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GNRO-2011/00079

September 12, 2011

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

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

REFERENCES: 1. License Amendment Request, Extended Power Uprate, dated September 8, 2010 (GNRO-2010/00056, Accession Number ML102660403)

Dear Sir or Madam:

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

No change is needed to the no significant hazards consideration included in the initial LAR (Reference 1) as a result of the additional information provided. There is one new commitment included in this letter; it is summarized in Attachment 2.

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 September 12, 2011.

Sincerely,

MAK/FGB/dm

Attachments:
1. Response to Request for Additional Information, Electrical Engineering Branch
2. List of Regulatory Commitments

cc: Mr. Elmo E. Collins, Jr.
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Attachment 1

GNRO-2011/00079

Grand Gulf Nuclear Station Extended Power Uprate

Response to Request for Additional Information

Electrical Engineering Branch

Response to Request for Additional Information
Electrical 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). Entergy also provided responses to Requests for Additional Information related to equipment qualification in a letter dated May 5, 2011 (NRC ADAMS Accession No. ML111250552). The U.S. Nuclear Regulatory Commission (NRC) staff has determined that the following additional information is needed for the NRC Electrical Engineering Branch staff to complete their review of the amendment. Entergy's response to each item is also provided below.

RAI # 1

Regarding Licensee response to RAI #2 – Temperature:

Figure 2.3-1 of Attachment 5 to the LAR shows that the EPU MSLB / HELB temperature profile changes during the first 200 seconds of the event, with the short term plateau rising to 304 °F for approximately 200 seconds. For any qualified equipment located in the affected areas that is required to function during this event, the lowest qualification test temperature for aging (with a duration greater than 200 seconds) is 318 °F. Explain how the 15 °F margin (of IEEE-323-1974) is being maintained.

Response

The only change to the qualification profile for the Main Steam Line Break / High Energy Line Break (MSLB / HELB) for the EPU is the short term plateau temperature increasing from 298°F to 304°F. There are no changes to the peak temperature due to EPU as identified in Attachment 5, Figure 2.3-1. The existing peak temperatures and the margin between the peak calculated temperatures and Qualification Test temperatures remain unchanged.

There is one equipment type (see EQDP 4.9, Boston Insulated Wire) for which the maximum qualification temperature is 318°F and for which the qualification temperature margin has decreased below the 15°F suggested by IEEE-323-1974. However, the margin has been assured in an alternative fashion. The equipment qualification test assures adequate margin does exist by considering test duration at the peak temperature. The qualification of this equipment utilized a peak test temperature of 318 °F for a duration of at least 4500 seconds which envelops the short term plateau duration of approximately 200 seconds reflected in Attachment 5, Figure 2.3-1 for the EPU MSLB/HELB temperature profile.

IEEE-323-1974 recognizes this approach (increasing the test duration) as a method of assuring adequate margin exists.

The GGNS Licensing basis includes both NUREG-0588 Category I and Category II components, as outlined in GGNS FSAR Section 3.11.2.5.1. For Category II components, the qualification methodology is based on IEEE-323-1971, which does not contain a suggested temperature margin. The equipment (i.e., EQDP 4.9) affected here is Category II.

RAI # 2

Regarding Licensee response to RAI #2 – Radiation environment inside/outside containment:

Table 2-3 of the GGNS May 5, 2011 letter includes an entry for Rockbestos Firewall III Specialty Cable and cites Note 1, which says:

> Note 1: This cable is qualified using required insulation thickness for the TID it receives. The required insulation thickness is 19.19 mils; the cable has 21 mils of insulation which is a 20% margin in insulation thickness.

Identify which guidance the licensee is using for crediting insulation thickness for radiation shielding**.**

Response

The guidance for beta reduction is delineated in NRC IE Bulletin No. 79-01B, Enclosure 4, Section 4.1.2. It is used to address beta dose reduction for the subject cable which has 21 mils thickness of insulation.

The cable's test dose envelops the normal and accident gamma doses and a portion of the beta dose. The remaining beta dose is attenuated by crediting 19.19 mils of insulation thickness. This results in an effective remaining insulation thickness of 1.81 mils (i.e., 21 - 19.19); per equipment manufacturer testing, the required insulation thickness to perform its design function is approximately 1.5 mils. The effective remaining insulation thickness provides 20% margin in dielectric strength for the cable's service voltage (120V).

RAI # 3

Regarding Licensee response to RAI #2 - Replacement Equipment:

As indicated in Entergy's letter dated November 12, 2010 (GNRO-2010/00071, NRC ADAMS Accession Number ML103260003), these splices are to be replaced with qualified splices. Confirm this is captured as a commitment and identify the type of splices to be used.

Response

The Scotch tape splices identified in EPU LAR Attachment 5 Table 2.3-2 are to be replaced with Raychem splices (EQDP EQ 19.1) qualified for the EPU environment. These splices are located in the RHR rooms and are used at motor terminations for the jockey pumps and valve

actuators. The environmental conditions to which the replacement splice materials are qualified bound the requirements for EPU operation, as addressed in Entergy letter GNRO-2010/00071 dated November 18, 2010 (NRC ADAMS Accession No. ML103260003).

Entergy has reviewed the EPU LAR and the commitment summary. An explicit commitment to perform the replacement of the Group III equipment was inadvertently omitted. The EPU LAR did include the following statement: Remaining life determinations will be made for all Group II items and any required modifications or replacement of equipment will also be completed prior to EPU implementation. It is our intent and we commit to replace Group III non-qualified electrical splices for the six components prior to EPU implementation.

RAI #4

In LAR Section 2.3.5, under Condensate Inventory for Decay Heat Removal, the licensee stated that "The SBO [station blackout] evaluation at EPU condition shows a need for an additional approximately 24.4%, over CLTP, of CST water for use for RCIC use to ensure that adequate water volume is available to remove decay heat, depressurize the reactor, and maintain reactor vessel level above the top of active fuel. This increases the total volume required to approximately 136,014 gallons, which is within the current CST inventory reserve of 143,000 gallons".

The staff has also noted that FSAR Section 9.2.6.3 (Page 9.2-25a) indicates that "For station blackout only 115,278 gallons is required to cope with a 4 hour SBO event."

The staff needs a clarification of how the volume of the CST water at EPU conditions has been determined as 136,014 gallons for SBO, as CST water with 24.4% increase at EPU conditions appears to be higher than 136,014 gallons, if the current required volume considered is 115,278 gallons as per FSAR Section 9.2.6.3.

Response

SHEX evaluations were performed for both the current licensed thermal power (CLTP) and EPU cases. For the CLTP case, the required volume is 109,311 gallons. The required volume for the EPU case is 136,014 gallons, as stated in EPU LAR Attachment 5, Section 2.3.5. The 24.4% increase is relative to the CLTP calculated value (i.e., (136,014 – 109,311) / 109,311)).

The value in the FSAR was based on a different methodology.

Attachment 2

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Grand Gulf Nuclear Station Extended Power Uprate

List of Regulatory Commitments

List of Regulatory Commitments

The following table identifies those actions committed to by Entergy in this letter. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments.

COMMITMENT	TYPE (Check one)		SCHEDULED COMPLETION DATE (If Required)
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
1. Group III non-qualified electrical splices for the six components will be replaced with qualified splices prior to EPU implementation.	x		