

## NRR-PMDAPEm Resource

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**From:** Wang, Alan  
**Sent:** Tuesday, December 09, 2014 10:54 AM  
**To:** SCARBROUGH, RICHARD A (RSCARBR@entergy.com); Nadeau, James  
**Cc:** Burkhardt, Janet  
**Subject:** Grand Gulf Nuclear Station Request for Additional Information Regarding Battery Connection Resistances (TAC MF4338)

Richard and Jim,

By letter dated June 26, 2014 (Agencywide Document Access and Management System (ADAMS) Accession No. ML14177A270), Entergy Operations Inc. (Entergy, the licensee) submitted a license amendment request (LAR) for Grand Gulf Nuclear Station, Unit No. 1 (GGNS) to modify Technical Specification (TS) 3.8.4, "DC Sources – Operating Surveillance Requirements (SRs) 3.8.4.2 and 3.8.4.5. The US Nuclear Regulatory Commission (NRC) staff has reviewed the June 26, 2014, submittal for the new surveillance requirements and has determined that the following additional information is required to complete its review of the amendment request.

In Attachment 1 of the LAR, Entergy proposes the following new acceptance criteria for battery connection resistances in TS SR 3.8.4.2 and SR 3.8.4.5:

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.

And

Verify Division 3 connection resistance is  $\leq 1.0 \text{ E-4 ohm}$  ( $100\mu\Omega$ ) per inter-cell and inter-tier connection.

The licensee stated that the proposed acceptance criteria will impose more restrictive allowance values than the current requirement of  $\leq 1.5 \text{ E-4 ohms}$  for all connections in all three divisions.

1. Existing SRs 3.8.4.2 and 3.8.4.5 require verification of battery connection resistance for inter-cell, inter-tier, inter-rack and terminal connections. The revised SRs 3.8.4.2 and 3.8.4.5 do not include verification of battery terminal connection resistances for all three divisions and inter-rack connection resistances for Division 3 battery.
  - a. Please provide the acceptance criteria for the terminal connection resistances for Divisions 1, 2, and 3 batteries and for the inter-rack connection resistances for the Division 3 battery. Otherwise, please explain why the licensee is deviating from the current requirements in SRs 3.8.4.2 and 3.8.4.5.
  - b. In the proposed revised SRs, the word "battery" is deleted from the statements. For clarification of the proposed acceptance criteria, please consider adding the word "battery" to the statements.
2. In Attachment 1 of the LAR, the licensee stated that Engineering Change (EC) 43968 concluded that the proposed acceptance criteria for battery connection resistances in TS Surveillance Requirements (SRs) 3.8.4.2 and 3.8.4.5 are appropriate for Divisions 1, 2, and 3 batteries (1A3, 1B3, and 1C3). Provide a copy of EC 43968.
3. Section 8.3.2.1.6.2 of the GGNS updated safety analysis report states that the voltage at the safety-related battery terminals is designed to be maintained within the limit of 105 volts direct current (VDC) to 140 VDC during all modes of plant operation, including the first 4 hours of accident conditions.

- a. Please confirm that the minimum battery required terminal voltage (i.e., 105 V) will be maintained during and at the end of the battery performance/service test, if each battery connection (i.e., inter-cell, inter-tier, inter-rack, and terminal) is at the proposed maximum resistance value and all inter-tier and inter-rack connecting cables resistances are considered.
- b. Please confirm that the limiting voltage of 105 V provides adequate battery terminal voltage for all loads during the first 4 hours of accident conditions.

This RAI was discussed with Mr. Richard Scarbrough on December 8, 2014, and it was agreed that a response would be provided within 45 days of receipt of this email. If circumstances result in the need to revise the requested response date, please contact me at (301) 415-1445 or via e-mail at [Alan.Wang@nrc.gov](mailto:Alan.Wang@nrc.gov).

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