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GNRO-2011/00087

October 10, 2011

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

SUBJECT: Request for Additional Information Regarding
Extended Power Uprate
Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
License No. NPF-29

REFERENCES:
1. Email from A. Wang to F. Burford dated October 6, 2011, GGNS EPU Request for Additional Information Related to Mechanical and Civil Engineering Branch Review Excluding the Steam Dryer (ME4679)
2. License Amendment Request, Extended Power Uprate, dated September 8, 2010 (GNRO-2010/00056, NRC ADAMS Accession No. ML102660403)

Dear Sir or Madam:

The Nuclear Regulatory Commission (NRC) requested additional information (Reference 1) regarding certain aspects of the Grand Gulf Nuclear Station, Unit 1 (GGNS) Extended Power Uprate (EPU) License Amendment Request (LAR) (Reference 2). Attachment 1 provides responses to the additional information requested by the Mechanical and Civil Engineering Branch.

No change is needed to the no significant hazards consideration included in the initial LAR (Reference 2) as a result of the additional information provided. There are no new commitments included in this letter.

If you have any questions or require additional information, please contact Jerry Burford at 601-368-5755.

I declare under penalty of perjury that the foregoing is true and correct. Executed on October 10, 2011.

Sincerely,

MAK/FGB/dm

Attachments:

1. Response to Request for Additional Information, Mechanical and Civil Engineering Branch

cc: Mr. Elmo E. Collins, Jr.
Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
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U. S. Nuclear Regulatory Commission
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NRC Senior Resident Inspector
Grand Gulf Nuclear Station
Port Gibson, MS 39150

Attachment 1

GNRO-2011/00087

Grand Gulf Nuclear Station Extended Power Uprate

Response to Request for Additional Information

Mechanical and Civil Engineering Branch

Response to Request for Additional Information
Mechanical and Civil Engineering Branch

By letter dated September 8, 2010, Entergy Operations, Inc. (Entergy) submitted a license amendment request (LAR) for an Extended Power Uprate (EPU) for Grand Gulf Nuclear Station, Unit 1 (GGNS). By letters dated February 23, 2011 (NRC ADAMS Accession No. ML110540545), June 15, 2011 (NRC ADAMS Accession No. ML111670059), and August 25, 2011 (NRC ADAMS Accession No. ML112370770) Entergy submitted responses to the request for additional information (RAI) from the Mechanical and Civil Engineering Branch excluding the steam dryer. Subsequently, the U.S. Nuclear Regulatory Commission (NRC) staff has determined that the following additional information is needed for the NRC Mechanical and Civil Engineering Branch staff to complete their review of the amendment. Entergy's response to each item is provided below.

RAI # 1

Page 2-266 of the power uprate safety analysis report (PUSAR), which was submitted as part of Reference 1 in support of the proposed extended power uprate (EPU) at the Grand Gulf Nuclear Station, Unit 1 (GGNS), states that the GGNS annulus pressurization (AP) loads were reconciled for original licensed thermal power (OLTP), current licensed thermal power (CLTP) and EPU conditions, in response to General Electric-Hitachi (GEH) Safety Communication (SC) 09-01. Additionally, page 2-266 of the PUSAR states that evaluations were performed to determine the effect of revising the AP loads on the dynamic structural response of the reactor pressure vessel (RPV), reactor internals, piping and containment structures. With respect to the impact of the revision of the aforementioned AP loads on the EPU evaluations, please address the following:

a) Page 2-269 of the PUSAR indicates that the methodology for calculating jet impingement (JI) and jet reaction (JR) loads on the RPV and the bioshield wall (BSW) was refined to address the issues identified in GEH SC 09-01. Section 2.2.1.2.3 of the PUSAR states that the dynamic effects loadings at EPU conditions, resulting from existing postulated HELBs in the aforementioned affected piping, are bounded by the current licensing basis. Please confirm that the conclusion reached in Section 2.2.1.2.3 of the PUSAR extends to the evaluations performed in Section 2.6.2 of the PUSAR, i.e., confirm that the dynamic effects loads calculated for the RPV and BSW, using the revised AP loads, remain bounded by those used in the current licensing basis requirements related to the ……..

Response

GGNS EPU AP analysis compared the bounding EPU recalculated loads to the maximum design basis loads for each break analyzed on an element by element basis. The maximum ratio of the bounding EPU loads for all cases to the bounding values in the design basis is 0.89.

As stated on page 2-271 of Attachment 5 of the GGNS EPU LAR (PUSAR) "…some components did experience more severe loading as a result of the change in methodology". These load increases are seen in comparison to the original AP analysis at the same break location and reflect only the effects of changes in methodology on individual break results. Increased loads were only seen on non-limiting break locations; in all cases the limiting OLTP loads for a component remained limiting for EPU.

The conclusions reached in Section 2.2.1.2.3 of the EPU LAR Attachment 5, stating that the dynamic effects of the proposed EPU have been adequately addressed, were extended correctly from the evaluations performed in Section 2.6.2. The calculated dynamic effects loads for the reactor pressure vessel and bio-shield wall, using the revised annulus pressurization loads, remain bounded by OLTP design basis values.

RAI # 2

Section 2.2.2.1.3 of the PUSAR states that safety-related thermowells and probes in the main steam (MS) and feedwater (FW) systems were evaluated in support of EPU implementation to demonstrate that failure of these components due to flow-induced vibration (FIV) will not occur at EPU conditions. Page 2-47 of the PUSAR provides the results of the evaluations demonstrating that the MS, FW and reactor recirculation system (RRS) thermowells are structurally adequate at EPU conditions. Please provide a quantitative summary of the results of the evaluations performed for the safety-related probes. This summary should identify the safety-related probes evaluated and the corresponding stresses and stress limits resulting from the analyses performed for each probe. Additionally, please confirm that the lock-in condition, where the vortex shedding frequency associated with the MS and FW flows, does not occur for any safety-related thermowell or probe at EPU conditions.

Response

GGNS has no safety-related probes in the MS or FW systems. There is a safety-related probe in the reactor recirculation system, which remains bounded by the CLTP analysis since there is insignificant change of recirculation flow due to EPU. There is no resonance lock-in at EPU conditions for the safety-related thermowells discussed in Section 2.2.2.1.3 of EPU LAR Attachment 5 or in the reactor recirculation system sample probe discussed above.