October 7, 2008

Mr. Thomas L. Williamson
Manager, GGNS COLA Project
Entergy Nuclear
1340 Echelon Parkway
Jackson, MS 39213

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 12 RELATED TO THE SRP SECTION 8.2 and 8.3 FOR THE GRAND GULF COMBINED LICENSE APPLICATION

Dear Mr. Williamson:

By letter dated February 27, 2008, Entergy Operations Incorporated (EOI) submitted for approval a combined license application pursuant to 10 CFR Part 52. The U. S. Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed application.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter. To support the review schedule, you are requested to respond within 30 days of the date of this letter. If changes are needed to the safety analysis report, the staff requests that the RAI response include the proposed wording changes.

Docket No. 052-0024

eRAI Tracking No. 672 and 674

Enclosure:
Request for Additional Information

If you have any questions or comments concerning this matter, I can be reached at 301-415-3104 or by e-mail at michael.eudy@nrc.gov.

Sincerely,

/RA/

Michael Eudy, Project Manager
ESBWR/ABWR Projects Branch 2
Division of New Reactor Licensing
Office of New Reactors

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Enclosure:
Request for Additional Information

cc:
Distribution:
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ADAMS Accession No. ML082810107 NRO-002

OFFICE	EEB/TR	EEB/BC	NGE2/PM	OGC	NGE2/L-PM
NAME	APal	RJenkins	MEudy	SBrock	MTonacci
DATE	8/5/08	9/5/08	9/10/08	9/15/08	10/7/08

***Approval captured electronically in the electronic RAI system.**

OFFICIAL RECORD COPY

Grand Gulf, Unit 3 COLA
Entergy Operations, Inc.
Docket No. 52-024
SRP Section: 8.2 - Offsite Power Systems
FSAR Application Section: 8.2

QUESTIONS

08.02-1

Since all Grand Gulf units share the same switchyard, the offsite power system provided for Grand Gulf should have sufficient capacity and capability to safely shutdown all units. Operational experience as documented in various NRC generic communications (e.g., NRC Generic Letter 2007-01, “Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients” NRC Information Notice 98-07, “Offsite Power Reliability Challenges from Industry Deregulation,” and NRC Information Notice 95-37, “Inadequate Offsite Power Voltages During Design-Basis Events”) have shown the need to demonstrate that the offsite power system operation can support equipment important to safety in order to avoid plant transients.

For example, NRC Generic Letter 2006-02, Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power, states that, “For NPPs licensed in accordance with the GDC in Appendix A to 10 CFR Part 50, the design criteria for onsite and offsite electrical power systems are provided in GDC 17… which requires, among other things, that an offsite electric power system be provided to permit the functioning of certain SSCs important to safety in the event of anticipated operational occurrences.”

The staff requests that the applicant discuss the capacity and capability of the offsite system (i.e., the 500 kV lines and associated switchyard equipment) to mitigate the consequences of anticipated abnormal operational occurrences associated with unit operation.

08.02-2

COL Section 8.2.2.1.2, "Transmission System Monitoring and Analysis," discusses inspection, maintenance, and monitoring of switchyard components. The staff requests that the applicant discuss the industry (FERC, NERC, and IEEE) standards that will be followed for switchyard protection system, monitoring, maintenance and testing.

08.02-3

Section 8.2.2.1.1 states that, “The analysis included worst case disturbances, as a result of a single event, such as loss of the largest generation capacity supplying the grid; removal of the largest load from the grid; and loss of the most critical transmission line.” As referenced in SRP Section 8.2, operating experience has indicated that Palo Verde Nuclear Generating Station lost offsite power and all three units tripped on June 14, 2004. As a result of this operating experience, the staff requests the applicant to clairify whether the stability analysis identified for the Grand Gulf switchyard included tripping of both nuclear units. If the stability analysis did not include tripping of both nuclear units, then

the staff requests that the applicant provide a discussion (including failure mode and effect analysis) of why an event similar to Palo Verde will not cause the loss of both units at Grand Gulf Station; or, provide a discussion illustrating that there will be no impact to grid stability should such an event occur.

08.02-4

Section 8.2.2.1 established maximum and minimum switchyard voltage limits of 525 kV and 491 kV. The staff requests that the applicant explain how these limits are established. In addition, please confirm that these voltage limits are acceptable for auxiliary power system equipment operation including safety-related battery chargers and safety-related uninterruptible power supplies during different operating conditions. The confirmation should include the following (assumptions, acceptance criteria, and summary of results) load flow analysis (bus and load terminal voltages of the station auxiliary system), short circuit analysis, equipment sizing studies, protective relay setting and coordination, motor starting with minimum and maximum grid voltage conditions. A separate set of calculations should be performed for each available connection to offsite power supply. In addition, please include a discussion of how the results of the calculations will be verified.

08.02-5

Section 8.2.2.1.2 states that compliance with GDC 18 is achieved by designing testability and inspection capability into the system and then implementing a comprehensive testing and surveillance program. The staff requests that the applicant provide details regarding the testing and surveillance program for offsite power system components with respect to GDC 18.

08.02-6

Section 8.2.2.1.1 states that grid frequency must be maintained between 57 and 61.8 Hz. The staff requests that the applicant discuss how the auxiliary power system studies consider the combined effect of frequency and voltage variation on the operation of auxiliary power system equipment including safety-related battery chargers and safety-related UPS.

08.02-7

FSAR Chapter 1, Table 1.9-201, “Conformance with Standard Review Plan,” for SRP Section 8.2, indicates GDC-5 is not applicable. The ESBWR DCD, Rev. 4, Section 8.2.2.2 states that the ESBWR Reference Plant is designed as a single-unit plant; therefore, GDC-5 is not applicable. However, the staff notes that Grand Gulf Unit 3 switchyard is shared with Grand Gulf Unit 1; and therefore, GDC-5 is applicable. The staff requests that the applicant address this issue and provide a discussion on how they meet GDC-5.

08.02-8

FSAR Chapter 1, Table 1.9-201, “Conformance with Standard Review Plan,” for SRP Section 8.2, indicates GDC-4 is not applicable. However, RG-1.206 call for the applicant to demonstrate conformance with GDC-4. The staff requests that the applicant provide a discussion on how they meet GDC-4 or provide regulatory basis for not meeting GDC-4.

08.02-9

FSAR Chapter 1, Table 1.9-201, “Conformance with Standard Review Plan,” for SRP Section 8.2, indicates that GDC-2 is not applicable. However, RG-1.206 calls for the applicant to demonstrate conformance with GDC-2. The staff requests that the applicant clarify their conformance with GDC-2 as it relates to structures, systems, and components of the offsite power systems being capable of withstanding the effects of natural phenomena (excluding seismic, tornado, and flood) without the loss of the capability to perform their safety functions or provide regulatory basis for not conforming to GDC-2.

08.02-10

COL application, Chapter 1, Table 1.9-201, “Conformance with Standard Review Plan,” for SRP Section BTP 8-5, indicates that BTP 8-5, “Supplemental Guidance for Bypass and Inoperable Status Indication for Engineered Safety Features System,” is not applicable. However, the ESBWR DCD, Rev. 4, Section 8.3.2.2.2 indicates that BTP ICSB 21, “Supplemental Guidance for Bypass and Inoperable Status Indication for Engineered Safety Features System,” is applicable. Please note that BTP ICSB 21 has been renamed as BTP 8-5. The staff requests that the applicant modify Table 1.9-201 to indicate BTP 8-5 is applicable.

08.02-11

COL application, Chapter 1, Table 1.9-201, “Conformance with Standard Review Plan” for SRP Section BTP 8-6, indicates that BTP 8-6, “Adequacy of Station Electric Distribution System Voltage,” is not applicable. However, the ESBWR DCD, Rev. 4, Section 8.3.1.1.2 indicates that BTP PSB 1, “Adequacy of Station Electric distribution System Voltage,” is applicable. Please note that BTP PSB 1 has been renamed as BTP 8-6. The staff requests that the applicant modify Table 1.9-201 to indicate BTP 8-6 is applicable.

08.02-12

The ESBWR DCD, Rev. 4, Section 8.2.3 states that a station ground grid is provided consisting of a ground mat below grade at the switchyard that is connected to the foundation embedded loop grounding system provided for the entire power block and associated buildings. However, the Grand Gulf Station ground grid consists of switchyard ground grid, existing Unit 1 ground grid and new Unit 3 ground grid. The staff requests that the applicant discuss the interface and impact of station grounding due to addition of Unit 3 ground grid to the existing station ground consisting of switchyard and Unit 1 grounding. Please also provide a summary description of the existing grounding system at the Grand Gulf and the proposed grounding of the Unit 3 to achieve a single point ground at the site.

08.02-13

SRP 8.2 (III.1.I) identifies the need to address provisions for surge protection and lightning protection. However, staff review of Chapter 8 has not identified that these issues were addressed. The staff

requests that the applicant provides a discussion about the surge protection and lightning protection with respect to the offsite power system or justify an alternative approach.

08.02-14

COL Section 8.2.1.1 states that the GGNS 500 kV switching station is common to Units 1 and 3. The staff requests that the applicant confirm that they will be performing an evaluation regarding any effects on the operation (minimum and maximum grid voltage, degraded voltage, etc.) of the existing nuclear units due to addition of Unit 3 to the existing grid.

08.02-15

COL Section 8.2.1.2.1.1 states that there are two sources of power from 6.9 kV Plant Investment Protection (PIP) buses for the normal preferred switchyard power center and alternate preferred switchyard power center as shown on the ESBWR DCD, Rev. 4, Figure 8.1-1. The ESBWR DCD, Rev. 4, Section 8.2.3 requires that these cables are routed in separate raceways. The staff requests that the applicant confirm that two sources of ac power from the 6.9 kV Plant Investment Protection buses for normal preferred switchyard power center and alternate preferred switchyard power center are routed in separate raceways.

Grand Gulf, Unit 3 COLA
Entergy Operations, Inc.
Docket No. 52-024
SRP Section: 08.03.02 - DC Power Systems (Onsite)
Application Section: 8.3.2.1.1

08.03.02-1

Supplement (GGNS SUP 8.3.2) to Section 8.3.2.1.1 states that training and procedures to mitigate a station blackout (SBO) event are implemented in accordance with Sections 13.2 and 13.5. According to NUMARC 87-00 which is endorsed by RG 1.155, the SBO response procedures include (1) Station Blackout Response Guidelines, (2) AC Power Restoration, and (3) Severe Weather Guidelines. The staff requests that the applicant confirm that their specific SBO procedures and training will cover all three of the above identified procedures.