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GNRO-2012/00060

June 11, 2012

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

**SUBJECT:** Response to Request for Additional Information (RAI) dated May 15, 2012  
Grand Gulf Nuclear Station, Unit 1  
Docket No. 50-416  
License No. NPF-29

**REFERENCE:** NRC Letter, "Requests for Additional Information for the Review of the  
Grand Gulf Nuclear Station, License Renewal Application," dated May  
15, 2012 (GNRI-2012/00119)

Dear Sir or Madam:

Entergy Operations, Inc is providing, in the Attachment, the response to the referenced Request for Additional Information (RAI).

If you have any questions or require additional information, please contact Christina L. Perino at 601-437-6299.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 11th day of June, 2012.

Sincerely,

A handwritten signature in black ink, appearing to read "M. Perito".

MP/jas

Attachment: Response to Request for Additional Information (RAI)

cc: (see next page)

cc: with Attachment

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**Attachment to**  
**GNRO-2012/00060**  
**Response to Request for Additional Information (RAI)**

The format for the License Renewal Application (LRA) Request for Additional Information (RAI) responses below is as follows. The RAI is listed in its entirety as received from the Nuclear Regulatory Commission (NRC). This is followed by the Grand Gulf Nuclear Station (GGNS) RAI response to the individual question.

#### RAI 2.3.4-1

LRA Section 2.1 describes the applicant's scoping methodology, which specifies how systems or components were determined to be included in scope of license renewal. The staff confirms the inclusion of all components subject to aging management (AMR) by reviewing the results of the screening of components within the license renewal boundary. For the license renewal boundary drawing locations identified in the table below, the continuation of piping in scope for license renewal could not be located.

Drawing Number & Location	Continuation Issue
<b>2.3.4.2, Miscellaneous Steam and Power Conversion Systems in Scope for 10 CFR 54.4(a)(2)</b>	
LRA-M-1051B, locations C-4 & C-8	Downstream of reactor feed pump turbine rupture disks. A continuation was not provided.
LRA-M-1054, locations H-4 & H-5	Downstream of valves FX059 and FX057. A continuation was not provided.
LRA-M-1064E, location D-4	Downstream of valve F092. A continuation was not provided.
LRA-M-1066B Shts. 001 & 002, locations G-7 & H-7	"lube oil to turbine controls" and "lube oil to turbine bearings". A continuation was not provided.
LRA-M-1066C, location C-6	The two piping outlets from pressure limiting valve. A continuation was not provided.
LRA-M-1116B, location C-6	1"-HCD-407 piping "to CHRW." A continuation was not provided.
LRA-M-1117F, location D-1	1 ½" piping "to lube oil tank". A continuation was not provided.

Provide sufficient information to locate the license renewal boundaries. If the continuation cannot be shown on license renewal boundary drawings, then provide additional information describing the extent of the scoping boundary and if there are additional AMR component types between the continuation and the termination of the scoping boundary. If the scoping classification of a section of the piping changes over the continuation, provide additional information to clarify the change in scoping classification.

### **RAI 2.3.4-1 RESPONSE**

- a. LRA-M-1051B, locations C-4 & C-8: no continuation is intended. These lines are representative of the piping relief lines that vent to the atmosphere.
- b. LRA-M-1054, locations H-4 & H-5: no continuation is intended. These lines are representative of where sodium tracer could be injected into the feedwater system.
- c. LRA-M-1064E, location D-4, no continuation is intended. The nonsafety-related resin transfer piping connection and valve in the turbine building is within the scope of license renewal for 10 CFR 54.4(a)(2) and is included in the aging management review.
- d. LRA-M-1066B sheets 001 & 002, locations G-7 & H-7: this piping continues to the turbine lube oil system shown on LRA-M-1066C. The nonsafety-related lube oil lines in the turbine building are within the scope of license renewal for 10 CFR 54.4(a)(2) and are included in the aging management review.
- e. LRA-M-1066C, location C-6, no continuation is intended. Both of the lines flow back to the turbine lube oil reservoir which is the rectangle that includes most of the drawing. The nonsafety-related bypass valve and associated piping connection and the pressure limiting valve and associated piping in the turbine building are within the scope of license renewal for 10 CFR 54.4(a)(2) and are included in the aging management review.
- f. LRA-M-1116B, location C-6: this chemical radwaste (CHRW) piping continues to the drain system shown on LRA-M-1098D. The nonsafety-related piping is within the scope of license renewal for 10 CFR 54.4(a)(2) and included in the aging management review.
- g. On LRA-M-1117F, location D-1: this piping continues to the turbine lube oil system shown on LRA-M-1066C. The nonsafety-related piping is within the scope of license renewal for 10 CFR 54.4(a)(2) and is included in the aging management review.

The review associated with this RAI response confirmed that no additional component types were subject to aging management review.

**RAI 2.3.4.1-1**

LRA Section 2.1.2.1 states that nonsafety-related SSCs attached to safety-related SSCs are within the scope of license renewal for 10 CFR 54.4(a)(2) up to the first seismic anchor past the safety-related/nonsafety interface. On the following license renewal boundary drawings the staff could not locate seismic anchors on the non-safety related lines:

<b>License Renewal Application Drawing Number &amp; Location</b>	<b>10 CFR 54.4(a)(2) Pipe Line(s) or Identifier</b>
LRA-M-1065, location B-4	12"-HBC-203 upstream of valve Q1P11F061
LRA-M-1065, location C-4	12"-HBC-204 upstream of valve Q1P11F067

Provide additional information to locate the seismic anchors or anchored components between the safety-related/nonsafety-related interface and the end of the 10 CFR 54.4(a)(2) scoping boundary.

**RAI 2.3.4.1-1 RESPONSE**

This piping to the condensate storage tank and refueling water storage tank is welded to pipe sleeves embedded in three feet of concrete (auxiliary building wall) at the safety-related to nonsafety-related interface. The pipe sleeves are the seismic anchors at the end of the safety-related piping.

**RAI 2.3.4.1-2**

License renewal boundary drawing LRA-M-1065, locations B-6 and C-6, shows expansion joints XJ-G521 to be within the scope of license renewal. However, similar expansion joints (XJ-G522) at location E-5 are not shown as within the scope of license renewal, and noted as "not long-lived."

Provide additional information to clarify the difference in scoping classification.

**RAI 2.3.4.1-2 RESPONSE**

The expansion joint, marked "not long-lived" at location E-5 on license renewal drawing LRA-M-1065 is periodically replaced and therefore not subject to aging management review. The expansion joints on license renewal drawing LRA-M-1065, locations B-6 and C-6 are also periodically replaced and therefore, are not subject to aging management review. They should not have been highlighted on drawing LRA-M-1065.

LRA Table 3.4.2-2-19 is revised as shown below to remove the four lines that have Component Type – Expansion Joint with Material – Elastomer. Deletions are shown with strikethrough.

<b>Table 3.4.2-2-19: Condensate and Refueling Water Storage and Transfer System, Nonsafety-Related Components Affecting Safety-Related Systems</b>								
<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Expansion Joint	Pressure boundary	Elastomer	Air—indoor (ext)	Change in material properties	External Surfaces Monitoring	<del>VII.F1.AP-102</del>	<del>3.3.1-76</del>	G
Expansion Joint	Pressure boundary	Elastomer	Air—indoor (ext)	Cracking	External Surfaces Monitoring	<del>VII.F1.AP-102</del>	<del>3.3.1-76</del>	G
Expansion Joint	Pressure boundary	Elastomer	Treated water (int)	Change in Material properties	Internal Surfaces in Miscellaneous Piping and Ducting Components	<del>VII.A4.AP-101</del>	<del>3.3.1-86</del>	G
Expansion Joint	Pressure boundary	Elastomer	Treated water (int)	Cracking	Internal Surfaces in Miscellaneous Piping and Ducting Components	<del>VII.A4.AP-101</del>	<del>3.3.1-86</del>	G

**RAI 2.3.4.2-1**

In the following instances, license renewal boundary drawings show piping “to & from turbine bldg. cooling water system” and vent piping as not within scope of license renewal. However, these piping sections are shown on license renewal boundary drawing LRA-M-1062B as within the scope of license renewal for 10 CFR 54.4(a)(2).

<b>License Renewal Drawing</b>	<b>Location</b>
LRA-M-1066B Sht. 001 and 002	C-7
LRA-M-1066C	B-8
LRA-M-1120B	B-3, B-4, B-5, B-6, B-7, B-8, E-6
LRA-M-1117A	B-2, B-3
LRA-M-1121	B-3, C-3, C-4, C-5
LRA-M-1092A	C-8

Provide additional information to clarify the scoping classification of these pipe sections.

**RAI 2.3.4.2-1 RESPONSE**

These situations involve heat exchangers shown on one drawing, with the associated cooling water piping shown on LRA-M-1062B or LRA-M-1120C. Because these are shown on another drawing, they are not highlighted on the drawings listed in this RAI. All of the piping and components in question are highlighted on LRA-M-1062B or LRA-M-1120C as appropriate and are in scope for license renewal.

**RAI 2.3.4.2-2**

Condensate and feedwater system license renewal boundary drawing LRA-M-1053E, locations F-4, F-6, and F-8, shows 1/2"-GBD-188, 1/2"-GBD-187, and 1/2"-GBD-186, “oxygen flow control rack,” piping to the condensate system as not within the scope of license renewal. However, the piping is connected to in-scope piping without a separation (i.e., valve).

Provide additional information to justify the scoping classification of these pipe sections.

**RAI 2.3.4.2-2 RESPONSE**

These three lines shown on LRA-M-1053E (locations F-4, F-6, and F-8) are in scope for 10 CFR 54.4(a)(2) and are subject to aging management review. As such, they should have been highlighted up to and including the first isolation valve for each line. Piping on the other side of the valves is not fluid filled.

An LRA drawing depicting these isolation valves does not exist. However, the associated component types “piping” and “valve body” are included in LRA Table 2.3.4-2-3, Condensate and Feedwater System Nonsafety-Related Components Affecting Safety-Related Systems Subject to Aging Management Review, and are included in the aging management evaluation in LRA Table 3.4.2-2-3 as “piping” and valve body” – carbon steel.



### **RAI 2.3.4.2-3**

Circulating water system license renewal boundary drawing LRA-M-1059B, locations B-3 and B-4, shows injection nozzles of the condenser tube cleaning system "A" & "B" as within the scope of license renewal. LRA Table 2.3.4-2-18 does not list these injection nozzles.

Provide additional information to justify the exclusion of injection nozzles from LRA Table 2.3.4-2-18.

### **RAI 2.3.4.2-3 RESPONSE**

The injection nozzles shown at locations B-3 and B-4 on drawing LRA-M-1059B are inside the circulating water piping. Their failure would not cause spray or leakage onto safety-related SSCs. Therefore, these injection nozzles are not subject to aging management review.

### **RAI 2.3.4.2-4**

Main and reheat steam system license renewal boundary drawing LRA-M-1051A, locations C-3 and C-4, shows two 48" lines to the low pressure turbines A and C from the moisture separator reheaters as not within the scope of license renewal. However, the 48" line to the low pressure turbine B from the moisture separator reheater is shown as within the scope of license renewal for 10 CFR 54.4(a)(2).

Additionally, moisture separator reheater vents and drains system license renewal boundary drawings LRA-M-1056A & B, locations G-4 & G-5, show 1" vent piping to the moisture separator reheater hot reheat line as not within scope of license renewal. However, these lines are connected to the moisture separator reheaters, which are in scope for 10 CFR 54.4(a)(2).

Provide additional information to justify the scoping classification of these pipe sections.

### **RAI 2.3.4.2-4 RESPONSE**

Piping and piping components shown on LRA drawing 1051A (C-3) and (C-4) and LRA drawing LRA-M-1056A & B (G-4) and (G-5) are part of the moisture separator reheater and low pressure turbines pressure boundary and are in scope for 10CFR54.4(a)(2) and is subject to aging management review and, as such, should have been highlighted from the low pressure turbines to the moisture separator reheaters.

Component types "piping" and "valve body" are included in LRA Table 2.3.4-2-2, Main and Reheat Steam System Nonsafety-Related Components Affecting Safety-Related Systems Subject to Aging Management Review, and are included in the aging management evaluation in LRA Table 3.4.2-2-2 as "piping" and "valve body" – carbon steel.

**RAI 2.3.4.2-5**

Main and reheat steam system license renewal boundary drawing LRA-M-1051D, location F-7, shows 6"-HBD-1145 piping from the 2nd stage reheater "B" excess steam bypass to the moisture separator/reheater as not within the scope of license renewal. However, on license renewal boundary drawing LRA-M-1056B, location G-8, this pipe is shown as within the scope of license renewal for 10 CFR 54.4(a)(2).

Provide additional information to clarify the scoping classification of this pipe section.

**RAI 2.3.4.2-5 RESPONSE**

The piping in question, shown on LRA drawing 1051D (F-7) as part of the main and reheat steam system excess steam bypass, is in scope for 10CFR54.4(a)(2) and is subject to aging management review.

Component types "piping" and "valve body" are included in LRA Table 2.3.4-2-2, Main and Reheat Steam System Nonsafety-Related Components Affecting Safety-Related Systems Subject to Aging Management Review, and are included in the aging management evaluation in LRA Table 3.4.2-2-2 as "piping" and "valve body" – carbon steel.

**RAI 2.3.4.2-6**

Lube oil system license renewal boundary drawing LRA-M-1066D was included in the drawing package but is not included in the table of license renewal boundary drawings in LRA Section 2.3.4.2.

Clarify why license renewal boundary drawing LRA-M-1066D is not included in the list of drawings associated with the lube oil system.

**RAI 2.3.4.2-6 RESPONSE**

LRA drawing LRA-M-1066D, Lube Oil System (Turbine Generator) Unit-1, was inadvertently left out of the list of license renewal lube oil system drawings. LRA Section 2.3.4.2, License Renewal Drawings, is revised as follows. Additions are shown with underline.

License Renewal Drawings

Additional details for components subject to aging management review are provided in the following license renewal drawings.

System Code	System	LRA Drawings	
N34	Lube Oil	LRA-M-1066A LRA-M-1066B SH01 LRA-M-1066B SH02 LRA-M-1066C	LRA-M-1066E LRA-M-1116A LRA-M-1116B <u>LRA-M-1066D</u>

#### **RAI 2.3.4.2-7**

Seal oil system license renewal boundary drawings LRA-M-1116A & B show details for miscellaneous vents and drains for turbine generator equipment. However, there are inconsistencies between the information presented in drawing LRA-M-1116A, Table 1, and the highlighted detail drawings for valves and piping in scope for 10 CFR 54.4(a)(2). For example, valve NIN44F119 is highlighted in scope on LRA-M-1116A, Table 1 but is not highlighted in the connection M52 drawing or the associated detail drawing. Another example is the ¾"-HCD-410 that is shown as within the scope of license renewal in the connection M38 drawing and drawing LRA-M-1116A, detail 5, but shown as not within scope of license renewal in LRA-M-1116A, Table 1.

Provide additional information to clarify the discrepancies between the scoping boundaries shown in LRA-M-1116A, Table 1, and the connection and detail drawings.

#### **RAI 2.3.4.2-7 RESPONSE**

Valve NIN44F119 is in scope for 10 CFR 54.4(a)(2) and is included as part of LRA Section 2.3.3.10, Floor and Equipment Drainage. The valve was inadvertently not highlighted on the "connection M52" detail provided in LRA-M-1116A.

Line ¾"-HCD-410 is within scope for 10 CFR 54.4(a)(2) and is included as part of LRA Section 2.3.3.10, Floor and Equipment Drainage. Tables on LRA drawings, such as Table 1 on LRA-M-1116A, are used to show valves that are subject to aging management review, but not piping lines.

The review associated with this RAI response confirmed that no additional component types were subject to aging management review.

#### **RAI 2.3.4.2-8**

Seal oil system license renewal boundary drawing LRA-M-1116B, location G-8, shows the detail for connection M51 as within the scope of license renewal for 10 CFR 54.4(a)(2). However, drawing LRA-M-1116A, Table 1, does not have any information on connection M51.

Provide additional information to clarify the scoping classification for connection M51.

#### **RAI 2.3.4.2-8 RESPONSE**

Connection M51 is the connection for the drain piping from a primary water pump chamber check valve to the drain header. It is occasionally fluid filled and is located in the turbine building. It is therefore included within the scope of license renewal for 10 CFR 54.4(a)(2) spatial interaction and is included in LRA Table 3.3.2-19-20, Floor and Equipment Drainage System, as carbon steel piping. Seal oil system license renewal boundary drawing LRA-M-1116B, location G-8, shows the detail for connection M51 as within the scope of license renewal for 10 CFR 54.4(a)(2).

**RAI 2.3.4.2-9**

Generator primary water system license renewal boundary drawing LRA-M-1044A, location G-6, shows "Cooler B003" as not within the scope of license renewal. However lines 1"-JBD-1341 and 1"-JBD-1342 run through the cooler and are within the scope of license renewal for 10 CFR 54.4(a)(2).

Provide additional information to clarify why cooler B0003 is not shown as within the scope of license renewal.

**RAI 2.3.4.2-9 RESPONSE**

The lines connected to the cooler are in scope for 10 CFR 54.4(a)(2) as shown on LRA-M-1044A and as listed in LRA Table 2.3.4-2-14. The tube side of cooler B003 is liquid filled and the shell side is gas filled. Leakage or spray from the tubes within the cooler boundary will not affect any safety-related components; therefore, the tubes within the cooler are not in scope of license renewal.

**RAI 2.3.4.2-10**

Generator primary water system license renewal boundary drawing LRA-M-1044A, locations F-1 and E-6, show traps D035 & D037 as within the scope of license renewal. LRA Table 2.3.4-2-14 does not list traps as a component type subject to AMR.

Provide additional information to justify the exclusion of a trap component type from Table 2.3.4-2-14.

**RAI 2.3.4.2-10 RESPONSE**

These traps on drawing LRA-M-1044A are correctly depicted as within the scope of license renewal for 10 CFR 54.4(a)(2). They were inadvertently omitted from LRA Tables 2.3.4-2-14 and 3.4.2-2-14. LRA Tables 2.3.4-2-14 and 3.4.2-2-14 are revised to include a component type of "trap" with the intended function of "pressure boundary." Additions are shown with underline.

**Table 2.3.4-2-14**  
**Generator Primary Water System**  
**Nonsafety-Related Components Affecting Safety-Related Systems**  
**Components Subject to Aging Management Review**

<b>Component Type</b>	<b>Intended Function(s)<sup>1</sup></b>
Bolting	Pressure boundary
Demineralizer	Pressure boundary
Filter housing	Pressure boundary
Flexible connection	Pressure boundary
Flow element	Pressure boundary
Heat exchanger (bonnet)	Pressure boundary
Heat exchanger (shell)	Pressure boundary
Orifice	Pressure boundary
Piping	Pressure boundary
Pump casing	Pressure boundary
Strainer housing	Pressure boundary
Tank	Pressure boundary
Thermowell	Pressure boundary
<u>Trap</u>	<u>Pressure boundary</u>
Tubing	Pressure boundary
Valve body	Pressure boundary

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1. For component types included under 10CFR 54.4(a)(2), the intended function of pressure boundary includes providing structural/seismic support for components that are included for nonsafety-related SSCs directly connected to safety-related SSCs.

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Program</b>	<b>NUREG-1801 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Pump casing	Pressure boundary	Carbon steel	Treated water (int)	Loss of material	Water Chemistry Control – Closed Treated Water Systems	VIII.E.S-23	3.4.1-25	C
Strainer housing	Pressure boundary	Carbon steel	Air – indoor (ext)	Loss of material	External Surfaces Monitoring	VIII.H.S-29	3.4.1-34	A
Strainer housing	Pressure boundary	Carbon steel	Treated water (int)	Loss of material	Water Chemistry Control – Closed Treated Water Systems	VIII.E.S-23	3.4.1-25	C
Tank	Pressure boundary	Carbon steel	Air – indoor (ext)	Loss of material	External Surfaces Monitoring	VIII.H.S-29	3.4.1-34	A
Tank	Pressure boundary	Carbon steel	Treated water (int)	Loss of material	Water Chemistry Control – Closed Treated Water Systems	VIII.E.S-23	3.4.1-25	C
Thermowell	Pressure boundary	Carbon steel	Air – indoor (ext)	Loss of material	External Surfaces Monitoring	VIII.H.S-29	3.4.1-34	A
Thermowell	Pressure boundary	Carbon steel	Treated water (int)	Loss of material	Water Chemistry Control – Closed Treated Water Systems	VIII.E.S-23	3.4.1-25	C
<u>Trap</u>	<u>Pressure boundary</u>	<u>Carbon steel</u>	<u>Air – indoor (ext)</u>	<u>Loss of material</u>	<u>External Surfaces Monitoring</u>	<u>VII.I.A-77</u>	<u>3.3.1-78</u>	<u>A</u>
<u>Trap</u>	<u>Pressure boundary</u>	<u>Carbon steel</u>	<u>Treated water (int)</u>	<u>Loss of material</u>	<u>Water Chemistry Control – Closed Treated Water Systems</u>	<u>VII.C2.AP-202</u>	<u>3.3.1-114</u>	<u>A</u>

**RAI 2.3.4.2-11**

Main turbine and auxiliaries system license renewal boundary drawing LRA-M-1117A, locations D-3 and D-4, show valves PV F505A and PV 505B with associated piping as not within the scope of license renewal. However, these valves are shown on drawing LRA-M-1057A, location H-4, as within the scope of license renewal for 10 CFR 54.4(a)(2).

Provide additional information to clarify the scoping classification of these pipe sections.

**RAI 2.3.4.2-11 RESPONSE**

These turbine seal steam isolation valves, shown on LRA-M-1117A and LRA-M-1057A, are in scope of license renewal for 10 CFR 54.4(a)(2) and are included in LRA table 2.3.4-2-7, Main and RFP Turbine Seal Steam and Drain System, as “valve body”. The “dashed” lines used on LRA-M-1117A indicate these components are shown on another drawing, in this case LRA-M-1057A. LRA-M-1057A shows these components are in scope of license renewal for 10 CFR 54.4(a)(2), and are highlighted on this drawing which depicts their normal flow path.

**RAI 2.3.4.2-12**

Main turbine and auxiliaries system license renewal boundary drawing LRA-M-1117A, location A-2, shows the “control fluid purifier skid” as not within the scope of license renewal. However, the lines connecting to this skid are within the scope of license renewal for 10 CFR 54.4(a)(2).

Provide additional information to justify the exclusion of the “control fluid purifier skid” from the scope of license renewal.

**RAI 2.3.4.2-12 RESPONSE**

The control fluid purifier skid is in the turbine building and all fluid-filled components on the control fluid purifier skid are in the scope of license renewal for 10 CFR 54.4(a)(2). The skid was inadvertently not highlighted on LRA-M-1117A. The component types for this system are included in LRA table 2.3.4-2-6, Main Turbine and Auxiliaries, and are included in the aging management evaluation in LRA Table 3.4.2-2-6.