November 28, 2007

TO: Those on the Enclosed List

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1: REVISION OF SAFETY EVALUATION RELATED TO LICENSE AMENDMENT NO. 177 (TAC NO. MD3469)

Dear Sir or Madam:

On October 24, 2007, the U.S. Nuclear Regulatory Commission (NRC) issued License Amendment No. 177 for the Grand Gulf Nuclear Station, Unit 1. The NRC staff's related safety evaluation (SE) was enclosed with the amendment. A copy was distributed to you by mail.

The NRC staff has determined that a portion of the information contained in the SE should not have been included in the SE. The NRC staff has subsequently removed the information and revised the SE. The revised SE is available in its entirety under Agencywide Documents Access and Management System (ADAMS) Accession No. ML073190250.

In an effort to control further dissemination of the information that was inadvertently placed in the SE that was mailed to you, please destroy your copy of pages 3 and 4 of the SE, along with any additional copies that were made. Replacement pages 3 and 4 of the SE are enclosed.

Thank you for your assistance in resolving this matter. If you have any questions regarding this letter, please contact me at (301) 415-3308 or via e-mail at bkv@nrc.gov.

Sincerely,

/RA/

Bhalchandra Vaidya, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosures: 1. List of Recipients of October 24, 2007, letter
2. Revised SE pages 3 and 4

November 28, 2007

TO: Those on the Enclosed List

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1: REVISION OF SAFETY EVALUATION RELATED TO LICENSE AMENDMENT NO. 177 (TAC NO. MD3469)

Dear Sir or Madam:

On October 24, 2007, the U.S. Nuclear Regulatory Commission (NRC) issued License Amendment No. 177 for the Grand Gulf Nuclear Station, Unit 1. The NRC staff's related safety evaluation (SE) was enclosed with the amendment. A copy was distributed to you by mail.

The NRC staff has determined that a portion of the information contained in the SE should not have been included in the SE. The NRC staff has subsequently removed the information and revised the SE. The revised SE is available in its entirety under Agencywide Documents Access and Management System (ADAMS) Accession No. ML073190250.

In an effort to control further dissemination of the information that was inadvertently placed in the SE that was mailed to you, please destroy your copy of pages 3 and 4 of the SE, along with any additional copies that were made. Replacement pages 3 and 4 of the SE are enclosed.

Thank you for your assistance in resolving this matter. If you have any questions regarding this letter, please contact me at (301) 415-3308 or via e-mail at bkv@nrc.gov.

Sincerely,

/RA/

Bhalchandra Vaidya, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosures: 1. List of Recipients of October 24, 2007, letter
2. Revised SE pages 3 and 4

DISTRIBUTION:

PUBLIC	RidsNrrDorlDpr	RidsOgcRp
LPLIV r/f	RidsNrrDorlLpl4	RidsRgn4MailCenter
RidsAcrsAcnwMailCenter	RidsNrrLAJBurkhardt	PLien, NRR/SRXB
RidsNrrDirsItsb	RidsNrrPMBVaidya	
RidsNrrDeEicb(WKemper)	RidsNrrDssSrxb(GCranston)	

ADAMS Accession No. ML073190201

OFFICE	NRR/LPL4/PM	NRR/LPL4/LA	NRR/LPL4/BC
NAME	BVaidya	JBurkhardt	THiltz
DATE	11/28/07	11/28/07	11/28/07

OFFICIAL RECORD COPY

Letter to the Recipients on the Enclosed List dated November 28, 2007.

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1: REVISION OF SAFETY

EVALUATION RELATED TO LICENSE AMENDMENT NO. 177
(TAC NO. MD3469)

Mr. William R. Brian
Site Vice President
Grand Gulf Nuclear Station
Entergy Operations, Inc.
P.O. Box 756
Port Gibson, MS 39150

Senior Vice President
Entergy Nuclear Operations
P.O. Box 31995
Jackson, MS 39286-1995

Senior Vice President and COO
Entergy Operations, Inc.
P.O. Box 31995
Jackson, MS 39286-1995

Vice President, Operations Support
Entergy Services, Inc.
P.O. Box 31995
Jackson, MS 39286-1995

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

Director, Nuclear Safety & Licensing
Entergy Services, Inc.
440 Hamilton Avenue
White Plains, NY 10601

Director, Nuclear Safety Assurance
Entergy Operations, Inc.
P.O. Box 756
Port Gibson, MS 39150

Senior Manager, Nuclear Safety & Licensing
Entergy Services, Inc.
P.O. Box 31995
Jackson, MS 39286-1995

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

State Health Officer
State Health Board
P.O. Box 1700
Jackson, MS 39215

Attorney General
Asst. Attorney General
State of Mississippi
P.O. Box 22947
Jackson, MS 39225-2947

Office of the Governor
State of Mississippi
Jackson, MS 39201

Attorney General
Department of Justice
State of Louisiana
P.O. Box 94005
Baton Rouge, LA 70804-9005

President
Claiborne County
Board of Supervisors
P.O. Box 339
Port Gibson, MS 39150

Mr. Richard Penrod, Senior Environmental
Scientist/State Liaison Officer
Office of Environmental Services
Northwestern State University
Russell Hall, Room 201
Natchitoches, LA 71497

Chief, Energy and Transportation Branch
Environmental Compliance and
Enforcement Division
Mississippi Department of Environmental
Quality
P.O. Box 10385
Jackson, MS 39289-0385

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
P.O. Box 399
Port Gibson, MS 39150

ENCLOSURE 1

ENCLOSURE 2

GRAND GULF NUCLEAR STATION, UNIT 1

REVISED PAGES 3 AND 4 TO

SAFETY EVALUATION DATED OCTOBER 24, 2007,

RELATED TO AMENDMENT NO. 177

November 1, 2006 (Reference 1), the licensee presented its analysis of the proposed TS change, which is summarized below:

- The current SR was originally based on using the P-1 core monitoring system and older design LPRM detector, which experienced drift between calibrations. GGNS currently uses an improved AREVA NP POWERPLEX-III core monitoring system and newer LPRM chambers (NA250 series) which exhibit more consistent sensitivity than older LPRM detectors.

- The uncertainty in the power distribution will remain within the value used in the GGNS minimum critical power ratio (MCPR) safety limit analysis for Cycle 12 operation, dated April 2001 (Reference 2).

- The basis for the extension of the calibration period is that the increase in the uncertainty in the nodal power distribution resulting from LPRM response uncertainty due to the extension of calibration period should not exceed the uncertainty currently assumed in the MCPR safety limit calculation.

Additionally, in response to the U.S. Nuclear Regulatory Commission (NRC) staff's requests for additional information (RAIs), the licensee provided its technical justification regarding extension of the calibration interval from 1000 MWD/T to 2000 MWD/T, and included justification for the 25 percent increase in the interval allowed by TS 3.0.2, which is summarized below:

- The licensee conducted detailed statistical evaluations of the uncertainty in LPRM calibration cases from Cycle 3 to 14 with exposure intervals up to 3000 MWD/T (Reference 1). In the analysis, over 900 points of actual calibration data were used to establish a database of various calibration intervals. Starting from an actual data point as the initial condition, a prediction of calibration current with a specified exposure interval could be made through an exponential decay equation (Reference 4). Comparing the predicted current to the actual calibrated current for the exposure interval, the percentage of deviation was obtained for the exposure interval. Since this method could skip the actual calibration point, more prediction points than actual calibration points were established in the deviation analysis. For data points with a calibration interval from 500 MWD/T to 1500 MWD/T, the relative standard deviation for 1000 MWD/T was obtained as [ ][1] percent. A similar approach was conducted for calibration interval from 1500 MWD/T to 2500 MWD/T and the relative standard deviation was determined to be [ ] percent for 2000 MWD/T (Reference 6). The decay constant used in the decay equation had variations among the 168 LPRMs. The applicant determined detector-specific decay factors for each detector and applied them in the analysis. The increase of the relative standard deviation was [ ] percent. A separate conservative approach used a fixed nominal value for all LPRMs and re-performed a similar analysis. An increase of the relative standard deviation was found to be [ ] percent in this approach.

- These evaluations showed that the equivalent LPRM response uncertainty for the increased calibration interval of 2000 MWD/T would increase the LPRM

[1]The information in [ ] contained the proprietary information and as such has been redacted in this nonproprietary version of SE.

response uncertainty from 3.4 percent to [ ] percent (3.4 percent + [ ] percent), which is less than the 4.3 percent uncertainty limit currently used in calculating radial bundle power distribution for MCPR safety limit analysis. Thus, the radial bundle power uncertainty is maintained and MCPR safety limit results remain unchanged.

- In the application dated November 1, 2006, GGNS also stated that the TS provision of SR 3.0.2 would continue to allow the LPRM calibration interval to be considered met if the calibration was performed within 1.25 times the interval specified, as measured from the previous calibration. Staff requested additional analysis from the licensee for exposure of 2500 MWD/T (2000 MWD/T x 1.25) to ensure the power uncertainty limit of the MCPR calculation was met. With a detector-specific decay factor, the analysis showed a relative standard deviation of [ ] percent with an increase of [ ] percent from an exposure interval of 1000 MWD/T ([ ] percent). With a fixed nominal decay factor, the relative standard deviation was [ ] percent and the increase of relative standard deviation was [ ] percent from an exposure interval of 1000 MWD/T [ ] percent). The increase of relative standard deviation was within 0.9 percent (4.3 percent - 3.4 percent) in the detector-specific decay factor analysis; however, the increase of relative standard deviation exceeded the 0.9 percent limit in the fixed decay factor analysis. The licensee stated in its RAI response (Reference 6), "The LPRM uncertainty results using the detector specific sensitivity values are more appropriate for the evaluation because detector specific sensitivities are used in the GGNS calibration process. Since the greater uncertainties associated with a fixed detector sensitivity are not representative of actual practice, it would be inappropriate and overly conservative to evaluate the effect of an extended calibration interval based upon a fixed detector." The licensee also performed additional analysis with plant calibration data points only (with no extrapolation of skipping actual calibration data) and showed the increase of relative standard deviation of [ ] percent for the detector-specific decay factor analysis and [ ] percent for the fixed decay factor analysis (Reference 6). The small increase ([ ] percent) in the detector-specific decay factor study was due to fewer actual calibration data points available in the exposure interval (2000 MWD/T to 3000 MWD/T), which resulted in a lower relative standard deviation. A linear extrapolation resulted in [ ] percent of relative standard deviation increase. Based on the detector-specific decay factor analysis and conservative fixed decay factor analysis on multiple sampling points (with and without exposure interval extrapolation), the staff has reasonable assurance that the allowance of the 2500 MWD/T calibration interval would not cause violation of the LPRM response uncertainty limit that is currently used in the SLMCPR calculation.

- These analyses have shown that the equivalent LPRM response uncertainty for the increased calibration interval of 2500 MWD/T would increase the LPRM response uncertainty from 3.4 percent to [ ] percent (3.4 percent + [ ] percent), which is less than the 4.3 percent uncertainty limit currently used in calculating radial bundle power distribution for MCPR safety limit analysis. Thus the radial bundle power uncertainty is maintained and MCPR safety limit results remain unchanged.