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William F. Maguire
Site Vice President
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RBG-47812

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 (LRA) NRC Request for Additional Information (RAI) Set 4
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, Set 4 – RBS License Renewal Application – dated December 13, 2017 (ADAMS Accession No. ML17347B424)

3) Entergy Letter: Request for Due Date Extension for License Renewal Application NRC Request for Additional Information – Set 4 (RBG-47814 dated December 20, 2017)

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 December 13, 2017, (Reference 2) the NRC staff made a Request for Additional Information (RAI), needed to complete the License Renewal application review. On December 20, 2017, (Reference 3) Entergy requested that the due date for this submittal be extended from a 30 day response to a 45 day response. The extension was requested due to decreased resources during the latter part of December 2017. Enclosure 1 provides the responses to the Set 4 RAIs. Enclosure 2 provides voluntary changes to the License Renewal Application (Reference 1). Enclosure 3 describes two regulatory commitments. 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 to the designated State Official.

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

Sincerely,



WFM/RMC/alc

Enclosure 1: Set 4 RAI Responses – River Bend Station

Enclosure 2: Voluntary License Renewal Application Changes – River Bend Station

Enclosure 3: Commitments - River Bend Station

cc: (with Enclosure)

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

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RBF1-17-0167

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Enclosure 1

Responses to Request for Additional Information

Set 4

**REQUEST FOR ADDITIONAL INFORMATION
LICENSE RENEWAL APPLICATION
RIVER BEND STATION, UNIT 1 – SET 4
DOCKET NO.: 50-458
CAC NO.: MF9757
Office of Nuclear Reactor Regulation
Division of Materials and License Renewal**

Question

TRP 040, RAI 3.1.2.4.2.1 (Lubricating Oil Analysis)

Background

The LRA states that the Oil Analysis program will be consistent with GALL Report AMP XI.M39, "Lubricating Oil Analysis." GALL Report AMP XI.M39 recommends a verification of the effectiveness of the lubricating oil program, such as GALL Report AMP XI.M32, "One-Time Inspection," to ensure that significant degradation is not occurring and the component's intended function is maintained during the period of extended operation.

Issue

LRA Table 3.1.2-4-2 states that nickel alloy flex hose exposed to lube oil will be managed for loss of material by the Oil Analysis program.

LRA Table 3.3.2-3 states that titanium heat exchanger tubes exposed to lube oil will be managed for loss of material by the Oil Analysis program.

The above LRA Tables 3.1.2-4-2 and 3.3.2-3 do not appear to include a plant-specific note indicating that they will be included in the One-Time Inspection program inspection sample, as recommended by GALL Report AMP XI.M39.

Request

Confirm whether a one-time inspection program such as GALL Report, AMP XI.M32, "One-Time Inspection," will be used to verify the effectiveness of the Oil Analysis program for managing loss of material by including the nickel alloy flex hose and titanium heat exchanger tube in the One-Time Inspection program. Alternatively, provide justification for not including the items in question in the One-Time inspection program.

Response

The One-Time Inspection Program, described in LRA Section B.1.32, will verify the effectiveness of the Oil Analysis Program by confirming that unacceptable loss of material is not occurring. Under this program, a representative sample of susceptible components of each material and environment crediting the Oil Analysis Program for aging management will be inspected. Thus, the nickel alloy flex hose exposed to lube oil in Table 3.1.2-4-2 and the titanium heat exchanger tubes exposed to lube oil in Table 3.3.2-3 are included in the One-Time Inspection Program.

LRA Tables 3.1.2-4-2 and 3.3.2-3 have Note G for the nickel alloy flex hose and the titanium heat exchanger tubes exposed to lube oil because the lube oil environment is not in NUREG-1801 for these components and materials. Since the component/material/environment combinations are

not in NUREG-1801, plant-specific notes to show consistency with NUREG-1801 are not applied.

Question

TRP-6, RAI B.1.5-1 (BWR CRD Return Line Nozzle)

Background

The "scope of program" program element of GALL Report AMP XI.M6, "Control Rod Drive Return Line Nozzle," states that the scope of the program includes the control rod drive return line (CRDRL) nozzle and its nozzle-to-reactor-vessel welds which are ASME Code Class 1 components. The program element also indicates that, if an applicant has cut the piping to the CRDRL nozzle and capped the CRDRL nozzle, the scope of the program also includes a CRDRL nozzle cap and any associated nozzle-to-cap welds.

LRA Sections B.1.5 (program description) and A.1.5 (USAR supplement for the program) and program basis document (RBS-15-00006, Revision 1) indicate the following: (a) the CRDRL was removed and the CRDRL nozzle was capped prior to the plant operation; (b) the capped nozzle design includes a carbon steel safe end between the carbon steel nozzle and the nickel alloy cap; (c) the program scope includes the CRDRL nozzle, nozzle-to-reactor vessel weld, CRDRL nozzle cap, and Inconel end cap to carbon steel safe end dissimilar metal weld; and (d) the nozzle, cap, and associated welds are included in the applicant's inservice inspection and visual inspections (VT-2) are performed on these components.

NRC Information Notice (IN) 2004-08, which is referenced in GALL Report AMP XI.M6, describes the operating experience regarding stress corrosion cracking (SCC) in the CRDRL nozzle-to-cap weld (Inconel 82/182 weld).

Issue

The CRDRL nozzle design includes a safe end between the nozzle and the cap. In contrast, the LRA does not clearly indicate that the program scope includes the nozzle-to-safe-end weld.

Request

1. Clarify whether the program scope includes the nozzle-to-safe-end weld. If it is not included in the program scope, identify a program that is used to manage cracking for this weld.
2. Clarify whether the applicant performs volumetric inspections on the nozzle-to-safe-end weld and safe-end-to-cap weld (e.g., ISI or BWRVIP-75-A inspections). If such volumetric inspections are not performed on these welds, provide justification for why volumetric inspections are not necessary in light of the industry operating experience (IN 2004-08) and potential material susceptibility to SCC.

Response

1. The Control Rod Drive Return Line Nozzle Program includes the control rod drive return line nozzle-to-safe-end weld.
2. The nozzle-to-safe-end weld and dissimilar metal safe-end-to-nozzle cap weld are not selected for inspection as part of the risk-based ISI. In accordance with a new program enhancement, the safe-end-to-cap weld will be inspected once prior to the period of extended operation and once every 10 years during the period of extended operation.

The changes to LRA Sections A.1.5, A.4, B.1.5 and Table B.3 follow with additions underlined and deletions lined through.

LRA Section A.1.5 BWR CRD Return Line Nozzle

The BWR Control Rod Drive (CRD) Return Line Nozzle Program manages cracking of the CRD return line (CRDRL) reactor pressure vessel nozzle using preventive, mitigative, and inservice inspection activities. The CRDRL nozzle, which is exposed to a reactor coolant environment, was capped during construction prior to plant operation. This examination program originated through NUREG-0619 but is now governed by ASME Code, Section XI. Therefore, augmented inspections specified by NUREG-0619 are not applicable. The CRDRL inner radius is volumetrically examined to monitor the effects of cracking in accordance with the ASME Code, Section XI as part of the ISI Program. The examination is performed at least once each ISI interval. The scope of the program includes the CRDRL nozzle, the nozzle-to-reactor vessel weld, the nozzle-to-safe-end weld, the CRDRL nozzle cap, and the Inconel end cap to carbon steel safe end dissimilar metal weld. An enhancement is included to volumetrically examine the safe-end-to-cap weld once prior to the period of extended operation and once every 10 years during the period of extended operation. The nozzle, cap, and associated welds are included in the visual inspection (VT-2) during the reactor pressure test performed after each refueling outage.

LRA Section A.4 LICENSE RENEWAL COMMITMENT LIST

No.	Program or Activity	Commitment	Implementation Schedule	Source (Letter Number)
30	<u>Control Rod Drive Return Line Nozzle Program</u>	<u>Enhance the Control Rod Drive Return Line Nozzle Program as described in LRA Section A.1.5.</u>	<u>Prior to February 28, 2025, or the end of the last refueling outage prior to August 29, 2025, whichever is later.</u>	<u>RBG-47812</u>

LRA Section B.1.5 BWR CRD RETURN LINE NOZZLE

The BWR Control Rod Drive (CRD) Return Line Nozzle Program manages cracking of the CRD return line (CRDRL) reactor pressure vessel nozzle using preventive, mitigative, and inservice inspection activities. The CRDRL nozzle, which is exposed to a reactor coolant environment, was capped during construction prior to plant operation. This examination program originated through NUREG-0619 but is now governed by ASME Code, Section XI. Therefore, augmented inspections specified by NUREG-0619 are not applicable. The CRDRL nozzle inner radius is volumetrically examined to monitor the effects of cracking in accordance with the ASME Code, Section XI as part of the ISI Program. The examination is performed at least once each ISI interval. The scope of the program includes the CRDRL nozzle, the nozzle-to-reactor vessel weld, nozzle-to-safe-end weld, the CRDRL nozzle cap, and the Inconel end cap to carbon steel safe end dissimilar metal weld. The nozzle, cap, and associated welds are included in the visual inspection (VT-2) during the reactor pressure test performed after each refueling outage.

Enhancements

~~None~~ The following enhancement will be implemented prior to the period of extended operation.

<u>Element Affected</u>	<u>Enhancement</u>
4. Detection of Aging Effects	The safe-end-to-cap weld will be volumetrically examined once prior to the period of extended operation and once every 10 years during the period of extended operation.

LRA Table B-3 RBS Program Consistency with NUREG-1801

Program Name	Plant-Specific	NUREG-1801 Comparison	
		Program has Enhancements	Program has Exceptions to NUREG-1801
BWR CRD Return Line Nozzle [B.1.5]		<u>X</u>	

Question

TRP 031, RAI B.1.15-1 (Fuel Oil Chemistry)

Background

SRP-LR Table 3.0-1, "FSAR Supplement for Aging Management of Applicable Systems," summary description provides an acceptable program description for the GALL Report AMP XI.M30, "Fuel Oil Chemistry," as per 10 CFR 54.21(d). The FSAR Supplement includes the specific ASTM Standards used for monitoring and control of fuel oil contamination to maintain fuel oil quality.

Issue

LRA Section A.1.15, "Diesel Fuel Monitoring," USAR supplement does not appear to include the specific industry standards used for the program. The current licensing basis will not be consistent with the staff-issued guidance document during the period of extended operation if the industry standards recommended by the GALL Report are not used.

Request

Justify the apparent absence of the above mentioned industry standards in the USAR supplement for the Diesel Fuel Monitoring program. Alternatively, state the changes to the USAR supplement necessary to include the GALL Report recommended industry standards that will be used for the program.

Response

Changes are provided to the USAR supplement to identify ASTM standards used in the monitoring and control of diesel fuel, specifically, ASTM D4057, D1796, D2274 and D2276.

The changes to LRA A.1.15 and B.1.15 follow with additions underlined and deletions lined through.

A.1.15 Diesel Fuel Monitoring

The Diesel Fuel Monitoring Program manages loss of material in piping, tanks and other components in an environment of diesel fuel oil by verifying the quality of the fuel oil source. This is performed by receipt inspection, sampling, and limiting the quantities of contaminants before allowing it to enter the fuel oil storage tanks. Parameters monitored include water and sediment content, total particulates, and levels of microbiological organisms in the fuel oil. Monitoring and control are performed in accordance with ASTM standards D4057, D1796, D2274 and D2276. The program includes multi-level sampling of fuel oil storage tanks. Where multi-level sampling cannot be performed due to design, a representative sample is taken from the lowest part of the tank. A stabilizer/biocide is added to new fuel.

B.1.15 Diesel Fuel Monitoring

Program Description

The Diesel Fuel Monitoring Program manages loss of material in piping, tanks and other components in an environment of diesel fuel oil by verifying the quality of the fuel oil source. This is performed by receipt inspection, sampling, and limiting the quantities of contaminants before allowing it to enter the fuel oil storage tanks. Parameters monitored include water and sediment content, total particulates, and levels of microbiological organisms in the fuel oil. Monitoring and control are performed in accordance with ASTM standards D4057, D1796, D2274 and D2276. The program includes multi-level sampling of fuel oil storage tanks. Where multi-level sampling cannot be performed due to design, a representative sample is taken from the lowest part of the tank. A stabilizer/biocide is added to new fuel.

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Enclosure 2

Voluntary License Renewal Application Change

TRP 34-1 Voluntary LRA Change to Address Audit Question

During the review of NRC audit questions on the River Bend License Renewal Application (LRA), an inconsistency was discovered between LRA tables and the description of the Selective Leaching Program in LRA Appendix A and Appendix B. Specifically, LRA Tables 3.3.2-18-17 and 3.3.2-18-23 cite valve bodies exposed to waste water with an aging effect of loss of material managed by the Selective Leaching Program whereas the Selective Leaching Program description does not include waste water as an applicable environment. Waste water is an applicable environment within the Selective Leaching Program. Consequently, LRA Sections A.1.39 and B.1.39, Selective Leaching, are revised to include waste water as an applicable environment. LRA Section A.1.39 is also revised to correct a typographical error. The changes to LRA Sections A.1.39 and B.1.39 follow with additions underlined.

A.1.39 Selective Leaching

The Selective Leaching Program demonstrates the absence of selective leaching through assessment of a sample of components (i.e., 20 percent of the population with maximum of 25 components) fabricated from gray cast iron and copper alloys (except for inhibited brass) that contain greater than 15 percent zinc or greater than 8 percent aluminum in an environment of—, raw water, treated water, waste water, or soil. A population is defined as components with the same material and environment combination. Where practical, the sample will focus on components most susceptible to the effects of aging due to time in service, severity of operating condition, and lowest design margin. The program will include a one-time visual inspection of selected components coupled with hardness measurement or other mechanical examination techniques such as destructive testing, scraping, or chipping to determine whether loss of material is occurring due to selective leaching that may affect the ability of a component to perform its intended function through the period of extended operation.

B.1.39 SELECTIVE LEACHING

Program Description

The Selective Leaching Program is a new program that will demonstrate the absence of selective leaching through assessment of a sample of components (i.e., 20 percent of the population with a maximum of 25 components) fabricated from gray cast iron and copper alloys (except for inhibited brass) that contain greater than 15 percent zinc or greater than 8 percent aluminum in an environment of raw water, treated water, waste water, or soil. A population is defined as components with the same material and environment combination. Where practical, the sample will focus on components most susceptible to the effects of aging due to time in service, severity of operating condition, and lowest design margin. The program will include a one-time visual inspection of selected components coupled with hardness measurement or other mechanical examination techniques such as destructive testing, scraping, or chipping to determine whether loss of material is occurring due to selective leaching that may affect the ability of a component to perform its intended function through the period of extended operation.

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Enclosure 3

Responses to Request for Additional Information

Set 4

Commitments

This table identifies actions discussed in this letter for which Entergy commits to perform. Any other actions discussed in this submittal are described for the NRC's information and are **not** commitments.

COMMITMENT	TYPE (Check one)		SCHEDULED COMPLETION DATE (If Required)
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
No. 30, RAI B.1.5-1 Enhance the Control Rod Drive Return Line Nozzle Program as described in LRA Section A.1.5	X		Prior to February 28, 2025, or the end of the last refueling outage prior to August 29, 2025, whichever is later.
The safe-end-to-cap weld will be volumetrically examined.		X	Once prior to the period of extended operation and once every 10 years during the period of extended operation.