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William F. Maguire
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River Bend Station

RBG-47822

January 24, 2018

Attn: Document Control Desk
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852-2738

SUBJECT: Response to License Renewal Application NRC Request for Additional Information - Clarification, Severe Accident Mitigation Alternatives
River Bend Station, Unit 1
Docket No. 50-458
License No. NPF-47

References: 1) Entergy Letter: License Renewal Application (RBG-47735 dated May 25, 2017)

2) NRC email: River Bend Station, Unit 1, Request for Additional Information, RBS Severe Accident Mitigation Alternatives - License Renewal Application – dated November 9, 2017. (ADAMS Accession No. ML17317A002).

3) Entergy Letter: Response to License Renewal Application (LRA) NRC Request for Additional Information, Severe Accident Mitigation Alternatives dated December 5, 2017. (ADAMS Accession No. ML17339A795)

Dear Sir or Madam:

In Reference 1, Entergy Operations, Inc (Entergy) submitted an application for renewal of the Operating License for River Bend Station (RBS) for an additional 20 years beyond the current expiration date. In an email dated November 9, 2017, (Reference 2) the NRC staff made a Request for Additional Information (RAI), needed to complete the License Renewal application review. In Reference 3, Entergy submitted responses to the NRC staff RAIs. On January 4, 2018, a call was held between the NRC staff and Entergy during which it was determined that two of Entergy's RAI responses should be clarified to facilitate review of the License Renewal application.

Enclosure 1 provides revised responses to clarify two of the Severe Accident Mitigation Alternatives RAI responses that were provided in Reference 3.

There are no regulatory commitments contained in this submittal. If you require additional information, please contact Mr. Tim Schenk at (225)-381-4177 or tschenk@entergy.com.

In accordance with 10 CFR 50.91(b)(1), Entergy is notifying the State of Louisiana and the State of Texas by transmitting a copy of this letter.

I declare under penalty of perjury that the foregoing is true and correct. Executed on January 24, 2018.

Sincerely,

WFM/RMC/alc

Enclosure 1: Severe Accident Mitigation Alternatives RAI Response Clarification – River Bend Station

cc: (with Enclosure)

U. S. Nuclear Regulatory Commission
Attn: David Drucker
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cc: (w/o Enclosure)

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RBFI-18-0009

Enclosure 1

Responses to Request for Additional Information - Clarification

Severe Accident Mitigation Alternatives

**SEVERE ACCIDENT MITIGATION ALTERNATIVES
LICENSE RENEWAL APPLICATION
RIVER BEND STATION, UNIT 1**

Question 2.a

Source term categories (STCs) 5 and 6 are for large ruptures of containment while STCs 7 through 14 are for penetration failures. Briefly discuss the analysis of containment integrity that lead to these STC assignments and how this was modeled in the Level 2 PRA.

2.a Response:

A detailed, plant-specific evaluation of the RBS containment internal pressure fragility was performed in 1992. Median and 95% non-exceedance pressures were calculated for all relevant containment penetrations and for the regions of the containment structure itself. The analysis determined that as containment pressurizes, leakage failures of containment penetrations (e.g., the containment hatch, containment dome ventilation opening and drywell equipment hatch/personnel door) occur at much lower pressures than the large containment rupture failure mechanisms. For sequences with a gradual pressurization of containment, the predicted containment penetration leakage failures were modeled in the MAAP code to predict a realistic release profile for RBS. The median pressure distribution from the containment fragility analysis was utilized in the MAAP analyses. The large containment rupture pressure was also input into the MAAP model, but the leakage area, which increases as pressure rises, tends to prevent containment from reaching the median pressure of large containment failure. The MAAP analyses results showed in a peak containment pressure of 63.7 psig. The fragility analysis calculated a median large containment rupture pressure of 107 psig and a 95% non-exceedance large containment rupture pressure of 86 psig. Since the peak containment pressure reached in the MAAP analyses using the median pressure distribution is well below both the median and 95% non-exceedance large containment rupture pressures, the MAAP analyses have appropriately considered the potential containment failure modes. Further MAAP analyses to consider uncertainty in the pressure distribution from the containment fragility analysis would not result in identification of additional cost-beneficial SAMAs.

STCs 5 and 6 represent large ruptures of containment due to rapid pressure loading caused by hydrogen explosions.

STCs 7 through 14 involve sequences with gradual pressurization of containment, and the MAAP analyses predict releases from the leakage failures of containment. The pressures do not reach the level of containment rupture.

Question 5.b.v:

Event SWP-MOV-CC-F055A "motor operated valve [MOV] 1SWP*MOV55A fails to open on demand" is said to be addressed by SAMAs 75 and 80, both of which pertain to the service water pumps. Discuss the potential for a SAMA for the operator to manually open the valve.

5.b.v Response:

The RBS model includes an operator action (SWP-XHE-FO-F055A) to manually open valve SWP-MOV55A if it fails due to a loss of AC power. This action is needed for SBO Accident Sequences because valve SWP-AOV599, which provides the initial HPCS diesel service water return path to the cooling towers, has a 4 hour air supply. Loss of both Division 1 and Division 2 power is required by SWP-AOV599 logic to open the valve to provide the required return path for Service Water. SWP-AOV599 is a normally closed valve which provides a bypass path for SWP-MOV55A. Valves SWP-MOV55A and SWP-AOV599 are located in the plant piping tunnels near the base of the Standby Cooling Tower. This allows the Division 3 diesel generator to function under SBO conditions to support HPCS pump operations as well as operation of Standby Service Water pump SWP-P2C; SWP-P2C is one of the two "A" Train pumps but is powered from Division 3.

Without Service Water cooling, operating diesels will overheat in one to three minutes on a loss of cooling. In calculating the nonrecovery probability, the RBS PRA assumes a median response time of 30 minutes for the operator action to manually open SWP-MOV55A, including travel time to its location in the piping tunnels and the time to manually open this 30-inch valve. This assumed time greatly exceeds the 3 minutes that would be available for this action under situations in which power is available before diesels overheat. Thus, in LOSP sequences, an action to manually open SWP-MOV-55A is not feasible.

The risk impact of this operator action in non-SBO, non-LOSP sequences has been assessed with the Rev. 5A PRA model. The transient sequence cutsets, with offsite power available, which include failures of SWP-MOV55A contribute only 1.3E-09/yr to CDF. Thus, the contribution is very low and is not significant, with a Fussell Vesely of 4.71E-04. Therefore, the benefit of an action to manually open SWP-MOV-55A is only $842 ($3369 with uncertainty), which is well below the estimate cost of a procedure change. Thus, the proposed SAMA is not cost-beneficial.