a facility’s RPV surveillance program that may be used to address the requirements of Appendix H to 10 CFR Part 50.

The first alternative is the implementation of a plant-specific RPV surveillance program consistent with the requirements of American Society for Testing and Materials (ASTM) Standard Practice E 185, “Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels.” In the design of a plant-specific RPV surveillance program, a licensee may use the edition of ASTM Standard Practice E 185 which was current on the issue date of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code on which the reactor vessel was purchased, or later editions through the 1982 edition.

The second alternative provided in Appendix H to 10 CFR Part 50 is the implementation of an ISP. An ISP is defined in Appendix H to 10 CFR Part 50 as occurring when, “the representative materials chosen for surveillance for a reactor are irradiated in one or more other reactors that have similar design and operating features.” Five specific criteria are stated in Appendix H to 10 CFR Part 50 which must be met to support approval of an ISP:

- a. The reactor in which the materials will be irradiated and the reactor for which the materials are being irradiated must have sufficiently similar design and operating features to permit accurate comparisons of the predicted amount of radiation damage.
- b. Each reactor must have an adequate dosimetry program.
- c. There must be adequate arrangement for data sharing between plants.
- d. There must be a contingency plan to assure that the surveillance program for each reactor will not be jeopardized by operation at reduced power level or by an extended outage of another reactor from which data are expected.
- e. There must be substantial advantages to be gained, such as reduced power outages or reduced personnel exposure to radiation, as a direct result of not requiring surveillance capsules in all reactors in the set.

As noted in Section 1.0 above, the NRC staff approved the proposed BWRVIP ISP in Reference 7, which addressed either completely or partially all of the criteria cited above for approval of an ISP. For those criteria that could not be fully addressed, plant-specific information was required. The NRC staff identified in Reference 7 the specific information that would be required from licensees who wished to implement the BWRVIP for their facilities. As stated in Reference 7:

[A] licensee who wishes to participate in the BWR ISP shall provide, for NRC staff approval, information that defines how it will determine RPV and/or surveillance capsule fluences based on the dosimetry data which will become available for its facility. This information must be submitted concurrently with each licensee’s submittal to replace their existing plant-specific surveillance

program with the BWR ISP as part of their facility's licensing basis. The information submitted must be sufficient for the staff to determine that:

- (1) RPV and surveillance capsule fluences will be established based on the use of an NRC-approved fluence methodology that will provide acceptable results based on the available dosimetry data, and
- (2) if one "best estimate" methodology is used to determine the neutron fluence values for a licensee's RPV and one or more different methodologies are used to establish the neutron fluence values for the ISP surveillance capsules which "represent" that RPV in the ISP, the results of these differing methodologies are compatible (i.e., within acceptable levels of uncertainty for each calculation).

This plant-specific information was required by the NRC staff to ensure that criterion (III.B) for an ISP from Appendix H to 10 CFR Part 50 could be met by each facility and to confirm that data which would be shared as part of the BWRVIP ISP could be effectively utilized by each licensee for the monitoring of RPV embrittlement for their facility.

3.0 TECHNICAL EVALUATION

The staff has reviewed the licensee's regulatory and technical analyses in support of its proposed license amendment. 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.

In References 1 and 2, EOI submitted information for RBS that addressed the information requested in Reference 7. EOI provided a revised Updated Safety Analysis Report (USAR) Section 5.3.1.6.2, "Neutron Flux and Fluence Calculations," which stated:

Future neutron fluence calculations will be performed in accordance with Regulatory Guide 1.190.

The NRC staff has concluded that the inclusion of this statement in the RBS USAR is sufficient to address both items (1) and (2) from Reference 7. Regarding item (1), the licensee's use of a methodology for determining RBS RPV neutron fluence values, which is consistent with the attributes of Regulatory Guide 1.190 and has been approved by the NRC staff, will provide acceptable results based upon the available dosimetry data. Regarding item (2), RPV surveillance capsules tested under the BWRVIP ISP will have their fluences determined by the use of a methodology which is consistent with the attributes of Regulatory Guide 1.190 and has been approved by the NRC staff. The NRC staff has concluded that any two (or more) different fluence methodologies will provide "compatible" (as defined in Reference 7) results provided that the best estimate fluence values are within each other's uncertainty bounds. In addition, EOI provided an additional commitment in Reference 2 regarding when they will perform an updated RPV fluence analysis for the RBS RPV:

[RBS also commits to p]erform new fluence analysis in accordance with the guidance of Regulatory Guide 1.190 and incorporate the RPV surveillance capsule testing results/data that will be available in 2003...from the BWRVIP ISP. Based on the new fluence analysis and surveillance capsule data, we will evaluate the current P-T [Pressure-Temperature] Limit Curves for their "As-Is" acceptance, or revise accordingly. Work will be completed and submitted to the NRC by December 2004.

The NRC staff found this commitment by EOI to be acceptable since the current RPV fluence calculations for the RBS RPV are expected to remain conservative with respect to the actual, accumulated RPV neutron fluence through December 2004 to support operation of the facility.

Inasmuch as this action was submitted as a license amendment, consistent with the NRC staff's understanding of the decision given in Commission Memorandum and Order CLI-96-13, EOI provided a revised USAR Section 5.3.1.6.1, "Compliance with Reactor Vessel Material Surveillance Program Requirements," via Reference 2 which documented the licensee's incorporation of the BWRVIP ISP into the RBS licensing basis:

...The proposed withdrawal schedule is in accordance with BWRVIP-86 (including future revisions), as approved by the NRC in their Safety Evaluation for the Boiling Water Reactor Vessel [and] Internals Project (BWRVIP) Integrated Surveillance Program (ISP) Plan requirements per Reference 5 [Reference 7 of this SE]. Other program elements of the ISP will be implemented consistent with the NRC's ISP Safety Evaluation (Reference 5) [Reference 7 of this SE], and information referenced in BWRVIP-86-A (Reference 6) [of Reference 2 of this SE].

The NRC staff has concluded that the information provided in the revised RBS USAR is adequate to document the licensee's intent to appropriately implement the BWRVIP ISP as the method for demonstrating the compliance of RBS with the requirements of Appendix H to 10 CFR Part 50.

3.1 Technical Conclusion

The NRC staff has concluded that the information provided by EOI was sufficient to conclude that the BWRVIP ISP, as approved in Reference 7, can be implemented for RBS as the basis for demonstrating the facility's continued compliance with the requirements of Appendix H to 10 CFR Part 50. As part of the implementation and documentation of the licensee's intent to utilize the BWRVIP ISP for this purpose, the licensee shall modify the RBS USAR as noted in Section 3.0 of this SE and as stated in References 1 and 2.

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 or changes a

surveillance requirement. 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 61679, published October 1, 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.

7.0 REFERENCES

1. P. D. Hinnenkamp (EOI), to U.S. NRC Document Control Desk, "License Amendment Request (LAR) 2002-23, 'Request for a Change to the Reactor Vessel Material Surveillance Program'," August 15, 2002.
2. R. J. King (EOI), to U.S. NRC Document Control Desk, "License Amendment Request (LAR) 2002-23, 'Request for a Change to the Reactor Vessel Material Surveillance Program'," May 9, 2003.
3. C. Terry (BWRVIP) to U.S. NRC Document Control Desk, "Project No. 704 - BWR Vessel and Internals Project, BWR Integrated Surveillance Program Plan (BWRVIP-78)," December 22, 1999.
4. C. Terry (BWRVIP) to U.S. NRC Document Control Desk, "Project No. 704 - BWRVIP-86: BWR Vessel and Internals Project, BWR Integrated Surveillance Program Implementation Plan," Electric Power Research Institute (EPRI) Technical Report 1000888, December 22, 2000.
5. C. Terry (BWRVIP) to U.S. NRC Document Control Desk, "Project No. 704 - BWRVIP Response to NRC Request for Additional Information Regarding BWRVIP-78," December 15, 2000.
6. C. Terry (BWRVIP) to U.S. NRC Document Control Desk, "Project No. 704 - BWRVIP Response to Second NRC Request for Additional Information on the BWR Integrated Surveillance Program," May 30, 2001.
7. W. H. Bateman (NRC) to C. Terry, "Safety Evaluation Regarding EPRI Proprietary Reports 'BWR Vessel and Internals Project, BWR Integrated Surveillance Program Plan

(BWRVIP-78)' and 'BWRVIP-86: BWR Vessel and Internals Project, BWR Integrated Surveillance Program Implementation Plan,' " February 1, 2002.

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Date: July 24, 2003