



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

April 30, 2012

Mr. Michael Perito  
Vice President, Site  
Entergy Operations, Inc.  
P.O. Box 756  
Port Gibson, MS 39150

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE  
GRAND GULF NUCLEAR STATION LICENSE RENEWAL APPLICATION (TAC  
NO. ME7493)

Dear Mr. Perito:

By letter dated October 28, 2011, Entergy Operations, Inc. submitted an application pursuant to Title 10 of the *Code of Federal Regulations*, Part 54, to renew the operating license for Grand Gulf Nuclear Station, Unit 1 (GGNS) for review by the U.S. Nuclear Regulatory Commission (NRC or the staff). The staff is reviewing the information contained in the license renewal application and has identified, in the enclosure, areas where additional information is needed to complete the review.

These requests for additional information were discussed with Jeff Seiter, and a mutually agreeable date for the response is within 30 days from the date of this letter. If you have any questions, please contact me at 301-415-1045 or e-mail [nathaniel.ferrer@nrc.gov](mailto:nathaniel.ferrer@nrc.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "N. Ferrer", is written over a horizontal line.

Nathaniel Ferrer, Project Manager  
Projects Branch 1  
Division of License Renewal  
Office of Nuclear Reactor Regulation

Docket No. 50- 416

Enclosure:  
Requests for Additional  
Information

cc w/encl: Listserv

GRAND GULF NUCLEAR STATION  
LICENSE RENEWAL APPLICATION  
REQUESTS FOR ADDITIONAL INFORMATION SET 10

**RAI B.1.28-1**

Background. The license renewal application (LRA) states that the Non-EQ Cable Connections Program is consistent with GALL Report AMP XI.E6. The GALL Report “parameters monitored/inspected” program element recommends that the following factors are considered for sampling:

- voltage level (medium and low voltage)
- circuit loading (high load)
- connection type
- location (high temperature, high humidity, vibration, etc.)

Most connections used in nuclear power plants include splices (butt or bolted), crimp-type ring lugs, connectors, and terminal blocks. The program basis document GGNS-EP-08-LRD08, Revision 1, states that the representative sample of electrical cable connections will be tested, and the factors considered for sample selection will be application (medium and low voltage), circuit loading (high voltage), and location (high temperature, high humidity, vibration, etc.).

Issue. The “parameters monitored or inspected” program element of the applicant’s basis document GGNS-EP-08-LRD08, Revision 1, does not consider or address connection types in the sample selection criteria.

Request. Clarify how the Non-EQ Cable Connections Program is consistent with GALL Report AMP XI.E6 with respect to sample selection criteria including connection type.

**RAI B.1.28-2**

Background. The GALL Report AMP XI.E6 “detection of aging affects” program element states that testing may include thermography, contact resistance testing, or other appropriate testing methods without removing the connection insulation, such as heat shrink tape, sleeving, insulation boots, etc. The program basis document, GGNS-EP-08-LRD08, states that inspection methods may include thermography, contact resistance testing, or other appropriate quantitative methods based on plant configuration and industry guidance.

Issue. Based on the program description in the program basis document, it appears that the applicant may be using other quantitative methods that may include removing the connection insulation.

Request. Clarify if there are other appropriate quantitative methods, which may include removing connection insulation that will be used at GGNS. If there are other methods, justify why this practice is consistent with the recommendations in GALL Report AMP XI.E6.

ENCLOSURE

### **RAI B.1.28-3**

Background. The SRP-LR, Table 3.0.1, "FSAR Supplement for Aging Management of Applicable Systems," item for GALL Report AMP XI.E6, recommends that the program consists of a representative sample of electrical connections within the scope of license renewal, which is tested at least once prior to the period of extended operation to confirm that there are no aging effects requiring management during that period. Testing may include thermography, contact resistance testing, or other appropriate testing methods without removing the connection insulation, such as heat shrink tape, sleeving, insulating boots, etc. LRA Section A.1.28 states that the Non-EQ Cable Connections Program is a one-time inspection program that provides reasonable assurance that the intended function of the metallic parts of electrical connections is maintained with the current license basis through the period of extended operation. The LRA further states that cable connections included are those connections susceptible to age-related degradation resulting in increased resistance of connection due to thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion, or oxidation that are not subject to the environmental qualification requirements of 10 CFR 50.49. This program provides for one time quantitative inspection that will be completed prior to the period of extended operation on a sample of connections.

Issue. LRA Section A.1.28 states that the Non-EQ Cable Connections Program is consistent with GALL Report AMP XI.E6. However, the Updated Final Safety Analysis Report (UFSAR) Supplement description for the program does not describe the type of testing that may be performed.

Request. Justify why the UFSAR supplement description does not describe the type of testing that may be performed, consistent with that in SRP-LR Table 3.0-1 for GALL Report AMP XI.E6.

### **RAI B.1.31-1**

Background. The LRA states that Non-EQ Insulated Cables and Connections Program will be consistent with GALL Report AMP XI.E1. GALL Report, item VI.A.LP-33 states that one of the applicable aging effects is reduced insulation resistance due to photolysis ultra violet (UV) of organic polymers (cable jacket). The GALL Report AMP XI.E1 "scope of program" program element states this program applies to accessible electrical cables and connections within the scope of license renewal that are located in adverse localized environments caused by temperature, radiation, or moisture. During the onsite walkdown, the staff identified cables from engineered safety feature (ESF) transformer Nos. 11, 12, and 21, which sits on support trays.

Issue. These ESF transformer cable trays do not use covers, leaving cables exposed to open-air environment, which will subject cables to moisture and ultra violet radiation. It is not clear how the Non-EQ Insulated Cables and Connections Program will be used to manage the aging effects of reduced insulation resistance in this open-air environment.

Request. Explain how these ESF transformer cables will be managed for aging, during the period of extended operation.

**RAI B.1.31-2**

Background. The LRA states that Non-EQ Insulated Cables and Connections Program will be consistent with GALL Report AMP XI.E1. The GALL Report AMP XI.E1 "scope of program" program element states that this program applies to accessible electrical cables and connections within the scope of license renewal that are located in adverse localized environments caused by temperature, radiation, or moisture. An adverse localized environment exists based on the most limiting condition for temperature, radiation, or moisture for the insulation material of the electrical cables or connections. GALL Report AMP XI.E1 "parameters monitored or inspected" program element states that an adverse localized environment is a plant-specific condition; therefore the applicant should clearly define how this condition is determined. The program element also states that the applicant should determine and inspect the adverse condition localized environment for each of the most limiting temperature, radiation, or moisture conditions for the accessible cables and connections that are within the scope of license renewal.

Issue. The LRA does not identify the Non-EQ Insulated cables and Connections Program will determine an adverse localized environment or the most limiting condition for the insulation material of electrical cables or connections.

Request. Describe how the Non-EQ Insulated Cables and Connections Program will identify an adverse localized environment or what limiting conditions for temperature, radiation, or moisture of insulation material of electrical cables and connections will be applied in the identification of an adverse localized environment.

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Mr. Michael Perito  
Vice President, Site  
Entergy Operations, Inc.  
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/RA/

Nathaniel Ferrer, Project Manager  
Projects Branch 1  
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