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G3NO-2008-00030

December 12, 2008

U. S. Nuclear Regulatory Commission  
Washington, DC 20555-0001  
Attention: Document Control Desk

DOCKET: No. 52-024

SUBJECT: Response to NRC Request for Additional Information, Letter No. 25  
(GG3 COLA)

REFERENCE: NRC Letter to Entergy Nuclear, *Request for Additional Information  
Letter No. 25 Related to the SRP Section 12.03-12.04-4 for the Grand  
Gulf Combined License Application*, dated November 24, 2008  
(ADAMS Accession No. ML083260651).

Dear Sir or Madam:

In the referenced letter, the NRC requested additional information on one item to support the review of certain portions of the Grand Gulf Unit 3 Combined License Application (GG3 COLA). The response to the following Request for Additional Information (RAI) in the referenced letter is provided in Attachment 1 to this letter as follows:

1. RAI Question 12.03-12.04-4, Zinc Injection System utilization

Should you have any questions, please contact me as follows:

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Mail Stop M-ECH-21  
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E-Mail Address: twilli2@entergy.com

This letter contains no new commitments.

D088  
NPO

I declare under penalty of perjury that the foregoing is true and correct.

Executed on December 12, 2008.

Sincerely,



TLW/ghd

Attachment: 1. Response to RAI Question No. 12.03-12.04-4

cc (email unless otherwise specified):

**NRC**

NRC Project Manager – Grand Gulf Unit 3 COLA  
NRC Project Manager – North Anna Unit 3 COLA  
NRC Director – Division of Construction Projects (Region II)  
NRC Regional Administrator - Region IV  
NRC Resident Inspectors' Office - GGNS

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Mr. R. Foster  
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**Entergy**

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Ms. D. Jacobs (ECH)  
Ms. K. J. Lichtenberg (L-ENT)  
Ms. D. Millar (ECH)  
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Manager, Licensing (GGNS-1)  
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Mr. B. R. Johnson (GE-Hitachi)  
Mr. P. Smith (DTE)

**ATTACHMENT 1**

**G3NO-2008-00030**

**RESPONSE TO NRC RAI LETTER NO. 25**

**RAI QUESTION NO. 12.03-12.04-4**

**RAI QUESTION NO. 12.03-12.04-4**

**NRC RAI 12.03-12.04-4**

STD Conceptual Design Information for Grand Gulf FSAR Section 1.2.2.12.15, Zinc Injection System, states that a Zinc Injection System will not be utilized at Grand Gulf, Unit 3. One of the benefits of utilizing a Zinc Injection System to inject depleted zinc (DZO) in the feedwater is to suppress cobalt plate-out on reactor building piping. Minimizing the plate-out of radioactive cobalt on reactor building piping can lead to potentially lower dose rates in the vicinity of this piping and result in correspondingly lower doses to personnel in this portion of the plant. Justify your decision to not utilize a Zinc Injection System at Grand Gulf, Unit 3 in light of the requirement in 10 CFR 20.1101(b) which states that the licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses that are as low as reasonably achievable (ALARA).

**Entergy Response**

The use of zinc injection has been beneficial in plants where cobalt-containing alloys have been employed. Radioactive cobalt plates out on surfaces, especially stainless steel, subsequently leading to increased dose rates and increased personnel exposure throughout the coolant system areas. Operating experience has indicated that a reduction in the use of cobalt can decrease dose rates. An example is Japan's ABWR Kashiwazaki-Kariwa 6 and 7 units where reduced dose rates have been achieved without zinc injection but with the use of low cobalt materials.

Based on this knowledge and operating experience, the ESBWR standard plant incorporates the following measures:<sup>1</sup>

- Reduced the amount of cobalt in alloys used in high fluence areas (fuel assemblies and control rods)
- Used non-cobalt alloys for pins and rollers in control rods
- Restricted the cobalt content in stainless steel components in the reactor vessel and other selected stainless steel components that have large surface areas exposed to high flow rates toward the reactor vessel, and minimized the use of Stellite, which is a high cobalt alloy.

Additionally, the ESBWR has no reactor coolant recirculation loops which are the primary contributors to drywell dose in existing BWRs.

Based on these factors, Entergy decided to not utilize a Zinc Injection System (ZIS) at Grand Gulf Unit 3. As discussed in DCD Section 9.3.11, the ESBWR standard plant design includes the capability to connect a ZIS, including piping connections for a bypass loop around the feedwater pumps, and space for ZIS equipment, if it is decided later to include this system.

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<sup>1</sup> Reference ESBWR DCD Revision 5, Sections 5.2.3.2.2, 12.3.1, 12.4.1 and 12.4.6

**Proposed COLA Revision**

None