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GNRO-2013/00080

June 26, 2014

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

SUBJECT: License Amendment Request  
Revision to Battery Cell Resistances to Address Potential Non-  
Conservative Technical Specification  
Grand Gulf Nuclear Station, Unit 1  
Docket No. 50-416  
License No. 29

Dear Sir or Madam:

In accordance with the provisions of Section 50.90 of Title 10 *Code of Federal Regulations* (10 CFR), Entergy Operations, Inc. (Entergy) is submitting a request for an amendment to the Technical Specifications (TS) for Grand Gulf Nuclear Station, Unit 1.

The proposed amendment modifies the TS Surveillance Requirements (SRs) for safety-related batteries in TS SRs 3.8.4.2 and 3.8.4.5. This change is needed to address a potential non-conservative TS value.

Attachment 1 provides a description of the proposed change. Attachment 2 provides the existing TS pages marked up to show the proposed change. Attachment 3 shows the proposed change.

Approval of this amendment is requested within one year after the date of this submittal. Once approved, the amendment shall be implemented within 60 days.

This letter contains no new commitments. If you have any questions or require additional information, please contact Mr. James Nadeau at (601) 437-2103.

I declare under penalty of perjury that the foregoing is true and correct. Executed on June 26, 2014.

Sincerely,

  
OJM/ras 4/26/14

Attachments and CC: (see next page)

Attachments:

1. Analysis of Proposed Technical Specification Change
2. Proposed Technical Specification Changes (mark-up)
3. Proposed Technical Changes (clean page)

cc: U.S. Nuclear Regulatory Commission  
ATTN: Mr. Mark Dapas, (w/2)  
Regional Administrator, Region IV  
1600 East Lamar Boulevard  
Arlington, TX 76011-4511

NRC Senior Resident Inspector  
Grand Gulf Nuclear Station  
Port Gibson, MS 39150

U. S. Nuclear Regulatory Commission  
ATTN: Mr. Alan Wang, NRR/DORL (w/2)  
Mail Stop OWFN 8 B1  
Washington, DC 20555-0001

State Health Officer  
Mississippi Department of Health  
P.O. Box 1700  
Jackson, MS 39215-1700

**Attachment 1**

**GNRO-2013/00080**

**Analysis of Proposed Technical Specification Change**

## 1.0 DESCRIPTION

The proposed amendment modifies the Grand Gulf Nuclear Station (GGNS) Technical Specifications (TS) Surveillance Requirements (SRs) for safety-related battery resistances in TS SRs 3.8.4.2 and 3.8.4.5 for batteries 1A3, 1B3, and 1C3.

## 2.0 BACKGROUND

Review of Operating Experience (OE) from Quad Cities identified a potential non-conservative TS value for safety-related battery inter-cell resistances. In response, administrative controls in surveillance procedure 06-EL-1L11-R-0001, "125 Volt Battery Bank Physical Condition Check" were implemented in 2007 until the non-conservative SRs could be resolved. All surveillances performed in the past 3 years have met the more restrictive acceptance criteria.

TS SR 3.8.4.2 (page 3.8-27) and TS SR 3.8.4.5 (page 3.8-28) list battery connection resistances for inter-cell, inter-rack, inter-tier, and terminal connections to be  $\leq 1.5 \text{ E-4 ohm}$  for Division 1 (1A3), Division 2 (1B3), and Division 3 (1C3) batteries. Institute of Electrical and Electronics Engineers (IEEE) Power Engineering Society correspondence indicates it is likely these values were inadvertently introduced into the GGNS TS from an example of nominal values provided in a draft template related to development of Standard Technical Specifications during the 1980s. Some plants implemented the  $\leq 1.5 \text{ E-4 ohm}$  acceptance criteria as the nominal value with no further basis.

## 3.0 TECHNICAL ANALYSIS

To determine the new acceptance criteria, the results of each battery's performance discharge test (06-EL-1L11-R-003) were reviewed to determine the worst case portion of the discharge profile. The difference between the minimum measured battery terminal resistance and the minimum allowable value of each was then divided by the total number of cells in the battery and the current observed at that particular moment. This resulted in the average additional connection resistance that could be tolerated by the battery. Engineering Change (EC) 43968 concluded the following acceptance criteria are appropriate TS SR 3.8.4.2 and TS SR 3.8.4.5 resistances for batteries 1A3, 1B3, and 1C3.

- For Division 1 and Division 2 connection resistance:  
 $\leq 0.5 \text{ E-4 ohm (50 } \mu\Omega)$  for inter-cell connections and  $\leq 1.0 \text{ E-4 ohm (100 } \mu\Omega)$  for inter-rack or inter-tier connections.
- For Division 3 connection resistance:  
 $\leq 1.0 \text{ E-4 ohm (100 } \mu\Omega)$  for inter-cell and inter-tier connections.

This change will impose more restrictive allowance values than  $\leq 1.5 \text{ E-4 ohm (150 } \mu\Omega)$  for all connections in all three divisions.

#### 4.0 REGULATORY SAFETY ANALYSIS

##### 4.1 No Significant Hazards Consideration Determination

Entergy Operations, Inc. (Entergy) has evaluated whether or not a significant hazards consideration is involved with the proposed amendment(s) by focusing on the three standards set forth in Title 10 *Code of Federal Regulations* (10 CFR) 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed change revises the TS SRs for safety-related battery resistances in TS SRs 3.8.4.2 and 3.8.4.5. This change addresses a potential non-conservative TS value. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed change revises the TS SRs for safety-related battery resistances in TS SRs 3.8.4.2 and 3.8.4.5. The change does not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed) or a change in the methods governing normal plant operations. The change does not alter assumptions made in the safety analysis.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The proposed change revises the TS SRs for safety-related battery resistances in TS SRs 3.8.4.2 and 3.8.4.5. The proposed change does not alter the manner in which safety limits, limiting safety system settings or limiting conditions for operation are determined. This change addresses a potential non-conservative TS value. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, Entergy concludes that the proposed change presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

#### 4.2 Applicable Regulatory Requirements/Criteria

The direct current (DC) electrical power system is required by 10 CFR 50, Appendix A, General Design Criteria (GDC) 17. According to the GGNS TS Bases, the resistance measurements required by TS SRs 3.8.4.2 and 3.8.4.5 provide an indication of physical damage or abnormal deterioration that could potentially degrade battery performance, and do not state resistance measurement acceptance criteria. As this revision addresses a potentially non-conservative value, these two TS SRs will continue to meet the intent described in the TS Bases and meet the requirements of 10 CFR 50, Appendix A, GDC 17.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The proposed change would change a TS SR. However, the proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed change.

#### 6.0 CONCLUSION

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the NRC's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

**Attachment 2**

**GNRO-2013/00080**

**Proposed Technical Specification Changes (mark-up)**

Note, markup deletions identified by strikethrough (~~delete~~) and additions identified by underline (addition).

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Division 3 DC electrical power subsystem inoperable for reasons other than Condition A.	D.1 Declare High Pressure Core Spray System inoperable.	Immediately
E. Required Action and associated Completion Time of Condition C or D not met.	E.1 Be in MODE 3.	12 hours
	<u>AND</u> E.2 Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.4.1 Verify battery terminal voltage is $\geq 129$ V on float charge.	7 days
SR 3.8.4.2 Verify no visible corrosion at battery terminals and connectors.  <u>OR</u> Verify Division 1 and 2 battery connection resistance is $\leq 1.5 \text{ E-4 ohm}$ for inter-cell connections, $\leq 1.5 \text{ E-4 ohm}$ for inter-rack connections, $\leq 1.5 \text{ E-4 ohm}$ for inter-tier connections, and $\leq 1.5 \text{ E-4 ohm}$ for terminal connections. $\leq 0.5 \text{ E-4 ohm}$ for inter-cell connections and $\leq 1.0 \text{ E-4 ohm}$ for inter-rack or inter-tier connections.  <u>AND</u> Verify Division 3 connection resistance is $\leq 1.0 \text{ E-4 ohm}$ per inter-cell and inter-tier connection.	92 days

(continued)



SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.4.3 Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	24 months
SR 3.8.4.4 Remove visible corrosion and verify battery cell to cell and terminal connections are coated with anti-corrosion material.	24 months
SR 3.8.4.5 Verify Division 1 and 2 battery connection resistance is <del><math>\leq 1.5 \text{ E-4 ohm}</math> for inter-cell connections, <math>\leq 1.5 \text{ E-4 ohm}</math> for inter-rack connections, <math>\leq 1.5 \text{ E-4 ohm}</math> for inter-tier connections, and <math>\leq 1.5 \text{ E-4 ohm}</math> for terminal connections.</del> <u><math>\leq 0.5 \text{ E-4 ohm}</math> for inter-cell connections and <math>\leq 1.0 \text{ E-4 ohm}</math> for inter-rack or inter-tier connections.</u>  <u>AND</u>  <u>Verify Division 3 connection resistance is <math>\leq 1.0 \text{ E-4 ohm}</math> per inter-cell and inter-tier connection.</u>	24 months
SR 3.8.4.6 Verify each Division 1 and 2 required battery charger supplies $\geq 400$ amps at $\geq 125 \text{ V}$ for $\geq 10$ hours; and the Division 3 battery charger supplies $\geq 50$ amps at $\geq 125 \text{ V}$ for $\geq 4$ hours.	24 months

(continued)

**Attachment 3**

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**Proposed Technical Specification Changes (clean page)**

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Division 3 DC electrical power subsystem inoperable for reasons other than Condition A.	D.1 Declare High Pressure Core Spray System inoperable.	Immediately
E. Required Action and associated Completion Time of Condition C or D not met.	E.1 Be in MODE 3.	12 hours
	<u>AND</u> E.2 Be in MODE 4.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.4.1 Verify battery terminal voltage is $\geq 129$ V on float charge.	7 days
SR 3.8.4.2 Verify no visible corrosion at battery terminals and connectors.  <u>OR</u>  Verify Division 1 and 2 connection resistance is $\leq 0.5 \text{ E-4 ohm}$ for inter-cell connections and $\leq 1.0 \text{ E-4 ohm}$ for inter-rack or inter-tier connections.  <u>AND</u>  Verify Division 3 connection resistance is $\leq 1.0 \text{ E-4 ohm}$ per inter-cell and inter-tier connection.	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.4.3    Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.</p>	<p>24 months</p>
<p>SR 3.8.4.4    Remove visible corrosion and verify battery cell to cell and terminal connections are coated with anti-corrosion material.</p>	<p>24 months</p>
<p>SR 3.8.4.5    Verify Division 1 and 2 connection resistance is <math>\leq 0.5 \text{ E-4 ohm}</math> for inter-cell connections and <math>\leq 1.0 \text{ E-4 ohm}</math> for inter-rack or inter-tier connections.</p> <p>AND</p> <p>Verify Division 3 connection resistance is <math>\leq 1.0 \text{ E-4 ohm}</math> per inter-cell and inter-tier connection.</p>	<p>24 months</p>
<p>SR 3.8.4.6    Verify each Division 1 and 2 required battery charger supplies <math>\geq 400 \text{ amps}</math> at <math>\geq 125 \text{ V}</math> for <math>\geq 10 \text{ hours}</math>; and the Division 3 battery charger supplies <math>\geq 50 \text{ amps}</math> at <math>\geq 125 \text{ V}</math> for <math>\geq 4 \text{ hours}</math>.</p>	<p>24 months</p>

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