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Jerry C. Roberts  
Director, Nuclear Safety Assurance

January 25, 2008

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555

SUBJECT: License Amendment Request  
Main Turbine Bypass System  
River Bend Station, Unit 1  
Docket No. 50-458  
License No. NPF-47

REFERENCES: 1. Standard Technical Specifications General Electric Plants,  
BWR/6-NUREG-1434 Vol. 1, Rev. 3.  
2. Generic Letter 88-16, "Removal of Cycle-Specific Parameter  
Limits From Technical Specification," October 3, 1998.

RBG-46690

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Entergy Operations, Inc. (Entergy) hereby requests the following amendment for River Bend Station, Unit 1 (RBS). The proposed change will revise the Operating License to allow revision of reactor operational limits, as specified in the RBS Core Operating Limits Report (COLR), to compensate for the inoperability of the Main Turbine Bypass System (MTBS). The revised Technical Specification (TS) will require that either the Main Turbine Bypass System be OPERABLE or that Minimum Critical Power Ratio (MCPR), Average Planar Linear Heat Generation Rate (APLHGR) and Linear Heat Generation Rate (LHGR) limits for the inoperable MTBS be placed in effect as specified in the COLR. Attachment 3 contains marked-up copies of the TS Bases for your information only.

The proposed change has been evaluated in accordance with 10 CFR 50.91(a)(1) using criteria in 10 CFR 50.92(c) and it has been determined that this change involves no significant hazards consideration. The bases for these determinations are included in the attached submittal.

The proposed change includes new commitments as summarized in Attachment 4. The proposed change is consistent with NUREG-1434, *Standard Technical Specifications General Electric Plants, BWR/6*. LHGR has been added to ensure that the appropriate operating limits listed in TS 5.6.5 are used.

A001  
NRR

RBG-46690

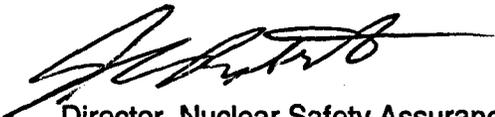
Page 2 of 2 (corrected copy)

Entergy requests approval of the proposed amendment as soon as practical. Once approved, the amendment shall be implemented within 60 days. Although this request is neither exigent nor emergency, your prompt review is requested.

If you have any questions or require additional information, please contact Bill Brice at 601-368-5076.

I declare under penalty of perjury that the foregoing is true and correct. Executed on January 25, 2008.

Sincerely,



Director, Nuclear Safety Assurance  
River Bend Station - Unit 1

JCR/DNL/bmb

Attachments:

1. Analysis of Proposed Technical Specification Change
2. Proposed Technical Specification Changes (mark-up)
3. Changes to Technical Specification Bases Pages – For Information Only
4. List of Regulatory Commitments

cc: Mr. Elmo E. Collins, Jr.

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**Attachment 1**

**RBG-46690**

**Analysis of Proposed Technical Specification Change**

## 1.0 DESCRIPTION

This letter is a request to amend Operating License NPF-47 for River Bend Station, Unit 1 (RBS).

The proposed changes will revise the Operating License to allow revision of reactor operational limits, as specified in the RBS Core Operating Limits Report (COLR), to compensate for the inoperability of the Main Turbine Bypass System (MTBS). This will provide an alternative to the existing Limiting Condition for Operation (LCO) for the MTBS. The revised Technical Specification (TS) will require that either the MTBS be OPERABLE or that Average Planar Linear Heat Generation Rate (APLHGR), Minimum Critical Power Ratio (MCPR), and Linear Heat Generation Rate and limits for the inoperable MTBS be placed in effect as specified in the COLR.

## 2.0 PROPOSED CHANGE

The current LCO of RBS Technical Specification 3.7.5 "Main Turbine Bypass System," states:

The Main Turbine Bypass System shall be OPERABLE.

This requirement is applicable any time thermal power is  $\geq 23.8$  RPT (Rated Thermal Power). The proposed change would modify the LCO to add an OR statement which would incorporate additional provisions that would allow the alternative of taking applicable penalties when the MTBS is inoperable as specified in the COLR. This change would add:

### OR

The following limits for inoperable Main Turbine Bypass System, as specified in the COLR are made applicable:

1. LCO 3.2.1, "AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)," and
2. LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)," and
3. LCO 3.2.3, "LINEAR HEAT GENERATION RATE (LHGR)."

ACTION A of the LCO currently requires restoration of the MTBS to OPERABLE status within 2 hours whenever the MTBS is inoperable. The new ACTION A would require the system be returned to OPERABLE or to apply the limits as specified in the COLR.

A.1 Restore the Main Turbine Bypass System to OPERABLE status

### OR

A.2 Apply the APLHGR, LHGR and MCPR limits for inoperable Main Turbine Bypass System as specified in the COLR

ACTION B would then require a reduction in thermal power as it currently does.

This LCO allows the imposition of APLHGR, MCPR, and LHGR operating penalties in lieu of the MTBS to ensure adequate margin for the fuel thermal limits. The penalties will be calculated using approved analytical methods, and will be documented in the COLR in accordance with TS 5.6.5, CORE OPERATING LIMITS REPORT (COLR). The proposed change is consistent with NUREG-1434, *Standard Technical Specifications General Electric Plants, BWR/6*. LHGR has been added in addition to the other two penalties in the NUREG to ensure that the appropriate core operating limits listed in TS 5.6.5 are used.

The Bases will be revised to confirm that the alternative MCPR, APLHGR, and LHGR operating limits are sufficient to mitigate pressurization transient effects and that the alternative limits maintain the margin to the MCPR, APLHGR and LHGR assumed in the safety analysis.

In summary, this amendment allows revision of reactor operational limits, as specified in the River Bend Station Unit 1, Core Operating Limits Report, to compensate for possible inoperability of the Main Turbine Bypass System. The revised TS will require that either the MTBS be OPERABLE or that applicable limits for the inoperable MTBS be placed in effect as specified in the COLR. The proposed change is consistent with NUREG-1434, *Standard Technical Specifications General Electric Plants, BWR/6*. LHGR has been added to ensure that the appropriate core operating limits listed in TS 5.6.5 are used.

### 3.0 BACKGROUND

The Main Turbine Bypass System is designed to control steam pressure when reactor steam generation exceeds turbine requirements during unit startup, sudden load reduction and cool down. It allows excess steam flow from the reactor to the condenser without going through the turbine. The bypass capacity of the system is approximately 9.5% of the Nuclear Steam Supply System rated steam flow. Sudden load reductions within the capacity of the steam bypass can be accommodated without a reactor scram.

The bypass valve assembly consists of a single multi-valve manifold. There are two bypass valves connected to the main steam lines between the main steam isolation valves and the turbine stop valves. The bypass valves exhaust to the two main condenser shells. The valves are normally closed directing all steam to the turbine. The Steam Bypass and Pressure Regulation System is described in Section 7.7.1.4 of the RBS USAR.

The MTBS has a dual function. The system controls steam pressure when reactor steam generation exceeds turbine requirements as described above. The system is also required to be operable to limit the reactor pressure and power increases during certain transients postulated in the accident analysis. This ensures that the MCPR, APLHGR and LHGR safety limits are not exceeded. With the Main Turbine Bypass System inoperable, modifications to the MCPR, APLHGR and LHGR are made and applied to ensure that the values remain within the accident analysis.

#### 4.0 TECHNICAL ANALYSIS

The MTBS operates to limit reactor pressure and power increases during a transient. This ensures an adequate margin to protect the MCP, APLHGR and LHGR safety limits. This proposed Technical Specification change adds requirements to implement more conservative MCP, APLHGR and LHGR limits if the MTBS becomes inoperable. This change is consistent with NUREG-1434, *Standard Technical Specifications General Electric Plants, BWR/6*. LHGR has been added to ensure that the appropriate core operating limits listed in TS 5.6.5 are used.

The fuel designs used at RBS have evolved over time and are more critical power ratio and LHGR tolerant than earlier designs. This has reduced the need for the MTBS function. Therefore the development of fuel thermal limits that do not credit the MTBS function will have a minor impact on plant operation over the operating cycle. Entergy intends to implement more restrictive core operating limits that do not credit the MTBS function to protect MCP, APLHGR, and LHGR safety limits at RBS when the function is inoperable. Note that the MTBS function is not being disabled and actuation of this feature, if OPERABLE, is expected for any applicable turbine event. The effect of MTBS actuation will be to lessen the severity of any plant transient.

The cycle specific fuel operating limits based on the design function of the MTBS are currently implemented by and documented in the RBS COLR. Operating limits for the entire cycle are based on an operable MTBS function. The proposed change will allow the COLR to contain operating limits that are applicable when the MTBS function is not operable. The additional restrictions imposed by the revised set of operating limits will offset the impact of losing the MTBS function. Therefore, there are no safety consequences associated with the proposed changes.

Reload analyses are performed each cycle using NRC approved methods documented in TS 5.6.5, CORE OPERATING LIMITS REPORT (COLR). Adjustments will be made to the MCP, APLHGR and LHGR limits to support operation with MTBS inoperable. The adjustments will be incorporated into the COLR and into the core monitoring software in the core monitoring computer. This will effectively change the initial conditions for the applicable transients. Core damage risk and other risk measures are unaffected by the proposed change since implementation of revised core operating limits provides the equivalent protection for anticipated transients.

#### 5.0 REGULATORY ANALYSIS

##### 5.1 Applicable Regulatory Requirements/Criteria

The proposed changes have been evaluated to determine whether applicable regulations and requirements continue to be met.

Entergy has determined that the proposed changes do not require any exemptions or relief from regulatory requirements, other than the TS, and do not affect conformance with any General Design Criterion (GDC) differently than described in the Updated Safety Analysis Report (USAR.)

Title 10 of the *Code of Federal Regulations*, General Design Criterion (GDC) 10, "Reactor design," requires that the reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.

Generic Letter 88-16 (Reference 2) allows licensees to include the cycle specific parameter limits (i.e., MCPR) in the COLR, provided the changes in the parameter limits are determined using the NRC-approved methodology and consistent with all applicable limits of the USAR. This proposed amendment follows that guidance.

## 5.2 No Significant Hazards Consideration

Entergy Operations, Inc. has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The Main Turbine Bypass System (MTBS) functions to limit reactor pressure and power increases during certain transients postulated in the accident analysis. The MTBS is a mitigation function and not the initiator of any evaluated accident or transient. Operation with inoperable MTBS and compliance with the revised set of Minimum Critical Power Ratio (MCPR), Average Planar Linear Heat Generation Rate (APLHGR) and Linear Heat Generation Rate (LHGR) operating limits will offset the impact of losing the MTBS function.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed change will not create any new modes of plant or equipment operation. The proposed change allows the option to apply an additional penalty factor to the MCPR, APLHGR, and LHGR when the MTBS is inoperable. With the revised set of operating limits will offset the impact of losing the MTBS function, the margin to the MCPR SL and the thermal mechanical design limits are maintained. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

The additional restrictions imposed by the revised set of operating limits will offset the impact of losing the MTBS function. Therefore, there are no safety consequences associated with the proposed changes.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

By establishing new restrictive APLHGR, MCPR, and LHGR operating limits, there are no changes to the plant design and safety analysis. There are no changes to the reactor core design instrument setpoints. The margin of safety assumed in the safety analysis is not affected. Applicable regulatory requirements will continue to be met and adequate defense-in depth will be maintained. Sufficient safety margins will be maintained.

The analytical methods used to determine the revised core operating limits were reviewed and approved by the NRC, and are described in Technical Specification 5.6.5.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, Entergy concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

### 5.3 Environmental Considerations

The proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

### 6.0 PRECEDENCE

This change is similar to a request made by PPL Susquehanna Steam Electric Station by letter dated 12/5/03 for Units 1 and 2 (reference 2). The change was made to include penalties for LHGR limits only as MCPR limits had already been included.

### 7.0 REFERENCES

1. Standard Technical Specifications General Electric Plants, BWR/6-NUREG-1434 Vol. 1, Rev. 3
2. Request made by PPL Susquehanna Steam Electric Station by letter dated 12/5/03 for Units 1 and 2 (ML33500447) and approved by letter dated December 3, 2004 (ML043350010)

**Attachment 2**

**RBF1-07-0075**

**Proposed Technical Specification Changes (mark-up)**

Main Turbine Bypass System  
 3.7.5

3.7 PLANT SYSTEMS

3.7.5 Main Turbine Bypass System

LCO 3.7.5

~~The Main Turbine Bypass System shall be OPERABLE.~~

INSERT  
A

APPLICABILITY: THERMAL POWER  $\geq$  23.8 RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<del>A. Main Turbine Bypass System inoperable.</del>	<del>A.1 Restore Main Turbine Bypass System to OPERABLE status.</del>	<del>2 hours</del>
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to < 23.8% RTP.	4 hours

INSERT  
B

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.5.1 Verify one complete cycle of each main turbine bypass valve.	31 days
SR 3.7.5.2 Perform a system functional test.	18 months
SR 3.7.5.3 Verify the TURBINE BYPASS SYSTEM RESPONSE TIME is within limits.	18 months

**INSERT A**

LCO 3.7.5 A. The Main Turbine Bypass System shall be OPERABLE.

OR

B. The following limits for inoperable Main Turbine Bypass System, as specified in the COLR are made applicable:

1. LCO 3.2.1, "AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)," and
2. LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)," and
3. LCO 3.2.3, "LINEAR HEAT GENERATION RATE (LHGR)."

**INSERT B**

A. Main Turbine Bypass System inoperable.	A.1 Restore the Main Turbine Bypass System to OPERABLE status  <u>OR</u> A.2 Apply the APLHGR, LHGR and MCPR limits for inoperable Main Turbine Bypass System as specified in the COLR.	2 hours  2 hours
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**Attachment 3**

**RBG-46690**

**Changes to Technical Specification Bases Pages**

**For Information Only**

Main Turbine Bypass System  
B 3.7.5

B 3.7 PLANT SYSTEMS

B 3.7.5 Main Turbine Bypass System

BASES

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BACKGROUND

The Main Turbine Bypass System is designed to control steam pressure when reactor steam generation exceeds turbine requirements during unit startup, sudden load reduction, and cooldown. It allows excess steam flow from the reactor to the condenser without going through the turbine. The bypass capacity of the system is 10% of the Nuclear Steam Supply System rated steam flow. Sudden load reductions within the capacity of the steam bypass can be accommodated without reactor scram. The Main Turbine Bypass System consists of a two valve chest connected to the main steam lines between the main steam isolation valves and the turbine stop valves. Each of these valves is sequentially operated by hydraulic cylinders. The bypass valves are controlled by the pressure regulation function of the Turbine Pressure Regulator and Control System, as discussed in the USAR, Section 7.7.1.4 (Ref. 1). The bypass valves are normally closed, and the pressure regulator controls the turbine control valves, directing all steam flow to the turbine. If the speed governor or the load limiter restricts steam flow to the turbine, the pressure regulator controls the system pressure by opening the bypass valves. When the bypass valves open, the steam flows from the bypass chest, through connecting piping, to the pressure breakdown assemblies, where a series of orifices are used to further reduce the steam pressure before the steam enters the condenser.

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APPLICABLE  
SAFETY ANALYSES

The Main Turbine Bypass System is assumed to function during the design basis feedwater controller failure, maximum demand event, described in the USAR, Section 15.1.2 (Ref. 2). Opening the bypass valves during the pressurization event mitigates the increase in reactor vessel pressure, which affects the MCPR during the event. An inoperable Main Turbine Bypass System may result in an MCPR penalty.

The Main Turbine Bypass System satisfies Criterion 3 of the NRC Policy Statement.

*APLHR, and  
LHR penalties.*

(continued)

BASES (continued)

LCO

The Main Turbine Bypass System is required to be OPERABLE to limit peak pressure in the main steam lines and maintain reactor pressure within acceptable limits during events that cause rapid pressurization, such that the Safety Limit MCPR is not exceeded.

insert 1

An OPERABLE Main Turbine Bypass System requires the bypass valves to open in response to increasing main steam line pressure. This response is within the assumptions of the applicable analysis (Ref. 2).

APPLICABILITY

The Main Turbine Bypass System is required to be OPERABLE at  $\geq 23.8\%$  RTP to ensure that the fuel cladding integrity Safety Limit and the cladding 1% plastic strain limit are not violated during the feedwater controller failure, maximum demand event. As discussed in the Bases for LCO 3.2.1, "AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)," and LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)," sufficient margin to these limits exists  $< 23.8\%$  RTP. Therefore, these requirements are only necessary when operating at or above this power level.

ACTIONS

A.1

If the Main Turbine Bypass System is inoperable (one or more bypass valves inoperable), the assumptions of the design basis transient analysis may not be met. Under such circumstances, prompt action should be taken to restore the Main Turbine Bypass System to OPERABLE status. The 2 hour Completion Time is reasonable, based on the time to complete the Required Action and the low probability of an event occurring during this period requiring the Main Turbine Bypass System.

B.1

If the Main Turbine Bypass System cannot be restored to OPERABLE status within the associated Completion Time, THERMAL POWER must be reduced to  $< 23.8\%$  RTP. As discussed in the Applicability section, operation at  $< 23.8\%$  RTP results in

(continued)

**INSERT 1 to B 3.7.6**

With the Main Turbine Bypass System inoperable, modifications to the APLHGR limits (LCO 3.2.1, "AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)"), MCPR limits (LCO 3.2.2 "MINIMUM CRITICAL POWER RATIO (MCPR)" (including power and flow dependent limits)) and LHGR limits (LCO 3.2.3 "LINEAR HEAT GENERATION RATE (LHGR)(including power and flow dependent limits)") may be applied as applicable to allow continued operation.

**Attachment 4**

**RBG-46690**

**List of Regulatory Commitments**

**List of Regulatory Commitments**

The following table identifies those actions committed to by Entergy in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments.

COMMITMENT	TYPE (Check one)		SCHEDULED COMPLETION DATE (If Required)
	ONE- TIME ACTION	CONTINUING COMPLIANCE	
The Bases will be revised to confirm that the alternative MCPR, APLHGR, and LHGR operating limits are sufficient to mitigate pressurization transient effects and that the alternative limits restore the margin to the APLHGR, MCPR, and LHGR assumed in the safety analysis.	X		within 60 days of approval
The adjustments will be incorporated into the COLR and into the core monitoring software in the core monitoring computer.	X		within 60 days of approval of this amendment.