Entergy

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

Vincent Fallacara
Vice President, Operations
Grand Gulf Nuclear Station
Tel. (601) 437-7500

GNRO-2016/00053

December 30, 2016

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

SUBJECT: Mitigating Strategies Assessment (MSA) for Flooding Submittal
Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
License No. NPF-29

REFERENCES:

1. NRC letter to Entergy, *RFI Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3 of the NTTF Review of Insights from the Fukushima Dai-ichi Accident*, dated March 12, 2012 (GNRI-2012/00059) (ML12053A340)
2. Entergy letter to NRC, *Response to March 12, 2012, Request for Information, Enclosure 2, Recommendation 2.1, Flooding, Required Response 1, Integrated Assessment Approach,* dated January 29, 2013 (GNRO-2013/00002) (ML13029A627)
3. Entergy letter to NRC, *Required Response 2 for Near-Term Task Force Recommendation 2.1: Flooding – Hazard Reevaluation Report,* dated March 11, 2013 (GNRO-2013/00020) (ML13071A457)
4. Entergy letter to NRC, *Grand Gulf Nuclear Station Request for Additional Information Regarding Flooding Hazard, dated December 11, 2013*, dated January 9, 2014 (GNRO-2014/00005) (ML14014A277)
5. *NRC Staff Requirements Memoranda to COMSECY-14-0037, "Integration of Mitigating Strategies for Beyond-Design-Basis External Events and the Reevaluation of Flooding Hazards",* dated March 30, 2015 (ML 15089A236)
6. NRC Letter, *Coordination of Requests for Information Regarding Flooding Hazard Reevaluations and Mitigating Strategies for Beyond-Design-Basis External Events*, dated September 1, 2015 (ML15174A257)
7. Nuclear Energy Institute (NEI), *Report NEI 12-06 [Rev 2], Diverse and Flexible Coping Strategies (FLEX) Implementation Guide*, dated December 2015 (ML15348A015)
8. NRC Letter to Entergy, Grand Gulf Nuclear Station, Unit 1, *Supplement to Staff Assessment of Response to 10 CFR 50.54(f) Information Request - Flood-Causing Mechanism Reevaluation*, dated December 4, 2015 (CAC NO. MF1102)

9. U.S. Nuclear Regulatory Commission, *JLD-ISG-2012-01, Revision 1, Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigating Strategies for Beyond-Design-Basis External Events*, dated January 22, 2016 (ML1537A163)

Dear Sir or Madam:

On March 12, 2012, the US Nuclear Regulatory Commission (NRC) issued a request for information pursuant to Title 10 of the Code of Federal Regulations, Section 50.54(f) (Reference 1). The request was issued as part of implementing lessons learned from the accident at the Fukushima Dai-ichi nuclear power plant. Enclosure 2 to the 50.54(f) letter requested licensees to reevaluate flood-causing mechanisms using present-day methodologies and guidance. Grand Gulf Nuclear Station (GGNS) responded to the 50.54(f) letter by References 2 and 3. Supplemental information was provided in Reference 4.

Concurrent to the flood hazard reevaluation, GGNS developed and implemented mitigating strategies in accordance with NRC Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design-Basis External Events". In Reference 5, the NRC affirmed that licensees need to address the reevaluated flooding hazards within their mitigating strategies assessment (MSA) for beyond-design basis (BDB) external events, including the reevaluated flood hazards. This requirement was confirmed by the NRC in Reference 6. Guidance for performing MSA for Flooding is contained in Appendix G of Reference 6, endorsed by the NRC in Reference 9. For the purpose of the MSA for Flooding and in Reference 6, the NRC termed the reevaluated flood hazard, summarized in Reference 8, as the "Mitigating Strategies Flood Hazard Information" (MSFHI). Reference 6, Appendix G, describes the MSA for Flooding.

In Reference 8, the NRC concluded that the "reevaluated flood hazards information, as summarized in the Attachment to this letter, is suitable for the assessment of mitigating strategies developed in response to Order EA-12-049" for Plant and Unit.

The use of the sandbags as discuss on page five and ten of the attachment has been identified as a nonconforming condition for the use of manual operator actions in place of a permanent plant modification and is being addressed through the Grand Gulf Corrective Action Program.

The Attachment to this letter provides the Mitigating Strategies Assessment for Flooding Report for Grand Gulf Nuclear Station, Unit 1. The assessment concluded that the existing FLEX strategy can be successfully implemented and deployed as designed for all applicable-flood causing mechanisms.

This letter contains no new Regulatory Commitments.

If you have any questions or require additional information, please contact James Nadeau at 601-437-2103.

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 30, 2016.

Sincerely,

Mark Giacini

VF/sas

Attachment: 2016 Mitigating Strategies Assessment for Flooding Documentation Requirements at Grand Gulf Nuclear Station

cc: U.S. Nuclear Regulatory Commission
ATTN: Mr. Jim Kim, NRR/DORL (w/2)
Mail Stop OWFN 8 B1
Rockville, MD 20852-2738

U.S. Nuclear Regulatory Commission
ATTN: Mr. Kriss M. Kennedy (w/2)
Regional Administrator, Region IV
1600 East Lamar Boulevard
Arlington, TX 76011-4511

Mr. B. J. Smith (w/2)
Director, Division of Radiological Health
Mississippi State Department of Health
Division of Radiological Health
3150 Lawson Street
Jackson, MS 39213

NRC Senior Resident Inspector
Grand Gulf Nuclear Station
Port Gibson, MS 39150

Attachment to GNRO-2016/00053

2016 Mitigating Strategies Assessment for Flooding Documentation Requirements at Grand Gulf Nuclear Station

Entergy

ENTERGY NUCLEAR
Engineering Report Cover Sheet

Engineering Report Title:

2016 MITIGATING STRATEGIES ASSESSMENT FOR FLOODING DOCUMENTATION REQUIREMENTS AT GRAND GULF NUCLEAR STATION

Engineering Report Type:

New ☒ Revision ☐ Cancelled ☐ Superseded ☐
Superseded by: ________

Applicable Site(s)

IP1 ☐	IP2 ☐	IP3 ☐	JAF ☐	PNPS ☐	VY ☐	WPO ☐
ANO1 ☐	ANO2 ☐	ECH ☐	GGNS ☒	RBS ☐	WF3 ☐	PLP ☐

EC No. 64741

Report Origin: ☐ Entergy ☒ Vendor
Vendor Document No.: ENTCORP038-REPT-002

Quality-Related: ☐ Yes ☒ No

Prepared by: Tori L. Robinson / [signature] Date: 8/1/16
Responsible Engineer (Print Name/Sign)

Design Verified: N/A Date: N/A
Design Verifier (if required) (Print Name/Sign)

Reviewed by: Stephen G. Oman / [signature] Date: 8/1/16
Reviewer (Print Name/Sign)

Approved by: [signature] Date: 8/1/16
Supervisor / Manager (Print Name/Sign)

PROJECT REPORT COVER SHEET	PAGE 1 OF 11

Title:	2016 MITIGATING STRATEGIES ASSESSMENT FOR FLOODING DOCUMENTATION REQUIREMENTS AT GRAND GULF NUCLEAR STATION
REPORT NO.:	ENTCORP038-REPT-002
REVISION:	0
Client:	Entergy
Project Identifier:	ENTCORP038

Item	Cover Sheet Items	Yes	No
1	Does this Project Report contain any open assumptions, including preliminary information that require confirmation? (If **YES**, identify the assumptions.)	☐	☒
2	Does this Project Report supersede an existing Project Report? (If **YES**, identify the superseded Project Report.) **Superseded Project Report No.** ____________	☐	☒

Scope of Revision:
Initial Issue

Revision Impact on Results:
N/A

Safety-Related ☐ **Non-Safety-Related** ☒

Originator: Jessica Maddocks Jessica Maddocks

Reviewer: Jeffrey Head Jeffrey Head

Approver: Jared Monroe [signature] **Date:** 7/8/2016

2016 MITIGATING STRATEGIES ASSESSMENT FOR FLOODING DOCUMENTATION REQUIREMENTS AT GRAND GULF NUCLEAR STATION	REPORT NO.: ENTCORP038-REPT-002
	REVISION: 0

PROJECT REPORT REVISION STATUS

REVISION	DATE	DESCRIPTION
0	7/8/2016	Initial Issue

ATTACHMENT REVISION STATUS

ATTACHMENT NO.	NO. OF PAGES	REVISION	ATTACHMENT NO.	NO. OF PAGES	REVISION
N/A					

2016 Mitigating Strategies Assessment Flooding Documentation Requirements Grand Gulf Nuclear Station

Acronyms:

- CDB – Current Design Basis
- ELAP – Extended Loss of AC Power
- FHRR – Flood Hazard Reevaluation Report
- FLEX DB – FLEX Design Basis (flood hazard)
- FSG – FLEX Support Guideline
- GGNS – Grand Gulf Nuclear Station
- LIP – Local Intense Precipitation
- MSFHI – Mitigating Strategies Flood Hazard Information (from the FHRR and MSFHI letter)
- MSL – Mean Sea Level
- PA – Protected Area
- PMF – Probable Maximum Flood
- PMP – Probable Maximum Precipitation
- PMWE – Probable Maximum Water Elevation
- SSC - Structures, Systems and Components

Definitions:

FLEX Design Basis: The flood hazard for which FLEX was designed.

FLEX Design Basis Flood Hazard: The controlling flood parameters used to develop the FLEX flood strategies.

1. Summary

The GGNS FHRR (Ref. 7) has concluded that the PMF on the Mississippi River and Stream A are not bounded by the CDB PMF but are bounded by the FLEX DB for storage building design and equipment staging. PMF on Stream A leads to the loss of the deployment path from the north FLEX storage building (Site 1). The deployment path from the south storage building (Site 4) remains available, so the overall strategy for the storage and deployment of FLEX equipment can still be implemented as designed.

The GGNS FHRR (Ref. 7) has concluded that the PMF on Stream B is bounded by the CDB and the FLEX DB.

The FHRR, as updated by Reference 9, determined LIP exceeds the CDB for flooding at the plant site but is bounded by the FLEX design basis. LIP is the only flood mechanism that results in inundation of the outdoor areas in the vicinity of SSCs important to safety, and due to the existing mitigating strategy of sandbag deployment, door seals on inactive doors, and the relatively fast recession times, the overall strategy for the storage and deployment of FLEX equipment from the south storage building (Site 4) can be implemented as designed.

Other reevaluated flood hazard mechanisms (e.g., tsunami, channel migrations/diversions, etc.) are bounded by the FLEX design basis and CDB, and therefore have no impact on the site. Details of the FLEX strategies along with the bounding flood will be discussed later in this document.

2. Documentation

2.1. NEI 12-06, Rev. 2, Section G.2 – Characterization of the MSFHI.

The FHRR (Ref. 7) identified that LIP and PMF of the Mississippi River and Stream A are not bounded by the CDB flood elevation. Stream B PMF is bounded by the CDB flood elevation. The FHRR also analyzed the watershed associated with the Bayou Pierre and determined that there is no impact on the GGNS plant site. Other reevaluated flood hazard mechanisms (e.g., tsunami, channel migrations/diversions, etc.) are bounded by the CDB and have no impact on the site.

Mississippi River PMF

The Mississippi River PMF maximum flood height of 106.2 ft. MSL is 3.2 ft. higher than the CDB flood height of 103 ft. MSL. The PMWE on the Mississippi River at GGNS is 122.5 ft. This is the combination of stillwater elevation and wave setup and wave runup induced by the 2-year wind speed. Plant grade is at 132.5 ft. and any safety-related equipment or FLEX equipment is protected from this event. Therefore, this event does not challenge the FLEX strategies.

Stream A PMF

Stream A PMF maximum flood height of 132.1 ft. MSL is 3.2 ft. higher than the CDB flood height of 128.9 ft. MSL. The PMWE on Local Stream A is 132.5 ft. This is the combination of stillwater elevation and wave setup and wave runup induced by the 2-year wind speed. This flood level leads to loss of certain parts of one of the two deployment paths (i.e. loss of the path from the north FLEX storage building [Site 1]).

Stream B PMF

Stream B PMF maximum flood height determined by the MSFHI of 131.7 ft. MSL is 1.1 ft. lower than the CDB flood height of 132.8 ft. MSL. Wind wave height was not calculated because Stream B is bounded by Stream A. Plant grade is at 132.5 ft. Therefore, this event does not challenge the FLEX strategies.

Bayou Pierre

The Bayou Pierre was not evaluated as part of the CDB but was evaluated by the FHRR. The FHRR concluded that the maximum flood level of the Bayou Pierre is 130.7 ft., which is well below the elevation of the Bayou Pierre watershed divide elevation of about 175 ft. Therefore, this event does not challenge the FLEX strategies.

LIP

Flood Height

The maximum water surface elevation due to the LIP at GGNS results from a total rainfall depth of 19.3 inches within an hour and 31.4 inches within 6 hours. In the immediate vicinity of GGNS Unit 1, predicted maximum water depths at safety related building entrances resulting from the LIP range from approximately 0.3 ft to 1.0 ft (Ref. 9) at doors protecting safety related equipment. These flow depths correspond to water surface elevations ranging from 133.3 ft. to 133.7 ft. (Ref. 7 and 9). This is above the CDB flood height of 133.25 ft., and is bounded by the FLEX DB height of 133.7 ft for the south FLEX storage building (Site 4). Sandbags up to a height of 1.5 ft. and door seals at inactive doors 1D301 and OCT05 are used to protect these exterior doors from flooding. Therefore, flooding through doorways is not a concern (Ref. 7).

Flow velocities around doors ranges from 0.4 fps to 2.1 fps (Ref. 9). Significant debris loading/transportation is not a safety hazard due to the relatively low velocity and depth of LIP flood waters in the vicinity of safety-related SSCs at GGNS, in addition to the lack of natural debris sources on site (Ref. 7).

Flood Event Duration

Flood durations were evaluated at various locations around the power block near external doors protective safety related equipment. Flood durations vary at each location, but the analyzed locations typically reach the peak flood elevation about 30 minutes after the beginning of the LIP event, dropping rapidly to below half of the peak flood depth approximately 2 hours after the onset of the LIP event, which is before Phase 2 equipment is deployed (Ref. 7). Flood depths almost completely recede by 8 hours which is 2 hours before any Phase 2 portable equipment is credited. This general trend of flood recession is deemed appropriate for the South Storage Building at Site 4 and the primary deployment path(s) from Site 4 due to the proximity to the power block and because the terrain is very similar. However, these recession times may not apply to areas flooded by Stream A (specifically the area of the North Access Road that is under approximately 6 ft of water, preventing deployment of equipment from the North Storage Building at Site 1) because water is intentionally diverted to Stream A for drainage, thus increasing the recession time.

It should be noted Reference 9 reanalyzes the LIP flood depths by considering roof runoff, but this does not change the flood durations by a significant amount such that the FLEX strategy would be affected.

Relevant Associated Effects

Only the south storage building at Site 4 is within the scope of the LIP reanalysis due to its location relatively close to the power block. Due to its remote location and grade elevation, Site 1 is not included in the LIP reanalysis. The LIP reanalysis supports a maximum expected depth of 0.1 ft. to 0.2 ft. at Site 1 based upon the adjacent modeled areas. The north FLEX storage building at Site 1 is located such that the top-of-slab elevation is at 163 ft., and Site 4 has a top-of-slab elevation of 133.2 ft. The foundation (slab) designs of both storage buildings include an internal spill containment curb extending 0.5 ft. above the top-of-slab. This results in an "effective" top-of-slab elevation of 163.5 ft. for Site 1 and 133.7 ft. for Site 4. The flood heights at these locations are 163.2 ft. and 133.5 ft. respectively. Therefore, given the concrete slab, curb height, grading, and drainage, the building elevations are sufficient to preclude challenges/impact to the stored equipment.

The primary deployment path between the north storage building at Site 1 and the PA runs along the North Access Road for most of its length. In one location the road dips approximately 6 feet below the LIP flood elevation (Ref. 10). Therefore, it would require deployment of the FLEX equipment from the south storage building at Site 4. Site 4 is located approximately 500 ft west of the PA. The primary deployment route for Site 4 is north along the Plant Access Road gaining access to the PA through the Sally Port located just south of the Administration Building. The alternate paths for Site 1 and Site 4 both run along the north access road, behind the Unit 2 warehouse, and enter the site near the ISFSI pad at the northeastern edge of the protected area. Portions of this path are unanalyzed for all flooding scenarios so it is assumed that the alternate paths are unavailable.

Based on Figure 12 of Reference 9, the maximum LIP depth along the primary deployment path from Site 4 to the staging locations is 1.5 feet. Because of Site 4's proximity to the power block, it is expected that the recession times for the deployment path from Site 4 would be similar to the recession times for the safety related doors stated in the "Flood Event Duration" section above. Therefore, the 1.5 ft. depth would be decreased to approximately 0.75 ft. or less after 2 hours and would be almost completely receded by 8 hours. The limiting piece of phase 2 equipment with respect to height off the ground is the Chevy 3500 truck which has a clearance of approximately 16" from the ground to the center of the exhaust pipe per the RBS FLEX Equipment Walkdown Report, Attachment 10.002 to EC 64548 (Ref. 11). GGNS and RBS both utilize the Chevy 3500 truck for FLEX equipment deployment. Since no equipment is required to be deployed prior to 2 hours, at which time the maximum flood depth would be approximately 0.75 ft (9 inches), there is no impact on deployment of FLEX equipment from the south storage building at Site 4 due to the LIP. It should also be noted that the FLEX electrical equipment is protected from the rain by design and will not be submersed in flood waters since the trailer heights are sufficiently above the flood levels at the time equipment is deployed (at least 7 inches of clearance). This would also preclude any significant runup due to traversing the flood waters since the trailer floors are above the flood level at the time of deployment.

For Phase 3, the NSRC's ability to transport equipment to Staging Area B (site location where equipment will be pre-staged, parked, or placed prior to movement into the final location) is discussed in the GGNS SAFER Response Plan (Ref. 2) which includes multiple means and pathways of transporting NSRC equipment to the site. Therefore, transportation of NSRC equipment to the site is deemed feasible and is not discussed further in this document. Since deployment of NSRC equipment occurs later in the event (after 24 hours), no further analysis is necessary. Note that deployment of Phase 3 equipment is not impacted by any flood mechanisms identified in the FHRR.

Warning Time

A flood warning time of 24 hours is used for prediction of over 12 inches (30.5 cm) of rain from the National Weather Service (Ref. 3), and site preparation is governed by the Off-Normal Event Procedure 05-1-02-VI-2, "Off-Normal Event Procedure – Hurricanes, Tornadoes, and Severe Weather – Safety Related" (Ref. 5).

2.2. NEI 12-06, Rev. 2, Section G.3 – Comparison of the MSFHI and FLEX DB Flood

Table 1 reflects data from the FHRR for the LIP compared to the site's CDB and FLEX design basis flood.

A table is not included for the PMF from the Mississippi River, Stream A, Stream B, and Bayou Pierre because, as stated in Section 2.1, plant grade, safety-related equipment, the south storage building at Site 4, and the Site 4 deployment path required for the FLEX strategy are well above any wind-wave water level such that this does not need to be evaluated.

Any parameters where the FLEX DB flood does not bound the MSFHI are evaluated in Section 2.3.

Table 1 - Flood Causing Mechanism (LIP) or Bounding Set of Parameters

	Flood Scenario Parameter	Plant Current Design Basis Flood Hazard	FLEX Design Basis Flood Hazard	MSFHI LIP	Bounded (B) or Not Bounded (NB) by FLEX DB
Flood Level and Associated Effects	1. Max Stillwater Elevation (ft. MSL)	133.25	133.7 (See Note 1)	133.7	B
	2. Max Wave Run-up Elevation (ft. MSL)	Not Identified in CDB	Not Identified in FLEX	See Note 2	B
	3. Max Hydrodynamic/Debris Loading (psf)	Not identified in the CDB	See Note 3	See Note 3	N/A
	4. Effects of Sediment Deposition/Erosion	Not identified in the CDB	See Note 4	See Note 4	N/A
	5. Other Associated effects (identify each effect)	N/A	N/A	N/A	N/A
	6. Concurrent Site Conditions	Not identified in the CDB	See Note 6	See Note 6	B
	7. Effects on Groundwater	Not identified in the CDB	See Note 7	See Note 7	B
Flood Event Duration	8. Warning Time (hours)	Not identified in the CDB.	24	24	B
	9. Period of Site Preparation (hours)	Not identified in the CDB	6	24	NB
	10. Period of Inundation (hours)	6	6	>15	NB
	11. Period of Recession (hours)	7	8	>14	NB
Other	12. Plant Mode of Operations	Normal Operations	Normal Operations	Normal Operations	B
	13. Other Factors	N/A	N/A	N/A	N/A

N/A = Not Applicable

Additional notes, 'N/A' justifications (why a particular parameter is judged not to affect the site), and explanations regarding the bounded/non-bounded determination. The note numbers below correspond to the parameter number in the table.

1. The GGNS FIP (Ref. 1) addressed the maximum flood height elevation of 133.7 ft. MSL from the GGNS FHRR.
2. Consideration of wind-wave action for the LIP event is not explicitly required by NUREG/CR-7046 and is judged to be negligible because of limited fetch lengths and flow depths.
3. Debris loading is not considered a hazard due to the relatively low velocity and depth of LIP flood waters in the vicinity of safety-related SSCs, in addition to the lack of natural debris sources on the site.
4. Erosion and sedimentation are not applicable to this site, and therefore, do not need to be evaluated. (Ref. 6)

	5. None 6. The Gumbel Distribution was applied to the 2-minute wind speed data from NCDC station at Tallulah Vicksburg Regional Airport, to determine the 2-year return period wind speed, which was calculated to be 45.2 mph. 7. The PMP event impact on the ground water level was discounted as a majority of the precipitation resulting from a PMP event does not infiltrate to the local ground water table but instead results in surface water runoff to streams and rivers. 8. None 9. None 10. Local Intense Precipitation and Associated Drainage for 6 hour precipitation event. This is based on the hydrograph at the door "OCT5" presented by Figure 3.1-16 in the FHRR. 11. Local Intense Precipitation and Associated Drainage for 6 hour precipitation event. This is based on the hydrograph at the door "OCT5" presented by Figure 3.1-16 in the FHRR. 12. None 13. None

2.3. NEI 12-06, Rev. 2, Section G.4 – Evaluation of Mitigating Strategies for the MSFHI

2.3.1. NEI 12-06, Rev. 2, Section G.4.1 – Assessment of Current FLEX Strategies

2.3.1.1. Stream A PMF

PMF on Stream A with coincident wind generated waves results in inundation of the primary access road, but does not result in inundation of SSCs important to safety. Inundation of the primary access road would potentially restrict deployment of FLEX equipment from the north FLEX storage building (Site 1) located north of Stream A. However, as Figure 2 of the Final Integration Plan shows (Ref. 1), there is a second redundant FLEX storage facility located south of Stream A, such that inundation of the access road will not restrict deployment. Therefore, the FLEX strategies are not impacted by this event. (Ref. 7)

2.3.1.2. LIP

Three flooding scenario parameters for the LIP are not bounded by the FLEX strategy: Period of Site Preparation (hours), Period of Inundation (hours), and Period of Recession (hours). To address this, protection of FLEX equipment against external flooding events was evaluated in accordance with Section 6.2.3.1.1.a of NEI 12-06 (Ref. 8) which states that the FLEX equipment is protected from floods if it is stored above the flood elevation determined in the most recent site flood analysis. Flooding due to LIP is the controlling flood event for the new flood evaluation. No other flood mechanism generates water elevations with the potential to impact safety related SSCs or equipment relied upon for FLEX. The maximum water surface elevation due to the LIP at GGNS results from a total rainfall of 19.3 inches within an hour and 31.4 inches within 6 hours. In the immediate vicinity of GGNS Unit 1, predicted maximum water depths at safety related structure doorways resulting from the LIP range from approximately 0.3 ft to 1.0 ft (Ref. 9).

Table 4.3-1 in the FHRR (Ref. 7) as revised by Section 6.4.7 of Reference 9 shows the height of modeled LIP flood water at each doorway to a safety related structure that can be potentially impacted by this event. Sandbags are used up to a height of 1.5 ft. to protect entrances to the diesel generator building, standby service water buildings and control building; and door seals at inactive doors 1D301 and OCT05 also protect these exterior doors from flooding.

None of the protections in place for identified safety-related SSC or PMP sealed doors are exceeded by LIP flood water heights. Therefore, equipment in these areas are protected and the areas remain accessible for use during a FLEX event.

2.3.2. Conclusions

The plant response strategies to an ELAP and loss of ultimate heat sink event using the current FLEX strategy and associated ECs have been developed in accordance with the GGNS flooding reanalysis. Inundation of the primary access road would require mobilization of FLEX equipment from the south FLEX storage facility located south of Stream A since inundation potentially restricts mobilization of the equipment from the north FLEX storage facility located north of Stream A. Therefore, the flooding re-assessment will have no impact on the GGNS FLEX strategy. Equipment and personnel will be available such that the GGNS FLEX Strategies can be implemented as described in the Final Integrated Plan (Ref. 1).

2.4. References

1. GNRO-2016-00006, Final Integrated Plan Document Grand Gulf Nuclear Station, April 2016
2. GNRO-SA-15-00001, Rev. 001, SAFER Response Plan for Grand Gulf Nuclear Station, September 8, 2015
3. NEI 15-05, Rev. 6, Warning Time for Local Intense Precipitation Events, April 2015
4. EC 50275, Rev. 2, FLEX Basis EC
5. 05-1-02-VI-2, Rev. 129, Off-Normal Event Procedure – Hurricanes, Tornados, and Severe Weather, December 4, 2014
6. Grand Gulf Nuclear Station, Unit 1 – Supplement to Staff Assessment of Response to 10 CFR 50.54(f) Information Request – Flood-causing Mechanism Reevaluation (CAC No. MF1102), December 4, 2015
7. 51-9195288-000, Entergy Fleet Fukushima Program Flood Hazard Reevaluation Report for Grand Gulf Nuclear Station, ML13071A457, March 2013
8. NEI 12-06, Rev. 2, Diverse and Flexible Coping Strategies (FLEX) Implementation Guide, December 2015
9. 32-9195573-000, Rev. 1, Flood Hazard Re-evaluation – Local Intense Precipitation – Generated Flood Flow and Elevations at Grand Gulf Nuclear Stations, September 24, 2014
10. EC 50287, Rev. 0, GGNS FLEX Storage Building
11. EC 64548, Rev. 0, Admin EC to Issue FLEX Flood Mitigating Strategies Assessment (MSA) Report