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

February 14, 2012

Vice President, Operations
Entergy Operations, Inc.
Grand Gulf Nuclear Station
P.O. Box 756
Port Gibson, MS 39150

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 – REQUEST FOR ADDITIONAL INFORMATION FOR THE STEAM DRYER EVALUATION RE: EXTENDED POWER UPRATE LICENSE AMENDMENT REQUEST (TAC NO. ME4679)

Dear Sir or Madam:

By application dated September 8, 2010 (Reference 1), as supplemented by letters dated November 18, 2010 (Reference 2), November 23, 2010 (Reference 3), February 23, 2011 (four letters, References 4, 5, 6, and 7), March 9, 2011 (two letters, References 8) and 9, March 22, 2011 (Reference 10), March 30, 2011 (Reference 11), March 31, 2011 (Reference 12), April 14, 2011 (Reference 13), April 21, 2011 (Reference 14), May 3, 2011 (Reference 15), May 5, 2011 (Reference 16), May 11, 2011 (Reference 17), June 8, 2011 (Reference 18), June 15, 2011 (Reference 19), June 21, 2011 (Reference 20) June 23, 2011 (Reference 21), July 6, 2011 (Reference 22), July 28, 2011 (Reference 23), August 25, 2011 (Reference 24), August 29, 2011 (Reference 25), August 30, 2011 (Reference 26), September 2, 2011 (Reference 27), September 9, 2011 (Reference 28), September 12, 2011 (Reference 29), September 15, 2011 (Reference 30), September 26, 2011 (Reference 31), October 10, 2011 (two letters, References 32 and 33), October 24, 2011 (Reference 34), November 14, 2011 (Reference 35), November 25, 2011 (Reference 36), November 28, 2011 (Reference 37), December 19, 2011 (Reference 38), and February 6, 2012 (Reference 39), Entergy Operations, Inc. (Entergy, the licensee), submitted a license amendment request for Grand Gulf Nuclear Station, Unit 1 (GGNS). Portions of the letters dated September 8 and November 23, 2010, and February 23, April 21, May 11, July 6, July 28, September 2, October 10, November 14, November 25, and November 28, 2011, and February 6, 2012 contain sensitive unclassified non-safeguards information (proprietary) and, accordingly, have been withheld from public disclosure. The proposed amendment requests an increase in the maximum steady-state power level at GGNS from 3898 megawatts thermal (MWt) to 4408 MWt. This represents an approximate 13 percent increase above the current licensed thermal power or an approximate 15 percent increase above the original licensed thermal power.

The U.S. Nuclear Regulatory Commission (NRC) staff has determined that the following additional information is needed for the NRC staff to complete our review of this amendment. This enclosed request for additional information (RAI) pertaining to the steam dryer evaluation was discussed with Mr. Jerry Burford of your staff on January 21, 2012, and it was agreed that a

NOTICE: Enclosure 1 to this letter contains Proprietary Information. Upon separation from Enclosure 1, this letter is DECONTROLLED.

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response to all RAIs would be provided by February 15, 2012. The NRC staff's proprietary version of the RAI is provided in Enclosure 1 and a nonproprietary version is provided in Enclosure 2. A list of references is provided in Enclosure 3.

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.

Sincerely,

Alan Wang

Alan B. Wang, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosure:
1. Request for Additional Information (proprietary)
2. Request for Additional Information (non-proprietary)
3. List of References

cc w/Encl 2 and 3: Distribution via Listserv

ENCLOSURE 2 (NON-PROPRIETARY)

REQUEST FOR ADDITIONAL INFORMATION

STEAM DRYER EVALUATION

GRAND GULF NUCLEAR STATION, UNIT NO. 1

EXTENDED POWER UPRATE LICENSE AMENDMENT REQUEST

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-416

REQUEST FOR ADDITIONAL INFORMATION

STEAM DRYER EVALUATION

GRAND GULF NUCLEAR STATION, UNIT NO. 1

EXTENDED POWER UPRATE LICENSE AMENDMENT REQUEST

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-416

By letter dated September 8, 2010, as supplemented (see Enclosure 3), Entergy Operations, Inc. (Entergy), submitted a license amendment request (LAR) for the Grand Gulf Nuclear Station, Unit No. 1 (GGNS). The proposed amendment requests an increase in the maximum steady-state power level at GGNS from 3898 megawatts thermal (MWt) to 4408 MWt. This represents an approximate 13 percent increase above the current licensed thermal power or an approximate 15 percent increase above the original licensed thermal power.

The U.S. Nuclear Regulatory Commission (NRC) staff's review of the LAR has identified areas regarding the steam dryer for which additional information is required for the NRC staff to complete its review. Please note that the staff has determined that portions of this request for additional information (RAI) contain sensitive unclassified non-safeguards information (proprietary) and, accordingly, those portions of the RAI identified by text enclosed within double brackets have been withheld from public disclosure.

EMCB-GGNS1-SD-4-RAI-01
Rebenchmarking of PBLE and Clean Reanalysis

(a) Based on examining the images and cutaway views of the Quad Cities Unit 2 (QC2) benchmarking model provided by General Electric - Hitachi (GEH) during staff interviews at GEH-Wilmington on December 7, 2011, the NRC staff can no longer confirm the conservatism of the plant based load evaluation (PBLE) approach using a [redacted] and its accompanying bias errors and uncertainties. Many of the acoustic elements in the QC2 benchmark are too large to resolve adequately frequencies up to [redacted] while maintaining a minimum of [redacted] Also, the main steam line (MSL) nozzle regions are under-resolved, may be inaccurate and several inconsistencies between the acoustic model and structural models have been identified. The current [redacted] frequency benchmarking is limited to frequencies [redacted] Finally, many regions in the model appear to use only [redacted] between adjacent dryer bank regions, which cannot accurately resolve acoustic loads.

The licensee is therefore requested to provide:

- An updated QC2 PBLE benchmark that satisfies acoustic mesh resolution requirements, is shown to be converged in spatially narrow regions (such as those within the dryer) and over [redacted], and is shown to

resolve previously provided LMS concerns about meshing errors and discrepancies between the acoustic and structural finite element (FE) models. The revised QC2 acoustic model should be consistent with the model developed for the GGNS and Susquehanna Steam Electric Station (SSES) calculations. Benchmarks for both [redacted] PBLE approaches should be revised.

[redacted] plots of QC2 dryer surface pressures, delta pressures for locations where inner and outer pressure transducers are available, and accompanying low frequency (LF), high frequency (HF), and [redacted] bias errors and uncertainties for [redacted] and [redacted] PBLE calculations.

- Plots of the updated [redacted] terms for the revised QC2 benchmark.

The licensee is also requested to apply their updated QC2 [redacted] PBLE approach to demonstrate its conservatism (including bias errors and uncertainties) to the GGNS valid prototype- the SSES replacement dryer. This updated calculation should be performed using a converged, accurate SSES PBLE acoustic model, with mesh resolution satisfying the [redacted] requirement, accurate MSL nozzle representations, and an appropriately [redacted] The licensee should confirm that the resulting SSES PBLE bias errors and uncertainties are bounded by the QC2 benchmark bias errors and uncertainties. If they are not bounded, the licensee should provide an updated set of bias errors and uncertainties for the [redacted] PBLE that bound the worst-case conditions from both the QC2 and SSES benchmarks.

Finally, the licensee is requested to update its FE stress modeling bias error and uncertainty calculations using end-to-end benchmarking of both the QC2 and SSES instrumented dryer datasets. Worst-case bias errors and uncertainties should be provided based on the re-benchmarking.

(b) Following the resolution of part (a) above, the licensee is requested to provide a clean reanalysis of the GGNS dryer as there are many errors noted in QC2 benchmark as well as GGNS to capture the integrated cumulative effect of the errors rather than addressing individual effects as some of the effects may not be linear or fully captured by superposition of the linear effects..

EMCB-GGNS1-SD-4-RAI-02
MSL Strain Gage Bias Errors

The licensee is requested to provide a detailed description of the bias errors and uncertainties (including actual values) of the strain gages used for the QC2, SSES, and GGNS MSL acoustic pressure measurements and how they are accounted for in the PBLE benchmarking and in the GGNS dryer analysis. In particular, the licensee is requested to explain the ramifications [redacted] The licensee is asked to [redacted]

[redacted] Finally, the licensee is requested to address how these errors affect the PBLE benchmarking and the GGNS dryer stress calculations.

EMCB-GGNS1-SD-4-RAI-03
Stresses near partial penetration welds in the GGNS and SSES dryers

The licensee is requested to provide a full accounting of all errors in alternating stress calculations made near welds in the GGNS and SSES dryer, and in particular near partial penetration welds. For GGNS, the licensee is requested to provide a complete list of any dryer design changes, including weld changes that were specified to reduce alternating stresses below 50 percent of the American Society of Mechanical Engineers (ASME) alternating stress limits.

EMCB-GGNS1-SD-4-RAI-04
Solid to Shell Transition Interface Modeling (Follow-Up to Action Item #5)

In response to Action Item #5 (letter GNRO-2011/00088 dated October 10, 2011; Reference 32), the licensee explains how it determined the [redacted] based on a study of [redacted] The response appears to be acceptable as it shows that for the [redacted] would modify the steam dryer structure and makes it stiffer at the shell-solid interface, and may affect the steam dryer overall structural response. For solid-shell transition interface modeling, the ANSYS general purpose FE program does have an option to use constraint equations with *Command CEINTF*. In addition, ANSYS has another option for modeling shell-solid assembly as described in Section 9.2, *Modeling a Shell-Solid Assembly*, of ANSYS Documentation, Release 11. The licensee is requested to confirm whether the use of these options provides the steam dryer stresses that are similar to the ones obtained using the [redacted]

EMCB-GGNS1-SD-4-RAI-05
Dryer Inspection Plan (Follow-up RAI 8)

a. In response to RAI 8(a)(ii) in the previous round of RAIs, the licensee stated that the steam dryer inspection plan includes a detailed inspection of the dryer in order to identify potential problems related to fabrication. The NRC staff requests that the licensee explain whether the inspection plan would include inspection of the partial penetration welds. Also explain whether industry operating experience includes any fatigue cracking of partial penetration welds. The licensee is also requested to provide the root cause report for SSES (which is prototype for GGNS) steam dryer cracking (fatigue cracking of seismic block-support ring area).

b. In response to RAI 8(b), the licensee states that it will follow the inspection recommendations of the Boiling Water Reactor Vessel Internals Program (BWRVIP)-139, "Steam Dryer Inspection and Flaw Evaluation Guidelines," and consider the detailed inspection results (mentioned above in (a) above) in

developing the re-inspection plan for the GGNS Replacement Steam Dryer (RSD). The licensee is requested to quantify the re-inspection frequency. The licensee is also requested to explain whether the re-inspection frequency and scope would be adequate for a timely detection of high-cycle fatigue cracks, which may take place within the first three or four cycles of operation or after as long as 16 years of operation as described in General electric Service Information Letter, SIL No. 644, Rev. 2 (P. 3, *BWR/5-Style Dryer Observation*).

EMCB-GGNS1-SD-4-RAI-06
Partial Penetration Welds (Follow-Up RAI 9)

a. In response to RAI 9(a) in the previous round of RAIs, the licensee states that the weld fatigue factors are discussed in Subsections 3.3.4.3 and 3.3.4.4 of NEDC-33601P, "Grand Gulf Steam Dryer Fatigue Stress Analysis Using PBLE Methodology" (a non-proprietary version, designated as NEDO-33601, is available in Reference 1). The NRC staff does not find any discussion of fatigue factors in these sections, but it does find it in Section 3.3.2.2.3 of NEDC-33601, which discusses fatigue factors for [redacted] but not partial penetration welds. In addition, Section 4.2 of Appendix E, NEDC-33601, states, "The weld types of relevance for the steam dryer analysis are [redacted]" and discusses weld factors for these two types of welds. Figure 4.2-1 of Appendix F only refers to these two types of welds. The lack of discussion on partial penetration welds provides a false impression that the fatigue assessment of these welds is not important for the structural integrity of the RSD. The NRC staff therefore requests that the licensee modify Section 3.3.2.2.3 of NEDC-33601 and Section 4.2 and Figure 4.2-1 of Appendix F by discussing the fatigue factor for partial penetration welds.

b. The response to RAI 9(c) in the previous round of RAIs states that all partial penetration welds in the RSD have been evaluated and only one weld was not analyzed in accordance with the response to RAI 9(b) in the previous round of RAIs. The licensee is requested to explain how many partial penetration welds are in the RSD, what are the plate thicknesses at these locations and any applicable undersize factors.

EMCB-GGNS1-SD-4-RAI-07.
Assessment of FE Modeling Bias and Uncertainty (SSES Dryer Hammer Test Data)

RAI deleted from GGNS RAI scope.

EMCB-GGNS1-SD-4-RAI-08.
GGNS Steam Dryer Finite Element Model Verification

(i) The licensee is requested to perform a thorough re-verification of the FE models (global model, sub-models, and shell-to-solid transition areas) used in the steam dryer analysis for GGNS and confirm that in the FE models used in the steam dryer analysis for GGNS: (a) all nodes are appropriately connected; (b) nodes

that are supposed to be connected are not left free inadvertently, and the load path is not shifted away from the critical areas; (c) in case that there are any unconnected nodes, the licensee is requested to provide a description of such locations and the impact on the GGNS steam dryer stresses at EPU conditions.

(ii) The licensee is also requested to verify and confirm that the quality of the FE mesh (shape or aspect ratios) is acceptable to ensure that there are no regions with poor mesh quality in the global model, in the submodels, and in shell-to-solid transition areas of the GGNS steam dryer FE model. In case that there is a poor quality mesh, the licensee is requested to provide a description of the impact on the GGNS steam dryer stresses at EPU conditions.

(iii) The licensee is further requested to provide a summary of the results from the FE model mesh density convergence studies, used in the steam dryer analysis for GGNS, to validate proper stress convergence.

EMCB-GGNS1-SD-4-RAI-09
Instrumenting the Steam Dryer

The NRC staff notes that the licensee is planning to instrument the GGNS RSD. The licensee is requested to provide a strong, technically sound, defensible, and convincing justification for the type, number, location, and redundancy of instruments to be used on the steam dryer. The licensee is also requested to provide the calibration and measurement errors associated with the instruments. In addition, the licensee is requested to describe (1) how the PBLE validation will be made using the actual GGNS plant data at various power plateaus during power ascension using MSL and on-dryer instrument data, particularly pressure differences between internal and external sensors; (2) how the validation of the overall end-to-end strain calculations will be made using the structural FE model based on actual GGNS plant data at various power plateaus during power ascension using loads derived from [redacted] instrument data, and (3) how the maximum fatigue stress location and magnitude will be determined during power ascension.

EMCB-GGNS1-SD-4-RAI-10
Reference to ESBWR LTRs

The Economic Simplified Boiling Water Reactor (ESBWR) Licensing Topical Reports (LTRs) will be revised due to recently identified errors. In addition, the GGNS EPU LAR predates the approval dates of the ESBWR LTRs. The review of PBLE methodology will be a plant-specific review for the GGNS application. Therefore the licensee is requested to remove the following references to ESBWR LTRs, as noted in Attachment 11B of GGNS's LAR (Reference 1): Appendix B, NEDC-33408P, Revision 1: 'ESBWR Steam Dryer - Plant Based Load Evaluation Methodology', June 2009; Appendix C, NEDC-33408P, Supplement 1, Revision 2, "ESBWR Steam Dryer - Plant Based Load Evaluation Methodology," July 2010; and Appendix D, NEDC-33436P, Revision 0, "GEH Boiling Water Reactor Steam Dryer - Plant Based Load Evaluation Methodology," November 2008.

EMCB-GGNS1-SD-4-RAI-11
Repair/Rework of the Replacement Steam Dryer

The NRC staff notes that the GGNS RSD is being modified at several partial penetration weld locations. The licensee is requested to describe which quality control and other measures are implemented to ensure that these locations do not become locations for intergranular stress corrosion cracking (IGSCC), due to any cold work and residual stresses that could grow under fatigue loading. Therefore, the staff also requests the licensee to describe whether the requirements addressed in the topical reports BWRVIP-84, "BWR Vessel and Internals Project, Guidelines for Selection and Use of Materials for Repairs to BWR Internal Components," October 2000, and BWRVIP-181, "BWR Vessel and Internals Project, Steam Dryer Repair Design Criteria," November 2007, will be followed during the repair of the steam dryers.

EMCB-GGNS1-SD-4-RAI-12
Dryer Stress: Analysis versus Operating Dryer Cracking Experience

Fatigue cracking was observed in the SSES steam dryer (which is a prototype for GGNS) near the dryer support. The licensee is requested to describe what was deficient in the FE modeling at that location of the SSES dryer in order that the dynamic FE stress analysis did not predict high alternating stresses to cause a fatigue crack. The licensee is requested to provide the fatigue stress at the cracked location. The NRC staff notes that the licensee made design improvements to the GGNS dryer at the location corresponding to the SSES steam dryer. However, the licensee is requested to describe whether a similar deficiency is present at one or more locations in the GGNS dryer. The staff requests that the licensee review the FE model of the GGNS dryer by comparing it with the design drawings to confirm whether the deficiency similar to that of the SSES steam dryer model is present at any location in the GGNS dryer. If present, the licensee is requested to explain how the deficiency in the GGNS steam dryer FE model will be corrected.

EMCB-GGNS1-SD-4-RAI-13
VPF Loading

In response to Audit Action Item 7 regarding the vane passing frequency (VPF), the licensee states that based on the test results for SSES steam dryer, it is found that [redacted]

The licensee is requested to provide response to the following.

a. Since the GGNS has a constant speed recirculation pump and its VPF frequency is different from those for SSES, the licensee is requested to explain why the finding regarding the VPF loads based on the SSES test results is applicable to GGNS.

b. Although [redacted], it acts at different locations on the dryer and its contribution to the dryer dynamic stresses may not be small. The licensee is requested to provide justification to substantiate that [redacted]

ENCLOSURE 3 - REFERENCES

1. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "License Amendment Request, Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated September 8, 2010 (GNRO-2010/00056) (ADAMS Accession No. ML102660409).

2. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Supplemental License Amendment Request, Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated November 18, 2010 (GNRO-2010/00071) (ADAMS Accession No. ML103260003).

3. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Supplemental License Amendment Request, Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated November 23, 2010 (GNRO-2010/00073) (ADAMS Accession No. ML103330146).

4. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated February 23, 2011 (GNRO-2011/00007) (ADAMS Accession No. ML110540534).

5. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated February 23, 2011 (GNRO-2011/00012) (ADAMS Accession No. ML110540540).

6. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated February 23, 2011 (GNRO-2011/00011) (ADAMS Accession No. ML110540545).

7. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated February 23, 2011 (GNRO-2011/00013) (ADAMS Accession No. ML110550318).

8. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated March 9, 2011 (GNRO-2011/00017) (ADAMS Accession No. ML110680507).

9. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated March 9, 2011 (GNRO-2011/00016) (ADAMS Accession No. ML110730025).

10. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated March 22, 2011 (GNRO-2011/00019) (ADAMS Accession No. ML110820262).

11. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated March 30, 2011 (GNRO-2011/00018) (ADAMS Accession No. ML110900275).

12. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated March 31, 2011 (GNRO-2011/00021) (ADAMS Accession No. ML110900586).

13. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated April 14, 2011 (GNRO-2011/00024) (ADAMS Accession No. ML111050134).

14. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated April 21, 2011 (GNRO-2011/00025) (ADAMS Accession No. ML111120329).

15. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated May 3, 2011 (GNRO-2011/00034) (ADAMS Accession No. ML111240288).

16. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated May 5, 2011 (GNRO-2011/00035) (ADAMS Accession No. ML111250552).

17. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated May 11, 2011 (GNRO-2011/00037) (ADAMS Accession No. ML111320263).

18. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated June 8, 2011 (GNRO-2011/00043) (ADAMS Accession No. ML111590836).

19. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated June 15, 2011 (GNRO-2011/00046) (ADAMS Accession No. ML111670059).

20. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated June 21, 2011 (GNRO-2011/00050) (ADAMS Accession No. ML111730235).

21. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated June 23, 2011 (GNRO-2011/00052) (ADAMS Accession No. ML111750244).

22. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated July 6, 2011 (GNRO-2011/00053) (ADAMS Accession No. ML111880138).

23. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated July 28, 2011 (GNRO-2011/00055) (ADAMS Accession No. ML112101485).

24. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated August 25, 2011 (GNRO-2011/00070) (ADAMS Accession No. ML112370770).

25. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated August 29, 2011 (GNRO-2011/00073) (ADAMS Accession No. ML112410566).

26. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Supplemental Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated August 30, 2011 (GNRO-2011/00074) (ADAMS Accession No. ML112420169).

27. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Supplemental Information Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated September 2, 2011 (GNRO-2011/00075) (ADAMS Accession No. ML112490050).

28. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Supplemental Information Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated September 9, 2011 (GNRO-2011/00033) (ADAMS Accession No. ML112521284).

29. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated September 12, 2011 (GNRO-2011/00079) (ADAMS Accession No. ML112550495).

30. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated September 15, 2011 (GNRO-2011/00080) (ADAMS Accession No. ML112580223).

31. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated September 26, 2011 (GNRO-2011/00082) (ADAMS Accession No. ML112690143).

32. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated October 10, 2011 (GNRO-2011/00087) (ADAMS Accession No. ML112840155).

33. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated October 10, 2011 (GNRO-2011/00088) (ADAMS Accession No. ML112840171).

34. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Supplemental Information Pertaining to Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated October 24, 2011 (GNRO-2011/00092) (ADAMS Accession No. ML112980113).

35. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated November 14, 2011 (GNRO-2011/00101) (ADAMS Accession No. ML113190403).

36. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated November 25, 2011 (GNRO-2011/00105) (ADAMS Accession No. ML113290137).

37. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated November 28, 2011 (GNRO-2011/00107) (ADAMS Accession No. ML113320403).

38. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated December 19, 2011 (GNRO-2011/00111) (ADAMS Accession No. ML113530656).

39. Krupa, M. A., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Additional Information Regarding Extended Power Uprate, Grand Gulf Nuclear Station, Unit 1," dated February 6, 2012 (GNRO-2012/00006) (ADAMS Accession No. ML12039A071).

response to all RAIs would be provided by February 15, 2012. The NRC staff's proprietary version of the RAI is provided in Enclosure 1 and a nonproprietary version is provided in Enclosure 2. A list of references is provided in Enclosure 3.

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.

Sincerely,

/RA/

Alan B. Wang, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosure:
1. Request for Additional Information (proprietary)
2. Request for Additional Information (non-proprietary)
3. List of References

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RidsNrrDeEmcb Resource
RidsNrrDorlLpl4 Resource
RidsNrrLAJBurkhardt Resource
RidsNrrPMGrandGulf Resource
RidsRgn4MailCenter Resource
CBasavaraju, NRR/DE/EMCB

ADAMS Accession Nos.: Pkg ML120400181; Proprietary RAI ML120400213;
Non-Proprietary RAI ML120400216 *RAI memo dated

OFFICE	NRR/DORL/LPL4/PM	NRR/DORL/LPL4/LA	NRR/DE/EMCB/BC	NRR/DORL/LPL4/BC	NRR/DORL/LPL4/PM
NAME	AWang	JBurkhardt	MMurphy*	MMarkley	AWang (LWilkins for)
DATE	2/13/12	2/10/12	1/26/12	2/14/12	2/14/12

OFFICIAL AGENCY RECORD