



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

May 30, 2012

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:
TECHNICAL SPECIFICATION 3.3.6.1, "PRIMARY CONTAINMENT AND
DRYWELL ISOLATION INSTRUMENTATION" (TAC NO. ME6843)

Dear Sir or Madam:

The Commission has issued the enclosed Amendment No. 174 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 July 27, 2011, as supplemented by letters dated September 16, 2011, and February 7, February 24, and April 3, 2012.

The amendment modifies TS 3.3.6.1, "Primary Containment and Drywell Isolation Instrumentation," to revise the allowable value and related setpoints for the Main Steam Tunnel Temperature functions 1.e, 3.f, and 4.h in TS Table 3.3.6.1-1. In addition, the station's Emergency Action Levels will be revised to reflect the changes to the allowable value and related setpoints to TS 3.3.6.1.

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,

A handwritten signature in black ink that reads "Alan Wang".

Alan B. Wang, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-458

Enclosures:

1. Amendment No. 174 to NPF-47
2. Safety Evaluation

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

ENTERGY GULF STATES LOUISIANA, LLC

AND

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-458

RIVER BEND STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 174
License No. NPF-47

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Entergy Operations, Inc. (the licensee), dated July 27, 2011, as supplemented by letters dated September 16, 2011, and February 7, February 24, and April 3, 2012, 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
 - 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.

Enclosure 1

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. 174 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



Michael T. Markley, 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: May 30, 2012

ATTACHMENT TO LICENSE AMENDMENT NO. 174

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

<u>Remove</u>	<u>Insert</u>
-3-	-3-

Technical Specifications

<u>Remove</u>	<u>Insert</u>
3.3-53	3.3-53
3.3-55	3.3-55
3.3-56	3.3-56

- (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 I 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. 174 and the Environmental Protection Plan contained in Appendix 8, are hereby incorporated in the license. EOI shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

Primary Containment and Drywell Isolation Instrumentation 3.3.6.1

Table 3.3.6.1-1 (page 1 of 5)
Primary Containment and Drywell Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Main Steam Line Isolation					
a. Reactor Vessel Water Level-Low Low Low, Level 1	1,2,3	2	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6 SR 3.3.6.1.7	≥ -147 Inches
b. Main Steam Line Pressure -Low	1	2	E	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6 SR 3.3.6.1.7	≥ 837 psig
c. Main Steam Line Flow-High	1,2,3	2 per MSL	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6 SR 3.3.6.1.7	≤ 190 psid, Line A ≤ 194 psid, Line B ≤ 194 psid, Line C ≤ 194 psid, Line D
d. Condenser Vacuum-Low	1,2(a), 3(a)	2	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6	≥ 7.6 inches Hg vacuum
e. Main Steam Tunnel Temperature-High	1,2,3	2	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 183°F
f. deleted					
g. deleted					
h. deleted					
(continued)					

(a) With any turbine stop valve not closed.

Primary Containment and Drywell Isolation Instrumentation 3.3.6.1

Table 3.3.6.1-1 (page 3 of 5)
Primary Containment and Drywell Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. RCIC System Isolation (continued)					
d. RCIC Turbine Exhaust Diaphragm Pressure-High	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 20 psig
e. RCIC Equipment Room Ambient Temperature-High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 186.4°F
f. Main Steam Line Tunnel Ambient Temperature -High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 183°F
g. Main Steam Line Tunnel Temperature Timer	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	NA
h. RHR Equipment Room Ambient Temperature-High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 121.1°F
i. RCIC/RHR Steam Line Flow-High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 64.2 inches water
j. Drywell Pressure-High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 1.88 psid
k. Manual Initiation	1,2,3	1	G	SR 3.3.6.1.6	NA

(continued)

Primary Containment and Drywell Isolation Instrumentation 3.3.6.1

Table 3.3.6.1-1 (page 4 of 5)
Primary Containment and Drywell Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4. Reactor Water Cleanup (RWCU) System Isolation					
a. Differential Flow-High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 62.1 gpm
b. Differential Flow-Timer	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.6	≤ 47 seconds
c. RWCU Heat Exchanger Equipment Room Temperature-High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 107.5°F
d. RWCU Pump Rooms Temperature-High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 169.5°F
e. RWCU Valve Nest Room Temperature-High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 114.5°F
f. RWCU Demineralizer Rooms Temperature-High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 114.5°F
g. RWCU Receiving Tank Room Temperature-High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 114.5°F
h. Main Steam Line Tunnel Ambient Temperature-High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 183°F
i. Reactor Vessel Water Level-Low Low, Level 2	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6	≥ - 47 Inches
j. Standby Liquid Control System Initiation	1,2	1	I	SR 3.3.6.1.6	NA
k. Manual Initiation	1,2,3	2	G	SR 3.3.6.1.6	NA

(continued)



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 174 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 July 27, 2011 (Reference 1), as supplemented by letters dated September 16, 2011, and February 7, February 24, and April 3, 2012 (References 2, 3, 4, and 5, respectively), Entergy Operations, Inc. (Entergy, the licensee), requested changes to the Technical Specifications (TSs) for the River Bend Station, Unit 1 (RBS). The supplemental letters dated September 16, 2011, and February 7, February 24, and April 3, 2012, 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 February 7, 2012 (77 FR 6147).

The proposed changes would revise TS 3.3.6.1, "Primary Containment and Drywell Isolation Instrumentation." Specifically, the amendment would revise the allowable value (AV) and related setpoints for the Main Steam Tunnel Temperature functions 1.e, 3.f, and 4.h in TS Table 3.3.6.1-1. In addition, the station's Emergency Action Levels (EAL) will be revised to reflect the changes to the AV and related setpoints to TS 3.3.6.1.

2.0 REGULATORY EVALUATION

Section 50.36, "Technical specifications," of Title 10 of the *Code of Federal Regulations* (10 CFR) requires that the TSs include items in the following specific categories: (1) safety limits, limiting safety systems settings, and limiting control settings; (2) limiting conditions for operation (LCOs); (3) surveillance requirements (SRs); (4) design features; and (5) administrative controls. The regulations in 10 CFR 50.36(c)(2)(D) require that TSs include LCOs for "a structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety." The regulations in 10 CFR 50.36(c)(3), specify that SRs are "requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility

operation will be within safety limits, and that the limiting conditions for operation will be met.”

Appendix A, “General Design Criteria for Nuclear Power Plants,” to 10 CFR Part 50, General Design Criteria (GDC) 13, “Instrumentation and control,” requires that

Instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems. Appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges.

Appendix A to 10 CFR 50, GDC 24, “Separation of protection and control systems,” requires that

The protection system shall be separated from control systems to the extent that failure of any single control system component or channel, or failure or removal from service of any single protection system component or channel which is common to the control and protection systems leaves intact a system satisfying all reliability, redundancy, and independence requirements of the protection system. Interconnection of the protection and control systems shall be limited so as to assure that safety is not significantly impaired.

NRC Regulatory Guide (RG) 1.105, Revision 1, “Setpoints for Safety-Related Instrumentations,” November 1976, describes a method acceptable to the NRC staff for complying with the NRC's regulations for ensuring that instrumentation setpoints are initially within and remain within the TS limits.

NRC Regulatory Issue Summary (RIS) 2006-17, “NRC Staff Position on the Requirements of 10 CFR 50.36, ‘Technical Specifications,’ Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels,” dated August 24, 2006 (Reference 6), discusses the requirements of 10 CFR 50.36 related to limiting safety system settings (LSSS) and provides an approach acceptable to the NRC to address LSSS issues. The LSSSs are settings for automatic protective devices related to those variables having significant safety functions.

Section 50.47, “Emergency plans,” of 10 CFR Part 50 sets forth emergency plan requirements for nuclear power plant facilities. The regulations in 10 CFR 50.47(a)(1)(i) state, in part, that:

... no initial operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

Section 50.47(b) establishes the standards that the onsite and offsite emergency response plans must meet for NRC staff to make a positive finding that there is reasonable assurance that

the licensee can and will take adequate protective measures in the event of a radiological emergency. The regulations in 10 CFR 50.47(b)(4) state that:

A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures.

Section 50.47(b)(4) of 10 CFR specifies a standard emergency classification and action level scheme, and as such, the NRC staff will ensure that implementation methods are relatively consistent throughout the industry for a given reactor and containment design while simultaneously providing an opportunity for a licensee to modify its EAL scheme as necessary to address plant-specific design considerations or preferences.

In addition, the proposed change to the EALs were evaluated against the standards in Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50 and the guidance in Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels."

The regulations in 10 CFR 50.54(q)(4) states, in part, that:

The changes to a licensee's emergency plan that reduce the effectiveness of the plan as defined in paragraph (q)(1)(iv) of this section may not be implemented without prior approval by the NRC.

The proposed change was submitted to the NRC for a technical and regulatory review prior to implementation by the licensee, as required under 10 CFR 50.54(q).

3.0 TECHNICAL EVALUATION

3.1. Background

The primary containment and drywell isolation instrumentation automatically initiates closure of appropriate primary containment isolation valves and drywell isolation valves. The isolation instrumentation includes the sensors, relays, and switches that are necessary to cause initiation of primary containment and reactor coolant pressure boundary (RCPB) isolation. Functional diversity is provided by monitoring a wide range of independent parameters. These parameters include isolation functions from: (1) Main Steam Line (MSL) Isolation, (2) Primary Containment and Drywell Isolation, (3) Reactor Core Isolation Cooling (RCIC) System Isolation, (4) Reactor Water Cleanup (RWCU) System Isolation, and (5) Residual Heat Removal (RHR) System Isolation. These functions receive several signals to activate the isolation function. One of the signals is the MSL Tunnel Ambient Temperature – High, which is input to the MSL Isolation, RCIC System Isolation, and RWCU System Isolation. The high temperature alarms in the main control room provide a signal to close the main steam and drain line isolation valves, RCIC steam isolation valves, and the RWCU system isolation valves.

In the license amendment request (LAR), Entergy noted that during the summer months, the MSL tunnel area ambient temperatures, in conjunction with minor steam leaks in the MSL tunnel, have approached the trip setpoint for the MSL Tunnel Ambient Temperature – High for the functions described above. The setpoints for these functions are designed to detect a 25-gallon per minute (gpm) leak in the Main Steam Tunnel – North area and initiate plant isolations.

3.2 GOTHIC Analysis Review

In its letter dated July 27, 2011, the licensee stated that the proposed change will maintain the design leak detection criteria while providing additional margin for plant operation. The licensee was able to accomplish this by refining the analysis that establishes the analytical limit for the MSL tunnel temperature corresponding to a 25-gpm leak by removing unnecessary conservatism and raising the analytical temperature limit to increase the margin. The steam leakage criteria of 25 gpm in the MSL tunnel as described in the RBS Updated Final Safety Analysis Report (USAR) Section 5.2.5.1.3, "Detection of Leakage External to Containment," is not changed. As part of this LAR, the analytical limit (AL) for the high value of MSL tunnel temperature is increased from 154 degrees Fahrenheit (°F) to 194.77 °F. Based on the new AL of 194.77 °F, the corresponding setpoint calculation determined a new limiting allowable value (AV) of ≤ 183.0 °F.

In its letter dated July 27, 2011, the licensee stated that the current calculation was performed using the THREED computer program, a Stone & Webster modified version of RELAP4 intended for sub-compartment analysis. The licensee performed the proposed calculation using the Generation of Thermal-Hydraulic Information for Containments (GOTHIC) computer program. By letter dated May 20, 2004 (Reference 7), the NRC staff approved the use of GOTHIC for high-energy line breaks (HELBs) inside and outside containment for the RBS with some conditions, including the assumption of homogeneous equilibrium flow through vent paths and 100 percent entrainment except where it is more conservative not to employ these assumptions. The licensee has implemented these conditions as described in USAR Sections 6.2.1.1.3.2.1, "Reactor Water Cleanup Break," and 6.2.1.1.3.7.2, "Model for High-Energy Line Breaks Inside Containment."

In its letter dated July 27, 2011, the licensee stated that the current approach used in the analysis for calculating the AL for the north side of the main steam tunnel temperature is highly conservative because it assumes a constant temperature of 105 °F and a constant relative humidity of 32 percent for the return air irrespective of the conditions of the air being drawn from the MSL tunnel. Realistically, as the suction temperature and humidity in the MSL tunnel rise, the return temperature will also rise. Thus, the calculated temperature at 1 hour is conservative in the current calculation.

In its letter dated February 7, 2012, in response to an NRC staff request for additional information (RAI) dated January 9, 2012 (Reference 8), the licensee stated that in the proposed calculation, the MSL tunnel air/steam mixture cooler is modeled as a "Fan Cooler" in GOTHIC (see response to RAI 1 in Reference 3). The Fan Cooler model in GOTHIC models a steam/gas mixture-to-water heat exchanger with hot steam/gas in the primary side, cooled and condensed by cooling water in the secondary side. This model calculates both sensible and latent heat transfer from the steam/gas mixture to the cooling water. The licensee introduced

conservatisms in the proposed analysis by using bounding low values from the historical plant data for the outside air temperature, cooling water temperature, and the MSL tunnel area temperature. The licensee stated that for the relative humidity, no plant data exists. Therefore, the licensee analyzed two cases for the initial relative humidity, one case with its bounding low value and the other with its bounding high value.

The licensee selected the lower 1-hour value obtained from the MSL temperature transient analyses results as the analytical limit which is conservative. In an NRC staff RAI dated January 25, 2012 (Reference 9), the licensee was requested to justify that the proposed analytical limit of 194.77 °F is the bounding lowest analytical temperature for a 25-gpm leak anywhere in the main steam tunnel. In its response dated February 7, 2012 (Reference 3), the licensee stated:

The limits of the RCPB in the Main Steam Tunnel are to the outer Main Steam Isolation Valves (MSIV's). The four outer MSIV's are located in the north steam tunnel area. Figure 1.2-14 in the USAR identifies the location of the MSIV's and the jet impingement wall. The area between the containment and the jet impingement wall identifies the north area of the steam tunnel.

The temperature instrumentation in the north steam tunnel is not intended to resolve leaks in the south steam tunnel. There is temperature instrumentation in the south steam tunnel which is intended to resolve leaks in the south steam tunnel. The analytical limit for the south steam tunnel instrumentation is 153 °F. The south steam tunnel instrumentation is not the subject of this application.

Based on the above, the NRC staff concludes that the proposed analytical limit of 194.77 °F is the lower bounding limit for the temperature instrument detecting leaks anywhere in the MSL tunnel. The north steam tunnel area contains portions of the RCPB while the south side of the MSL tunnel does not. As such, the north side of the tunnel contains the bounding temperature limit. The south side of the tunnel has separate temperature instruments for leak detection whose AL is 153 °F and is not affected by this change. The NRC staff considers the results for the analytical limit of the temperature instruments used to detect leakage in the north side of the MSL tunnel acceptable because the licensee used conservative inputs and assumptions and the GOTHIC code whose application in the same area was accepted previously by NRC staff.

In its submittals, the licensee stated that it had reviewed the equipment qualification within the affected area and determined the equipment will perform as required with the proposed TS change. Based on a review of the licensee's proposed AL for the temperature instruments for the leak detection in the north side of the MSL tunnel, the NRC staff concludes that the proposed change is acceptable. In addition, the NRC staff concludes that the proposed change does not affect the current "25 gpm leak" design criteria of the RCPB in the north side of the MSL tunnel.

3.3 Proposed Changes to TS Table 3.3.6.1-1

Entergy proposed to change the AV setpoints contained in the following TS Table 3.3.6.1-1 items:

- MSL Isolation, Function 1.e, Main Steam Tunnel Temperature-High – Detects a leak in the RCPB, and provides diversity to the high flow instrumentation. The isolation occurs when a very small leak has occurred.
- RCIC System Isolation, Function 3.f, Main Steam Line Tunnel Ambient Temperature-High – Detects a leak in the RCPB and provides diversity to the high flow instrumentation. The isolation occurs when a very small leak has occurred.
- RWCU System Isolation, Function 4.h, Main Steam Line Tunnel Ambient Temperature-High, Function 4.h – Detects a leak in the RCPB and provides diversity to the high flow instrumentation. The isolation occurs when a very small leak has occurred.

The high main steam tunnel temperature provides both alarm and isolation for the main steam, RCIC lines and RWCU lines. For these functions, the ambient temperature monitoring AV is chosen to detect a leak equivalent to 25 gpm. Note that credit for these instruments is not taken in any transient or accident analysis in RBS's USAR, since bounding analyses are performed for large breaks such as main steam line breaks (MSLBs).

The proposed change to the AV for the main steam tunnel temperature isolation instrumentation arises from a change in the engineering model being used to calculate the AL for these instruments. Further, this modification is requested to use additional margin for elevated temperatures in the main steam tunnel – North; and thus remove unnecessary conservatism. By letter dated February 24, 2012 (Reference 4), in response to an NRC staff RAI, Entergy explained that the alarms used for the main steam tunnel are currently set at 135 °F. Also, Entergy provided data showing the MSL tunnel area ambient temperature during the summer months in conjunction with minor steam leaks in the MSL tunnel. This data showed that the tunnel temperature has approached the trip setpoint for the Main Steam Line Tunnel Ambient Temperature – High for the functions described above.

The proposed change does not change the number of temperature elements employed or where the instruments are physically located. Also, the proposed change does not delete or remove any high-temperature alarms.

The AL for the main steam tunnel temperature - high is increased from 154 °F to 194.77 °F. The basis for the main steam tunnel temperature - high setpoint AL is an area temperature rise equivalent to a 25-gpm steam leakage rate. This basis is described in RBS USAR Section 5.2.5.1.3, "Detection of Leakage External to Containment." The basis is unchanged by this LAR, and thus, the design leaking criteria remains. Further, this function is not credited in the Entergy's current design basis analysis.

The new AL of 194.77 °F was determined based upon a refined analysis that established the AL for the main steam tunnel temperature corresponding to the same 25-gpm leak. In its letter dated February 24, 2012, in response to an NRC staff RAI, the licensee explained that this modification was reviewed under the licensee's 10 CFR 50.59 program. Thus, NRC approval is not requested for this change.

Entergy used a new AL of ≤ 183.0 °F. This new AV was determined by the licensee using the existing plant setpoint methodology. Entergy's setpoint methodology is in accordance with GE Nuclear Energy NEDC-31336P, "General Electric Instrument Setpoint Methodology," September 1996 (Reference 10). In its letter dated February 24, 2012, in response to an NRC staff RAI, Entergy noted that the methodology used to determine the setpoint is similar to the methodology described for balance-of-plant safety system setpoints.

In addition to the changes to the AV setpoints, a corresponding change would be made to increase the nominal trip setpoint (NTSP) maintained in RBS's Technical Requirements Manual functions identified above. The NRC staff did not evaluate the change made to the NTSP, since this modification was controlled by the licensee's 10 CFR 50.59 program. The AV and NTSP were established from the new AL by accounting for instrument accuracy, calibration and drift uncertainties, as well as process measurement accuracy and primary element accuracy.

Function Variable	Current Value	Proposed Value
Analytical Limit	194.7 °F	194.7 °F
Allowable Value	≤ 148.5 °F	≤ 183.0 °F
Nominal Trip Setpoint	144.0 °F	173.0 °F

The licensee's calculation G13.18.6.1-E31*009 describes the setpoint calculation for determining the AV for the Main Steam Tunnel Temperature functions. A summary of this setpoint calculation was submitted to the NRC by letter dated September 16, 2011 (Reference 2), in response to the NRC staff's request for supplemental information dated September 1, 2011 (Reference 11). Further, the NRC staff reviewed the complete calculation on March 7, 2012, during a limited scope regulatory audit (Reference 12). During this audit, the staff reviewed input data and the algorithm used to determine the AV and NTSP. Also, the staff confirmed that input data uncertainties and bias terms were appropriately identified and incorporated in the calculation. Further, the licensee's calculation showed that additional margin was incorporated in the form of a miscellaneous error factor in the calculation, as well as an additional margin added to the final result. This additional margin adds conservatism to the AV and NTSP values. The staff did not identify any issues or open items associated with the calculation.

In its letter dated February 24, 2012, in response an NRC staff RAI, Entergy described that independent, random, and normally distributed variables were combined by the square root of the sum of the squares (SRSS), and that non-random uncertainty related to insulation resistance effects was summed algebraically (included as a bias). This was also confirmed during the review of the licensee's complete calculation G13.18.6.1-E31*009. During the audit, the NRC staff confirmed that input data uncertainties were appropriately identified and carried throughout the calculation.

The GE Setpoint Methodology is designed to result in a 95 percent probability of providing a channel trip before the process variable reaches the AL, considering drift and assuming a one-sided normal distribution. The GE Setpoint Methodology utilizes single-sided distributions in the development of trip setpoints and AVs. In the LAR, Entergy explained that in previous discussions with the NRC staff, the staff found that the methodology used met the intent of RIS 2006-17. Based on the above, the NRC staff concludes the uncertainty terms and setpoint calculation are acceptable to meet 10 CFR 50.36(c)(1).

The licensee's calculation G13.18.6.1-E31*009 and instrumentation and control setpoint data sheet E31-TSN604A-F showed how the as-found and as-left values were determined. The calibration tolerance for the temperature switches installed in the main steam tunnel is provided below. These values are verified in accordance with the licensee's plant-specific program.

As-left: $\pm 2.0^{\circ}$

As-found: $\pm 4.0^{\circ}$

In addition to the proposed TS changes, the TS Bases for SR 3.3.6.1.5 would be revised upon implementation to include the following statement:

For Functions 1.e, 3.f and 4.h there is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.

This statement was implemented in accordance with the Technical Specifications Task Force (TSTF)-493 Bases revision to NUREG-1434, "Standard Technical Specifications – General Electric Plants (BWR/6)." These functions are not limited system safety settings.

The NRC staff reviewed the licensee's application related to the modification of the allowable value setpoints for the main steam tunnel temperature – high function. The staff concludes that the licensee adequately addressed the uncertainty terms and setpoint calculation acceptable to meet 10 CFR 50.36(c)(1) and established a new AV for this function. Furthermore, the staff concludes that the systems will continue to meet the requirements of GDCs 13 and 24. The NRC staff has no objections to the proposed Ts Bases.

3.4 EAL Change

The licensee has requested a corresponding change to the EAL for the fission barrier matrix. The NRC staff has reviewed the technical basis for the proposed EAL change and the licensee's evaluation of the proposed changes. The EAL threshold is based upon the proposed revised value in TS 3.3.6.1 which the NRC staff is approving with the issuance of this amendment. The proposed change to the EAL is acceptable and the NRC staff concludes that the proposed changes meet the guidance in Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels," the requirements of 10 CFR 50.47(b)(4), and the standards in Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50.

3.5 Conclusion

The NRC staff has reviewed the licensee's analysis to support the proposed change to increase the AL for the high value of MSL tunnel temperature from 154 °F to 194.77 °F, which is the bounding lowest analytical temperature for a 25-gpm leakage anywhere in the main steam tunnel. The NRC staff concludes that the change to the AL for the temperature instruments for the leak detection in the north side of the MSL tunnel is acceptable. The NRC staff concludes that the proposed change does not affect the current "25 gpm leak" design criteria of the RCPB in the north side of the MSL tunnel. As a result of the increase of the AL for the high value of MSL tunnel temperature, Entergy has revised the AV setpoint for the main steam tunnel temperature – high function. The NRC staff concludes that the licensee has adequately addressed the uncertainty terms and setpoint calculation acceptable to meet 10 CFR 50.36(c)(1) and established a new AV for this function. Furthermore, the NRC staff concludes that the systems will continue to meet the requirements of GDCs 13 and 24. Based on the above, the NRC staff concludes that the proposed changes meet the guidance in Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels," the requirements of 10 CFR 50.47(b)(4), and the standards in Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50. Therefore, the NRC staff concludes that the proposed EAL change provides reasonable assurance that the licensee can and will take adequate protective measures in the event of a radiological emergency.

4.0 REGULATORY COMMITMENTS

By letter dated July 27, 2011 (Reference 1), Entergy made the following regulatory commitment:

In addition to the identified changes to the Technical Specifications above, the BASES will be revised upon implementation to include the following information based upon TSTF- 493 BASES revision to NUREG-1434, SR 3.3.6.1.5 to include the following statement;

There is a plant specific program which verifies that the instrument channel functions as required by verifying the as-left and as-found setting are consistent with those established by the setpoint methodology.

The NRC staff concludes that reasonable controls for the implementation and for subsequent evaluation of the proposed change pertaining to the above regulatory commitment is best provided by the licensee's administrative processes, including its commitment management program.

5.0 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.

6.0 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 in the *Federal Register* on February 7, 2012 (77 FR 6147). 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.

7.0 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.

8.0 REFERENCES

1. Roberts, J. C., Entergy Operations, Inc. letter to U.S. Nuclear Regulatory Commission, "License Amendment Request, Changes to Technical Specification 3.3.6.1, 'Primary Containment and Drywell Isolation Instrumentation,' River Bend Station, Unit 1, Docket No. 50-458, License No. NPF-47," dated July 27, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11214A093).
2. Clark, J. A., Entergy Operations, Inc. letter to U.S. Nuclear Regulatory Commission, "Supplemental Information, Changes to Technical Specification 3.3.6.1, 'Primary Containment and Drywell Isolation Instrumentation,' River Bend Station, Unit 1, Docket No. 50-458, License No. NPF-47," dated September 16, 2011 (ADAMS Accession No. ML11263A013).
3. Clark, J. A., Entergy Operations, Inc. letter to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information, Changes to Technical Specification 3.3.6.1, 'Primary Containment and Drywell Isolation Instrumentation,' River Bend Station, Unit 1, Docket No. 50-458, License No. NPF-47," dated February 7, 2012 (ADAMS Accession No. ML12045A528).
4. Clark, J. A., Entergy Operations, Inc. letter to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information, Changes to Technical Specification 3.3.6.1, 'Primary Containment and Drywell Isolation Instrumentation,' River Bend Station, Unit 1, Docket No. 50-458, License No. NPF-47," dated February 24, 2012 (ADAMS Accession No. ML12059A150).

5. Roberts, J. C. Entergy Operations, Inc. letter to U.S. Nuclear Regulatory Commission, "Supplemental Information Concerning License Amendment Applications, River Bend Station, Unit 1, Docket No. 50-458, License No. NPF-47," dated April 3, 2012 (ADAMS Accession No. ML12101A241).
6. U.S. Nuclear Regulatory Commission, Regulatory Issue Summary (RIS) 2006-17, "NRC Staff Position on the Requirements of 10 CFR 50.36, 'Technical Specifications,' Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels," dated August 24, 2006 (ADAMS Accession No. ML051810077).
7. Webb, M., U.S. Nuclear Regulatory Commission, letter to Paul D. Hinnenkamp, Entergy Operations, Inc., "River Bend Station, Unit 1 – Issuance of Amendment Re: High Energy Line Break Analysis (TAC No. MB5096)," dated May 20, 2004 (ADAMS Accession No. ML041410566).
8. Wang, A. B., U.S. Nuclear Regulatory Commission, electronic mail to Barry Burmeister, Entergy Operations, Inc., "River Bend Station Main Steam Tunnel Temps TS Change Request for Additional Information (ME6843)," dated January 9, 2012 (ADAMS Accession No. ML120090163).
9. Wang, A. B., U.S. Nuclear Regulatory Commission, electronic mail to Barry Burmeister, Entergy Operations, Inc., "MS Tunnel Temps (ME6843)," dated January 25, 2012 (ADAMS Accession No. ML120250177).
10. GE Nuclear Energy, NEDC-31336P-A, "General Electric Instrument Setpoint Methodology," September 1996 (not publicly available – proprietary).
11. Wang, A. B., U.S. Nuclear Regulatory Commission, letter to Entergy Operations, Inc., "River Bend Station, Unit 1 -Supplemental Information Needed for Acceptance of Requested Licensing Action Re: Request to Modify Main Steam Tunnel Temperature Function (TAC No. ME6843)," dated September 1, 2012 (ADAMS Accession No. ML112430254).
12. U.S. Nuclear Regulatory Commission, John E. Thorp memorandum to Michael T. Markley, "Audit of River Bend's Setpoint Calculation for the Main Steam Tunnel Temperature Function (TAC# ME6843)," dated March 22, 2012 (not publicly available).

Principal Contributors: R. Alvarado
A. Sallman
D. Johnson

Date: May 30, 2012

May 30, 2012

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:
TECHNICAL SPECIFICATION 3.3.6.1, "PRIMARY CONTAINMENT AND
DRYWELL ISOLATION INSTRUMENTATION" (TAC NO. ME6843)

Dear Sir or Madam:

The Commission has issued the enclosed Amendment No. 174 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 July 27, 2011, as supplemented by letters dated September 16, 2011, and February 7, February 24, and April 3, 2012.

The amendment modifies TS 3.3.6.1, "Primary Containment and Drywell Isolation Instrumentation," to revise the allowable value and related setpoints for the Main Steam Tunnel Temperature functions 1.e, 3.f, and 4.h in TS Table 3.3.6.1-1. In addition, the station's Emergency Action Levels will be revised to reflect the changes to the allowable value and related setpoints to TS 3.3.6.1.

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/

Alan B. Wang, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-458

Enclosures:

1. Amendment No. 174 to NPF-47
2. Safety Evaluation

cc w/encls: Distribution via Listserv

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RAIvarado, NRR/DE/EICB
ASallman, NRR/DSS/SCVB
DJohnson, NSIR/DPR

ADAMS Accession No. ML121070557

*SE memo dated

OFFICE	NRR/LPL4/PM	NRR/LPL4/LA	NRR/DSS/STSB/BC	NSIR/DPR/ORLOB/BC	NRR/DSS/SCVB/BC
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DATE	5/2/12	5/1/12	5/7/12	3/1/12	4/6/12
OFFICE	NRR/DE/EICB/BC	OGC NLO	NRR/LPL4/BC	NRR/LPL4/PM	
NAME	JThorp*	AGhosh	MMarkley	ABWang	
DATE	3/22/12	5/16/12	5/30/12	5/30/12	

OFFICIAL AGENCY RECORD