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

November 6, 2017

Mr. Bryan C. Hanson
Senior Vice President
Exelon Generation Company, LLC
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 – STAFF ASSESSMENT OF FLOODING FOCUSED EVALUATION (CAC NOS. MG0092 AND MG0093)

Dear Mr. Hanson:

By letter dated March 12, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340), the U.S. Nuclear Regulatory Commission (NRC) issued a request for information to all power reactor licensees and holders of construction permits in active or deferred status, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.54(f), "Conditions of Licenses" (hereafter referred to as the "50.54(f) letter"). The request was issued in connection with implementing lessons learned from the 2011 accident at the Fukushima Dai-ichi nuclear power plant, as documented in the NRC's Near-Term Task Force (NTTF) report (ADAMS Accession No. ML111861807). Enclosure 2 to the 50.54(f) letter requested that licensees reevaluate flood hazards for their sites using present-day methods and regulatory guidance used by the NRC staff when reviewing applications for early site permits and combined licenses (ADAMS Accession No. ML12056A046). By letter dated August 12, 2015 (ADAMS Accession No. ML15233A067), Exelon Generation Company, LLC (Exelon, the licensee) responded to this request for Peach Bottom Atomic Power Station, Units 1 and 2 (Peach Bottom).

After its review of the licensee's response, by letter dated March 31, 2016 (ADAMS Accession No. ML16091A136), the NRC issued an interim staff response (ISR) letter for Peach Bottom. The ISR letter provided the reevaluated flood hazard mechanisms that exceeded the current design basis (CDB) for Peach Bottom and parameters that are a suitable input for the mitigating strategies assessment (MSA). As stated in the letter, because storm surge, seiche, ice-induced flooding, and local intense precipitation (LIP) flood-causing mechanisms at Peach Bottom are not bounded by the plant's CDB, additional assessments of the flood hazard mechanisms are necessary. The conclusions in the ISR were confirmed in the flood hazard reevaluation report staff assessment dated October 30, 2017 (ADAMS Accession No. ML17284A035).

By letter dated March 17, 2017 (ADAMS Accession No. ML17079A052), the licensee submitted the focused evaluation (FE) for Peach Bottom. The FEs are intended to confirm that licensees have adequately demonstrated, for unbounded mechanisms identified in the ISR letter, that: 1) a flood mechanism is bounded based on further reevaluation of flood mechanism parameters; 2) effective flood protection is provided for the unbounded mechanism; or 3) a feasible response

is provided if the unbounded mechanism is local intense precipitation. The purpose of this letter is to provide the NRC's assessment of the Peach Bottom FE.

The NRC staff has concluded that the Peach Bottom FE was performed consistent with the guidance described in Nuclear Energy Institute (NEI) 16-05, Revision 1, "External Flooding Assessment Guidelines" (ADAMS Accession No. ML16165A178). Guidance document NEI 16-05, Revision 1, has been endorsed by Japan Lessons-Learned Division (JLD) interim staff guidance (ISG) JLD-ISG-2016-01, "Guidance for Activities Related to Near-Term Task Force Recommendation 2.1, Flood Hazard Reevaluation" (ADAMS Accession No. ML16162A301). The NRC staff has further concluded that the licensee has demonstrated that effective flood protection, if appropriately implemented, exists for the LIP and probable maximum storm surge flood mechanisms during a beyond-design-basis external flooding event. This closes out the licensee's response for Peach Bottom for the reevaluated flooding hazard portion of the 50.54(f) letter and the NRC's efforts associated with CAC Nos. MG0092 and MG0093.

If you have any questions, please contact me at 301-415-1056 or at Lauren.Gibson@nrc.gov.

Sincerely,

Lauren Kate Gibson

Lauren K. Gibson, Project Manager
Beyond-Design-Basis Management Branch
Division of Licensing Projects
Office of Nuclear Reactor Regulation

Enclosure:
Staff Assessment Related to the
Flooding Focused Evaluation for Peach Bottom

Docket Nos: 50-277 and 50-278

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STAFF ASSESSMENT BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE FOCUSED EVALUATION FOR

PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3

AS A RESULT OF THE REEVALUATED FLOODING HAZARD NEAR-TERM TASK FORCE

RECOMMENDATION 2.1 - FLOODING

(CAC NOS. MG0092 AND MG0093)

1.0 INTRODUCTION

By letter dated March 12, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340), the U.S. Nuclear Regulatory Commission (NRC) issued a request for information to all power reactor licensees and holders of construction permits in active or deferred status, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.54(f) (hereafter referred to as the "50.54(f) letter"). The request was issued in connection with implementing lessons learned from the 2011 accident at the Fukushima Dai-ichi nuclear power plant, as documented in the NRC's Near-Term Task Force (NTTF) report (ADAMS Accession No. ML111861807).

Enclosure 2 of the 50.54(f) letter requested that licensees reevaluate flood hazards for their respective sites using present-day methods and regulatory guidance used by the NRC staff when reviewing applications for early site permits and combined licenses (ADAMS Accession No. ML12056A046). If the reevaluated hazard for any flood-causing mechanism is not bounded by the plant's current design basis (CDB) flood hazard, an additional assessment of plant response would be necessary. Specifically, the 50.54(f) letter states that an integrated assessment should be submitted and described the information that the integrated assessment should contain. By letter dated November 30, 2012 (ADAMS Accession No. ML12311A214), the NRC staff issued Japan Lessons-Learned Division (JLD) interim staff guidance (ISG) JLD-ISG-2012-05, "Guidance for Performing the Integrated Assessment for External Flooding."

On June 30, 2015 (ADAMS Accession No.ML15153A104), the NRC staff issued COMSECY-15-0019, describing the closure plan for the reevaluation of flooding hazards for operating nuclear power plants. The Commission approved the closure plan on July 28, 2015 (ADAMS Accession No. ML15209A682). COMSECY-15-0019 outlines a revised process for addressing cases in which the reevaluated flood hazard is not bounded by the plant's CDB. The revised process describes a graded approach in which licensees with hazards exceeding their CDB flood will not be required to complete an integrated assessment, but instead will perform a focused evaluation (FE). As part of the FE, licensees will assess the impact of the hazard(s) on their site and then evaluate and implement any necessary programmatic, procedural, or plant modifications to address the hazard exceedance.

Nuclear Energy Institute (NEI) 16-05, Revision 1, "External Flooding Assessment Guidelines" (ADAMS Accession No. ML16165A178), has been endorsed by the NRC as an appropriate methodology for licensees to perform the focused evaluation in response to the 50.54(f) letter. The NRC's endorsement of NEI 16-05, including exceptions, clarifications, and additions, is described in NRC JLD-ISG-2016-01, "Guidance for Activities Related to Near-Term Task Force

Recommendation 2.1, Flood Hazard Reevaluation" (ADAMS Accession No. ML16162A301). Therefore, NEI 16-05, Revision 1, describes acceptable methods for demonstrating that Peach Bottom Atomic Power Station, Units 2 and 3 (Peach Bottom) has effective flood protection.

2.0 BACKGROUND

This provides the final NRC staff assessment associated with the information that the licensee provided in response to the reevaluated flooding hazard portion of the 50.54(f) letter. Therefore, this background section includes a summary description of the reevaluated flood information provided by the licensee and the associated assessments performed by the NRC staff. The reevaluated flood information includes: 1) the flood hazard reevaluation report (FHRR); 2) the mitigation strategies assessment (MSA); and 3) the FE.

Flood Hazard Reevaluation Report

By letter dated August 12, 2015 (ADAMS Accession No. ML15233A067), Exelon Generation Company, LLC (Exelon, the licensee) submitted the flood hazard reevaluation report (FHRR) for Peach Bottom. After reviewing the licensee's response, by letter dated March 31, 2016 (ADAMS Accession No. ML16091A136), the NRC issued an interim staff response (ISR) letter for Peach Bottom. The ISR letter discusses the reevaluated flood hazard mechanisms that exceeded the CDB for Peach and parameters that are a suitable input for the MSA. As stated in the ISR letter, because the local intense precipitation (LIP), probable maximum storm surge (PMSS), seiche, and ice-induced flooding flood-causing mechanisms at Peach Bottom are not bounded by the plant's CDB, additional assessments of the flood hazard mechanisms are necessary. By letter dated October 4, 2016 (ADAMS Accession No. ML16278A530), the licensee provided additional information about flood event durations and associated effects. The NRC staff issued a final staff assessment of the FHRR in a letter dated October 30, 2017 (ADAMS Accession No. ML17284A035). The NRC staff's conclusions regarding the flood mechanisms exceeding the Peach Bottom CDB remained unchanged from the information provided in the ISR letter.

Mitigation Strategies Assessment

By letter dated June 30, 2016 (ADAMS Accession No. ML16182A009), Exelon submitted the MSA for Peach Bottom for review by the NRC staff. The MSAs are intended to confirm that licensees have adequately addressed the reevaluated flooding hazards within their mitigation strategies for beyond-design-basis external events. By letter dated January 11, 2017 (ADAMS Accession No. ML16362A208), the NRC issued its assessment of the Peach Bottom MSA. The NRC staff has concluded that the Peach Bottom MSA was performed consistent with the guidance described in Appendix G of Nuclear Energy Institute 12-06, Revision 2, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide" (ADAMS Accession No. ML16005A625). The NRC's endorsement of NEI 12-06, Revision 2, is described in JLD-ISG-2012-01, Revision 1, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML15357A163). The NRC staff further concluded that the licensee has demonstrated that the mitigation strategies, if appropriately implemented, are reasonably protected from reevaluated flood hazards conditions for beyond-design-basis external events.

Focused Evaluation

By letter dated March 17, 2017 (ADAMS Accession No. ML17079A052), the licensee submitted the FE for Peach Bottom. The FEs are intended to confirm that licensees have adequately demonstrated, for unbounded mechanisms identified in the ISR letter, that: 1) a flood mechanism is bounded based on further reevaluation of flood mechanism parameters; 2) effective flood protection is provided for the unbounded mechanism; or 3) a feasible response is provided if the unbounded mechanism is local intense precipitation. These 3 options associated with performing an FE are referred to as Path 1, 2, or 3, as described in NEI 16-05, Revision 1. The purpose of this staff assessment is to provide the results of the NRC's evaluation of the Peach Bottom FE.

3.0 TECHNICAL EVALUATION

Exelon stated that its FE followed Path 2 of NEI 16-05, Revision 1 and utilized Appendix B for guidance on evaluating the site strategy. The Peach Bottom FE addresses the LIP, PMSS, seiche, and ice-induced flooding mechanisms, which were found to exceed the plant's CDB as described in the FHRR and ISR letter. This technical evaluation will address the following topics: characterization of flood parameters; evaluation of flood impact assessments; evaluation of available physical margin and reliability of flood protection features; and overall site response.

Elevations in this staff assessment are given in North American Vertical Datum 1988 (NAVD88) unless otherwise noted. The NAVD88 is 0.13 feet (ft.) lower than Conowingo Datum, which is noted where used.

3.1 Characterization of Flood Parameters

Associated effects (AE) and flood event duration (FED) parameters were assessed by Exelon and have already been reviewed by the NRC, as summarized by letter dated January 11, 2017 (ADAMS Accession No. ML16362A208). Exelon used the AE and FED parameters as input to the Peach Bottom FE and concluded that the site's flood strategy is effective in protecting structures, systems, and components (SSCs) that support key safety functions (key SSCs). Exelon supported its conclusion of adequate flood protection by demonstrating adequate available physical margin (APM) and reliable flood protection features for LIP. In its MSA and FE for Peach Bottom, Exelon indicated that the site does not require manual actions by plant personnel to protect key SSCs; therefore, an evaluation of the overall site response was not necessary.

The Peach Bottom finished grade is 115.87 ft. Table 3.1 provides the elevations for the four reevaluated flood mechanisms. For storm surge, seiche, and ice-induced flooding, the elevations in the focused evaluation are lower than those discussed in the FHRR and the ISR. They were lowered to better reflect the physical reality of the site. In particular, any waves would break up at the shore of Conowingo Pond, therefore the wave run up would not affect the power block. The licensee therefore subtracted the wave set up and run up values to determine the flood parameters for this FE.

For the LIP condition, the licensee relies on available physical margin between the depth of the interior puddle that is created by the water ingress and the already-established action level in the procedure for addressing water in lower level reactor building rooms.

Table 3.1 Summary of Reevaluated Flood Hazards Elevations Included in the Peach Bottom FE.

Mechanism	Antecedent	Wind Setup	Reevaluated Flood Height
Storm Surge	109.1 ft.	1.1 ft.	110.2 ft.
Seiche	109.1 ft	1.1 ft.	110.2 ft.
Ice-Induced Flooding	-	-	111.5 ft.
LIP at Door 239 (maximum)	-	-	135.91 ft.

3.2 Evaluation of Flood Impact Assessment for LIP

3.2.1 Description of Impact of Unbounded Hazard

The LIP flooding mechanism is considered not bounded by the design-basis because it is not addressed within it. The Peach Bottom FE discusses the impact of the unbounded hazard in two sets: the areas in which physical margin is available and those in which water ingress is expected.

Table 7 describes the available physical margin for certain structures. As discussed in the licensee's walkdown report (ADAMS Accession No. ML123250714), the Emergency Cooling Tower (ECT), Emergency Diesel Generator Building (EDGB), and the Emergency Pump Structure are protected to 137.4 ft. (137.5 ft. Conowingo Datum). The available physical margin between the maximum still water elevations at these structures is 10.4 ft., 5.4 ft., and 19.9 ft., respectively.

Water is expected to ingress into the reactor building. (The NRC staff notes that the possibility of water ingress into the reactor building is addressed qualitatively in the Updated Final Safety Analysis Report.) The reactor building is protected to 134.87 ft. while the reevaluated hazard may reach as high as 135.91 ft. at a particular door. The licensee performed a technical evaluation to determine the in-leakage into the reactor building and concluded that the volume was such that equipment operation would not be adversely affected. The NRC staff reviewed the licensee's summary of this evaluation and audited the related calculation, Technical Evaluation 2522427-03, Assessment of LIP, dated August 5, 2015.

3.2.2 Evaluation of Available Physical Margin and Reliability of Flood Protection Features

As stated above, available physical margin exists for LIP at the ECT, EDG building, and the emergency pump structure. The NRC staff finds the licensee's determination of available physical margin to be acceptable.

The licensee identified potential water ingress at six doors of the reactor building, determined the in-leakage destination, and calculated the depth of the water and compared it to the alarm and action levels of the existing procedure to address water in lower level reactor building rooms. The NRC audited the licensee's calculation.

Water ingress is expected at each unit's exterior truck bay airlock doors. For Unit 2, the flood elevation is expected to exceed the passive protection for 14.4 minutes with a maximum exceedance of 0.36 ft. For Unit 3, it is expected to exceed for 29.4 minutes with a maximum exceedance of 0.30 ft. The licensee conservatively determined a water ingress of 25 cubic feet

by using the higher of the two exceedances paired with the longer period of maximum exceedance (0.36 ft. for 29.4 min.). The 25 cubic feet translates into an average water depth of 0.13 in. given the square footage of the airlock floor space. There are no key structures, systems, or components in the truck bay, so the concern is whether the water could leak past the interior airlock door. The NRC agrees that a depth of 0.13 is insufficient to leak past the interior airlock door. Therefore, the water ingress into each unit's truck bay would not affect key structures, systems, or components.

Water ingress is also possible at Doors 244 (Unit 3) and 183 (Unit 2), which are emergency exit doors at the bottom of stairwells. Under each respective stairwell, there is an open hatch that leads to an upper residual heat removal (RHR) room on a lower elevation. The floor of the upper RHR room is an open grating that leads to the lower RHR room. Therefore, water leakage past the emergency exit doors would go to the floor of the lower RHR rooms. The licensee used the worst-case in leakage of 107 gallons over 57 minutes (at Door 183) to calculate the depth of water in the lower RHR room. (The licensee notes that there is a sump pump that is expected to be able to handle this leakage rate, but the licensee does not rely on the sump in the focused evaluation.) The depth of the water would be less than 0.22 in.

There is an existing procedure, Transient Response Implementation Plan (TRIP) Procedure T-103 Secondary Containment Control, to address water in lower level reactor building rooms. The NRC verified that the alarm and action levels are well above the expected depth of the water, with available physical margin of 1 ft., 2.78 in. to the action level. Therefore, given that there is available physical margin to the pre-determined action level, the NRC concludes that key structures, systems, and components would not be affected.

The remaining two doors that could experience in-leakage are also emergency exit doors. Doors 239 (Unit 3) and 188 (Unit 2) are at the top of open-grate staircases that terminate near each unit's High Pressure Coolant Injection Room (HPCI) on elevation 88 ft. There are two doors near the bottom of the stairs, a watertight door to the RHR rooms and a door to the HPCI room. The licensee calculated that the worst case in-leakage of 204 gallons over 58 minutes at Door 188 would lead to a puddle depth of less than 0.16 inches, assuming that the entire volume of water that leaked down the staircase would leak through the HPCI room door. This is also assuming that the floor drains, which lead to the reactor building sump room, are plugged.

The procedure to address water in lower level reactor building rooms applies to the HPCI room as well. The NRC verified that the alarm and action levels are well above the expected depth of the water, with available physical margin of 1 ft., 2.78 in. to the action level. Therefore, given that there is available physical margin to the pre-determined action level, the NRC concludes that key structures, systems, and components would not be affected.

The reliability of the flood protection features was discussed in the licensee's flooding walkdown report dated November 19, 2012(ADAMS Accession No. ML123250714). The licensee has not introduced any additional flood protection measures beyond those discussed in that report. Furthermore, the licensee does not credit the drains or sumps when determining that available physical margin exists.

Because increased focus has been placed on flood protection since the accident at Fukushima, licensees and NRC inspectors have identified deficiencies with equipment, procedures, and analyses relied on to either prevent or mitigate the effects of external flooding at a number of licensed facilities. Recent examples include those found in Information Notice 2015-01, "Degraded Ability to Mitigate Flooding Events" (ADAMS Accession No. ML14279A268). In

addition, the NRC is cooperatively performing research with the Electric Power Research Institute to develop flood protection systems guidance that focuses on flood protection feature descriptions, design criteria, inspections, and available testing methods in accordance with a memorandum of understanding dated September 28, 2016 (ADAMS Accession No. ML16223A495). Therefore, the NRC staff expects that licensees will continue to maintain flood protection features in accordance with their current licensing basis. The NRC staff further expects that continued research involving flood protection systems will be performed and shared with licensees in accordance with the guidance provided in Management Directive 8.7, "Reactor Operating Experience Program," (ADAMS Accession No. ML122750292), as appropriate.

The NRC staff concludes that the Peach Bottom flood protection features described above meet the definition of being reliable to maintain key safety functions found in Appendix B of NEI 16-05, Rev 1.

3.2.3 Overall Site Response

The licensee does not rely on any personnel actions or new modifications to the plant in order to respond to the beyond-design-basis (BDB) LIP event. As described above, the licensee's evaluation relied on passive existing flood protection features to demonstrate adequate flood protection; therefore, there is no need to review overall site response.

3.3 Evaluation of Flood Impact Assessment for Probable Maximum Storm Surge

3.3.1 Description of Impact of Unbounded Hazard

The PMSS is considered not bounded by the design-basis because it is not addressed within it. The FHRR, ISR, and FHRR staff assessment state a maximum water elevation due to PMSS of 118.5 ft. (Note that a separate wave run-up value was not given in the staff's tables; rather, the staff used the value provided by the licensee that had already taken into account wave run up.) However, the licensee evaluated a lower value of 110.2 ft. in the FE to better reflect that the waves would dissipate at the river shore, more than 400 ft. away from the plant protected area. The 110.2 ft. was obtained from the maximum controlled antecedent water elevation of 109.1 ft. plus the wind setup height of 1.1 ft., as described in the licensee's calculation, PEAS-FLOOD-10, which the NRC reviewed during the audit. The licensee also chose to evaluate the value of 110.2 ft. against the site grade of 115.9 ft., rather than against the current licensing basis' permanent, passive flood protection level of 134.9 ft. The NRC agrees with this approach, and notes that it results in lower APM than comparing the ISR elevation against the protection level of 134.9 ft.

Since 110.2 ft. is less than the site grade, no impacts were identified.

3.3.2 Evaluation of Available Physical Margin and Reliability of Flood Protection Features

The licensee calculated an APM of 5.7 ft. between the reevaluated (FE) flood height of 110.2 ft. and the site grade of 115.9 ft. The NRC staff reviewed the APM calculation and concludes, based on the information provided by Exelon, that adequate margin exists for the reevaluated PMSS mechanism. The natural topography around the site provides protection from the reevaluated hazard and this feature has APM for additional assurance that the event will not impact key SCCs.

Peach Bottom relies on the natural topography around the site to provide protection from the reevaluated PMSS conditions. Therefore, Peach Bottom did not evaluate potential failure modes such as those listed in Appendix B of NEI 16-05, Rev 1 that could prevent this feature from providing protection of PMSS conditions. As noted in Section 3.2.2 of this document, the NRC staff expects that licensees will continue to maintain flood protection features in accordance with their current licensing basis.

The NRC staff concludes that the Peach Bottom flood protection features described above meet the definition of being reliable to maintain key safety functions found in Appendix B of NEI 16-05, Rev 1.

3.3.3 Overall Site Response

The licensee does not rely on any personnel actions or new modifications to the plant in order to respond to the BDB PMSS event. As described above, the licensee's evaluation relied on passive existing features to demonstrate adequate flood protection. Therefore, there is no need to review overall site response.

3.4 Evaluation of Flood Impact Assessment for Seiche

3.4.1 Description of Impact of Unbounded Hazard

The seiche flooding mechanism is considered not bounded by the design-basis because it is not addressed within it. The FHRR, ISR, and FHRR staff assessment state a maximum water elevation due to seiche of 112.8 ft. (Note that a separate wave run-up value was not given in the staff's tables; rather, the staff used the value provided by the licensee that had already taken into account wave run up.) However, the licensee evaluated a lower value of 110.2 ft. in the FE to better reflect that the waves would dissipate at the river shore, more than 400 ft. away from the plant protected area. The 110.2 ft. was obtained from the maximum controlled antecedent water level of 109.1 ft. plus a seiche height of 1.1 ft., as described in the FHRR. The licensee also chose to evaluate the value of 110.2 ft. against the site grade of 115.9 ft., rather than against the current licensing basis' permanent, passive flood protection level of 134.9 ft. The NRC agrees with this approach, and notes that it results in lower available physical margin than comparing the ISR elevation against the protection level of 134.9 ft.

Since 110.2 ft. is less than the site grade, no impacts were identified.

3.4.2 Evaluation of Available Physical Margin and Reliability of Flood Protection Features

The licensee calculated an APM of 5.7 ft. between the reevaluated (FE) flood height of 110.2 ft. and the site grade of 115.9 ft. The NRC staff reviewed the APM calculation and concludes, based on the information provided by Exelon, that adequate margin exists for the reevaluated seiche mechanism. The natural topography around the site provides protection from the reevaluated hazard and this feature has APM for additional assurance that the event will not impact key SCCs.

Peach Bottom relies on the natural topography around the site to provide protection from the reevaluated seiche conditions. Therefore, Peach Bottom did not evaluate potential failure modes such as those listed in Appendix B of NEI 16-05, Rev 1 that could prevent this feature from providing protection of seiche conditions. As noted in Section 3.2.2 of this document, the

NRC staff expects that licensees will continue to maintain flood protection features in accordance with their current licensing basis.

The NRC staff concludes that the Peach Bottom flood protection features described above meet the definition of being reliable to maintain key safety functions found in Appendix B of NEI 16-05, Rev 1.

3.4.3 Overall Site Response

The licensee does not rely on any personnel actions or new modifications to the plant in order to respond to the BDB seiche event. As described above, the licensee's evaluation relied on passive existing features to demonstrate adequate flood protection. Therefore, there is no need to review overall site response.

3.5 Evaluation of Flood Impact Assessment for Ice-Induced Flooding

3.5.1 Description of Impact of Unbounded Hazard

Ice-induced flooding is considered not bounded by the design-basis because it is not addressed within it. The FHRR, ISR, and FHRR staff assessment state a maximum still water elevation due to ice-induced flooding of 111.5 ft., with wave run-up not being applicable.

Since 111.5 ft. is less than the site grade, no impacts were identified.

3.5.2 Evaluation of Available Physical Margin and Reliability of Flood Protection Features

The licensee calculated an APM of 4.4 ft. between the reevaluated (FE) flood height of 111.5 ft. and the site grade of 115.9 ft. The NRC staff concludes, based on the information provided by Exelon, that adequate margin exist for the reevaluated ice-induced flooding mechanism. The natural topography around the site provides protection from the reevaluated hazard and this feature has APM for additional assurance that the event will not impact key SCCs.

Peach Bottom relies on the natural topography around the site to provide protection from the reevaluated ice-induced flooding conditions. Therefore, Peach Bottom did not evaluate potential failure modes such as those listed in Appendix B of NEI 16-05, Rev 1 that could prevent this feature from providing protection of ice-induced flooding conditions. As noted in Section 3.2.2 of this document, the NRC staff expects that licensees will continue to maintain flood protection features in accordance with their current licensing basis.

The NRC staff concludes that the Peach Bottom flood protection features described above meet the definition of being reliable to maintain key safety functions found in Appendix B of NEI 16-05, Rev 1.

3.5.3 Overall Site Response

The licensee does not rely on any personnel actions or new modifications to the plant in order to respond to the BDB ice-induced flooding event. As described above, the licensee's evaluation relied on passive existing features to demonstrate adequate flood protection. Therefore, there is no need to review overall site response.

4.0 AUDIT REPORT

The July 18, 2017, generic audit plan describes the NRC staff's intention to issue an audit report that summarizes and documents the NRC's regulatory audit of the licensee's FE. The NRC staff's Peach Bottom audit was limited to the review of the calculations and procedures described above. Because this staff assessment appropriately summarizes the results of the audit, the NRC staff concludes a separate audit report is not necessary, and that this document serves as the audit report described in the July 18, 2017, letter.

5.0 CONCLUSION

The NRC staff concludes that Exelon performed the Peach Bottom FE in accordance with the guidance described in NEI 16-05, Revision 1, as endorsed by JLD-ISG-2016-01, and that the licensee has demonstrated, if appropriately implemented, as described in the FE, that effective flood protection exist from the reevaluated flood hazards. Furthermore, the NRC staff concludes that Peach Bottom screens out of performing an integrated assessment based on the guidance found in JLD-ISG-2016-01. As such, in accordance with Phase 2 of the process outlined in the 50.54(f) letter, additional regulatory actions associated with the reevaluated flood hazard, beyond those associated with mitigation strategies assessment, are not warranted. The licensee has satisfactorily completed providing responses to the 50.54(f) activities associated with the reevaluated flood hazards.

PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 – STAFF ASSESSMENT OF FLOODING FOCUSED EVALUATION DATED NOVEMBER 6, 2017

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ADAMS Accession No.: ML17292B763 ***via email**

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