Exelon Generation

RS-16-183 10 CFR 50.54(f)

October 17, 2016

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Limerick Generating Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-39 and NPF-85
NRC Docket Nos. 50-352 and 50-353

Subject: Mitigating Strategies Flood Hazard Assessment (MSFHA) Submittal

References:

1. NRC Letter, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated March 12, 2012

2. Exelon Generation Company, LLC Letter to USNRC, Response to March 12, 2012 Request for Information Enclosure 2, Recommendation 2.1, Flooding, Required Response 2, Flooding Hazard Reevaluation Report, dated March 12, 2015 (RS-15-064)

3. Exelon Generation Company, LLC Letter to USNRC, Response to NRC Audit Review Request for Additional Information Regarding Fukushima Lessons Learned – Flood Hazard Reevaluation Report, dated October 28, 2015 (RS-15-268)

4. Exelon Generation Company, LLC Letter to USNRC, Supplemental Response to NRC Audit Review Request for Additional Information Regarding Fukushima Lessons Learned – Flood Hazard Reevaluation Report, dated January 13, 2016 (RS-16-002)

5. NRC Letter, Supplemental Information Related to Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Flooding Hazard Reevaluations for Recommendation 2.1 of the Near Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated March 1, 2013

6. 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

7. NRC Letter, Coordination of Requests for Information Regarding Flooding Hazard Reevaluations and Mitigating Strategies for Beyond-Design-Basis External Events, dated September 1, 2015

8. Nuclear Energy Institute (NEI), Report NEI 12-06 [Rev 2], Diverse and Flexible Coping Strategies (FLEX) Implementation Guide, dated December 2015

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

10. NRC Letter, Limerick Generating Station, Units 1 and 2 – Interim Staff Response to Reevaluated Flood Hazards Submitted in Response to 10 CFR 50.54(f) Information Request – Flood-Causing Mechanism Reevaluation (CAC Nos. MF6107 and MF6108), dated December 24, 2015

On March 12, 2012, the NRC issued Reference 1 to request information associated with Near-Term Task Force (NTTF) Recommendation 2.1 for Flooding. One of the Required Responses in Reference 1 directed licensees to submit a Flood Hazard Reevaluation Report (FHRR). For Limerick Generating Station, Units 1 and 2 the FHRR was submitted on March 12, 2015 (Reference 2). Additional information was provided with References 3 and 4. Per Reference 5, the NRC considers the reevaluated flood hazard to be "beyond the current design/licensing basis of operating plants".

Concurrent to the flood hazard reevaluation, Limerick Generating Station, Units 1 and 2 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 6, the NRC affirmed that licensees need to address the reevaluated flooding hazards within their mitigating strategies for beyond-design-basis (BDB) external events. This requirement was confirmed by the NRC in Reference 7. Guidance for performing mitigating strategies flood hazard assessments (MSFHAs) is contained in Appendix G of Reference 8, endorsed by the NRC in Reference 9. In Reference 10, the NRC concluded that the "reevaluated flood hazards information, as summarized in the Enclosure [Summary Table of the Reevaluated Flood Hazard Levels], is suitable for the assessment of mitigating strategies developed in response to Order EA-12-049" for Limerick Generating Station, Units 1 and 2.

Enclosure 1 to this letter provides the Mitigating Strategies Assessments for Flooding for the Limerick Generating Station, Units 1 and 2. This assessment indicated that the FLEX design basis did not bound the reevaluated flood hazard (i.e., Mitigating Strategies Flood Hazard Information (MSFHI)) for the local intense precipitation (LIP) flood, specifically at the Emergency Diesel Generator (EDG) building, but the FLEX strategy was not impacted and can be successfully implemented as designed. As a result, no changes to the FLEX strategies or additional flood mitigation modifications are required.

Additionally, as requested in order to support the NRC staff technical review of the Limerick FHRR, Enclosure 2 to this letter provides the Limerick Generating Station, Units 1 and 2 Engineering Technical Evaluation No. 01550669-36, dated February 23, 2015.

This letter contains no new regulatory commitments. If you have any questions regarding this report, please contact Ron Gaston at (630) 657-3359.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 17th day of October 2016.

Respectfully submitted,

D. P. Helker

David P. Helker
Manager - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Enclosures:

1. Limerick Generating Station, Units 1 and 2, Mitigating Strategies Assessments for Flooding, dated October 17, 2016
2. Limerick Engineering Technical Evaluation No. 01550669-36, February 23, 2015

cc: Director, Office of Nuclear Reactor Regulation
NRC Regional Administrator - Region I
NRC Senior Resident Inspector – Limerick Generating Station
NRC Project Manager, NRR – Limerick Generating Station
Ms. Tekia Govan, NRR/JLD/JHMB, NRC
Mr. John D. Hughey, NRR/JLD/JOMB, NRC
Director, Bureau of Radiation Protection – Pennsylvania Department of Environmental Resources
R. R. Janati, Chief, Division of Nuclear Safety, Pennsylvania Department of Environmental Protection, Bureau of Radiation Protection

Enclosure 1

Limerick Generating Station, Units 1 and 2

Mitigating Strategies Assessments for Flooding

dated October 17, 2016

(10 Pages)

Mitigating Strategies Assessments for Flooding

Limerick Generating Station

October 17, 2016

Contents

1 Executive Summary

This Mitigating Strategies Assessment (MSA) evaluates the impact of the reevaluated flood hazard on FLEX strategy implementation. The Mitigating Strategies Flood Hazard Information (MSFHI), based on Limerick Generating Station's (LGS) Flood Hazard Reevaluation as affirmed in the NRC's December 24, 2015 interim response letter, is used to define the flood hazard for the MSA. The FLEX strategies were developed prior to completion of the Flood Hazard Reevaluation. Therefore, the FLEX design basis flood was set to be equivalent to the Plant's design basis flood.

The MSFHI for LGS, submitted with the Flood Hazard Reevaluation Report (FHRR), resulted in combined-effect streams/rivers flood hazard along the Schuylkill River, Sanatoga Creek, and Possum Hollow Run (including the Probable Maximum Precipitation (PMP)/Probable Maximum Flood (PMF) and upstream dam failure) that is bounded by the FLEX design basis flood hazard (equivalent to the plant's DB flood hazard). Therefore, the FLEX design basis completely bounds all MSFHI for streams/rivers-related flooding and a Mitigating Strategies Assessment (MSA) is not required for this flood-causing mechanism. The only MSFHI flood-causing mechanism considered in the MSA is the Local Intense Precipitation (LIP) flood. Although the maximum reevaluated (MSFHI) flood level is bounded by the FLEX design basis for LIP, the south side of the plant (near the emergency diesel generators (EDGs)) was not analyzed for the plant's design basis LIP flood. Therefore, LIP was considered to be non-bounded in this area by the FLEX design basis.

The MSA for the LIP, which included an ingress evaluation at the EDGs, indicated that the FLEX strategy was not impacted by the MSFHI and can be implemented as designed. As a result, no changes to the FLEX strategies or additional flood mitigation modifications are required.

2 List of Acronyms

- AMS – Alternate Mitigation Strategy
- BDBEE – Beyond Design Basis External Event
- CLB – Current Licensing Basis
- DB – Design Basis
- DGB – Diesel Generator Building
- EDG – Emergency Diesel Generator
- ELAP – Extended Loss of A/C Power
- EOP – Emergency Operating Procedure
- FHRR – Flood Hazard Reevaluation Report
- FLEX – Strategy response to an ELAP and LUHS, postulated from a BDBEE
- FLEX DB – FLEX Design Basis (flood hazard)
- FSG – FLEX Support Guideline (procedure)
- LGS – Limerick Generating Station
- LIP – Local Intense Precipitation
- LUHS – Loss of Ultimate Heat Sink
- MSA – Mitigating Strategies Assessment
- MSFHA – Mitigating Strategy Flood Hazard Assessment
- MSFHI – Mitigating Strategy Flood Hazard Information
- MSL – Mean Sea Level
- NRC – Nuclear Regulatory Commission
- NTTF – Near-Term Task Force
- PMF – Probable Maximum Flood
- PMP – Probable Maximum Precipitation

- RCIC – Reactor Core Isolation Cooling (system)
- RHR – Residual Heat Removal (system)
- RHRSW – Residual Heat Removal Service Water (system)
- RPV – Reactor Pressure Vessel
- SFP – Spent Fuel Pool
- SRV – Safety Relief Valve
- THMS – Targeted Hazard Mitigating Strategy

3 Background

3.1 Purpose

This MSA evaluates the ability to implement FLEX strategies for the reevaluated flood hazard as defined by the MSFHI. It is performed in accordance with NEI 12-06 Appendix G and contains the following elements:

- Section G.2 – Characterization of the MSFHI
- Section G.3 – Basis for Mitigating Strategy Assessment (MSFHI-FLEX DB Comparison)
- Section G.4.1 – Assessment of current FLEX Strategy (if necessary)
- Section G.4.2 – Assessment for modifying FLEX Strategy (if necessary)
- Section G.4.3 – Assessment of AMS (if necessary)
- Section G.4.4 – Assessment of THMS (if necessary)

On March 12, 2012, the NRC issued a Request for Information (Reference 1) to request information associated with NTTF Recommendation 2.1 for Flooding. One of the required responses in Reference 1 directed licensees to submit a FHRR. The LGS FHRR was submitted on March 12, 2015 (Reference 2). Additional information was provided in supplemental responses (References 3 and 4). Per Reference 5, the NRC considers the reevaluated flood hazard to be "beyond the design/licensing basis of operating plants".

Concurrent to the flood hazard reevaluation, LGS 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". Those strategies are described in the LGS Implementation of Diverse and Flexible Coping Strategies (FLEX) and Spent Fuel Pool Instrumentation Program (Reference 11). In Reference 6, the Commission affirmed that licensees need to address the reevaluated flooding hazards within their mitigating strategies for BDBEE's. This requirement was confirmed by the NRC in Reference 7. Guidance for performing MSFHAs is contained in Appendix G of Reference 8, endorsed by the NRC in Reference 9.

Per NEI 12-06, Rev. 2, Appendix G, if a Section G.3 assessment shows that the FLEX DB flood completely bounds the reevaluated flood (i.e. MSFHI), only documentation for Sections G.2 and G.3 are required; assessments and documentation for the remaining sections (G.4.1 through G.4.4) are not necessary.

3.2 Site Description

The Limerick Generating Station is located in southeastern Pennsylvania on the Schuylkill River, about 1.7 miles southeast of the limits of the Borough of Pottstown and about 20.7 miles northwest of the Philadelphia city limits. The Schuylkill River passes through the site and separates the western portion, which is located in East Coventry Township, Chester County, from the eastern portion, which is partly in Limerick Township and partly in Lower Pottsgrove Township, both in Montgomery County, Pennsylvania. All of the major plant structures are located in the Limerick Township. The natural ground elevations vary from

110 feet mean sea level datum (MSL) at the Schuylkill River to 280 feet MSL at the highest elevation.

3.3 Overview of FLEX Strategy

The LGS FLEX response strategies to maintain Core Cooling, Containment, Spent Fuel Pool Cooling, and Safety Function Support are summarized below. This summary is derived from the LGS Program document (Reference 11).

The FLEX strategy mitigates the effects of an ELAP and LUHS, postulated from a BDBEE, by providing adequate capability to maintain or restore core cooling, containment, and SFP cooling capabilities at both units. The strategy is diverse and flexible to encompass a wide range of possible conditions, and is incorporated into the station's EOPs and FSGs.

For Phase 1, initial RPV water level control will be accomplished using the RCIC System. The RCIC pump can take suction from the suppression pool, which is qualified to withstand a seismic event. The ELAP event will cause the RPV to be isolated from the Main Condenser. Pressure in the RPV will be controlled by manual and/or automatic actuation of the SRVs. Power for RCIC system operation and required containment and reactor vessel instrumentation comes from installed Division 1 and 2 safety-related batteries.

One hour after the start of an event, station personnel will declare an ELAP and begin to line-up portable equipment. The Phase 2 strategy lines up portable FLEX Pumps to supply makeup water to the RPV, Suppression Pool and/or the SFP. The FLEX Pumps will take suction from the Spray Pond, and discharge through hoses into RHRSW. Ultimately this water would be supplied, via the RHR System, into the Suppression Pool, the RPV, and/or the SFP. The FLEX mechanical strategy utilizes one (1) FLEX Pump per unit. Connection points, pump storage location, and deployment pathways are at elevations higher than the FLEX DB flood level.

The Phase 2 electrical strategy lines up the portable FLEX Generators to re-energize 125V/250V DC battery chargers and selected 480V AC components. The electrical connection panels, the FLEX Generator staging areas, and the FLEX equipment fuel oil supply access are at elevations higher than the FLEX DB flood level. The FLEX electrical strategy utilizes one (1) FLEX Generator per unit connecting to both Division 1 and 2 electrical busses.

The FLEX equipment including FLEX Generators, cable trailers, FLEX Pumps, and hose trailers, are stored in a BDBEE-protected structure at an elevation higher than the FLEX DB flood level.

For Phase 3, existing and FLEX equipment is used with backup equipment and supplies available as required from the SAFER offsite location.

4 Characterization of MSFHI (NEI 12-06, Rev 2, Section G.2)

NRC has completed the "Interim Staff Response to Reevaluated Flood Hazards" (Reference 10) related to LGS's Flood Hazard Reevaluation Report (Reference 2). In Reference 10, the NRC states that the "staff has concluded that the licensee's reevaluated flood hazards information, as summarized in the Enclosure [to Reference 10], is suitable for the assessment of mitigation strategies developed in response to Order EA-12-049 (i.e., defines the mitigating strategies flood hazard information described in guidance documents currently being finalized by the industry and NRC staff [Reference 8]) for Limerick". Tables 1 and 2 of the enclosure to Reference 10 include a summary of the plant's DB and non-bounding reevaluated flood hazard parameters, respectively. In Table 1 of the enclosure to

Reference 10, the NRC lists the following flood-causing mechanisms for the current design basis flood:

- Local Intense Precipitation;
- Streams and Rivers;
- Failure of Dams and Onsite Water Control/Storage Structures;
- Storm Surge;
- Seige;
- Tsunmai;
- Ice Induced Flooding; and
- Channel Migrations/Diversions.

In Table 2 of the enclosure to Reference 9, the NRC lists flood hazard information for only the Local Intense Precipitation (at the DGB) flood-causing mechanism as being not bounded by the plant's DB hazard. This is the only reevaluated flood-causing mechanism addressed in the mitigating strategies assessment, specifically at the DGB. LIP at LGS is described in detail in Reference 2, the FHRR submittal. Below is a summary of the MSFHI flood elevations for the flood-causing mechanisms applicable to FLEX (those mechanisms that produce flood levels above plant grade) as summarized in Reference 9:

Flood-Causing Mechanism	Stillwater Elevation (feet NGVD29)	Wind-Wave Runup Height (feet)	Maximum Flood Elevation (feet NGVD29)
Local Intense Precipitation at the Diesel Generator Building	217.1	Minimal	217.1

5 Basis for Mitigating Strategy Assessment (NEI 12-06, Rev 2, Section G.3)

The plant's DB flood was incorporated as the design input to all FLEX related plant modifications. As discussed in the previous section, the only MSFHI flood-causing mechanism not bounded by the FLEX DB, equal to the plant's DB, and considered in the MSA is the LIP flood. Although the maximum reevaluated (MSFHI) flood level is bounded by the FLEX DB for LIP, the south side of the plant (at the DGB) was not analyzed for the plant's DB LIP flood. Therefore, LIP was considered to be non-bounded in this area by the FLEX DB. As a result, further evaluation is required to address the reevaluated flooding hazards for LIP at the DGB within the BDB mitigating (FLEX) strategies for both installed plant equipment and portable equipment deployment areas and paths. See Section 6 below.

For other areas of the site, since the FLEX DB bounds the MSFHI LIP flood, the current FLEX design remains valid for the LIP flood, including aspects related to the storage and deployment of FLEX equipment, validation of FLEX actions, and viability of FLEX connection points. Therefore, further assessment of the impact on FLEX for the MSFHI LIP flood is not required in the other areas of the site (areas other than the DGB).

6 Assessment of Current Flex Strategy (NEI 12-06, Rev 2, Section G.4.1)

As discussed in Section 5, LIP is not bounded by the FLEX DB and is, therefore, evaluated below as part of the MSA for Limerick. In summary, the MSA for the LIP, which included an

ingress evaluation at the EDGs, indicated that the FLEX strategy was not impacted by the MSFHI and can be implemented as designed. As a result, no changes to the FLEX strategies or additional flood mitigation modifications are required. Additional details are provided below.

6.1 Assessment Methodology and Process

This assessment reviews the effect of a LIP event and concurrent ELAP/LUHS on the FLEX strategy. The assessment addresses the following key aspects of the FLEX strategy from NEI 12-06, Rev 2, Section G.4.1 (Reference 8):

- In the sequence of events for the FLEX strategies, if the reevaluated flood hazard does not cause the ELAP/LUHS, then the time when the ELAP/LUHS is assumed to occur should be specified and a basis provided (e.g., the ELAP/LUHS occurs at the peak of the flood).

  Initiation of an ELAP will result in the deployment of FLEX equipment starting at 60 minutes from event start. For a LIP, the area of review is near the installed safety-related diesel generator building doors. The diesel generators are moved from the FLEX storage building to outside the diesel generator enclosures. A LIP is not assumed to cause an ELAP/LUHS. For this review, the LIP is assumed to occur between the initiating event start and declaration of an ELAP at one hour. This is considered a conservative assumption because minimal actions would be completed or initiated prior to the ELAP occurring.

- The impacts of the MSFHI should be used in place of the FLEX DB flood to perform the screening and evaluation per Section 6 of NEI 12-06, Rev 2:

  - Protection of FLEX Equipment (Section 6.2.3.1 of NEI 12-06, Rev 2)
    - Confirm that the guidance for protection of FLEX equipment (NEI 12-06, Rev 2, Section 11.3) was followed. Confirm that FLEX equipment is not impacted by MSFHI.

      FLEX equipment has been stored and designed to the requirements of NEI 12-06. The protection of FLEX equipment will not be affected by a LIP event. The LIP stillwater elevations at the FLEX equipment storage locations are the same as previously analyzed for the DB flood level (<1-inch depth).

    - If applicable, document that any flood protection features credited in the FLEX strategy meet the performance criteria (NEI 12-06, Rev 2, Section G.5). How were the flood protection features evaluated? Confirm that the flood protection features are not impacted by MSFHI.

      Flood protection features are not credited for FLEX. Based on this evaluation, no additional flood protection features will need to be credited for FLEX and no changes are required.

  - Deployment of FLEX Equipment (Section 6.2.3.2 of NEI 12-06, Rev 2)
    - Document that deployment of FLEX Equipment is not impacted by MSFHI – e.g., warning time, ability to move equipment and re-stock supplies, and availability of fuel.

      Required FLEX equipment is on trailers and is elevated. The maximum outside water level elevation due to a LIP (at the EDG buildings) is

approximately 3 to 4.5 inches during the beginning of the LIP (first 10-15 minutes). After 10-15 minutes, the water surface elevation decreases to approximately 1-2 inches. Within 1 hour, water elevation will be at site grade (<1 inch). Therefore, deployment areas and paths will not be affected due to the MSFHI.

The new analysis shows a rise in site water level from the FLEX DB evaluation at the EDG building outside doors. There could be some minor delays in deployment of FLEX cables and connections due to additional water in the area. Validations for FLEX procedures were reviewed and there is a minimum of 2.5 hours of margin in the FLEX Electrical Connection deployment procedures. Any minor delays due to additional water in the deployment area and paths are acceptable based on the 2.5 hours of margin in the validation. See Section 6.2 for further discussion.

- Document that availability and access to all connection points is not impacted by the MSFHI.

  All connection points are located in the EDG buildings and are protected from the impacts of flooding. Any water entering through undercuts in the doors will be contained in the diesel pits and will not affect the connection points for the diesel generators, per Reference 2.

- Document that deployment of temporary flood barriers is not impacted by MSFHI.

  FLEX does not credit the deployment of temporary flood barriers and is therefore not impacted by an LIP event.

- Procedural Interfaces (Section 6.2.3.3 of NEI 12-06, Rev 2)

  - Confirm that no procedural changes are required due to MSFHI.

    No procedural changes are required due to a LIP flood at the EDG for this MSFHI.

- Utilization of Off-site Resources (Section 6.2.3.4 of NEI 12-06, Rev 2)

  - Confirm that site access routes are not impacted by MSFHI.

    The LIP event will not impede site access routes and the functionality of FLEX deployment or Phase 3 equipment deployment. The area around the DGB, in particular, does not contain access or deployment routes.

- The equipment storage guidance of Section 11.3 should be reassessed based on the impacts of the MSFHI.

  Equipment storage was reassessed using the MSFHI for LIP and it resulted in no impacts. The equipment storage location for the FLEX equipment is not in the area of concern (EDG buildings) and meets the requirements for storage of equipment. FLEX buildings are elevated above grade elevation and water elevation around the plant due to the LIP. Also, no Phase 1 installed equipment is impacted by this MSFHI.

- The impacts of the MSFHI should be used in place of the FLEX DB flood in the consideration of robustness of plant equipment as defined in Appendix A of NEI 12-

06. For determining robustness only, the MSFHI should be used as the applicable hazard.

The FLEX equipment was evaluated for the worst case flood height and will still be capable to perform their functions due to the elevated heights of the transfer trailers.

6.2 Results

- Confirm that boundary conditions and assumptions in the initial FLEX design are maintained. If not, describe the differences. Describe the basis for this determination.

  The boundary conditions and assumptions in the initial FLEX design, including shift staffing levels and independent/concurrent events, are maintained and would not be impacted by the MSFHI LIP flood in the EDG area.

- Confirm that the sequence of events for the FLEX strategies is not impacted by MSFHI (including impacts due to the environmental conditions created by MSFHI) in such a way that the FLEX strategies cannot be implemented as currently developed. If yes, describe the impacts. Describe the basis for this determination.

  The sequence of events and tasks/steps in the FLEX Validation Plan was reviewed with the occurrence of the MSFHI LIP flood-causing mechanism, specifically in the EDG area. No new or re-ordered tasks were identified as a result of the MSFHI. Time to dispatch operators did not need to be accelerated to accomplish a task within the required time constraint. Therefore, the sequence of events for the FLEX strategies is not impacted by MSFHI (including impacts due to the environmental conditions created by MSFHI) in such a way that the FLEX strategies cannot be implemented as currently developed.

- Confirm that the validation performed for the deployment of the FLEX strategies is not impacted by MSFHI. If yes, describe the impacts. Describe the basis for this determination.

  The FLEX strategies, including actions/steps in the Validation Plan, were reviewed to determine the impact of the MSFHI LIP flood in the EDG area. It was concluded that some steps were adversely impacted and time margin decreased but the margin is still adequate. The new analysis shows a rise in site water level from the FLEX DB evaluation at the EDG building outside doors. There could be some minor delays (up to 1 hour based on event start time due to water outside the diesel buildings) in deployment of FLEX cables and connections due to additional water in the area. Validations for FLEX procedures were reviewed and there is a minimum of 2.5 hours of margin in the FLEX Electrical Connection deployment procedures. The FLEX implementation steps can be successfully completed, with delays due to additional water in this area, since there would be a minimum of 1.5 hours of margin in the validation. The 1.5 hours of margin for the impacted FLEX implementation steps is judged to be adequate.

6.3 Conclusions

The assessment concluded that the existing FLEX strategy at LGS can be successfully implemented and deployed as designed for all applicable flood-causing mechanisms. For the LIP event, the assessment showed that installed plant equipment that supports FLEX implementation and the storage and deployment of FLEX equipment are not adversely impacted and no additional actions or procedural changes were required.

7 References

1. NRC Letter, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated March 12, 2012.
2. Exelon Generation Company, LLC Letter to USNRC, Response to March 12, 2012, Request for Information Enclosure 2, Recommendation 2.1, Flooding, Required Response 2, Flooding Hazard Reevaluation Report, dated March 12, 2015 (RS-15-064).
3. Exelon Generation Company, LLC Letter to USNRC, Response to NRC Audit Review Request for Additional Information Regarding Fukushima Lessons Learned – Flood Hazard Reevaluation Report, dated October 28, 2015 (RS-15-268).
4. Exelon Generation Company, LLC Letter to USNRC, Supplemental Response to NRC Audit Review Request for Additional Information Regarding Fukushima Lessons Learned – Flood Hazard Reevaluation Report, dated January 13, 2016 (RS-16-002).
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6. 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.
7. NRC Letter, Coordination of Requests for Information Regarding Flooding Hazard Reevaluations and Mitigating Strategies for Beyond-Design-Basis External Events, dated September 1, 2015.
8. Nuclear Energy Institute (NEI), Report NEI 12-06 [Rev 2], Diverse and Flexible Coping Strategies (FLEX) Implementation Guide, dated December 2015.
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 [Effective February 29, 2016 per Federal Register / Vol. 81, No. 39].
10. NRC Letter to Exelon, "Limerick Generating Station, Units 1 and 2 – Interim Staff Response to Reevaluated Flood Hazards Submitted in Response to 10 CFR 50.54(f) Information Request – Flood-Causing Mechanism Reevaluation (CAC NOS. MF6107 and MF6108)", dated December 24, 2015 (ADAMS ML15357A517).
11. Limerick Generating Station, Implementation of Diverse and Flexible Coping Strategies (FLEX) and Spent Fuel Pool Instrumentation Program (CC-LG-118).

Enclosure 2

Limerick Generating Station, Units 1 and 2

Limerick Engineering Technical Evaluation No. 01550669-36, February 23, 2015

01550669-36

ENGINEERING TECHNICAL EVALUATION

This engineering technical evaluation is being prepared in accordance with procedure CC-AA-309-101.

This technical evaluation was screened per HU-AA-1212. The work activities associated with this evaluation are of medium plant consequence level. In addition, this evaluation has a low probability of error. As such, the evaluation has been determined to have a risk of 1, and only normal process reviews are required. CC-AA-102 has also been reviewed and applicable design attributes are addressed in the modification. As this evaluation is in support of Fukushima Project, it is classified as augmented quality.

REASON FOR EVALUATION / SCOPE

In performance of the Fukushima Flooding Hazard Reevaluation, two items were found that were either previously unanalyzed or went beyond current design basis. These two items were:

1. The local intense precipitation event (LIP) was performed and a previously unanalyzed condition was found. This area was on the south side of the plant, near the emergency diesel generators, where water could enter the diesel bays through the south doors due to a LIP.
2. The flooding height due to a probable maximum flooding at Possum Hollow Run was increased beyond current design basis, from 159 feet (current design basis) to 167.8 feet.

This evaluation will document the effects of the new flooding information on the plant.

DETAILED EVALUATION

Effects of LIP on Emergency Diesel Generators

Based on information provided in LM-0699, Rev. 0 (Ref. 1), Local Intense Precipitation (LIP) – Fukushima Flood Hazard Assessment, an area next to the diesel compartments was determined to have not been previously evaluated. The new information has some elevation of water for approximately 1 to 1.5 hours after event start. The doors to the diesels are not water tight and have a small 5/8" undercut in the door. This allows water to enter the diesel compartments through the undercut. This evaluation determines the effects of the water on the diesels based on the updated flooding information. The evaluation will review the amount of water that enters the diesel bays and compare that value to the volume of the diesel pit areas (located below the diesels.) As long as the volume of water entering the pit does not reach the diesel generators, no safety related equipment will be affected.

The total volume of the pit area is determined based on physical measurements of the pits in one diesel compartment (D13) and was compared to that in another compartment (D12). This walkdown is documented in Attachment 1 of this evaluation. The volume of each section, based on width and length, and the total volume is given below. A conservative height of 22 inches from the bottom of the pit to the bottom of the diesels are used in the volume calculation. This is conservative as the height of the bottom of the generator is at 2.0 feet.

Section	Width (in.)	Length(in.)	Area(in.^{2})	Volume(in.^{3})
1	120	206	24720	543840
2	416	64	26624	585728
3	44	210	9240	203280
4	164	24	3936	86592
5	46	42	1932	42504
6	56	370	20720	455840
7	78	90	7020	154440
Total				2072224

Based on the table above, the total volume in the pit is 2072224 in^3 or 1199 ft^3.

The amount of flow entering each of the diesel doors was determined using the methodology from NPB-013 (Ref. 2). This calculation determined the amount of water flow underneath a door with an undercut. The following equation is used to determine flow through a door:

$$Q(cfm) = flow = K_1 \times a\sqrt{2gh}$$

Where: a = door undercut (ft) = 5/8 in = 0.052 feet (A-013-B-00002, Ref. 3)
K_1 = constant from NPB-013=133.614 for a 3 foot wide door (A-0150, Sheet 1, Ref. 4)
h = water height at the door (ft)
g = gravity = 32.2 ft/s^2

Total volume is then calculated using the below equation:

$$Volume = Q\Delta t$$

Each door is looked at has a curb prior to the undercut. This curb height is determined based on walkdowns performed during the Fukushima 2.3 flooding walkdowns (forms documented in Attachment 3). The water height at the door is determined by calculation LM-0699, Attachment 12 (Selected pages for diesel doors from LM-0699 are included in Attachment 2 of this evaluation). The total water height at the door is determined by taking the water height at the door and subtracting the curb height. Also included is an excel spreadsheet (Attachment 4) with the values and times for the flooding height at each door based on graphs in Attachment 2.

These values, inserted into the equation above (shown in Attachment 4) determine the total flow into the room. Below is a summary table of volume into the room for each door:

Door Number	Total Volume (ft^3)	Below Acceptance Criteria (1199 ft^3)
211	163	Yes
213	714	Yes
215	1073	Yes
217	1037	Yes
219	481	Yes
221	452	Yes
223	275	Yes
225	275	Yes

Based on the above, all rooms have enough volume in the pit area to account for the flow that could enter the room in a beyond design basis event. These results are applicable in all modes of operation. These doors are normally closed with security cages around them. The only time that these doors would be opened, other than door checks by security or as an emergency exit, would be when the emergency diesel generator is in a system outage for maintenance. During this time, the diesel is out-of-service and would not be required. Also, per the barrier breach program (CC-LG-201), the external diesel doors are security barriers and if held open for an extended time, would require a security watch. Therefore, security can close the door if an event were to occur.

It should be noted that the force on the door from flooding will be minimal (only 2-3 inches of water at the bottom of a 7 foot door). Per engineering judgment, this force is well within the capability of the door and components (latches, etc.).

There are many conservatisms in the calculation (LM-0699, Ref. 1) that make this evaluation conservative. LM-0699 includes roof runoff onto the external diesel doors. The external diesel doors are underneath a 6-foot overhang (Ref. 8) that would ensure water does not run down the wall and doors, therefore, lowering the total height of water slightly. Also, the diesel building itself has a 2-foot tall parapet (Ref. 7) with drains on the side of the building (2 drains near the top of the parapet). In an actual event, the roof itself would collect water up to the parapet height prior to wall runoff. This would delay that water coming down the building at which point the amount of rain coming down is less. This would lower the initial height of water in the beginning of the event, therefore lowering the overall height of water and reducing the inflow into the room.

Based on the above, there is no effect on safety related equipment in the diesel generator rooms and no compensating actions are necessary.

Probable Maximum Flooding at Possum Hollow Run

Current design basis for the Possum Hollow flooding is 159 feet. Based on Calculation LM-0701 (Ref. 6), the total elevation was increased to 167.8 feet. This was due to higher drainage flows from the water shed feeding Possum Hollow. Although the total elevation increased approximately 9 feet, there is no effect on any safety related equipment on site since site grade is between 215-217 feet. Therefore, there is sufficient margin (48 feet) and no compensatory actions are required.

CONCLUSIONS / FINDINGS

Based on the above, there are no effects to any safety related equipment at Limerick Generating Station due to the flooding hazard reevaluation. For the updated LIP, the total flow into the diesel generator rooms is less than the pit acceptance criteria. This result is conservative as the water height does not take into account the roof volume and the roof overhang over the door way. The margin to the plant grade from the Possum Hollow flood was decreased from 57 feet to 48 feet but is still acceptable and will not affect any site equipment. Therefore, no compensatory actions are required at this time.

REFERENCES

1. LM-0699, Rev. 0.
2. NPB-013, Rev. 2
3. A-013-B-00002, Rev. 5
4. A-0150, Sheet 1, Rev. 45
5. CC-LG-201, Rev. 3.
6. LM-0701, Rev. 0
7. A-0402, Sheet 1, Rev. 16
8. A-0402, Sheet 2, Rev. 1

ATTACHMENTS

1. Diesel Bay Walkdown Form
2. Flood Curves from LM-0699
3. Flood Walkdown Forms
4. Excel Spreadsheet Calculations

Prepared By: Brian Wehrman 2/23/15

Reviewed By: Mackenzie Durand Mackenzie Durand 2/23/15

Independent review performed under CC-AA-309-101. All comments have been incorporated into this evaluation.

Approved By: Greg Wallace Greg A Wallace 2/23/15

ATTACHMENT 2
Walkdown Observation Record
Page 1 of 1

Type of Walkdown: 12110114 **Date of Walkdown:** Designer's

(Study, Designer's, Installer's, User's)

EC No.: 1550669-36

Participants:

Department	Name (Printed)	Signature
LEOP	Brian Wehrman	
LEOP	Mackenzie Durand	

Walkdown Comments:

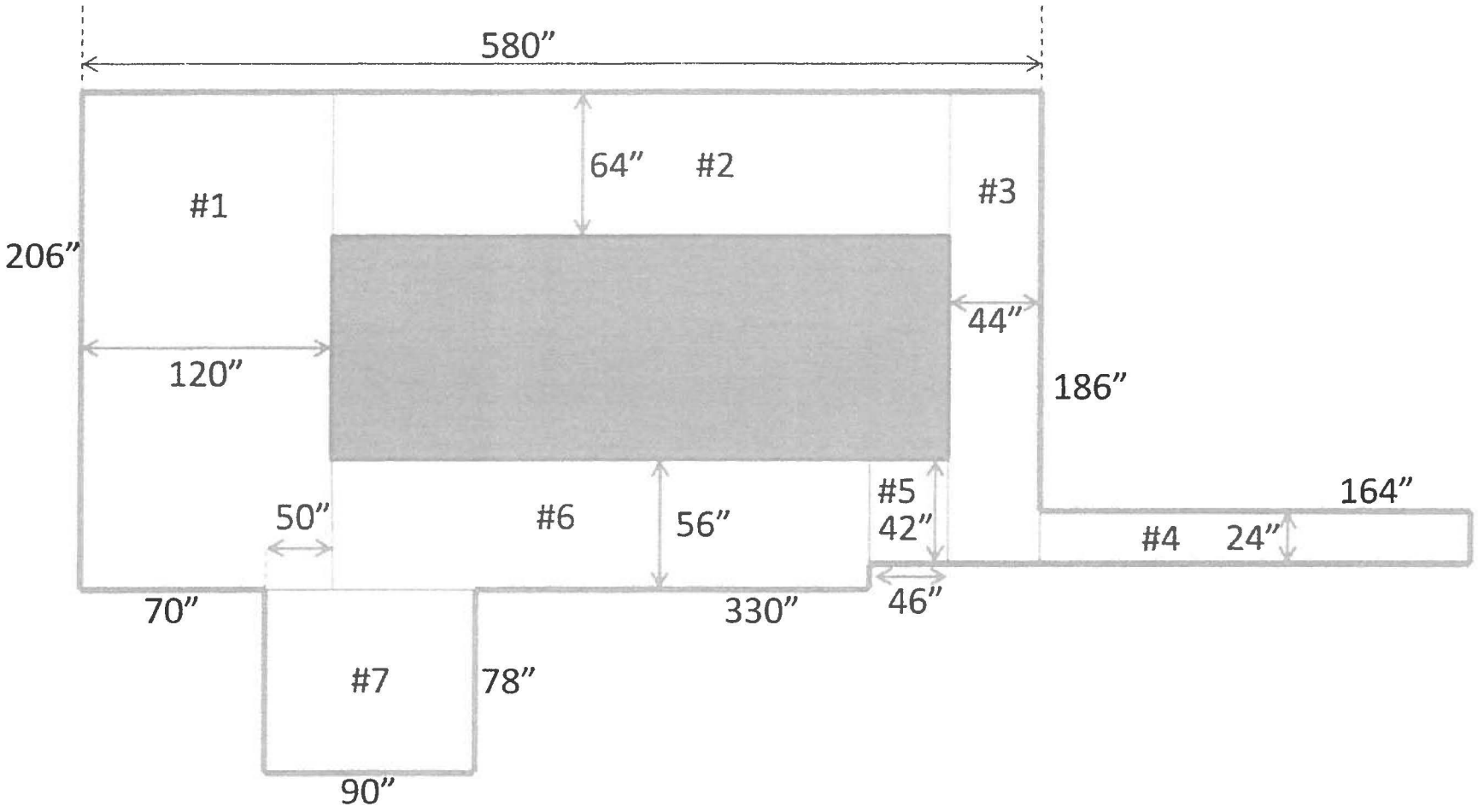
[Use additional pages as required. Note, if attachments are expected to be used as controlled design input for calculations (i.e., dimensional data, etc.), then the attachments must be properly prepared and reviewed/verified.]

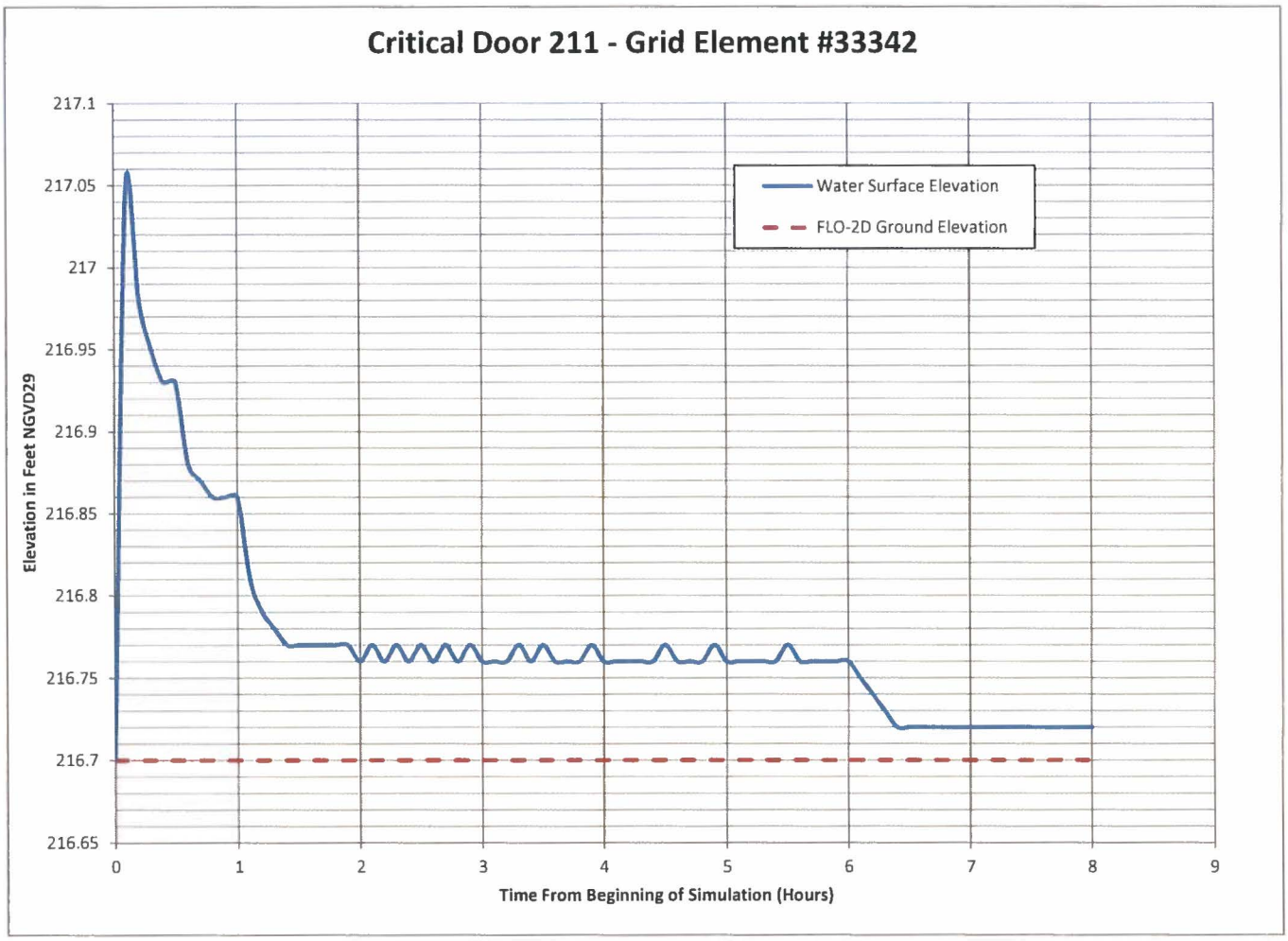
Distance from bottom of the pit to Diesel - 24"
See Page 2 for Attached diesel pit sizes

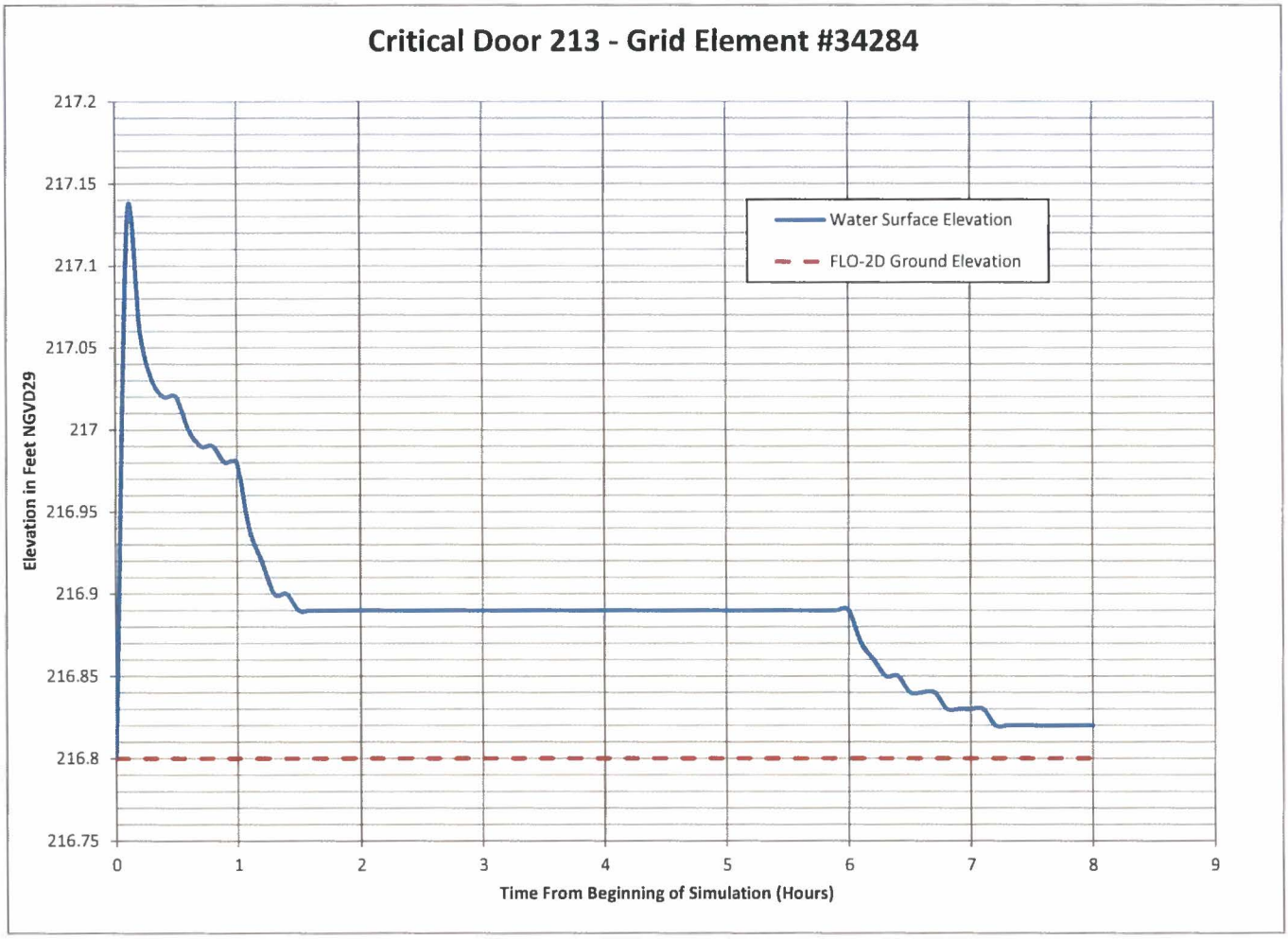
Eval 1550669-36

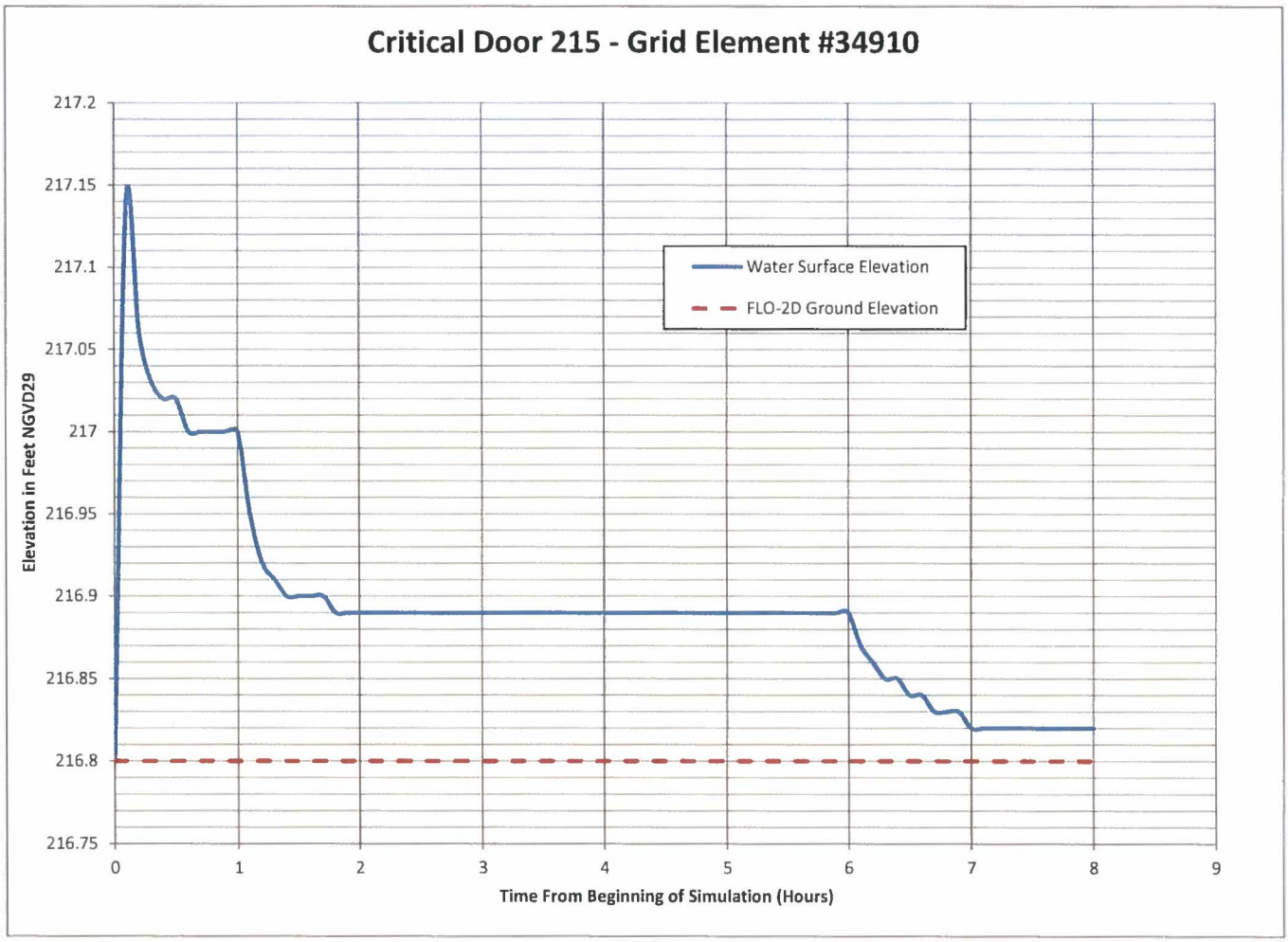
Attachment 1

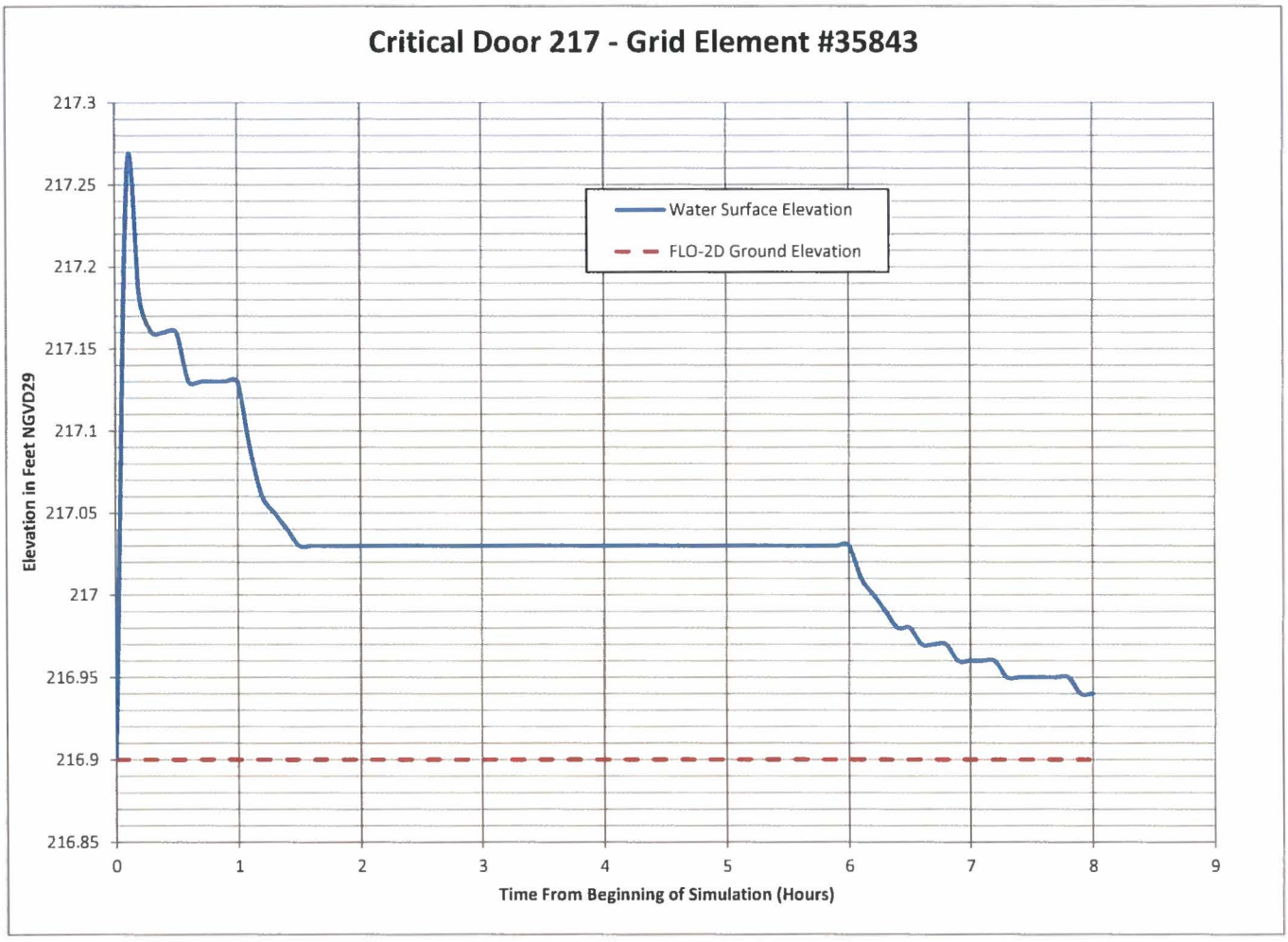
Page 2 of 2

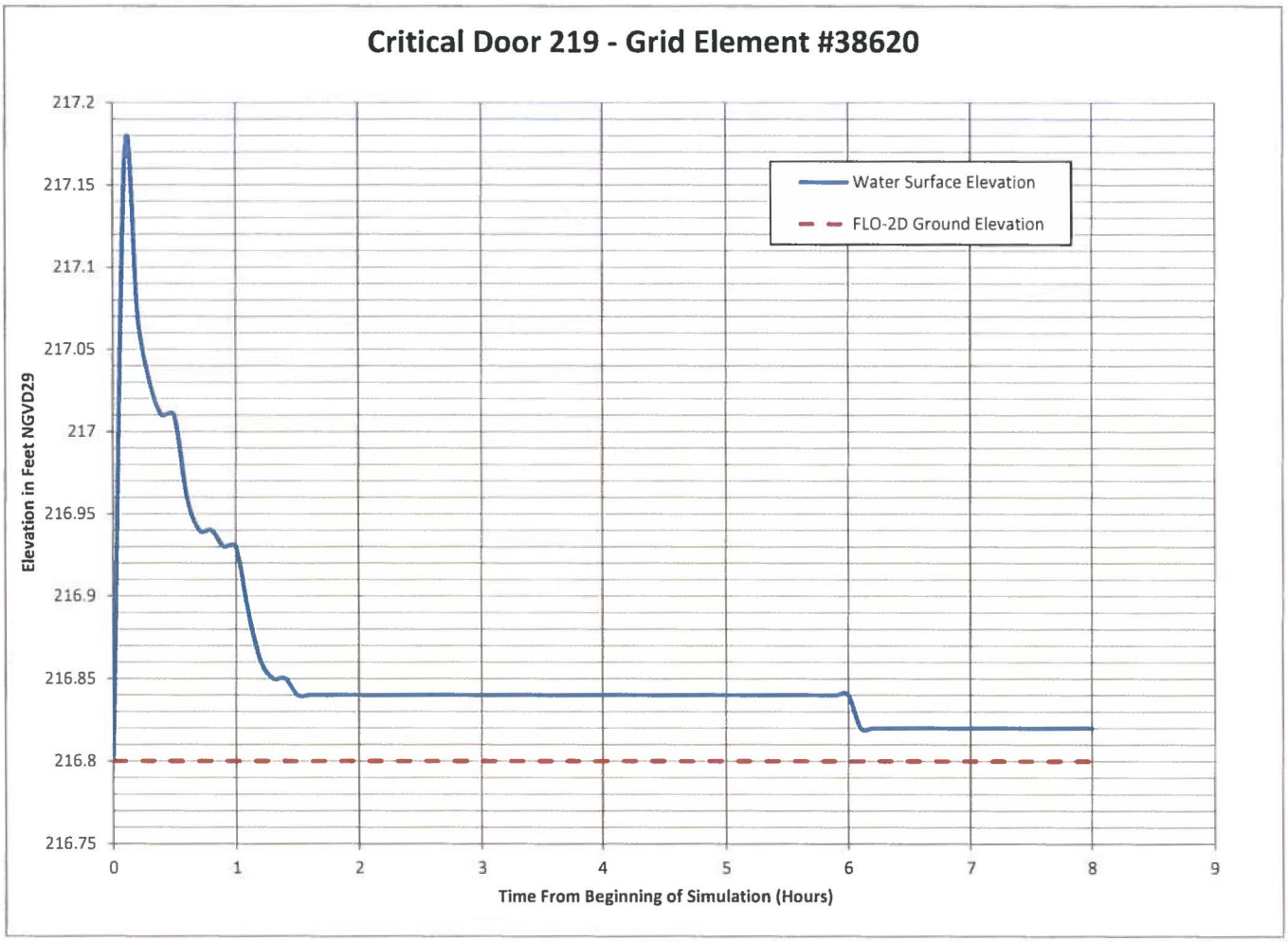


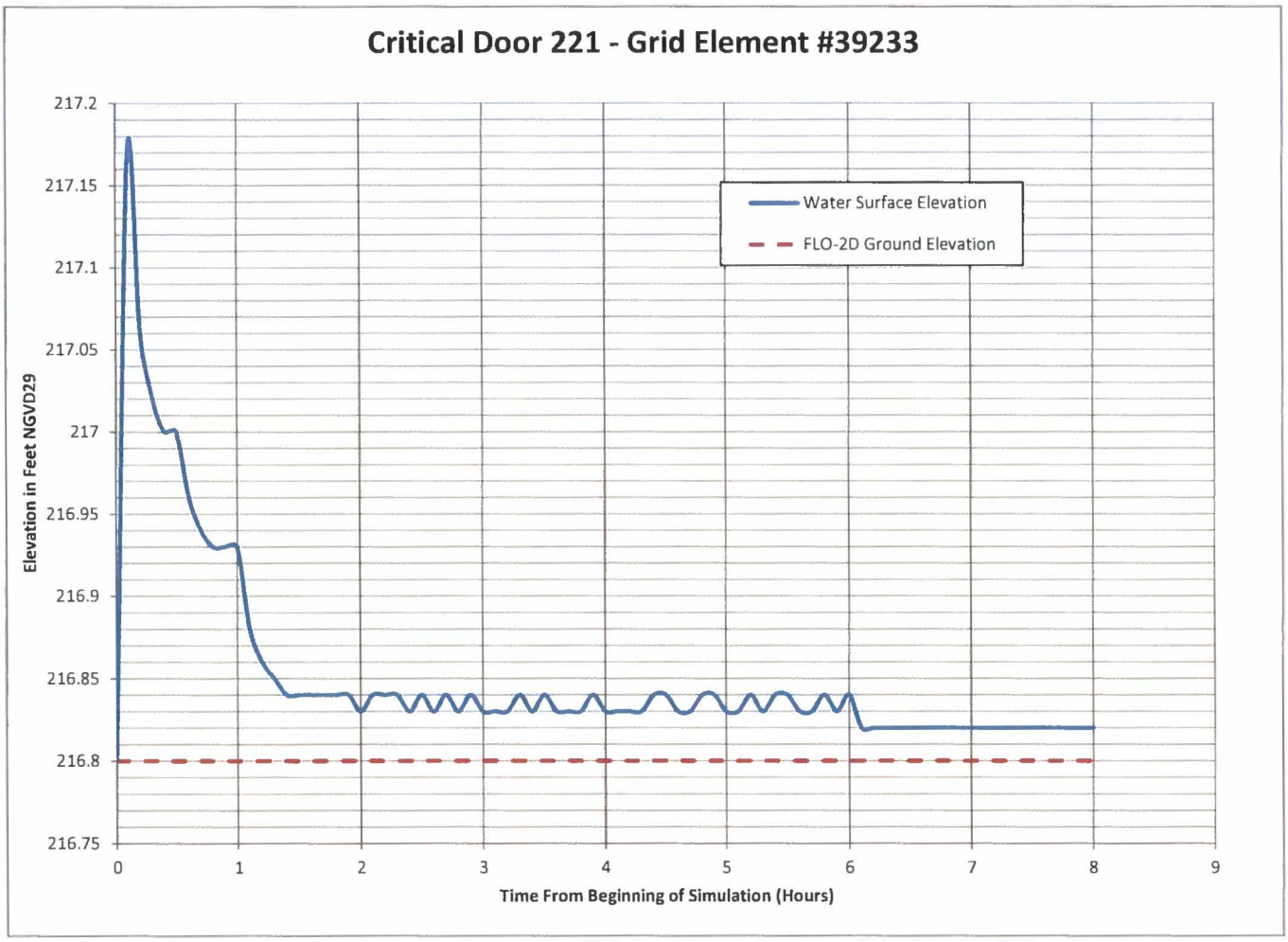

Critical Door 211 - Grid Element #33342
Water Surface Elevation
FLO-2D Ground Elevation
Elevation in Feet NGVD29
217.1
217.05
217
216.95
216.9
216.85
216.8
216.75
216.7
216.65
0
1
2
3
4
5
6
7
8
9
Time From Beginning of Simulation (Hours)

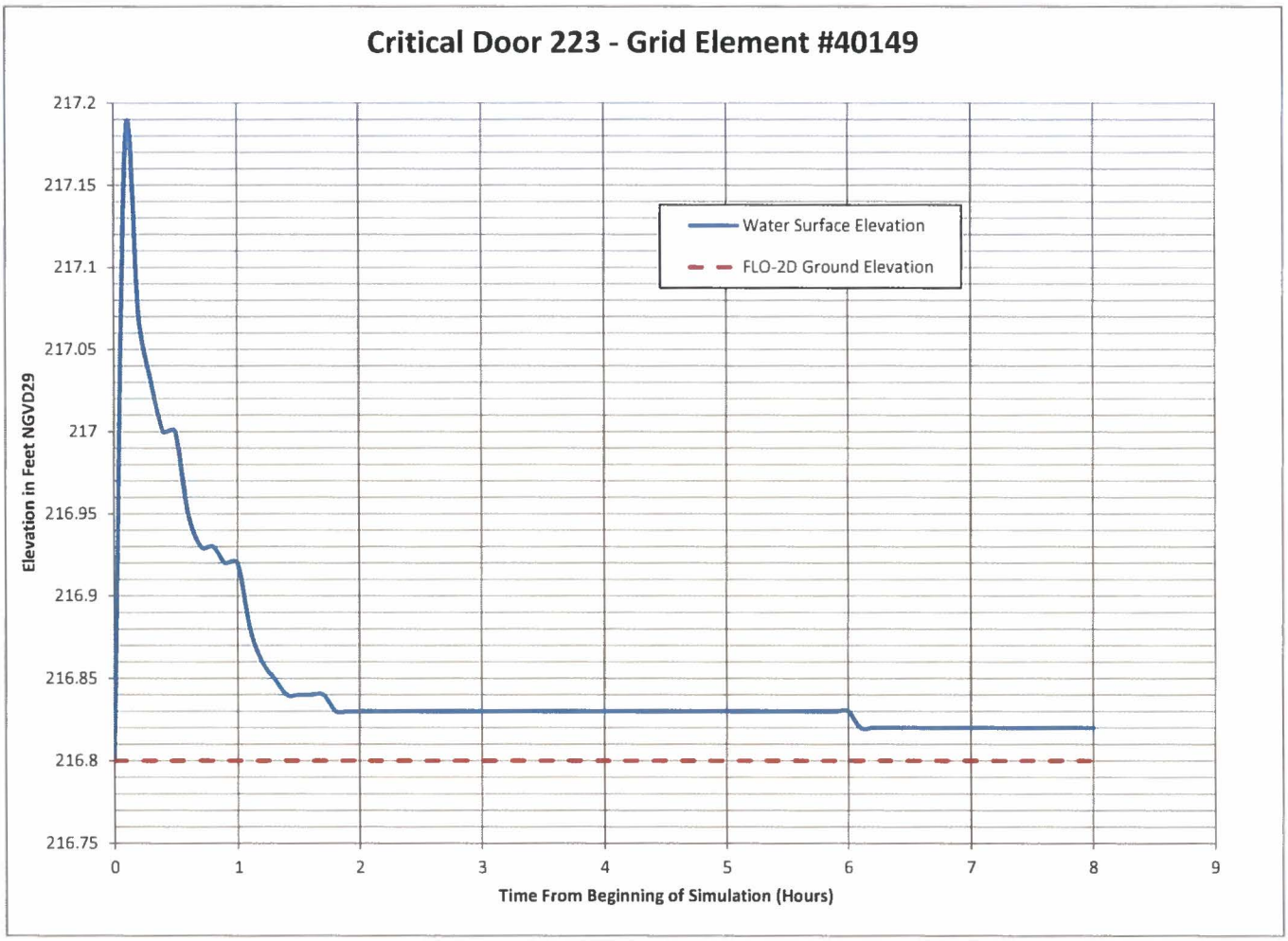

Critical Door 213 - Grid Element #34284
Water Surface Elevation
FLO-2D Ground Elevation
Elevation in Feet NGVD29
Time From Beginning of Simulation (Hours)
217.2
217.15
217.1
217.05
217
216.95
216.9
216.85
216.8
216.75
0
1
2
3
4
5
6
7
8
9

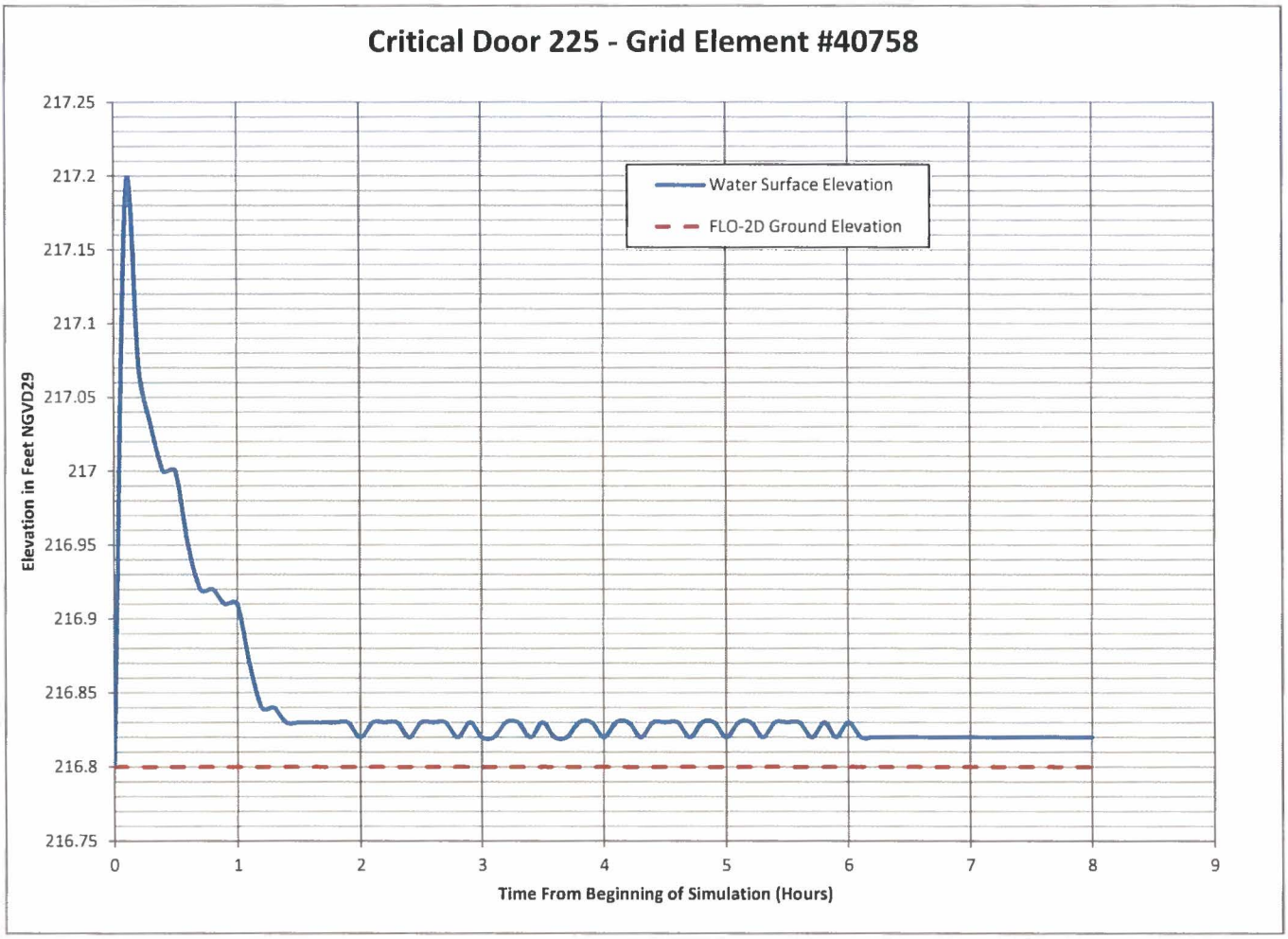

Critical Door 215 - Grid Element #34910
Water Surface Elevation
FLO-2D Ground Elevation
Elevation in Feet NGVD29
Time From Beginning of Simulation (Hours)
217.2
217.15
217.1
217.05
217
216.95
216.9
216.85
216.8
216.75
0
1
2
3
4
5
6
7
8
9


Critical Door 217 - Grid Element #35843
Water Surface Elevation
FLO-2D Ground Elevation
Elevation in Feet NGVD29
217.3
217.25
217.2
217.15
217.1
217.05
217
216.95
216.9
216.85
0
1
2
3
4
5
6
7
8
9
Time From Beginning of Simulation (Hours)


Critical Door 219 - Grid Element #38620
Water Surface Elevation
FLO-2D Ground Elevation
Elevation in Feet NGVD29
217.2
217.15
217.1
217.05
217
216.95
216.9
216.85
216.8
216.75
0
1
2
3
4
5
6
7
8
9
Time From Beginning of Simulation (Hours)


Critical Door 221 - Grid Element #39233
Water Surface Elevation
FLO-2D Ground Elevation
Elevation in Feet NGVD29
217.2
217.15
217.1
217.05
217
216.95
216.9
216.85
216.8
216.75
0
1
2
3
4
5
6
7
8
9
Time From Beginning of Simulation (Hours)


Critical Door 223 - Grid Element #40149
Water Surface Elevation
FLO-2D Ground Elevation
Elevation in Feet NGVD29
217.2
217.15
217.1
217.05
217
216.95
216.9
216.85
216.8
216.75
0
1
2
3
4
5
6
7
8
9
Time From Beginning of Simulation (Hours)


Critical Door 225 - Grid Element #40758
Water Surface Elevation
FLO-2D Ground Elevation
Elevation in Feet NGVD29
217.25
217.2
217.15
217.1
217.05
217
216.95
216.9
216.85
216.8
216.75
0
1
2
3
4
5
6
7
8
9
Time From Beginning of Simulation (Hours)

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Walkdown Record Form

Plant Name: LGS Unit: 1

PART A. IDENTIFICATION

List the flood protection feature credited in CLB documents for protection and mitigation against external flooding events.

Flood Protection Feature ID or Procedure Number: Door 211

Description or Procedure Title: Door w/ threshold

Location: Bldg. or Area Diesel Generator Building
Elevation 217'-00"
Room 311A Column Column Line A-B/ 15.3

Indicate below the type of the feature (check all that are applicable):

- ☐ Incorporated or Exterior Passive
- ☐ Temporary Passive
- ☒ Incorporated or Exterior Active
- ☐ Temporary Active

Enter the flood height at the location of the feature: 217'-00"
If the feature is a procedure, enter N/A
If the flooding design basis is determined by local-intense precipitation and the flood height is unknown, enter unknown

References:
1. Calculation LM-0615, Assess. Of Safety Related Equip For Potential Flooding
2. Procedure SE-4-3, Flooding External to Power Block
3. Procedure SE-9, Preparation for Severe Weather

Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

PART B. PRELIMINARY ANALYSIS

Part B.1 Visual Inspection

Q1. Is a visual inspection required? (Y) N

If No, Explain why not _____

If Yes:

- annotate (below) that Part C must be completed, and
- list any Licensing Basis / Acceptance Criteria that require verification during visual inspection (identify any critical characteristics / parameters applicable to the flood protection feature that are verifiable by inspection such as flood height or elevation, expected operation (e.g., door must close), and equipment name plate data (for example, pump capacity, seal rating, etc.)):

Part C must be completed. Verify presence of a gap, if applicable. Perform a visual inspection to confirm that the ground slopes away from the door and into the yard.

Part B.1 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Part B.2 Functional Testing or Periodic Monitoring

Q2. Is the component included in a preventive maintenance (PM) program? (Y) N

Q3. Is the component included in a periodic test (e.g. surveillance test)? Y (N)

- If either, or both, the answers to question Q2 and Q3 is "Yes", document the identified PM(s) or test(s)

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- If the answers to questions Q2 and Q3 are both "No", describe any other existing test(s) that periodically verify the ability of the component to perform its credited CLB flood protection function. If there are no such tests, annotate with "none".

- If there are no identified PMs or tests, should monitoring or testing be considered to periodically verify the component is able to perform its credited CLB flood protection function? Y (N)

  If "Yes", enter this observation in the CAP (include references to CAP in "Comments" below.

For all identified PMs or tests described above, evaluate whether the existing PM or test(s) are appropriate to verify the credited CLB flood protection function. Document findings in "Comments" below. If the existing test(s) are not, or may not be, sufficient to verify the credited CLB flood protection function, enter this observation in the CAP (include reference to CAP in "Comments" below).

Comments:_____

Part B.2 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Part B.3 Procedure Walk-Through / Reasonable Simulation (see sections 5.5.6 and 5.7)

Q4. Does an appropriate procedure exist for the operation, positioning, or installation of the flood protection feature? (X) (N) LM

If Yes, document the procedure number ~~SE-4-3, Flooding External to Power Block~~

If No and a procedure should govern the operation, positioning, or installation, enter the observation into the CAP and reference the CAP entry here:_____

Q5. Is a procedure or activity walk-through (reasonable simulation) applicable? (X) (N) LM

If Yes, ensure that all information in part D is documented.

If No, explain why not There is no time related activity assoc. with the response. The walkdown only needs to confirm ease of access to the door.

Q6. Is a separate walkdown record form for another flood protection feature being credited for completion of this reasonable simulation? Y (N)

If yes, indicate which Walkdown Record Form is being credited and ensure that all information in part D is documented: _____

If a reasonable simulation IS applicable, and a separate walkdown record form IS NOT being credited:

- annotate (below) that Part D must be completed, and
- list the applicable procedure(s)
- list any credited time dependent activities
- list critical characteristics for any Available Physical Margins that should be measured (e.g., height of temporary barrier)

Applicable Procedures / time dependent activities / applicable critical characteristics:

~~Part D must be completed. Follow procedure SE-4-3, Flooding External to Power Block to ensure door is closed.~~

Part B.3 Evaluated By: Paul N Hansen Date: 7/30/2012
Print / Sign

Summary of Findings

Suggested parts of the Walkdown Record Sheet to complete are as follows (Check those that apply, Part E always applies):

C (X) Visual Inspections
D ( ) Activity or Procedure Walk-Through (Reasonable Simulation)
E (X) Conclusions

Comments:
Part C, D and E apply.

Part B.1 to B.3 Reviewed By: Paul N Hansen Date: 7/30/2012
Print / Sign

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PART C. VISUAL INSPECTION

Q7. Is the feature accessible? (Y) N

If No, Explain (See section 5.1 and 5.10)_____

Q8. Is the Material Condition Acceptable? ~~(Y)~~ (N) PM#

Q9. Are the Critical Characteristics Per Design (refer to Q1 for list of critical characteristics)? (Y) N N/A

Comments: 3" curb below dock, sweep seal is slightly damaged, in need of repair

Q10. Can the equipment be operated as expected in order to achieve its flood protection function (see Q1)? (Y) N

Q11. Determine the available physical margin (the difference between licensing basis value of the critical characteristic (question Q.1) and the as found value – see definitions)

Actual height or name plate data:

Available Physical Margin: 3"

Q12: If the flood height is unknown, record the height of the barrier N/A

Comments:

Part C Performed By: Chad A. Thom Date: 8-9-2012
Print / Sign

Part C Performed By: Laura Maclay Date: 8/9/12
Print / Sign

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Walkdown Record Form

Plant Name: LGS Unit: 1

PART A. IDENTIFICATION

List the flood protection feature credited in CLB documents for protection and mitigation against external flooding events.

Flood Protection Feature ID or Procedure Number: Door 213

Description or Procedure Title: Door w/ threshold

Location: Bldg. or Area Diesel Generator Building
Elevation 217'-00"
Room 311C Column Column Line A-B/ 17.6

Indicate below the type of the feature (check all that are applicable):

- ☐ Incorporated or Exterior Passive
- ☐ Temporary Passive
- ☒ Incorporated or Exterior Active
- ☐ Temporary Active

Enter the flood height at the location of the feature: 217'-00"
If the feature is a procedure, enter N/A
If the flooding design basis is determined by local-intense precipitation and the flood height is unknown, enter unknown

References:
1. Calculation LM-0615, Assess. Of Safety Related Equip For Potential Flooding
2. Procedure SE-4-3, Flooding External to Power Block
3. Procedure SE-9, Preparation for Severe Weather

Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

PART B. PRELIMINARY ANALYSIS

Part B.1 Visual Inspection

Q1. Is a visual inspection required? (Y) N

If No, Explain why not _____

If Yes:

- annotate (below) that Part C must be completed, and
- list any Licensing Basis / Acceptance Criteria that require verification during visual inspection (identify any critical characteristics / parameters applicable to the flood protection feature that are verifiable by inspection such as flood height or elevation, expected operation (e.g., door must close), and equipment name plate data (for example, pump capacity, seal rating, etc.)):

Part C must be completed. Verify presence of a gap, if applicable. Perform a visual inspection to confirm that the ground slopes away from the door and into the yard.

Part B.1 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Part B.2 Functional Testing or Periodic Monitoring

Q2. Is the component included in a preventive maintenance (PM) program? (Y) N

Q3. Is the component included in a periodic test (e.g. surveillance test)? Y (N)

- If either, or both, the answers to question Q2 and Q3 is "Yes", document the identified PM(s) or test(s)

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- If the answers to questions Q2 and Q3 are both "No", describe any other existing test(s) that periodically verify the ability of the component to perform its credited CLB flood protection function. If there are no such tests, annotate with "none".

- If there are no identified PMs or tests, should monitoring or testing be considered to periodically verify the component is able to perform its credited CLB flood protection function? (Y) N

  If "Yes", enter this observation in the CAP (include references to CAP in "Comments" below.

For all identified PMs or tests described above, evaluate whether the existing PM or test(s) are appropriate to verify the credited CLB flood protection function. Document findings in "Comments" below. If the existing test(s) are not, or may not be, sufficient to verify the credited CLB flood protection function, enter this observation in the CAP (include reference to CAP in "Comments" below).

Comments:_____

Part B.2 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Part B.3 Procedure Walk-Through / Reasonable Simulation (see sections 5.5.6 and 5.7)

Q4. Does an appropriate procedure exist for the operation, positioning, or installation of the flood protection feature? (X) (N) LM

If Yes, document the procedure number ~~SB-4.3, Flooding External to Power Block~~

If No and a procedure should govern the operation, positioning, or installation, enter the observation into the CAP and reference the CAP entry here:_____

Q5. Is a procedure or activity walk-through (reasonable simulation) applicable? (X) (N) LM

If Yes, ensure that all information in part D is documented.

If No, explain why not: there is no time related activity assoc. with the response. The walkdown only needs to confirm ease of access to the door.

Q6. Is a separate walkdown record form for another flood protection feature being credited for completion of this reasonable simulation? Y (N)

If yes, indicate which Walkdown Record Form is being credited and ensure that all information in part D is documented: _____

If a reasonable simulation IS applicable, and a separate walkdown record form IS NOT being credited:

- annotate (below) that Part D must be completed, and
- list the applicable procedure(s)
- list any credited time dependent activities
- list critical characteristics for any Available Physical Margins that should be measured (e.g., height of temporary barrier)

Applicable Procedures / time dependent activities / applicable critical characteristics:

~~Part D must be completed. Follow procedure SE-4-3, Flooding External to Power Block to ensure door is closed.~~

Part B.3 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Summary of Findings

Suggested parts of the Walkdown Record Sheet to complete are as follows (Check those that apply, Part E always applies):

C (X) Visual Inspections
D ( ) Activity or Procedure Walk-Through (Reasonable Simulation)
E (X) Conclusions

Comments:
Part C, D and E apply.

Part B.1 to B.3 Reviewed By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

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May 2012

PART C. VISUAL INSPECTION

Q7. Is the feature accessible? (Y) N

If No, Explain (See section 5.1 and 5.10)_____

Q8. Is the Material Condition Acceptable? (Y) N

Q9. Are the Critical Characteristics Per Design (refer to Q1 for list of critical characteristics)? (Y) N N/A

Comments: 2" curb below door

Q10. Can the equipment be operated as expected in order to achieve its flood protection function (see Q1)? (Y) N

Q11. Determine the available physical margin (the difference between licensing basis value of the critical characteristic (question Q.1) and the as found value – see definitions)

Actual height or name plate data:

Available Physical Margin: 2"

Q12: If the flood height is unknown, record the height of the barrier N/A

Comments:

Part C Performed By: Chelsea Tilson Date: 8-9-2012
Print / Sign

Part C Performed By: Laura Maclay Date:_____
Print / Sign

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Walkdown Record Form

Plant Name: LGS Unit: 1

PART A. IDENTIFICATION

List the flood protection feature credited in CLB documents for protection and mitigation against external flooding events.

Flood Protection Feature ID or Procedure Number: Door 215

Description or Procedure Title: Door w/ threshold

Location: Bldg. or Area Diesel Generator Building
Elevation 217'-00"
Room 311B Column Column Line A-B/ 19.4

Indicate below the type of the feature (check all that are applicable):

- ☐ Incorporated or Exterior Passive
- ☐ Temporary Passive
- ☒ Incorporated or Exterior Active
- ☐ Temporary Active

Enter the flood height at the location of the feature: 217'-00"
If the feature is a procedure, enter N/A
If the flooding design basis is determined by local-intense precipitation and the flood height is unknown, enter unknown

References:
1. Calculation LM-0615, Assess. Of Safety Related Equip For Potential Flooding
2. Procedure SE-4-3, Flooding External to Power Block
3. Procedure SE-9, Preparation for Severe Weather

Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

PART B. PRELIMINARY ANALYSIS

Part B.1 Visual Inspection

Q1. Is a visual inspection required? (Y) N

If No, Explain why not _____

If Yes:

- annotate (below) that Part C must be completed, and
- list any Licensing Basis / Acceptance Criteria that require verification during visual inspection (identify any critical characteristics / parameters applicable to the flood protection feature that are verifiable by inspection such as flood height or elevation, expected operation (e.g., door must close), and equipment name plate data (for example, pump capacity, seal rating, etc.)):

Part C must be completed. Verify presence of a gap, if applicable. Perform a visual inspection to confirm that the ground slopes away from the door and into the yard.

Part B.1 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Part B.2 Functional Testing or Periodic Monitoring

Q2. Is the component included in a preventive maintenance (PM) program? (Y) N

Q3. Is the component included in a periodic test (e.g. surveillance test)? Y (N)

- If either, or both, the answers to question Q2 and Q3 is "Yes", document the identified PM(s) or test(s)

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- If the answers to questions Q2 and Q3 are both "No", describe any other existing test(s) that periodically verify the ability of the component to perform its credited CLB flood protection function. If there are no such tests, annotate with "none".

- If there are no identified PMs or tests, should monitoring or testing be considered to periodically verify the component is able to perform its credited CLB flood protection function? Y (N)

  If "Yes", enter this observation in the CAP (include references to CAP in "Comments" below.

For all identified PMs or tests described above, evaluate whether the existing PM or test(s) are appropriate to verify the credited CLB flood protection function. Document findings in "Comments" below. If the existing test(s) are not, or may not be, sufficient to verify the credited CLB flood protection function, enter this observation in the CAP (include reference to CAP in "Comments" below).

Comments:_____

Part B.2 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Part B.3 Procedure Walk-Through / Reasonable Simulation (see sections 5.5.6 and 5.7)

Q4. Does an appropriate procedure exist for the operation, positioning, or installation of the flood protection feature? (X) (N) LM

If Yes, document the procedure number ~~SE-4-3, Flooding External to Power Block~~

If No and a procedure should govern the operation, positioning, or installation, enter the observation into the CAP and reference the CAP entry here:_____

Q5. Is a procedure or activity walk-through (reasonable simulation) applicable? (X) (N) LM

If Yes, ensure that all information in part D is documented.

If No, explain why not There is no time related activity assoc. with the response. The walkdown only needs to confirm ease of access.

Q6. Is a separate walkdown record form for another flood protection feature being credited for completion of this reasonable simulation? Y (N)

If yes, indicate which Walkdown Record Form is being credited and ensure that all information in part D is documented: _____

If a reasonable simulation IS applicable, and a separate walkdown record form IS NOT being credited:

- annotate (below) that Part D must be completed, and
- list the applicable procedure(s)
- list any credited time dependent activities
- list critical characteristics for any Available Physical Margins that should be measured (e.g., height of temporary barrier)

Applicable Procedures / time dependent activities / applicable critical characteristics:
LM ~~Part D must be completed. Follow procedure SE-4-3, Flooding External to Power Block to ensure door is closed.~~

Part B.3 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Summary of Findings

Suggested parts of the Walkdown Record Sheet to complete are as follows (Check those that apply, Part E always applies):

C (X) Visual Inspections
D ( ) Activity or Procedure Walk-Through (Reasonable Simulation)
E (X) Conclusions

Comments: LM
Part C, ~~D~~ and E apply.

Part B.1 to B.3 Reviewed By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

NEI 12-07 (Rev. 0-A)
May 2012

Walkdown Record Form

Plant Name: LGS Unit: 1

PART A. IDENTIFICATION

List the flood protection feature credited in CLB documents for protection and mitigation against external flooding events.

Flood Protection Feature ID or Procedure Number: Door 217

Description or Procedure Title: Door w/ threshold

Location: Bldg. or Area Diesel Generator Building
Elevation 217'-00"
Room 311D Column Column Line A-B/ 21.5

Indicate below the type of the feature (check all that are applicable):

- ☐ Incorporated or Exterior Passive
- ☒ Incorporated or Exterior Active
- ☐ Temporary Passive
- ☐ Temporary Active

Enter the flood height at the location of the feature: 217'-00"
If the feature is a procedure, enter N/A
If the flooding design basis is determined by local-intense precipitation and the flood height is unknown, enter unknown

References:
1. Calculation LM-0615, Assess. Of Safety Related Equip For Potential Flooding
2. Procedure SE-4-3, Flooding External to Power Block
3. Procedure SE-9, Preparation for Severe Weather

Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

PART B. PRELIMINARY ANALYSIS

Part B.1 Visual Inspection

Q1. Is a visual inspection required? (Y) N

If No, Explain why not _____

If Yes:

- annotate (below) that Part C must be completed, and
- list any Licensing Basis / Acceptance Criteria that require verification during visual inspection (identify any critical characteristics / parameters applicable to the flood protection feature that are verifiable by inspection such as flood height or elevation, expected operation (e.g., door must close), and equipment name plate data (for example, pump capacity, seal rating, etc.)):

Part C must be completed. Verify presence of a gap, if applicable. Perform a visual inspection to confirm that the ground slopes away from the door and into the yard.

Part B.1 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Part B.2 Functional Testing or Periodic Monitoring

Q2. Is the component included in a preventive maintenance (PM) program? (Y) N

Q3. Is the component included in a periodic test (e.g. surveillance test)? Y (N)

- If either, or both, the answers to question Q2 and Q3 is "Yes", document the identified PM(s) or test(s)

M-200-047, Specification A-11 Special Doors Examination and Maintenance

- If the answers to questions Q2 and Q3 are both "No", describe any other existing test(s) that periodically verify the ability of the component to perform its credited CLB flood protection function. If there are no such tests, annotate with "none".

- If there are no identified PMs or tests, should monitoring or testing be considered to periodically verify the component is able to perform its credited CLB flood protection function? Y (N)

  If "Yes", enter this observation in the CAP (include references to CAP in "Comments" below.

For all identified PMs or tests described above, evaluate whether the existing PM or test(s) are appropriate to verify the credited CLB flood protection function. Document findings in "Comments" below. If the existing test(s) are not, or may not be, sufficient to verify the credited CLB flood protection function, enter this observation in the CAP (include reference to CAP in "Comments" below).

Comments:_____

Part B.2 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Part B.3 Procedure Walk-Through / Reasonable Simulation (see sections 5.5.6 and 5.7)

Q4. Does an appropriate procedure exist for the operation, positioning, or installation of the flood protection feature? (X) (N) LM

If Yes, document the procedure number ~~SE-4-3, Flooding External to Power Block~~

If No and a procedure should govern the operation, positioning, or installation, enter the observation into the CAP and reference the CAP entry here:_____

Q5. Is a procedure or activity walk-through (reasonable simulation) applicable? (X) (N) LM

If Yes, ensure that all information in part D is documented.

If No, explain why not There is no time related activity assoc. with the response. The walkdown only needs to confirm ease of access to the door.

Q6. Is a separate walkdown record form for another flood protection feature being credited for completion of this reasonable simulation? Y (N)

If yes, indicate which Walkdown Record Form is being credited and ensure that all information in part D is documented: _____

If a reasonable simulation IS applicable, and a separate walkdown record form IS NOT being credited:

- annotate (below) that Part D must be completed, and
- list the applicable procedure(s)
- list any credited time dependent activities
- list critical characteristics for any Available Physical Margins that should be measured (e.g., height of temporary barrier)

Applicable Procedures / time dependent activities / applicable critical characteristics:
~~Part D must be completed. Follow procedure SE-4-3, Flooding External to Power Block to ensure door is closed.~~

Part B.3 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Summary of Findings

Suggested parts of the Walkdown Record Sheet to complete are as follows (Check those that apply, Part E always applies):

C (X) Visual Inspections
D ( ) Activity or Procedure Walk-Through (Reasonable Simulation)
E (X) Conclusions

Comments:
Part C, D and E apply.

Part B.1 to B.3 Reviewed By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

NEI 12-07 (Rev. 0-A)
May 2012

PART C. VISUAL INSPECTION

Q7. Is the feature accessible? (Y) N

If No, Explain (See section 5.1 and 5.10)_____

Q8. Is the Material Condition Acceptable? ~~Y~~ (N) PM

Q9. Are the Critical Characteristics Per Design (refer to Q1 for list of critical characteristics)? (Y) N N/A

Comments: 2" curb under door, sweep damaged/missing

Q10. Can the equipment be operated as expected in order to achieve its flood protection function (see Q1)? (Y) N

Q11. Determine the available physical margin (the difference between licensing basis value of the critical characteristic (question Q.1) and the as found value – see definitions)

Actual height or name plate data:

Available Physical Margin: 2"

Q12: If the flood height is unknown, record the height of the barrier N/A

Comments:

Part C Performed By: Laura Maclay Date: 8/8/12
Print / Sign

Part C Performed By: [illegible] Date: 8/8/12
Print / Sign

NEI 12-07 (Rev. 0-A)
May 2012

Walkdown Record Form

Plant Name: LGS Unit: 2

PART A. IDENTIFICATION

List the flood protection feature credited in CLB documents for protection and mitigation against external flooding events.

Flood Protection Feature ID or Procedure Number: Door 219

Description or Procedure Title: Door w/ threshold

Location: Bldg. or Area Diesel Generator Building
Elevation 217'-00"
Room 315A Column Column Line A-B/ 24.5

Indicate below the type of the feature (check all that are applicable):

- ☐ Incorporated or Exterior Passive
- ☐ Temporary Passive
- ☒ Incorporated or Exterior Active
- ☐ Temporary Active

Enter the flood height at the location of the feature: 217'-00"
If the feature is a procedure, enter N/A
If the flooding design basis is determined by local-intense precipitation and the flood height is unknown, enter unknown

References:
1. Calculation LM-0615, Assess. Of Safety Related Equip For Potential Flooding
2. Procedure SE-4-3, Flooding External to Power Block
3. Procedure SE-9, Preparation for Severe Weather

Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

PART B. PRELIMINARY ANALYSIS

Part B.1 Visual Inspection

Q1. Is a visual inspection required? (Y) N

If No, Explain why not _____

If Yes:

- annotate (below) that Part C must be completed, and
- list any Licensing Basis / Acceptance Criteria that require verification during visual inspection (identify any critical characteristics / parameters applicable to the flood protection feature that are verifiable by inspection such as flood height or elevation, expected operation (e.g., door must close), and equipment name plate data (for example, pump capacity, seal rating, etc.)):

Part C must be completed. Verify presence of a gap, if applicable. Perform a visual inspection to confirm that the ground slopes away from the door and into the yard.

Part B.1 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Part B.2 Functional Testing or Periodic Monitoring

Q2. Is the component included in a preventive maintenance (PM) program? (Y) N

Q3. Is the component included in a periodic test (e.g. surveillance test)? Y (N)

- If either, or both, the answers to question Q2 and Q3 is "Yes", document the identified PM(s) or test(s)

M-200-047, Specification A-11 Special Doors Examination and Maintenance

- If the answers to questions Q2 and Q3 are both "No", describe any other existing test(s) that periodically verify the ability of the component to perform its credited CLB flood protection function. If there are no such tests, annotate with "none".

- If there are no identified PMs or tests, should monitoring or testing be considered to periodically verify the component is able to perform its credited CLB flood protection function? Y (N)

  If "Yes", enter this observation in the CAP (include references to CAP in "Comments" below.

For all identified PMs or tests described above, evaluate whether the existing PM or test(s) are appropriate to verify the credited CLB flood protection function. Document findings in "Comments" below. If the existing test(s) are not, or may not be, sufficient to verify the credited CLB flood protection function, enter this observation in the CAP (include reference to CAP in "Comments" below).

Comments:_____

Part B.2 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Part B.3 Procedure Walk-Through / Reasonable Simulation (see sections 5.5.6 and 5.7)

Q4. Does an appropriate procedure exist for the operation, positioning, or installation of the flood protection feature? (Y) N

If Yes, document the procedure number SE-4-3, Flooding External to Power Block

If No and a procedure should govern the operation, positioning, or installation, enter the observation into the CAP and reference the CAP entry here:_____

Q5. Is a procedure or activity walk-through (reasonable simulation) applicable? C.T. (N)

If Yes, ensure that all information in part D is documented.

If No, explain why not THERE IS NO TIME RELATED ACTIVITY ASSOCIATED WITH THE RESPONSE. THE WALK-DOWN ONLY NEED TO CONFIRM EASE OF ACCESS TO THE DOOR.

Q6. Is a separate walkdown record form for another flood protection feature being credited for completion of this reasonable simulation? Y (N)

If yes, indicate which Walkdown Record Form is being credited and ensure that all information in part D is documented: _____

If a reasonable simulation IS applicable, and a separate walkdown record form IS NOT being credited:

- annotate (below) that Part D must be completed, and
- list the applicable procedure(s)
- list any credited time dependent activities
- list critical characteristics for any Available Physical Margins that should be measured (e.g., height of temporary barrier)

Applicable Procedures / time dependent activities / applicable critical characteristics:

LM ~~Part D must be completed. Follow procedure SE-4-3, Flooding External to Power Block to ensure door is closed~~.

Part B.3 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Summary of Findings

Suggested parts of the Walkdown Record Sheet to complete are as follows (Check those that apply, Part E always applies):

C (X) Visual Inspections
D ( ) Activity or Procedure Walk-Through (Reasonable Simulation)
E (X) Conclusions

Comments:
Part C, ~~D~~ LM and E apply.

Part B.1 to B.3 Reviewed By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

PART C. VISUAL INSPECTION

Q7. Is the feature accessible? (Y) N

If No, Explain (See section 5.1 and 5.10)_____

Q8. Is the Material Condition Acceptable? (Y) N

Q9. Are the Critical Characteristics Per Design (refer to Q1 for list of critical characteristics)? (Y) N N/A

Comments: 2" curb below door, acceptable sweep, good condition. Ground Slope Away From Door.

Q10. Can the equipment be operated as expected in order to achieve its flood protection function (see Q1)? (Y) N

Q11. Determine the available physical margin (the difference between licensing basis value of the critical characteristic (question Q.1) and the as found value – see definitions)

Actual height or name plate data:

Available Physical Margin: 2"

Q12: If the flood height is unknown, record the height of the barrier N/A

Comments:

Part C Performed By: Laura Maclay Date: 8/8/12
Print / Sign

Part C Performed By: Charles T. Ash. Date: 8/8/12
Print / Sign

NEI 12-07 (Rev. 0-A)
May 2012

Walkdown Record Form

Plant Name: LGS Unit: 2

PART A. IDENTIFICATION

List the flood protection feature credited in CLB documents for protection and mitigation against external flooding events.

Flood Protection Feature ID or Procedure Number: Door 221

Description or Procedure Title: Door w/ threshold

Location: Bldg. or Area Diesel Generator Building
Elevation 217'-00"
Room 315C Column Column Line A-B/ 26.6

Indicate below the type of the feature (check all that are applicable):

- ☐ Incorporated or Exterior Passive
- ☐ Temporary Passive
- ☒ Incorporated or Exterior Active
- ☐ Temporary Active

Enter the flood height at the location of the feature: 217'-00"
If the feature is a procedure, enter N/A
If the flooding design basis is determined by local-intense precipitation and the flood height is unknown, enter unknown

References:
1. Calculation LM-0615, Assess. Of Safety Related Equip For Potential Flooding
2. Procedure SE-4-3, Flooding External to Power Block
3. Procedure SE-9, Preparation for Severe Weather

Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

PART B. PRELIMINARY ANALYSIS

Part B.1 Visual Inspection

Q1. Is a visual inspection required? (Y) N

If No, Explain why not _____

If Yes:

- annotate (below) that Part C must be completed, and
- list any Licensing Basis / Acceptance Criteria that require verification during visual inspection (identify any critical characteristics / parameters applicable to the flood protection feature that are verifiable by inspection such as flood height or elevation, expected operation (e.g., door must close), and equipment name plate data (for example, pump capacity, seal rating, etc.)):

Part C must be completed. Verify presence of a gap, if applicable. Perform a visual inspection to confirm that the ground slopes away from the door and into the yard.

Part B.1 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Part B.2 Functional Testing or Periodic Monitoring

Q2. Is the component included in a preventive maintenance (PM) program? (Y) N

Q3. Is the component included in a periodic test (e.g. surveillance test)? Y (N)

- If either, or both, the answers to question Q2 and Q3 is "Yes", document the identified PM(s) or test(s)

M-200-047, Specification A-11 Special Doors Examination and Maintenance

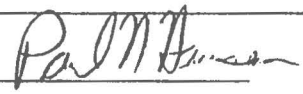
- If the answers to questions Q2 and Q3 are both "No", describe any other existing test(s) that periodically verify the ability of the component to perform its credited CLB flood protection function. If there are no such tests, annotate with "none".

- If there are no identified PMs or tests, should monitoring or testing be considered to periodically verify the component is able to perform its credited CLB flood protection function? Y (N)

  If "Yes", enter this observation in the CAP (include references to CAP in "Comments" below.

For all identified PMs or tests described above, evaluate whether the existing PM or test(s) are appropriate to verify the credited CLB flood protection function. Document findings in "Comments" below. If the existing test(s) are not, or may not be, sufficient to verify the credited CLB flood protection function, enter this observation in the CAP (include reference to CAP in "Comments" below).

Comments:_____

Part B.2 Evaluated By: Paul N Hansen  Date: 7/30/2012
Print / Sign

Part B.3 Procedure Walk-Through / Reasonable Simulation (see sections 5.5.6 and 5.7)

Q4. Does an appropriate procedure exist for the operation, positioning, or installation of the flood protection feature? (Y) N

If Yes, document the procedure number SE-4-3, Flooding External to Power Block

If No and a procedure should govern the operation, positioning, or installation, enter the observation into the CAP and reference the CAP entry here:_____

Q5. Is a procedure or activity walk-through (reasonable simulation) applicable? C.T. (N)

If Yes, ensure that all information in part D is documented.

If No, explain why not THERE IS NO TIME RELATED ACTIVITY ASSOCIATED WITH RESPONSE. WALKDOWN ONLY NEEDS TO CONFIRM EASE OF ACCESS TO THE DOOR.

Q6. Is a separate walkdown record form for another flood protection feature being credited for completion of this reasonable simulation? Y (N)

If yes, indicate which Walkdown Record Form is being credited and ensure that all information in part D is documented: _____

If a reasonable simulation IS applicable, and a separate walkdown record form IS NOT being credited:

- annotate (below) that Part D must be completed, and
- list the applicable procedure(s)
- list any credited time dependent activities
- list critical characteristics for any Available Physical Margins that should be measured (e.g., height of temporary barrier)

Applicable Procedures / time dependent activities / applicable critical characteristics:

LM ~~Part D must be completed. Follow procedure SE-4-3, Flooding External to Power Block to ensure door is closed~~.

Part B.3 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Summary of Findings

Suggested parts of the Walkdown Record Sheet to complete are as follows (Check those that apply, Part E always applies):

C (X) Visual Inspections
D ( ) Activity or Procedure Walk-Through (Reasonable Simulation)
E (X) Conclusions

Comments:
Part C, ~~D~~ LM and E apply.

Part B.1 to B.3 Reviewed By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

NEI 12-07 (Rev. 0-A)
May 2012

PART C. VISUAL INSPECTION

Q7. Is the feature accessible? (Y) N

If No, Explain (See section 5.1 and 5.10)_____

Q8. Is the Material Condition Acceptable? (Y) (N) PMT

Q9. Are the Critical Characteristics Per Design (refer to Q1 for list of critical characteristics)? (Y) N N/A

Comments: 2" curb below door, sweep damaged and 75% missing. Ground outside of door slopes away from door. Damaged sweep.

Q10. Can the equipment be operated as expected in order to achieve its flood protection function (see Q1)? (Y) N

Q11. Determine the available physical margin (the difference between licensing basis value of the critical characteristic (question Q.1) and the as found value – see definitions)

Actual height or name plate data:

Available Physical Margin: 2"

Q12: If the flood height is unknown, record the height of the barrier N/A

Comments:

Part C Performed By: Charles Tilson Date: 8-9-2012
Print / Sign

Part C Performed By: Paul N Hansen/Paul N Hansen Date: 8/9/2012
Print / Sign

NEI 12-07 (Rev. 0-A)
May 2012

Walkdown Record Form

Plant Name: LGS Unit: 2

PART A. IDENTIFICATION

List the flood protection feature credited in CLB documents for protection and mitigation against external flooding events.

Flood Protection Feature ID or Procedure Number: Door 223

Description or Procedure Title: Door w/ threshold

Location: Bldg. or Area Diesel Generator Building
Elevation 217'-00"
Room 315B Column Column Line A-B/ 28.4

Indicate below the type of the feature (check all that are applicable):

- ☐ Incorporated or Exterior Passive
- ☐ Temporary Passive
- ☒ Incorporated or Exterior Active
- ☐ Temporary Active

Enter the flood height at the location of the feature: 217'-00"
If the feature is a procedure, enter N/A
If the flooding design basis is determined by local-intense precipitation and the flood height is unknown, enter unknown

References:
1. Calculation LM-0615, Assess. Of Safety Related Equip For Potential Flooding
2. Procedure SE-4-3, Flooding External to Power Block
3. Procedure SE-9, Preparation for Severe Weather

Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

PART B. PRELIMINARY ANALYSIS

Part B.1 Visual Inspection

Q1. Is a visual inspection required? (Y) N

If No, Explain why not _____

If Yes:

- annotate (below) that Part C must be completed, and
- list any Licensing Basis / Acceptance Criteria that require verification during visual inspection (identify any critical characteristics / parameters applicable to the flood protection feature that are verifiable by inspection such as flood height or elevation, expected operation (e.g., door must close), and equipment name plate data (for example, pump capacity, seal rating, etc.)):

Part C must be completed. Verify presence of a gap, if applicable. Perform a visual inspection to confirm that the ground slopes away from the door and into the yard.

Part B.1 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Part B.2 Functional Testing or Periodic Monitoring

Q2. Is the component included in a preventive maintenance (PM) program? (Y) N

Q3. Is the component included in a periodic test (e.g. surveillance test)? Y (N)

- If either, or both, the answers to question Q2 and Q3 is "Yes", document the identified PM(s) or test(s)

M-200-047, Specification A-11 Special Doors Examination and Maintenance

- If the answers to questions Q2 and Q3 are both "No", describe any other existing test(s) that periodically verify the ability of the component to perform its credited CLB flood protection function. If there are no such tests, annotate with "none".

- If there are no identified PMs or tests, should monitoring or testing be considered to periodically verify the component is able to perform its credited CLB flood protection function? Y (N)

  If "Yes", enter this observation in the CAP (include references to CAP in "Comments" below.

For all identified PMs or tests described above, evaluate whether the existing PM or test(s) are appropriate to verify the credited CLB flood protection function. Document findings in "Comments" below. If the existing test(s) are not, or may not be, sufficient to verify the credited CLB flood protection function, enter this observation in the CAP (include reference to CAP in "Comments" below).

Comments:_____

Part B.2 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Part B.3 Procedure Walk-Through / Reasonable Simulation (see sections 5.5.6 and 5.7)

Q4. Does an appropriate procedure exist for the operation, positioning, or installation of the flood protection feature? (Y) N

If Yes, document the procedure number SE-4-3, Flooding External to Power Block

If No and a procedure should govern the operation, positioning, or installation, enter the observation into the CAP and reference the CAP entry here:_____

Q5. Is a procedure or activity walk-through (reasonable simulation) applicable? (N)

If Yes, ensure that all information in part D is documented.

If No, explain why not NO TIME RELATED ACTIVITY ASSOCIATED WITH THE RESPONSE. WALK-DOWN ONLY TO CONFIRM EASE OF ACESS TO THE DOOR.

Q6. Is a separate walkdown record form for another flood protection feature being credited for completion of this reasonable simulation? Y (N)

If yes, indicate which Walkdown Record Form is being credited and ensure that all information in part D is documented: _____

If a reasonable simulation IS applicable, and a separate walkdown record form IS NOT being credited:

- annotate (below) that Part D must be completed, and
- list the applicable procedure(s)
- list any credited time dependent activities
- list critical characteristics for any Available Physical Margins that should be measured (e.g., height of temporary barrier)

Applicable Procedures / time dependent activities / applicable critical characteristics:
~~Part D must be completed. Follow procedure SE-4-3, Flooding External to Power Block to ensure door is closed~~.

Part B.3 Evaluated By: Paul N Hansen Date: 7/30/2012
Print / Sign

Summary of Findings

Suggested parts of the Walkdown Record Sheet to complete are as follows (Check those that apply, Part E always applies):

C (X) Visual Inspections
D ( ) Activity or Procedure Walk-Through (Reasonable Simulation)
E (X) Conclusions

Comments:
Part C, D and E apply.

Part B.1 to B.3 Reviewed By: Paul N Hansen Date: 7/30/2012
Print / Sign

NEI 12-07 (Rev. 0-A)
May 2012

PART C. VISUAL INSPECTION

Q7. Is the feature accessible? (Y) N

If No, Explain (See section 5.1 and 5.10)_____

Q8. Is the Material Condition Acceptable? (Y) N

Q9. Are the Critical Characteristics Per Design (refer to Q1 for list of critical characteristics)? (Y) N N/A

Comments: 2 1/2" CURB. DOOR SWEEP IN GOOD CONDITION

Q10. Can the equipment be operated as expected in order to achieve its flood protection function (see Q1)? (Y) N

Q11. Determine the available physical margin (the difference between licensing basis value of the critical characteristic (question Q.1) and the as found value – see definitions)

Actual height or name plate data:

Available Physical Margin: 2 1/2"

Q12: If the flood height is unknown, record the height of the barrier_____

Comments:

Part C Performed By: [signature] Date: 8/10/12
Print / Sign

Part C Performed By: Laura Maclay Date: 8/10/12
Print / Sign

NEI 12-07 (Rev. 0-A)
May 2012

Walkdown Record Form

Plant Name: LGS Unit: 2

PART A. IDENTIFICATION

List the flood protection feature credited in CLB documents for protection and mitigation against external flooding events.

Flood Protection Feature ID or Procedure Number: Door 225

Description or Procedure Title: Door w/ threshold

Location: Bldg. or Area Diesel Generator Building
Elevation 217'-00"
Room 315D Column Column Line A-B/ 29

Indicate below the type of the feature (check all that are applicable):

- ☐ Incorporated or Exterior Passive
- ☐ Temporary Passive
- ☒ Incorporated or Exterior Active
- ☐ Temporary Active

Enter the flood height at the location of the feature: 217'-00"
If the feature is a procedure, enter N/A
If the flooding design basis is determined by local-intense precipitation and the flood height is unknown, enter unknown

References:
1. Calculation LM-0615, Assess. Of Safety Related Equip For Potential Flooding
2. Procedure SE-4-3, Flooding External to Power Block
3. Procedure SE-9, Preparation for Severe Weather

Evaluated By: Paul N Hansen Date: 7/30/2012
Print / Sign

PART B. PRELIMINARY ANALYSIS

Part B.1 Visual Inspection

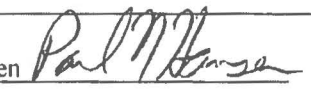
Q1. Is a visual inspection required? (Y) N

If No, Explain why not _____

If Yes:

- annotate (below) that Part C must be completed, and
- list any Licensing Basis / Acceptance Criteria that require verification during visual inspection (identify any critical characteristics / parameters applicable to the flood protection feature that are verifiable by inspection such as flood height or elevation, expected operation (e.g., door must close), and equipment name plate data (for example, pump capacity, seal rating, etc.)):

Part C must be completed. Verify presence of a gap, if applicable. Perform a visual inspection to confirm that the ground slopes away from the door and into the yard.

Part B.1 Evaluated By: Paul N Hansen  Date: 7/30/2012
Print / Sign

Part B.2 Functional Testing or Periodic Monitoring

Q2. Is the component included in a preventive maintenance (PM) program? (Y) N

Q3. Is the component included in a periodic test (e.g. surveillance test)? Y (N)

- If either, or both, the answers to question Q2 and Q3 is "Yes", document the identified PM(s) or test(s)

M-200-047, Specification A-11 Special Doors Examination and Maintenance

- If the answers to questions Q2 and Q3 are both "No", describe any other existing test(s) that periodically verify the ability of the component to perform its credited CLB flood protection function. If there are no such tests, annotate with "none".

- If there are no identified PMs or tests, should monitoring or testing be considered to periodically verify the component is able to perform its credited CLB flood protection function? Y (N)

  If "Yes", enter this observation in the CAP (include references to CAP in "Comments" below.

For all identified PMs or tests described above, evaluate whether the existing PM or test(s) are appropriate to verify the credited CLB flood protection function. Document findings in "Comments" below. If the existing test(s) are not, or may not be, sufficient to verify the credited CLB flood protection function, enter this observation in the CAP (include reference to CAP in "Comments" below).

Comments:_____

Part B.2 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Part B.3 Procedure Walk-Through / Reasonable Simulation (see sections 5.5.6 and 5.7)

Q4. Does an appropriate procedure exist for the operation, positioning, or installation of the flood protection feature? (Y) N

If Yes, document the procedure number SE-4-3, Flooding External to Power Block

If No and a procedure should govern the operation, positioning, or installation, enter the observation into the CAP and reference the CAP entry here:_____

Q5. Is a procedure or activity walk-through (reasonable simulation) applicable? C.T. (Y) (N)

If Yes, ensure that all information in part D is documented.

If No, explain why not NO TIME RELATED ACTIVITY ASSOCIATED WITH THE RESPONSE. WALK-DOWN TO CONFIRM EASE OF ACCESS TO THE DOOR.

Q6. Is a separate walkdown record form for another flood protection feature being credited for completion of this reasonable simulation? Y (N)

If yes, indicate which Walkdown Record Form is being credited and ensure that all information in part D is documented: _____

If a reasonable simulation IS applicable, and a separate walkdown record form IS NOT being credited:

- annotate (below) that Part D must be completed, and
- list the applicable procedure(s)
- list any credited time dependent activities
- list critical characteristics for any Available Physical Margins that should be measured (e.g., height of temporary barrier)

Applicable Procedures / time dependent activities / applicable critical characteristics:
LM ~~Part D must be completed. Follow procedure SE-4-3, Flooding External to Power Block to ensure door is closed~~.

Part B.3 Evaluated By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

Summary of Findings

Suggested parts of the Walkdown Record Sheet to complete are as follows (Check those that apply, Part E always applies):

C (X) Visual Inspections
D ( ) Activity or Procedure Walk-Through (Reasonable Simulation)
E (X) Conclusions

Comments:
Part C, ~~D~~ D, and E apply.

Part B.1 to B.3 Reviewed By: Paul N Hansen Paul N Hansen Date: 7/30/2012
Print / Sign

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May 2012

PART C. VISUAL INSPECTION

Q7. Is the feature accessible? (Y) N

If No, Explain (See section 5.1 and 5.10)_____

Q8. Is the Material Condition Acceptable? (Y) ~~N~~ C.T.

Q9. Are the Critical Characteristics Per Design (refer to Q1 for list of critical characteristics)?
(Y) N N/A

Comments: 2 1/8" curb. Door sweep is missing.

Q10. Can the equipment be operated as expected in order to achieve its flood protection function (see Q1)? (Y) N

Q11. Determine the available physical margin (the difference between licensing basis value of the critical characteristic (question Q.1) and the as found value – see definitions)

Actual height or name plate data:

Available Physical Margin: 2 1/2"

Q12: If the flood height is unknown, record the height of the barrier_____

Comments:

Part C Performed By: [signature] Date: 8-9-2012
Print / Sign

Part C Performed By: Laura Maclay Date: 8/9/12
Print / Sign

	Grade Elevation (ft)	216.7	Door 211							
Time (hr.)	Depths (ft)	Water Height from Grade (ft)	Water Height (Corrected to Curb Height)	Door Flow (cfm)	Volume (ft3)	K1	133.614			
0	216.7	0	-0.25			a	0.625	in	0.052083	ft
0.1	217.05	0.35	0.1	17.66	105.96	g	32.2	ft/s		
0.2	216.98	0.28	0.03	9.67	58.04	Bottom Door Elevation	216.95	ft		
0.3	216.95	0.25	0	0	0					
0.4	216.93	0.23	-0.02		164.00	Total Volume (cfm)				

	Grade Elevation (ft)	216.8	Door 213							
Time (hr.)	Depths (ft)	Water Height from Grade (ft)	Water Height (Corrected to Curb Height)	Door Flow (cfm)	Volume (ft3)	K1	133.614			
0	216.8	0	-0.167			a	0.625	in	0.052083	ft
0.1	217.13	0.33	0.163	22.5469329	135.2816	g	32.2	ft/s2		
0.2	217.06	0.26	0.093	17.0308038	102.1848	Bottom Door Elevation (ft)	216.967	ft		
0.3	217.03	0.23	0.063	14.0172864	84.10372					
0.4	217.02	0.22	0.053	12.856762	77.14057					
0.5	217.02	0.22	0.053	12.856762	77.14057					
0.6	217	0.2	0.033	10.144967	60.8698					
0.7	216.99	0.19	0.023	8.46949642	50.81698					
0.8	216.99	0.19	0.023	8.46949642	50.81698					
0.9	216.98	0.18	0.013	6.36744712	38.20468					
1	216.98	0.18	0.013	6.36744712	38.20468					
1.1	216.94	0.14	-0.027		714.7644	Total Volume (ft3)				

	Grade Elevation (ft)	216.8	Door 215							
Time (hr.)	Depths (ft)	Water Height from Grade (ft)	Water Height (Corrected to Curb Height)	Door Flow (cfm)	Volume (ft3)	K1	133.614			
0	216.8	0	-0.125			a	0.625	in	0.052083	ft
0.1	217.14	0.34	0.215	25.895	155.37	g	32.2	ft./s2		
0.2	217.06	0.26	0.135	20.519	123.12	Bottom Door Elevation (ft)	216.925	ft.		
0.3	217.03	0.23	0.105	18.096	108.58					
0.4	217.02	0.22	0.095	17.213	103.28					
0.5	217.02	0.22	0.095	17.213	103.28					
0.6	216.99	0.2	0.065	14.238	85.43					
0.7	216.99	0.2	0.065	14.238	85.43					
0.8	216.99	0.2	0.065	14.238	85.43					
0.9	216.99	0.2	0.065	14.238	85.43					
1	216.99	0.2	0.065	14.238	85.43					
1.1	216.95	0.15	0.025	8.830	52.98					
1.2	216.92	0.12	-0.005		1073.74	Total Flow (cfm)				

	Grade Elevation (ft)	216.9	Door 217							
Time (hr.)	Depths (ft)	Water Height from Grade (ft)	Water Height (Corrected to Curb Height)	Door Flow (cfm)	Volume (ft3)	K1	133.614			
0	216.9	0	-0.167			a	0.625	in	0.052083	ft
0.1	217.26	0.36	0.193	24.53	147.21	g	32.2	ft/s2		
0.2	217.18	0.28	0.113	18.77	112.64	Bottom Door Elevation (ft)	217.067	ft		
0.3	217.16	0.26	0.093	17.03	102.18					
0.4	217.16	0.26	0.093	17.03	102.18					
0.5	217.16	0.26	0.093	17.03	102.18					
0.6	217.13	0.23	0.063	14.02	84.10					
0.7	217.13	0.23	0.063	14.02	84.10					
0.8	217.13	0.23	0.063	14.02	84.10					
0.9	217.13	0.23	0.063	14.02	84.10					
1	217.13	0.23	0.063	14.02	84.10					
1.1	217.09	0.19	0.023	8.47	50.82					
1.2	217.06	0.16	-0.007		1037.73	Total Volume (ft3)				

	Grade Elevation (ft)	216.8	Door 219							
Time (hr.)	Depths (ft)	Water Height from Grade (ft)	Water Height (Corrected to Curb Height)	Door Flow (cfm)	Volume (ft3)	K1	133.614			
0	216.8		-0.167			a	0.625	in	0.052083	ft
0.1	217.17	0.37	0.203	25.16	150.97	g	32.2	ft/s2		
0.2	217.07	0.27	0.103	17.92	107.54	Bottom Door Elevation (ft)	216.967	ft		
0.3	217.03	0.23	0.063	14.02	84.10					
0.4	217.01	0.21	0.043	11.58	69.48					
0.5	217.01	0.21	0.043	11.58	69.48					
0.6	216.96	0.16	-0.007		481.58	Total Volume (ft3)				

	Grade Elevation (ft)	216.8	Door 221							
Time (hr.)	Depths (ft)	Water Height from Grade (ft)	Water Height (Corrected to Curb Height	Door Flow (cfm)	Volume (ft3)	K1	133.614			
0	216.8	0	-0.167			a	0.625	in	0.052083	ft
0.1	217.17	0.37	0.203	25.16	150.97	g	32.2	ft/s2		
0.2	217.06	0.26	0.093	17.03	102.18	Bottom Door Elevation (ft)	216.967	ft		
0.3	217.02	0.22	0.053	12.86	77.14					
0.4	217	0.2	0.033	10.14	60.87					
0.5	217	0.2	0.033	10.14	60.87					
0.6	216.96	0.16	-0.007		452.04	Total Volume (ft3)				

	Grade Elevation (ft)	216.8	Door 223							
Time (hr.)	Depths (ft)	Water Height from Grade (ft)	Water Height (Corrected to Curb Height)	Door Flow (cfm)	Volume (ft3)	K1	133.614			
0	216.8	0	-0.20833			a	0.625	in	0.052083	ft
0.1	217.18	0.38	0.17167	23.14	138.83	g	32.2	ft/s2		
0.2	217.07	0.27	0.06167	13.87	83.21	Bottom Door Elevation (ft)	217.0083	ft		
0.3	217.03	0.23	0.02167	8.22	49.33					
0.4	217	0.2	-0.00833		275.36	Total Volume (ft3)				

	Grade Elevation (ft)	216.8	Door 225							
Time (hr.)	Depths (ft)	Water Height from Grade (ft)	Water Height (Corrected to Curb Height)	Door Flow (cfm)	Volume (ft3)	K1	133.614			
0	216.8	0	-0.20833			a	0.625	in	0.052083	ft
0.1	217.19	0.39	0.18167	23.803	142.82	g	32.2	ft/s2		
0.2	217.07	0.27	0.06167	13.869	83.21	Bottom Door Elevation (ft)	217.0083	ft		
0.3	217.03	0.23	0.02167	8.221	49.33					
0.4	217	0.2	-0.00833		275.36	Total Volume (ft3)				

	Grade Elevation (ft)	216.8	Door 211		
Time (hr.)	Depths (ft)	Water Height from Grade (ft)	Water Height (Corrected to Curb Height)	Door Flow (cfm)	Volume (ft3)
0	=$C$1+C3	0	=B3-$H$5		
0.1	=$C$1+C4	0.39	=B4-$H$5	=$J$3*(SQRT(2*$H$4*D4))*$	=E4*(A4-A3)*60
0.2	=$C$1+C5	0.27	=B5-$H$5	=$J$3*(SQRT(2*$H$4*D5))*$	=E5*(A5-A4)*60
0.3	=$C$1+C6	0.23	=B6-$H$5	=$J$3*(SQRT(2*$H$4*D6))*$	=E6*(A6-A5)*60
0.4	=$C$1+C7	0.2	=B7-$H$5		=SUM(F4:F63)

K1	133.614			
a	0.625	in	=H3/12	ft
g	32.2	ft/s2		
Bottom Door Elevation (ft)	=C1+0.20833	ft		
Total Volume (ft3)				