



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

July 31, 2015

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 - AUDIT OF THE LICENSEE'S  
MANAGEMENT OF REGULATORY COMMITMENTS (TAC NO. MF4450)**

Dear Sir or Madam:

The U.S. Nuclear Regulatory Commission (NRC) informed licensees in Regulatory Issue Summary (RIS) 2000-17, "Managing Regulatory Commitments Made by Power Reactor Licensees to the NRC Staff," dated September 21, 2000, that the Nuclear Energy Institute (NEI) document NEI 99-04, "Guidelines for Managing NRC Commitment Changes," contains acceptable guidance for controlling regulatory commitments. RIS 2000-17 encouraged licensees to use the NEI guidance or similar administrative controls to ensure that regulatory commitments are implemented and that changes to the regulatory commitments are evaluated and, when appropriate, reported to the NRC.

The NRC Office of Nuclear Reactor Regulation has instructed its staff to perform an audit of licensees' commitment management programs once every 3 years to determine whether the licensees' programs are consistent with the industry guidance in NEI 99-04, and that regulatory commitments are being effectively implemented.

An audit of the Grand Gulf Nuclear Station, Unit 1 (GGNS) commitment management program was performed at the plant site in Port Gibson, Mississippi, during August 6-7, 2014. The NRC staff concludes, based on the audit, that Entergy Operations, Inc. (the licensee), has implemented NRC commitments made to the NRC on a timely basis, and has implemented an effective program for managing NRC commitment changes at GGNS. The details of the audit are set forth in the enclosed audit report.

During the audit the NRC staff identified one nonconformance with regards to a Regulatory Commitment made in response to Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems." In a letter dated October 13, 2008, the licensee had committed to evaluate and provide a submittal, as appropriate, to the NRC staff, communicating the need to adopt Technical Specification Task Force (TSTF) Traveler – 523, "Generic Letter 2008-01 Managing Gas Accumulation." This evaluation was to be completed within 90 days of the issuance of the TSTF-523 (approximately end of April 2014). The NRC staff has concluded that this is of low safety significance as discussed in the report. The licensee entered this issue in its corrective action program. By letter dated August 12, 2014, the licensee informed the NRC staff that this review had been completed and the TS change adopting TSTF-523 was submitted on October 7, 2014.

- 2 -

If you have any questions, please contact me at (301) 415-1445 or by e-mail at [Alan.Wang@nrc.gov](mailto:Alan.Wang@nrc.gov).

Sincerely,

A handwritten signature in black ink that reads "Alan Wang". The signature is written in a cursive, flowing style.

Alan B. Wang, Project Manager  
Plant Licensing Branch IV-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosure:  
Audit Report

cc w/encl: Distribution via Listserv



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

**AUDIT REPORT BY THE OFFICE OF NUCLEAR REACTOR REGULATION**

**LICENSEE MANAGEMENT OF REGULATORY COMMITMENTS**

**GRAND GULF NUCLEAR STATION, UNIT NO 1**

**DOCKET NO. 50-416**

**1.0 INTRODUCTION AND BACKGROUND**

The U.S. Nuclear Regulatory Commission (NRC) informed licensees in Regulatory Issue Summary (RIS) 2000-17, "Managing Regulatory Commitments Made by Power Reactor Licensees to the NRC Staff," dated September 21, 2000 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML003741774), that the Nuclear Energy Institute (NEI) document NEI 99-04, "Guidelines for Managing NRC Commitment Changes," contains acceptable guidance for controlling regulatory commitments. RIS 2000-17 encouraged licensees to use the NEI guidance or similar administrative controls to ensure that regulatory commitments are implemented and that changes to the regulatory commitments are evaluated and, when appropriate, reported to the NRC. NEI 99-04 describes a "regulatory commitment" as an explicit statement to take a specific action agreed to, or volunteered by, a licensee by a certain date and submitted in writing on the docket to the NRC.

The NRC Office of Nuclear Reactor Regulation (NRR) has instructed its staff to perform an audit of licensees' commitment management programs once every 3 years to determine whether the licensees' programs are consistent with the industry guidance in NEI 99-04, and that regulatory commitments are being effectively implemented. An audit of the Grand Gulf Nuclear Station, Unit 1 (GGNS) commitment management program was performed at the plant site in Port Gibson, Mississippi, during August 6-7, 2014. The audit reviewed commitments made since the previous audit on August 4-5, 2011 (ADAMS Accession No. ML12228A516).

NRR guidelines direct the NRR Project Manager (PM) to audit the licensee's commitment management program by assessing the adequacy of the licensee's implementation of a sample of commitments made to the NRC in past licensing actions (amendments, reliefs, exemptions, etc.) and activities (bulletins, generic letters, etc.).

**2.0 AUDIT PROCEDURE AND RESULTS**

The audit consisted of three major parts: (1) verification of the licensee's implementation of NRC commitments that have been completed, (2) verification of the licensee's program for managing changes to NRC commitments, and (3) verification that all regulatory commitments reviewed were correctly applied in NRC staff licensing action reviews.

Enclosure

## 2.1 Verification of Licensee's Implementation of NRC Commitments

The primary focus of this part of the audit is to confirm that the licensee has implemented commitments made to the NRC as part of past licensing actions/activities. For commitments not yet implemented, the NRC staff determines whether they have been captured in an effective program for future implementation. The audit also verifies that the licensee's commitment management system includes a mechanism to ensure traceability of commitments following initial implementation. This ensures that licensee personnel are able to recognize that future proposed changes to the affected design features or operating practices require evaluation in accordance with the commitment change control process.

### 2.1.1 Audit Scope

The audit addressed a sample of commitments made during the review period. The audit focused on regulatory commitments (as defined above) made in writing to the NRC as a result of past licensing actions (amendments, exemptions, etc.) or licensing activities (bulletins, generic letters, etc.). Commitments made in Licensee Event Reports or in response to Notices of Violation may be included in the sample, but the review will be limited to verification of restoration of compliance, not the specific methods used. Before the audit, the NRC staff searched ADAMS for the licensee's submittals since the last audit and selected a representative sample for verification.

The audit excluded the following types of commitments that are internal to licensee processes:

- (1) Commitments made on the licensee's own initiative among internal organizational components.
- (2) Commitments that pertain to milestones of licensing actions/activities (e.g., respond to an NRC request for additional information by a certain date). Fulfillment of these commitments was indicated by the fact that the subject licensing action/activity was completed.
- (3) Commitments made as an internal reminder to take actions to comply with existing regulatory requirements such as regulations and technical specifications (TSs). Fulfillment of these commitments was indicated by the licensee having taken timely action in accordance with the subject requirements.

### 2.1.2 Audit Results

GGNS commitments are tracked in accordance with Entergy Operations, Inc. (Entergy, the licensee), Corporate Nuclear Management Manual Procedure EN-LI-110, Revision 4, "Commitment Management Program." The licensee enters commitments made to the NRC using a commitment tracking database called the Licensing Research System (LRS). According to the licensee, the majority of these commitments fall into the category of "One-Time Actions." One-time action commitments are loaded into the database, tracked to implementation, and remain in the database for historical reference. Since the system was created, the licensee has entered more than 36,000 licensee-defined commitments of which at the time of the audit, the licensee was tracking approximately 5300 items in the LRS as regulatory commitments of which 28 were designated as "OPEN" actions items.

The licensee provided the documentation necessary to support the NRC staff's audit in each of the samples selected. The documents included summary sheets providing the status of the commitment and the appropriate backup documentation, as needed (i.e., plant procedures, incoming/outgoing records, and/or other plant documentation). In addition, the NRC staff reviewed two self-assessments.

The NRC staff reviewed documentation generated by the licensee categorized as commitment changes, generic letter responses, relief requests, and amendments, to assess the implementation of the licensee's Procedure EN-LI-110, including the status of their completion. After review of the commitments selected for the audit, the NRC staff found that the licensee's commitment tracking program had captured all of the regulatory commitments and that all of the commitments were met or were on schedule.

To help ensure regulatory commitments dates are met, the licensee stated that it generates a Licensing Status Report (LSR) at the beginning of each week for assigned licensing personnel and the personnel responsible for completing the actions identified. The weekly LSR provides a 2-week look ahead of upcoming actions in the LRS. In addition, occasionally longer term look ahead are generated to help ensure that regulatory commitments are not missed. Periodic assessments, approximately once per year, are performed to evaluate for the compliance with the requirements of the licensee's Procedure EN-LI-110. The licensee stated that while they change the focus of the assessment each year, they check for the consistency of the LRS data entry every assessment. This assures that the process for and entry of regulatory commitments is maintained and accurate. The NRC staff believes that the above processes are important for maintenance of the regulatory commitment tracking process.

The attached Audit Summary also provides details of this portion of the audit and its results.

The NRC staff concluded the licensee's procedure EN-LI-110 conforms to the NEI 99-04 guidelines for commitment tracking, commitment change process, traceability of commitments, and reporting requirements. In general, the licensee followed the process and regulatory commitments were captured, tracked and implemented in a timely manner.

During the audit, the NRC staff identified one nonconformance with regards to a Regulatory Commitment made in response to Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems." In a letter dated October 13, 2008, the licensee had committed to evaluate and provide a submittal, as appropriate, to the NRC staff, communicating the need to adopt Technical Specification Task Force (TSTF) Traveler – 523, "Generic Letter 2008-01 Managing Gas Accumulation." This evaluation was to be completed within 90 days of the issuance of the TSTF-523 (approximately end of April 2014). The NRC staff had concluded that this was of low safety significance as all other actions requested by GL 2008 had been completed and the GL 2008-01 was closed by the staff. The staff, in the closure letter, had noted it was working with the industry regarding an additional TS for managing gas accumulation. Entergy had made this regulatory commitment in response to this staff comment. During the audit, the licensee stated it had entered this issue in its corrective action program. By letter dated August 12, 2014, the licensee informed the staff that

this review had been completed and the TS change adopting TSTF-523 was submitted on October 7, 2014.

While the NRC staff has concluded the regulatory commitments are being accurately tracked, it notes that the LRS does not meet one of its primary purposes and, as such, is "unfriendly" for performing audits of regulatory commitments. In the licensee's Procedure EN-LI-110, Item 4 of Section 1.0, "Purpose," states:

The process outlined in this procedure focuses on commitments and is not intended to track obligations or action items. While some CMSs [Commitment Management Systems] have historically been used to manage information other than Regulatory Commitments, the preferred approach is to segregate Regulatory Commitments in a CMS. These "combined use" CMSs can be used to satisfy the requirements of this procedure provided Regulatory Commitments are clearly distinguished from other information.

The LRS is not dedicated to Regulatory Commitments. As such, during the audit, the licensee was not able to "clearly distinguish" Regulatory Commitments from all other commitments (obligations, and other action items) in the LRS, as required by the procedure. As requested in Section 2.3.1 of this audit report, the licensee was able identify all commitments made in license amendment safety evaluations, exemptions and relief request safety evaluations that have been issued for a facility since the last audit. However, for the licensee to accomplish this, each item in LRS for that time period had to be individually reviewed to determine if it was a Regulatory Commitment. The NRC staff believes this is a fleet wide issue, but has only confirmed this for GGNS; River Bend Station, Unit 1; and Waterford Steam Electric Station, Unit 3. Since the LRS tracks several action items and the licensee does not need to distinguish between action items, using LRS for this procedure to capture, track and implement all regulatory commitments is acceptable. The licensee informed the staff that it is working on revising the LRS to be dedicated to regulatory commitments or adding some sort of designation/flag to allow LRS to recognize regulatory commitments.

Procedure EN-LI-110 has added Section 5.12, "NRC Commitment Audit Preparation." Section 5.12 requires that a self-assessment be performed prior to the audit. It notes that the licensee could coordinate with the NRR PM before the audit on the sample of commitments for the self-assessment or select a sample from commitments made since the last audit. This additional section to the licensee's procedure should significantly improve the audit process.

## 2.2 Verification of the Licensee's Program for Managing NRC Commitment Changes

The primary focus of this part of the audit is to verify that the licensee has established administrative controls for modifying or deleting commitments made to the NRC. The NRC staff compared the licensee's process for controlling regulatory commitments to the guidelines in NEI 99-04, which the NRC has found to be an acceptable guide for licensees to follow for managing and changing commitments. The process used at GGNS is contained in Entergy's Procedure EN-LI-110. The audit did not identify any regulatory commitment changes that include changes that were or will be reported to the NRC, and changes that were not or will not be reported to the NRC. For GGNS, no changes were identified for the last 3 years.

## 2.3 Review to Identify Misapplied Commitments

The commitments reviewed for this audit were also evaluated to determine if they had been misapplied. A commitment is considered to be misapplied if the action comprising the commitment was relied on by the NRC staff in making a regulatory decision such as a finding of public health and safety in an NRC safety evaluation associated with a licensing action. Reliance on an action to support a regulatory decision must be elevated from a regulatory commitment to a legal obligation (e.g., license condition, condition of a relief request, regulatory exemption limitation or condition). A commitment is also considered to have been misapplied if the commitment involves actions that were safety significant (i.e., commitments used to ensure safety).

Each of the commitments selected for the audit sample were reviewed to determine if any had been misapplied. The NRC staff found no examples where a regulatory commitment was misapplied.

### 2.3.1 Review of Safety Evaluation Reports for Licensing Actions since the Last Audit to Determine if They Are Properly Captured as Commitments or Obligations

In addition to the commitments selected for the audit sample, all license amendment safety evaluations, exemptions, and relief request safety evaluations that have been issued for a facility since the last audit were identified. These documents were evaluated to determine if they contained any misapplied commitments as described above.

The NRC staff confirmed that all commitments made during this period in license amendment safety evaluations, exemptions and relief request safety evaluations were properly captured and tracked and contained no misapplied commitments.

## 3.0 CONCLUSION

The NRC staff concludes, based on the above audit, that the GGNS has implemented NRC commitments on a timely basis, and has implemented an effective program for managing NRC commitment changes.

## 4.0 LICENSEE PERSONNEL CONTACTED FOR THIS AUDIT

Richard Scarbrough  
Richard Meister  
James Nadeau

Principal Contributors: Alan Wang  
Michael Orenak

Date: July 31, 2015.

### Attachments:

1. Summary of Audit Results
2. Table of EPU Regulatory Commitments

### **AUDIT SUMMARY**

#### **MANAGEMENT OF CHANGES TO REGULATORY COMMITMENTS:**

The licensee stated that there were no changes to Regulatory Commitments during this period.  
The staff's audit consisted of a review of the following commitments.

| <b>Item No.</b> | <b>Grand Gulf Nuclear Station (GGNS) Submittal</b> | <b>NRC TAC No.</b> | <b>GGNS Source Document</b> | <b>U.S. Nuclear Regulatory Commission (NRC) Issuance</b>        | <b>Summary of Commitment and Licensee's Tracking Number</b>   | <b>Licensee Implementation Status (Documents listed are in GGNS Database)</b> |
|-----------------|--|--------------------|-----------------------------|---|---|---|
| 1               | June 11, 2012                                      |                    | GNRO-12/00057               | 50.54(f) Regarding Recommendation 2.3, Seismic                  | This 50.54(f) letter requested a seismic walkdown of the plant. A-36088   | Completed via response to the NRC dated July 10, 2012, GNRO-12/00068.         |
| 2               | October 31, 2012                                   |                    | GNRO-12/00038               | 50.54(f) Regarding Recommendation 9.3, Emergency Communications | This 50.54(f) requested an assessment of the current communications systems and equipment. A-36067  | Closed via letter dated October 31, 2012, GNRO-2012/00131.                    |
| 3               | May 2, 2012  | ME8525             | GNRO-12/00040               | Approval of Relief Request @ ISI-17                             | Per NRC approval submit within 90 days after completion of the outage results of stress analysis demonstrating acceptability of weld overlay. A-36065 | Closed via letter dated September 6, 2012, GNRO-2012/00109.                   |
| 4               | November 26, 2012                                  | ME7592             | GNRO-12/00143               | Approval of RR ISI-014  | Per NRC approval GGNS agreed to investigate the use of remote camera to inspect control rod drive welds. A-36104                                      | Continuing compliance via letter dated June 12, 2014, GNRO-2014/00043.        |



In addition, to the above samples, as part of the audit, the following two amendments with significant number of regulatory commitments were reviewed.

#### Power Range Neutron Monitoring System

Amendment No. 188 dated March 28, 2012 (TAC No. ME2531) (ADAMS Accession No. ML120400319) was related to the approval of the Power Range Neutron Monitoring System (PRNMS). The licensee made Regulatory Commitments in letters dated November 3, 2009 (GNRO-2009-00054) (thirteen Regulatory Commitments), May 18, 2010 (GNRO-2010-00035) (two Regulatory Commitments), June 3, 2010, (GNRO-2010/00040) (seven Regulatory Commitments), June 28, 2010 (GNRO-2010/00045) (one Regulatory Commitment), July 29, 2010 (GNRO-2010-00051) (one Regulatory Commitment), June 28, 2011 (GNRO-2011-00045) (three Regulatory Commitments), July 22, 2011 (GNRO-2011/00057) (four Regulatory Commitments), and November 8, 2011 (GNRO-2011/00091) (one Regulatory Commitment). The licensee provided a Licensing Research System (LRS) search for all the PRNMS Regulatory Commitments, which included the source documents dates, GNRO numbers, and status with letter closure dates, when applicable. The NRC staff confirmed that all the commitments were captured in the LRS database and that the commitments were completed as committed to. In addition, a license condition in the Extended Power Uprate (EPU) amendment required that the PRNMS had to be fully implemented before the EPU could be implemented. During the EPU review the licensee confirmed that the PRNMS was implemented. The staff found that all actions were completed well before the EPU was implemented.

#### EPU

The NRC staff approved the EPU by Amendment No. 191 on July 18, 2012 (TAC No. ME4679) (ADAMS Accession No. ML121210020). By letters dated September 8, 2010 (GNRO-2010/00056), September 9, 2011 (GNRO-2011/00033), October 10, 2011 (GNRO-2011/00087), November 14, 2011 (GNRO-2011/00101), November 25, 2011 (GNRO-2011/00105), December 19, 2011 (GNRO-2011/00111), February 6, 2012 (GNRO-2012/00006), and February 15, 2012 (GNRO-2012/00009), the licensee made thirty-eight Regulatory Commitments. The licensee provided its results of an LRS search for all the EPU Regulatory Commitments, which included the source documents dates, GNRO numbers, and status with letter closure dates documents, when applicable. The NRC staff confirmed that all the commitments were captured in the LRS database and that the commitments were completed as committed to. The licensee had performed an independent self-assessment on October 22, 2013, for the EPU regulatory commitments. The objectives of the assessment were to:

1. Determine if all commitments identified in the NRC staff's approval letter dated July 18, 2012, were entered into the Commitment Management System (LRS).
2. Determine if the commitments identified were adequately implemented, managed, and reported, in accordance with Procedure EN-LI-110.
3. Determine if current commitment status was updated in the Commitment Tracking database.

4. Perform an Operating Experience search (internal and external) for recent issues involving Regulatory Commitments.

At the time of the audit, the assessment determined 25 Regulatory Commitments were closed, and that 3 remained open. Thirty-seven of the 39 regulatory commitments have been completed. The assessment noted negative observations. These observations were added into the corrective action program and have been addressed appropriately.

The table in Attachment 2 of this audit report reflects the regulatory commitments made in the EPU Amendment No. 191.

### EXTENDED POWER UPRATE COMMITMENT TABLE

| <b>Commitment</b>  | <b>#</b> | <b>Due Date</b> | <b>Status</b>   |
|--|----------|-----------------|-----------------|
| 1. The Operating License and Technical Specifications (TSs) markups submitted as part of the Extended Power Uprate (EPU) will be revised, if required to be consistent with the U.S. Nuclear Regulatory Commission (NRC) approved Power Range Neutron Monitoring System TSs.   | A35945   | 3/1/12          | Closed 4/18/12  |
| 2. The Linear Heat Generation Rate and Minimum Critical Power Ratio limits for two inoperable main turbine bypass valves will be specified in the Core Operating Limits Report (COLR).   | A35946   | 7/15/12         | Closed 10/14/13 |
| 3. EPU startup testing would be performed as described in the "Extended Power Uprate Startup Test Plan," with the exception of EPU Test 10 – intermediate range monitor performance.   | A35947   | 10/4/12         | Closed 10/25/13 |
| 4. Vibration analysis and testing will be performed as described in the "Vibration Analysis and Testing Program."  | A35948   | 5/4/12          | Closed 5/24/12  |
| 5. Deleted   |          |                 |                 |
| 6. Approximately 216 megavolt ampere reactive of additional reactive power capability will be distributed appropriately at designated load centers throughout the system to ensure system reliability.   | A35950   | 7/15/12         | Closed 6/3/12   |
| 7. The Grand Gulf Nuclear Station, Unit 1 (GGNS) Containment Leakage Rate Program will be updated to incorporate the EPU Calculated Peak Containment Internal Pressure (P <sub>a</sub> ) value. (Power Uprate Safety Analysis Report (PUSAR) Section 2.2.4.1).   | A35951   | 7/15/12         | Closed 12/11/12 |
| 8. The 480 volts alternating current (VAC) motor control center minimum voltages supplied from offsite power are only marginally affected by EPU (0.51 VAC maximum voltage drop). This 0.11% voltage drop has a negligible effect on valve torque and will be incorporated into the affected motor operated valve calculations. (PUSAR Section 2.2.4.2).   | A35952   | 7/15/12         | Closed 6/24/14  |
| 9. Relief valves required by the modification to increase the fuel pool cooling and cleanup system heat removal capability will be added to the inservice testing program scope. (PUSAR Section 2.2.4.2).  | A35953   | 7/15/12         | Closed 12/12/13 |
| 10. Environmental qualification (EQ) file updates will be completed as required by Title 10 of the <i>Code of Federal Regulations</i> (10 CFR) 50.49, "Environmental qualification of electric equipment important to safety for nuclear power plants," prior to EPU implementation. Remaining life determinations will be made for all Group II items and any required modifications or replacement of equipment will also be completed prior to EPU implementation. (PUSAR Section 2.3.1). | A35954   | 7/15/12         | Closed 6/24/14  |
| 11. The changes to the GGNS EQ program brought about by the implementation of EPU will be documented and   | A35962   | 7/15/12         | Closed 6/24/14  |

| Commitment   | #      | Due Date | Status          |
|--|--------|----------|-----------------|
| administered per Entergy Administrative Procedure, "Environmental Qualification (NUREG-0588 / 10 CFR 50.49)" 01-S-06-57, Revision O. (PUSAR Section 2.3.1).  |        |          |                 |
| 12. The existing protective relay settings for the main generator will have to be recalculated due to the increased EPU power output. (PUSAR Section 2.3.2.2).   | A35963 | 7/15/12  | Closed 6/24/14  |
| 13. Because the high pressure turbine will be modified to support achieving the EPU rated thermal power level, new allowable values (AVs) (both upper bound and lower bound) in units of pounds per square in gauge (psig) must be established. The AVs (in psig) will be revised prior to EPU implementation. (PUSAR Section 2.4.1.3.4).  | A35964 | 7/15/12  | Closed 8/20/12  |
| 14. The rod withdrawal limiter (RWL) high-power set point analytical limit (in psig) will be revised prior to EPU implementation. The reactor control and information system RWL setpoint (in psig) will be validated during power uprate plant ascension start-up testing to ensure the actual plant interlock is cleared consistent with the safety analysis. (PUSAR Section 2.4.1.3.5).   | A35965 | 7/15/12  | Closed 6/24/14  |
| 15. Instrumentation and controls listed in PUSAR Table 2.4-2 will be recalibrated and rescaled as required to support EPU.   | A35966 | 7/15/12  | Closed 6/24/14  |
| 16. Instrumentation and controls listed in PUSAR Table 2.4-2 will be recalibrated and rescaled as required to support EPU.   | A35967 | 7/15/12  | Closed 6/24/14  |
| 17. Fuel rod thermal-mechanical performance will be evaluated as part of the reload analysis performed for the cycle-specific core. Documentation of acceptable fuel rod thermal-mechanical response will be included in the Supplemental Reload Licensing Report or COLR consistent with Limitation and Condition 9.10 of NEDC33173P- A. (PUSAR Section 2.8.5.2.1).   | A35968 | 5/29/12  | Closed 5/25/12  |
| 18. GGNS procedures, including system operating, abnormal, and emergency operating procedures, will be revised prior to implementing EPU. (PUSAR Section 2.11.1).  | A35969 | 7/15/12  | Closed 8/20/12  |
| 19. As determined by the training analysis process, appropriate classroom, simulator and in-plant training will be conducted prior to power escalation or as required to operate modified systems for plant start up. The simulator will be modified to maintain the required fidelity in accordance with site procedures and ANSI/ANS 3.5 - 1998. The simulator changes include hardware changes for new and modified instrumentation and controls, software updates for modeling EPU changes and retuning of the core physics model for cycle-specific data. Simulator performance will be validated using design analysis data and startup and test data from the EPU project and implementation program. (PUSAR Section 2.11.1.5). | A35970 | 7/15/12  | Closed 12/12/13 |
| 20. When EPU conditions are obtained and data collected at EPU conditions, a final stress analysis will be performed and   | A35971 | 12/4/12  | Closed 12/6/12  |

| Commitment   | #      | Due Date | Status                       |
|--|--------|----------|------------------------------|
| submitted to the NRC.  |        |          |                              |
| 21. During the subsequent refueling outages the replacement steam dryer will be inspected as recommended in General Electric Service Information Letter (SIL) 644, "BWR [Boiling-Water Reactor] Steam Dryer Integrity," dated August 30, 2006.   | A35991 | 1/1/14   | Scheduled Completion 2/29/16 |
| 22. Deleted  |        |          |                              |
| 23. GGNS will perform periodic surveillances of the Boraflex neutron absorbing material at least every five years using Boron-10 Areal Density Gage for Evaluating Racks (BADGER) testing. The first test campaign will be completed by December 31, 2012.<br><br>The tests will consist of at least 30 panels. The BADGER to RACKLIFE uncertainty will be developed from the test results. This value will be considered acceptable if it is less than the existing BADGER/RACKLIFE uncertainty. Additionally, the minimum BADGER areal density results will be confirmed to be greater than the criticality safety analysis (CSA) assumption. The gap size and location probability distributions will also be compared to those used in the CSA. The acceptability of these parameters will be based on verifying that all of the CSA distributions bound the corresponding BADGER measured distributions. Alternatively, the measured gap distributions are acceptable if the CSA calculations are repeated using the measured gap distributions and the resulting 95/95 k-effective is bounded by the corresponding CSA Region 1 result.<br><br>RACKLIFE analysis will continue to be performed each cycle. This analysis will include a comparison of the RACKLIFE predicted silica to the plant measured silica. This comparison will determine if adjustments to the RACKLIFE loss coefficient are merited. The analysis will include projections to the next planned RACKLIFE analysis date to ensure current Region' storage locations will not need to be reclassified as Region" storage locations in the analysis interval. | A35998 | 12/31/13 | Scheduled Completion 10/1/18 |
| 24. During power ascension to EPU conditions, the acoustic pressure within the main steam lines will be monitored, the trending updated, and the resulting pressure loads on the dryer will be compared to the power ascension limit curves, which were determined from the flow-induced vibration (FIV) analysis results.   | A35990 | 7/15/12  | Closed 9/17/12               |
| 25. Four safety relief valve (SRV) locations on each of the four main steam lines will be used for piping and SRV monitoring. Each location will have three orthogonal accelerometers  | A36017 | 5/31/12  | Closed 10/31/12              |
| 26. Upon final selection of the FIV data acquisition system (DAS) and instruments, instrument bias and uncertainty will  | A36018 | 5/31/12  | Closed 10/31/12              |

| Commitment   | #      | Due Date | Status          |
|--|--------|----------|-----------------|
| be addressed by appropriate adjustment of the acceptance limits.   |        |          |                 |
| <p>27. In the event GGNS observes excessive vibration during the power ascension, the steam dryer and FIV monitoring limits will ensure that the EPU power ascension is stopped at a level where the valve and dryer loads are acceptable. If this occurs, GGNS will perform a detailed assessment of the FIV loads and piping and SRV responses and provide the NRC with an updated plan to mitigate the excessive vibration or the resulting stresses.</p> <p>At GGNS, the initial onset of second shear layer resonance was observed at 203 and 208 Hertz (Hz). If excessive valve vibration should occur at EPU conditions, the following actions will be pursued: If the main steam line (MSL) strain gage data indicates that acoustic loads are of low to medium amplitude, the sensitive piping and valve modal response would be identified using the accelerometer data and piping/SRV models and piping/SRV support modifications would be identified to shift or eliminate the piping/SRV response mode.</p> <p>If the MSL strain gage data indicates that acoustic loads are of high amplitude, indicative of a second shear wave being the primary cause of the excessive vibration, the acoustic data will be used to define the acoustic mode shape in the reactor pressure vessel/piping/SRV system. Then GGNS would:</p> <ul style="list-style-type: none"> <li>mitigate the acoustic loads by employing an acoustic load mitigation device upstream of the SRV branch connections with contributing acoustic sources or</li> <li>modify the SRV-piping geometry to mitigate the acoustic response.</li> </ul> | A36019 | 5/31/12  | Closed 10/31/12 |
| 28. Group III non-qualified electrical splices for the six components will be replaced with qualified splices prior to EPU implementation.   | A36020 | 7/15/12  | Closed 9/20/11  |
| 29. Responses to items 2, 5, 6, and 9 will be provided by 11/17/2011.  | A36037 | 11/17/11 | Closed 11/28/11 |
| 30. Response to remaining request for additional information (RAI) 2 will be provided.   | A36038 | 11/29/11 | Closed 11/28/11 |
| 31. The final machined pad for each tie bar will be confirmed to be of sufficient thickness to ensure the stresses in the pad remain within the final stress results.  | A36039 | 2/10/12  | Closed 3/21/12  |

| <b>Commitment</b>  | <b>#</b> | <b>Due Date</b> | <b>Status</b>   |
|--|----------|-----------------|-----------------|
| 32. Entergy will provide data for the following simulator scenario runs on or before February 15, 2012:<br><br>1. Worst-case anticipated transient without scram (ATWS) long-term scenario at EPU conditions; include plots, sequence of events, and initial conditions.<br><br>2. Worst-case ATWS short-term pressure peak scenario at EPU conditions; include plots, sequence of events, and initial conditions. | A36095   | 2/15/12         | Closed 3/15/12  |
| 33. Responses to Items 1, 4 and 8 through 13 will be provided.   | A36041   | 2/15/12         | Closed 2/20/12  |
| 34. Entergy will include the remaining qualified partial penetration welds in these areas as well as the full-depth groove welds that replaced those partial penetration welds that could not be qualified in its' inspection plan. These welds are to be inspected during the baseline inspection to be performed at the end of the cycle following the power uprate outage. (response to RAI 5).                 | A36042   | 3/6/14          | Closed 9/14/14  |
| 35. Entergy made the commitment to provide a summary report describing the conclusions of the Susquehanna Steam Electric Station, Unit 2 skirt crack evaluation as well as the potential impact of its findings on the GGNS steam dryer once the root cause evaluation effort has been finalized. This information is to be provided in response to RAI 12 by 2/15/2012.   | A36094   | 2/15/12         | Closed 2/20/12  |
| 36. The responses to RAIs 8, 10 and 12 will be provided.   | A36045   | 2/21/12         | Closed 2/20/12  |
| 37. The bounding stress projections using wide band and narrow band methods will be validated for GGNS using on-dryer pressure, acceleration and strain instrumentation as described in our response to RAI-9.   | A36046   | 8/15/12         | Closed 10/31/12 |
| 38. During power ascension to EPU, Entergy will assess dryer vibration performance in accordance with the response to RAI-13.  | A36047   | 8/15/12         | Closed 10/31/12 |
| 39. Instrument calibration and power ascension testing will be performed in accordance with the response to RAI 09.  | A36048   | 8/15/12         | Closed 10/31/12 |

- 2 -

If you have any questions, please contact me at (301) 415-1445 or by e-mail at [Alan.Wang@nrc.gov](mailto:Alan.Wang@nrc.gov).

Sincerely,

/RA/

Alan B. Wang, Project Manager  
Plant Licensing Branch IV-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosure:  
Audit Report

cc w/encl: Distribution via Listserv

DISTRIBUTION:

PUBLIC

RidsNrrPMGrandGulf Resource  
RidsNrrLAPBechman Resource  
RidsAcrsAcnw\_MailCTR Resource

LPL4-2 R/F  
TOrf, NRR  
GWarnick, RGN-IV  
RidNrrDorIDpr Resource

RidsNrrDorILPL4-2 Resource  
RidsRgn4MailCenter Resource  
MYoung, RGN-IV

ACCESSION No.: ML15208A119

|        |                    |                   |                    |                   |
|--------|--------------------|-------------------|--------------------|-------------------|
| OFFICE | NRR/DORL/LPL4-2/PM | NRR/DORL/LPL4-2LA | NRR/DORL/LPL4-2\BC | NRR/DORL/LPL4-2PM |
| NAME   | AWang              | PBlechman         | MKhanna            | AWang             |
| DATE   | 7/30/15            | 7/30/15           | 7/31/15            | 7/31/15           |

OFFICIAL RECORD COPY