Entergy

Entergy Operations, Inc.
P. O. Box 756
Port Gibson, MS 39150

Michael Perito
Vice President, Operations
Grand Gulf Nuclear Station
Tel. (601) 437-6409

GNRO-2012/00078

July 23, 2012

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

SUBJECT: Response to Request for Additional Information (RAI) Set 23 dated June 22, 2012
Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
License No. NPF-29

REFERENCE: NRC Letter, "Requests for Additional Information for the Review of the Grand Gulf Nuclear Station, License Renewal Application," dated June 22, 2012 (GNRI-2012/00139) (ML12152A393)

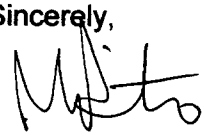
Dear Sir or Madam:

Entergy Operations, Inc. is providing, in the Attachment, the response to the referenced Request for Additional Information (RAI).

This letter contains no new commitments. If you have any questions or require additional information, please contact Christina L. Perino at 601-437-6299.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 23rd day of July, 2012.

Sincerely,



MP/jas

Attachment: Response to Request for Additional Information (RAI)

cc: (see next page)

cc: with Attachment

Mr. John P. Boska, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Stop O-8-C2
Washington, DC 20555

cc: without Attachment

Mr. Elmo E. Collins, Jr.
Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
1600 East Lamar Boulevard
Arlington, TX 76011-4511

U.S. Nuclear Regulatory Commission
ATTN: Mr. A. Wang, NRR/DORL
Mail Stop OWFN/8 G14
11555 Rockville Pike
Rockville, MD 20852-2378

U.S. Nuclear Regulatory Commission
ATTN: Mr. Nathaniel Ferrer NRR/DLR
Mail Stop OWFN/ 11 F1
11555 Rockville Pike
Rockville, MD 20852-2378

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

Attachment 1 to

GNRO-2012/00078

Response to Request for Additional Information (RAI)

The format for the RAI responses below is as follows. The Request for Additional Information (RAI) is listed in its entirety as received from the Nuclear Regulatory Commission (NRC) with a background, issue and request subparts. This is followed by the Grand Gulf Nuclear Station (GGNS) RAI response to the individual question.

RAI 3.6.2.2.1-1

Background NUREG-1800, Rev. 2, Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants (SRP-LR), Section 3.6.2.2.2 states that reduced insulation resistance of high voltage insulators due to presence of salt deposits and surface contamination could occur for plants located such that potential exists for salt deposits or surface contamination (e.g., in the vicinity of salt water bodies or industrial pollution). The applicant stated that GGNS is not located near the seacoast or near other sources of airborne particles. The applicant then concluded that reduced insulation resistance due to surface contamination is not an applicable aging effect for high-voltage insulators at GGNS.

Issue The applicant did not address the plant specific operating experience at GGNS to support the applicant's claim that contamination is not a significant aging effect for high voltage insulators at GGNS.

Request Please confirm that there has been no occurrence of insulator flashover due to contamination and/or dust at GGNS.

RAI 3.6.2.2.1-1 RESPONSE

Prior to LRA submittal, a review of GGNS operating experience (OE) for high-voltage insulators found no occurrence of insulator flashover. A subsequent review of OE up to June 30, 2012 found no occurrence of insulator flashover for GGNS high-voltage insulators.

RAI 3.6.2.3-1

Background In LRA Table 3.6.2-1, corresponding to LRA Table 3.6.1, items 16 and 17, the applicant stated that for fuse holder (not part of active equipment): metallic clamps exposed to air – indoor controlled, increased resistance of connection due to chemical contamination, corrosion, and oxidation; fatigue due to ohmic heating, thermal cycling, electrical transients and frequent manipulation or vibration are not applicable and no aging management program (AMP) is proposed. The aging management review (AMR) items cite generic note I. The applicant also indicated via Foot Note 601 that the fuse holders in the containment penetration panels (1BPZ1A, 1BPZ1B, 1BPZ2A, AND 1BPZ2B) are subject to AMR. The applicant stated that its evaluation of the fuses in the penetration protection cabinet fuse holder panels determined that the aging effects due to thermal fatigue in the form of high resistance caused by ohmic heating, thermal cycling, electrical transients, or mechanical fatigue caused by frequent manipulation (removal/replacement of the fuse), or vibration do not require aging management. GALL Report, items VI.A.LP-23 and 31, "Fuse Holders (Not Part of active equipment): Metallic Clamp," identifies the aging/effect mechanism as increased resistance of connection due to chemical contamination, corrosion, oxidation; fatigue due to ohmic heating, thermal cycling, electrical transients, increased resistance of connection due to fatigue caused by frequent manipulation or vibration. GALL Report AMP XI.E5, "Fuse Holders," states that fuse holders within the scope of license renewal should be tested to provide an indication of the condition of the metallic clamps of fuse holders.

Issue The applicant did not provide technical justifications of why the aging affects of the fuse holders in LRA Table 3.6.2-1, do not require aging management.

Request Provide justification for not managing the aging effects of the fuse holders listed in LRA Table 3.6.2-1, corresponding to LRA Table 3.6.1, items 16 and 17. Also provide an evaluation that addresses each aging effect/mechanism identified in GALL Report, items VI.A.LP-23 and 31.

RAI 3.6.2.3-1 RESPONSE

LRA Table 3.6.2-1, Note 601 summarizes the evaluation of potential aging effects and mechanisms for metallic clamps of fuse holders. The evaluation of the aging effect / mechanisms identified in generic aging lessons learned (GALL) Report, item VI.A.LP-23 and item VI.A.LP-31 is further explained as follows.

VI.A.LP-23, Increased Connection Resistance due to Chemical Contamination, Corrosion, and Oxidation

The location and mounting details of the penetration protection cabinet fuse holder panels were determined by review of GGNS drawings and documentation, and confirmed by plant walkdown. The auxiliary building rooms in which they are located have no sources of chemical contamination, and the fuse holders are housed in a protective enclosure to preclude this aging mechanism even if chemical contamination were possible. Therefore, based on their installed location and design configuration, increased connection resistance due to chemical contamination, corrosion, and oxidation is not considered an aging effect requiring management.

VI.A.LP-23, Increased Connection Resistance due to Fatigue caused by Ohmic Heating, Thermal Cycling and Electrical Transients

GGNS power circuits are sized based on power cable ampacity considering ohmic heating and short-circuit conditions. The cable sizing is based on ampacity values from insulated power cable engineers association (IPCEA) P-46-426, derating factors for installation configuration, and the ability to carry 125% of full-load current. Ohmic heating is minimized by conservative cable sizing, which addresses rated temperature limitations. Therefore, ohmic heating of the fuse clamps is minimized. Without ohmic heating, thermal cycling on the metallic portion of the fuse clips is minimized. For electrical transients, GGNS electrical design ensures that stresses associated with electrical faults and transients are mitigated by the fast action of circuit protective devices at high currents. Mechanical stress due to electrical faults is not considered a credible contributor to the effects of aging since such abnormal conditions are rare. Therefore, increased connection resistance due to fatigue caused by ohmic heating, thermal cycling and electrical transients is not an aging effect requiring management.

VI.A.LP-31, Increased Resistance of Connection due to Fatigue Caused by Frequent Manipulation or Vibration

A review of GGNS operating practices was performed to determine if fuses are frequently pulled. Fuses in the penetration protection cabinet fuse holder panels are rarely pulled, and the few that have been pulled are not pulled on a periodic or frequent basis. The location and mounting details of the penetration protection cabinet fuse holder panels were determined by

review of GGNS drawings and documentation, and confirmed by plant walkdown. The documentation and walkdown confirmed that there are no direct sources of vibration in proximity to the fuse holder panels. The fuse holder panels are floor mounted in the auxiliary building penetration rooms. Therefore, increased connection resistance due to fatigue caused by frequent manipulation or vibration is not an aging effect requiring management.

RAI B.1.1-1

Background In LRA Section B.1.1, under operating experience, the applicant states that the 115 kV Inaccessible Transmission Cable Program is a new program. Industry operating experience was considered in the development of this program. The applicant also stated that plant operating experience will be gained as the program is implemented and will be factored into the program via confirmation and corrective actions elements of the GGNS 10 CFR 50, Appendix B quality assurance program. The applicant further stated that this inspection program applies to a potential aging effect for which there is no operating experience at GGNS indicating the need for an AMP. Additionally, the applicant stated that a search of GGNS operating experience with the 115 kV inaccessible transmission cables and connections in this program identified no age-related failures.

SRP-LR Section A.1.2.3.10, under Operating Experience, states that for new AMPs that have yet to be implemented at an applicant's facility, the programs have not yet generated any operating experience (OE). However, there may be other relevant plant-specific OE at the plant or generic OE in the industry that is relevant to the AMP's program elements even though the OE was not identified as a result of the implementation of the new program.

During the switchyard walk-down, the staff noted that Manhole15 contains the 115 kV in-service transmission cables and the spare cables. These cables have the same manhole but different vaults. The spare cables have a manhole cover and appeared to have a new sump pump installed. However, the vault containing in-service cables appears to have never been inspected for water and does not have a sump pump. This vault is covered by the thick concrete slab with no manhole cover.

Issue When a power cable is exposed to wet, submerged, or other adverse environmental conditions for which it was not designed, an aging effect of reduced insulation resistance may result, causing a decrease in the dielectric strength of the conductor insulation. This can potentially lead to failure of the cable's insulation system.

Request Please confirm that manhole MH-15 containing in-service cable has been inspected. Describe recent operating experience with water accumulation in Manhole 15. If water is found submerging cables, describe corrective actions to prevent cable future submergence conditions.

RAI B.1.1-1 RESPONSE

Entergy inspected the 115 kV cables and the associated manhole MH-15 in 2009 and 2010. In 2009, a condition report was written for MH-15 stating that this cable manhole contained water, but there was no indication that the water level in the manhole was above the cables. In 2010, a condition report was written for MH-15 stating that water was discovered during the manhole inspection, but the water was not covering the cables. Entergy has a design modification prepared to install a solar-powered sump pump in manhole MH-15. The purpose of this modification is to provide a method to remove water from MH-15 that contains in-service cables.

RAI B.1.1-2

Background The staff reviewed the applicant's "corrective actions" program element against the criteria in SRP-LR Section A.1.2.3.7, which states that the actions to be taken when the acceptance criteria are not met should be described in appropriate detail or referenced to source documents. Corrective actions, including root cause determination and prevention of recurrence, should be timely. The applicant did require corrective actions when the test acceptance criteria are not met. However, the applicant did not specifically require corrective actions when inspection acceptance criteria are not met to ensure that the intended functions of the electrical cables can be maintained consistent with the current licensing basis.

Issue When the inspection acceptance criteria are not met, the applicant may not be required to perform an engineering evaluation to ensure that the electrical cables are not submerged again.

Request Revise the LRA and UFSAR supplement, as necessary, to describe the corrective actions when inspection acceptance criteria are not met or provide a technical justification of how the proposed corrective actions are consistent with the SRP-LR Section A.1.2.3.7.

RAI B.1.1-2 RESPONSE

The LRA will be revised as indicated below to clarify the corrective actions of the 115 kV Inaccessible Transmission Cable Program. Additions are shown with underline.

B.1.1 115 KV INACCESSIBLE TRANSMISSION CABLE

(Evaluation)
7. Corrective Actions

Corrective actions are taken and an engineering evaluation will be performed when the test or inspection acceptance criteria are not met to ensure that the intended functions of the electrical cables can be maintained consistent with the current licensing basis. When an unacceptable condition or situation is identified, a determination is made as to whether the same condition or situation is applicable to other in-scope transmission cables. Corrective actions may include, but are not limited to, installation of permanent drainage systems, installation of sump pumps and alarms, more frequent cable testing or manhole inspections, or replacement of the affected cable. When an unacceptable condition or situation is identified, the requirements of 10 CFR Part 50, Appendix B, will be used to address corrective actions.

A.1.1 115 kV Inaccessible Transmission Cable Program

The 115 kV Inaccessible Transmission Cable Program manages the effects of aging on the 115 kV inaccessible transmission cable systems. The program includes periodic actions to prevent inaccessible transmission cables from being exposed to significant moisture. In this program, inaccessible 115 kV transmission cables exposed to significant moisture will be tested at least once every six years to provide an indication of the condition of the cable insulation properties. Test frequencies may be adjusted based on test results and operating experience. The specific type of test will be a proven test for detecting deterioration of the cable insulation. The program includes periodic inspections for water accumulation in manholes at least once every year (annually). In addition to the periodic manhole inspections, manhole inspection for water after events, such as heavy rain or flooding will be performed. Inspection frequency will be increased as necessary based on evaluation of inspection results. The corrective action program will be

entered and an engineering evaluation will be performed when the test or inspection acceptance criteria are not met.

This program will be implemented prior to the period of extended operation. The first cable tests and manhole inspections are to be completed prior to the period of extended operation.