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GNRO-2015/00004

February 19, 2015

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555-0001

**SUBJECT:** Entergy's Fourth Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)  
Grand Gulf Nuclear Station, Unit 1  
Docket No. 50-416  
License No. NPF-29

- REFERENCES:**
1. NRC Order Number EA-12-049, *Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events*, dated March 12, 2012 (ML12054A735)
  2. Entergy Letter to NRC, *Overall Integrated Plan in Response to March 12, 2012, Commission Order Modifying License with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated February 27, 2013 (GNRO-2013/00015, ML13059A316)
  3. Entergy Letter to NRC, *Entergy's First Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated August 28, 2013 (GNRO-2013/0060, ML13240A264)
  4. Entergy Letter to NRC, *Entergy's Second Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated February 28, 2014 (GNRO-2014/00011, ML14059A080).
  5. Entergy Letter to NRC, *Entergy's Third Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated August 26, 2014 (GNRO-2014/00060, ML14239A316).

Dear Sir or Madam:

On March 12, 2012, the Nuclear Regulatory Commission ("NRC" or "Commission") issued an order (Reference 1) to Entergy. Reference 1 was immediately effective and directs Entergy to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event.

Reference 1 requires submission of a status report at six-month intervals following submittal of the overall integrated plan (Reference 2). References 3, 4, and 5 provided the first, second, and third six-month status reports. The purpose of this letter is to provide the fourth six-month status report pursuant to Section IV, Condition C.2, of Reference 1, that delineates progress made in implementing the requirements of Reference 1. The attached report provides an update of milestone accomplishments since the last status report, including any changes to the compliance method, schedule, or need for relief and the basis, if any.

This letter contains no new regulatory commitments. Should you have any questions regarding this submittal, please contact Mr. James J. Nadeau, Regulatory Assurance Manager, at (601) 437-2103.

I declare under penalty of perjury that the foregoing is true and correct; executed on February 19, 2015.

Sincerely,



KJM/tmc

Attachment: Grand Gulf Nuclear Station's Fourth Six Month Status Report for the Implementation of Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events

cc: U. S. Nuclear Regulatory Commission  
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NRC Senior Resident Inspector  
Grand Gulf Nuclear Station  
Port Gibson, MS 39150

**Attachment to GNRO-2015/00004**

**Grand Gulf Nuclear Station's Fourth Six Month Status Report for the  
Implementation of Order EA-12-049, Order Modifying Licenses with Regard to  
Requirements for Mitigation Strategies for Beyond-Design-Basis External Events**

**Grand Gulf Nuclear Station's  
Fourth Six-Month Status Report for the Implementation of Order EA-12-049,  
Order Modifying Licenses with Regard to Requirements for Mitigation  
Strategies for Beyond-Design-Basis External Events**

**1 Introduction**

Grand Gulf Nuclear Station (GGNS) developed an Overall Integrated Plan (Reference 1), documenting the diverse and flexible strategies (FLEX), in response to Reference 2. This attachment provides an update of milestone accomplishments since submittal of the last status report (Reference 6), including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any.

**2 Milestone Accomplishments**

The following milestone(s) have been completed since August 1, 2014, and are current as of January 31, 2015:

- Submit Six-Month Status Report 3 —August 2014
- Develop Strategies – November 2014
- Submit Six-Month Status Report 4 — Complete with submission of this document in February 2015

**3 Milestone Schedule Status**

The following provides an update to Attachment 2 of the Overall Integrated Plan. It provides the activity status of each item, and whether the expected completion date has changed. The dates are planning dates subject to change as design and implementation details are developed.

These milestone target dates do not impact the Order implementation date.

Milestone	Target Completion Date <sup>†</sup>	Activity Status	Revised Target Completion Date
<b>Submit 60 Day Status Report</b>	Oct 2012	Complete	
<b>Submit Overall Integrated Plan</b>	Feb 2013	Complete	
<b>Submit Six-Month Updates:</b>			
Report 1	Aug 2013	Complete	
Report 2	Feb 2014	Complete	
Report 3	Aug 2014	Complete	

Milestone	Target Completion Date <sup>†</sup>	Activity Status	Revised Target Completion Date
Report 4	Feb 2015	Complete	
Report 5	Aug 2015	Not Started	
Report 6	Feb 2016	Not Started	
Report 7	Deleted*	Deleted	
<b>Perform Staffing Analysis</b>	July 2015	Not Started	
<b>Modifications</b>			
Develop Mods (Design Start)	May 2014	Complete	
Develop Strategies	Nov 2014	Complete	
Develop Mods (Design Complete)	Nov 2014	Started	Mar 2015
Implementation Outage**	Mar 2016	Not Started	
Implement Mods	Mar 2016	Not Started	
<b>On-site FLEX Equipment</b>			
Purchase	Feb 2015	Started	
Procure	Dec 2015	Started	
<b>Off-site FLEX Equipment</b>			
Develop Strategies / Contract with NSRC	July 2015	Started	
<b>Procedures</b>			
Issue GG FSGs	May 2015	Started	Mar 2016
Create Maintenance Procedures	June 2015	Not Started	Oct 2015
Procedure Changes Training Material Complete	May 2015	Not Started	Feb 2016
<b>Training</b>			
Develop Training Plan	March 2015	Not Started	
Implement Training	Feb 2016	Not Started	
<b>Validation / Demonstration</b>	Mar 2016	Not Started	
<b>Submit Completion Report</b>	Aug 2016	Not Started	

\*Deleted due to Completion Report being submitted in August 2016.

\*\*Full compliance since second refueling outage is before 12/31/2016.

<sup>†</sup>Target Completion Date is the last submitted date from either the overall integrated plan or previous six-month status report.

## **4 Changes to Compliance Method**

In the continuing design development phase of the FLEX project at GGNS, changes have been identified to the compliance strategies as described in the original OIP (Reference 1). The significant changes are described below. The changes will be incorporated into a future or the final OIP update.

- Modifications required for core cooling as described on page 21 of the OIP have changed. In lieu of new cross tie piping from the High Pressure Core Spray (HPCS) Service Water (SW) piping in the Diesel Generator (DG) Building to the Auxiliary Building (AB), a hose will be run from the HPCS SW piping in the DG building to the AB. In lieu of a single connection point on the Residual Heat Removal (RHR) Loop C piping, a primary and alternate hose connection will be added on piping associated with the Condensate and Refueling Water Storage and Transfer (CRWST) system piping on the 139' elevation of the AB. The primary hose connection point will allow injection via the RHR C system and the alternate hose connection point will allow injection via the Low Pressure Core Spray (LPCS) system. These hose routes are less than 100' and it has been determined that there are adequate resources and time available to implement these strategies. The hoses will be maintained in the FLEX storage buildings and will be subject to the same maintenance and controls as other FLEX hoses.
- The Spent Fuel Pool (SFP) cooling "Method 3" strategy described on page 40 of the OIP has changed. In lieu of modifying the SFP pipe upstream of valve 1G41F007, an existing flush line upstream of a SFP cooling heat exchanger will be utilized. Following the BDBEE, the existing blind flange outboard of the flush line's manual isolation valve 1G41F247A will be removed and a flanged hose connection will be bolted on. Hose will be routed from the 185' elevation of the AB to the 139' elevation to connect to the hose run from the HPCS SW piping in the DG building. The physical location of this flush line is in the same area and elevation of the AB as the OIP proposed pipe modification location upstream of valve 1G41F007 such that this revised strategy can be implemented in approximately the same time. The final delivery point into the SFP has not changed.

## **5 Need for Relief/Relaxation and Basis for the Relief/Relaxation**

GGNS expects to comply with the order implementation date and no relief/relaxation is required at this time.

## **6 Open Items from Overall Integrated Plan and Interim Staff Evaluation**

The following tables provide a summary and status of any open items documented in the Overall Integrated Plan and any open items or confirmatory items documented in the Interim Staff Evaluation (ISE). A fourth table includes a listing of Audit Questions and the status of each item.

Overall Integrated Plan Open Items	Status
1. Structure, content and details of the National SAFER Resource Center (NSRC) Grand Gulf Response Plan will be determined.	Not Started

Interim Staff Evaluation Open Items		Status
3.1.2.A	<p>Since the GGNS Probable Maximum Precipitation is greater than the grade elevation and sandbags are needed to protect against flooding, it is unclear how GGNS can be designated as a "dry" site. Since the licensee identified GGNS as a dry site, licensee information related to NEI 12-06 guidelines identified in this report, Sections 3.1.2.1, 3.1.2.2, and 3.1.2.3 (storage, deployment, and procedural interfaces, respectively) are not discussed. If the resolution of this Open Item results in GGNS not being categorized as a "dry" site, the guidelines of the NEI 12-06 Sections related to these report sections will need to be addressed by the licensee as part of that resolution.</p>	<p>This Open Item was addressed in Section 4 of GGNS's second six month FLEX status report (Reference 5 of section 8).</p>

Interim Staff Evaluation Confirmatory Items		Status
3.1.1.1.A	<p>Confirm that the storage facilities and plans will conform to the guidance in NEI 12-06, Section 5.3.1, for protection from seismic events.</p>	<p>This Confirmatory Item was addressed in Section 4 of GGNS's second six month FLEX status report (Reference 5 of section 8)</p>
3.1.3.1.A	<p>Confirm that at least one of the two FLEX equipment storage buildings would not be damaged by tornado missiles, based on the guidance in NEI 12-06, Section 7.3.1.</p>	<p>This Confirmatory Item was addressed in Section 4 of GGNS's second six month FLEX status report (Reference 5 of section 8)</p>
3.1.3.2.A	<p>Confirm that procedures address UHS usability when wind generated debris is present in the UHS.</p>	<p>In Progress  This item will be addressed by update to AQ GGN-052 response when information is available</p>
3.2.1.1.A	<p>Confirm that the final Modular Accident Analysis Program Revision 4 (MAAP4) analysis of the RCS response conforms to</p>	<p>In Progress  This item will be addressed by update to AQ GGN-019</p>

<b>Interim Staff Evaluation Confirmatory Items</b>		<b>Status</b>
	the NEI position paper dated June 2013, entitled "Use of Modular Accident Analysis Program (MAAP) in Support of Post-Fukushima Applications" (ADAMS Accession Number ML13190A201) and the MAAP4 limitations of the NRC endorsement letter, dated October 3, 2013 (ADAMS Accession No. ML13275A318).	response when information is available
3.2.1.2.A	Confirm that the MAAP4 analysis includes appropriate recirculation pump seal leakage.	In Progress This item will be addressed by update to AQ GGN-025 response when information is available
3.2.1.3.A	Confirm that the final Sequence of Events (SOE) reflects the results of the final MAAP4 analysis of the RCS response and the licensee provides reasonable assurance by some means (e.g. by walkthrough) that the timing of the actions in the SOE is achievable.	In Progress This item will be addressed by update to AQ GGN-026 response when information is available
3.2.1.4.A	Confirm that operation with the suppression pool temperature at its calculated maximum temperature will not impact the mitigation strategies, especially RCIC operation and structural integrity of the suppression pool.	In Progress This item will be addressed by update to AQ GGN-024 response when information is available
3.2.1.8.A	Confirm that the hydraulic calculations for the FLEX pumps demonstrate that the required flow rates can be achieved.	In Progress This item will be addressed by update to AQ GGN-034 response when information is available
3.2.2.A	Confirm that the SFP area ventilation calculation demonstrates that portable ventilation is not required in the SFP area, or that the licensee provides a strategy to use portable ventilation.	In Progress This item will be addressed by update to AQ GGN-039 response when information is available
3.2.3.A	Confirm that the licensee's strategy for maintaining containment capabilities considers the results of the final MAAP4 analysis for RCS leakage and the containment venting strategy.	In Progress This item will be addressed by update to AQ GGN-026 response when information is available
3.2.4.2.A	Confirm that the RCIC room heat up calculation for ELAP uses appropriate heat loads and shows an acceptable room	In Progress This item will be addressed by update to AQ GGN-045

Interim Staff Evaluation Confirmatory Items		Status
	temperature.	response when information is available
3.2.4.4.A	Confirm that any required upgrades to the site's communications systems have been completed, as noted in the NRC's review of the GGNS communications assessment (ADAMS Accession No. ML13129A132).	NRC Confirmatory Action
3.2.4.8.A	Confirm that the licensee's analyses for size and loading of FLEX generators shows acceptable results.	In Progress This item will be addressed by update to AQ GGN-034 response when information is available
3.2.4.8.B	Confirm that the licensee's final proposed connections of FLEX Phase 2 and 3 electrical equipment to the permanent plant equipment are acceptable.	This item is addressed by updated AQ GGN-053 response.
3.2.4.9.A	Confirm that the licensee has plans to refuel FLEX equipment based on the fuel oil consumption rates.	In Progress This item will be addressed by update to AQ GGN-055 response when information is available
3.2.4.10.A	Confirm the acceptability of RCIC operation without the gland seal compressor (de-energized 30 minutes after loss of all ac power).	In Progress This item will be addressed by update to AQ GGN-072 response when information is available
3.2.4.10.B	Confirm that the calculations regarding battery sizing which show that Vital Batteries can provide required loads for at least 11 hours (considering load shedding) are acceptable.	In Progress This item will be addressed by update to AQ GGN-031 response when information is available

Audit Questions	Status	Completion or Target Date
GGN-001	Closed* - Updated response available on the ePortal.	
GGN-002	Closed* - Updated response available on the ePortal (associated with ISE Confirmatory Item 3.1.1.1.A)	
GGN-003	In Progress - This AQ response will be updated when information is available (associated with	Aug 2015

Audit Questions	Status	Completion or Target Date
	ISE Confirmatory Item 3.1.3.1.A)	
GGN-005	Closed* - Updated response available on the ePortal.	
GGN-007	Closed* - Updated response available on the ePortal.	
GGN-008	Closed* - Updated response available on the ePortal.	
GGN-010	In Progress - This AQ response will be updated when information is available.	Aug 2015
GGN-011	Closed* - Response available on the ePortal.	
GGN-012	Closed* - Response available on the ePortal.	
GGN-013	Closed* - Updated response available on the ePortal.	
GGN-014	Closed* - Updated response available on the ePortal.	
GGN-015	Closed* - Updated response available on the ePortal.	
GGN-016	Closed* - Updated response available on the ePortal.	
GGN-017	In Progress - This AQ response will be updated when information is available.	Aug 2015
GGN-019	In Progress - Updated response available on the ePortal (associated with ISE Confirmatory Item 3.2.1.1.A).	Aug 2015
GGN-021	In Progress - Updated response available on the ePortal.	Aug 2015
GGN-022	Closed* - Response available on the ePortal.	
GGN-023	Closed* - Response available on the ePortal.	
GGN-024	In Progress - Updated response available on the ePortal (associated with ISE Confirmatory Item 3.2.1.4.A).	Aug 2015
GGN-025	In Progress - Updated response available on the ePortal (associated with ISE Confirmatory Item 3.2.1.2.A).	Aug 2015
GGN-026	In Progress - This AQ response will be updated when information is available (associated with ISE Confirmatory Items 3.2.1.3.A and 3.2.3.A).	Aug 2015
GGN-028	In Progress – Updated response available on the	Aug 2015

Audit Questions	Status	Completion or Target Date
	ePortal.	
GGN-029	In Progress - This AQ response will be updated when information is available.	Aug 2015
GGN-030	In Progress - This AQ response will be updated when information is available.	Aug 2015
GGN-031	In Progress - This AQ response will be updated when information is available (associated with ISE Confirmatory Item 3.2.4.10.B).	Aug 2015
GGN-034	In Progress - This AQ response will be updated when information is available (associated with ISE Confirmatory Items 3.2.1.8.A and 3.2.4.8.A).	Aug 2015
GGN-036	In Progress - Updated response available on the ePortal.	Aug 2015
GGN-038	In Progress - This AQ response will be updated when information is available.	Aug 2015
GGN-039	In Progress – Updated response available on the ePortal (associated with ISE Confirmatory Item 3.2.2.A).	Aug 2015
GGN-040	Closed* - Response available on the ePortal.	
GGN-041	Closed* - Updated response available on the ePortal.	
GGN-042	Closed* - Response available on the ePortal.	
GGN-043	In Progress - This AQ response will be updated when information is available.	Aug 2015
GGN-044	Closed* - Response available on the ePortal.	
GGN-045	In Progress - Updated response available on the ePortal (associated with ISE Confirmatory Item 3.2.4.2.A).	Aug 2015
GGN-046	Closed* - Updated response available on the ePortal.	
GGN-047	In Progress - This AQ response will be updated when information is available.	Aug 2015
GGN-048	Closed* - Response available on the ePortal.	
GGN-050	Closed* - Response available on the ePortal.	
GGN-052	In Progress – Updated response available on the ePortal (associated with ISE Confirmatory Item 3.1.3.2.A).	Aug 2015
GGN-053	In Progress - Updated response available on the	Aug 2015

Audit Questions	Status	Completion or Target Date
	ePortal (associated with ISE Confirmatory Item 3.2.4.8.B).	
GGN-055	In Progress - This AQ response will be updated when information is available (associated with ISE Confirmatory Item 3.2.4.9.A).	Aug 2015
GGN-057	In Progress - This AQ response will be updated when information is available.	Aug 2015
GGN-058	In Progress - This AQ response will be updated when information is available.	Aug 2015
GGN-061	Closed* - Response available on the ePortal.	
GGN-062	In Progress - Updated response available on the ePortal.	Aug 2015
GGN-063	In Progress – Updated response available on the ePortal.	Aug 2015
GGN-064	In Progress - This AQ response will be updated when information is available.	Aug 2015
GGN-065	Closed* - Response available on the ePortal.	
GGN-066	Closed* - Response available on the ePortal.	
GGN-067	Closed* - Response available on the ePortal.	
GGN-071	In Progress - This AQ response will be updated when information is available.	Aug 2015
GGN-072	In Progress - Updated response available on the ePortal (associated with ISE Confirmatory Item 3.2.4.10.A).	Aug 2015

\*Closed indicates that Entergy's response is complete.

## 7 Potential Interim Staff Evaluation Impacts

There are no potential impacts to the Interim Staff Evaluation identified at this time except those identified in Section 4.

## 8 References

The following references support the updates to the Overall Integrated Plan described in this Attachment.

1. "Overall Integrated Plan in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)," dated February 27, 2013 (GNRO-2013/00015, ML13059A316).

2. NRC Order Number EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012 (ML12054A735).
3. Entergy Letter to NRC, *Entergy's first Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated August 28, 2013 (GNRO-2013/0060, ML13240A264).
4. NRC Letter, "Grand Gulf Nuclear Station - Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Order EA-12-049 (Mitigation Strategies) (TAC No. MF0954)," dated February 19, 2014 (ML14007A718).
5. Entergy Letter to NRC, *Entergy's Second Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated February 28, 2014 (GNRO-2014/00011, ML14059A080).
6. Entergy Letter to NRC, *Entergy's Third Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)*, dated August 26, 2014 (GNRO-2014/00060, ML14239A316).