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10 CFR 50.54(f)

RS-15-163

August 12, 2015

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

Peach Bottom Atomic Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56
NRC Docket Nos. 50-277 and 50-278

Subject: Exelon Generation Company, LLC Response to March 12, 2012, Request for Information Enclosure 2, Recommendation 2.1, Flooding, Required Response 2, Flood Hazard Reevaluation Report

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. NRC Letter, Prioritization of Response Due Dates for Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Flooding Hazard Reevaluations for Recommendations 2.1 of the Near-Term Task Force Review of Insights From the Fukushima Dai-ichi Accident, dated May 11, 2012.
3. Letter from Exelon Generation Company, LLC to U.S. Nuclear Regulatory Commission, Extension Request – Response to March 12, 2012, Request for Information Enclosure 2, Recommendation 2.1, Flooding, Required Response 2, Flood Hazard Reevaluation Report, dated March 12, 2014 (RS-14-056)
4. NRC Letter, Peach Bottom Atomic Power Station, Units 2, and 3 – Relaxation of Response Due Dates Regarding Flooding Hazard Reevaluations for Recommendation 2.1 of the Near-Term Task Force Review of the Insights from the Fukushima Dai-ichi Accident (TAC Nos. MF3671 and MF3672), dated July 17, 2014
5. Letter from Exelon Generation Company, LLC to U.S. Nuclear Regulatory Commission, Extension Request – Response to March 12, 2012, Request for Information Enclosure 2, Recommendation 2.1, Flooding, Required Response 2, Flood Hazard Reevaluation Report, dated January 5, 2015 (RS-15-005)

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6. NRC Letter, Peach Bottom Atomic Power Station, Units 2 and 3 – Relaxation of Response Due Dates Regarding Flooding Hazard Reevaluations for Recommendation 2.1 of the Near-Term Task Force Review of the Insights from the Fukushima Dai-ichi Accident (TAC Nos. MF5648 and MF5649), dated February 25, 2015
7. U.S. Nuclear Regulatory Commission, NUREG/CR-7046, Design-Basis Flood Estimation for Site Characterization at Nuclear Power Plants in the United States of America, dated November 2011
8. Letter from David L. Skeen, U.S. Nuclear Regulatory Commission, to Joseph E. Pollock, Nuclear Energy Institute – Trigger Conditions for Performing an Integrated Assessment and Due Date for Response, dated December 3, 2012
9. U.S. Nuclear Regulatory Commission, JLD-ISG-2012-05, Guidance for Performing the Integrated Assessment for External Flooding, dated November 30, 2012
10. Letter from Exelon Generation Company, LLC to U.S. Nuclear Regulatory Commission, 180-day Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding the Flooding Aspects of Recommendation 2.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated November 19, 2012 (RS-12-174)

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 this letter directed licensees to submit a Flood Hazard Reevaluation Report, including the interim action plan requested in Item 1.d of Reference 1, Enclosure 2, if appropriate. On May 11, 2012, the NRC issued the prioritization plan developed by the NRC and resultant Flood Hazard Reevaluation due dates for all sites. Reference 2, Enclosure 1 identified Peach Bottom Atomic Power Station, Units 2 and 3, as a Category 2 Site requiring a Flood Hazard Reevaluation Report submittal due date of March 12, 2014. In Reference 3, Exelon Generation Company, LLC (EGC) requested an extension to the flooding hazard reevaluation report (FHRR) due date to March 12, 2015. In Reference 4, the NRC granted the extension of the FHRR submittal due date to March 12, 2015. In Reference 5, EGC requested an additional extension of the FHRR submittal due date to August 12, 2015. In Reference 6, the NRC granted the additional extension of the FHRR submittal due date to August 12, 2015. The information in Enclosure 1 provides the Peach Bottom Atomic Power Station, Units 2 and 3, Flood Hazard Reevaluation Report. The Peach Bottom Atomic Power Station, Units 2 and 3, Flood Hazard Reevaluation Report follows the reevaluation process described in Reference 7.

Information Requested in Reference 1, Enclosure 2

a. Site information related to the flood hazard. Relevant SSCs important to safety and the UHS are included in the scope of this reevaluation, and pertinent data concerning these SSCs should be included. Other relevant site data includes the following:

i. Detailed site information (both designed and as-built), including present-day site layout, elevation of pertinent SSCs important to safety, site topography, as well as pertinent spatial and temporal data sets;

Response:

- Site layout and topography – See Section 2.2, and Figures 2.2.1, 2.2.2, and 2.2.3 of Enclosure 1.
- Pertinent Site Data is provided in Enclosure 2.

ii. Current design basis flood elevations for all flood causing mechanisms;

Response:

- See Section 2.3 of Enclosure 1, which describes the current design basis flood hazards for all flood causing mechanisms.

iii. Flood-related changes to the licensing basis and any flood protection changes (including mitigation) since license issuance;

Response:

- See Section 2.4 of Enclosure 1 for a description of flood-related changes to the licensing basis and any flood protection changes (including mitigation) since license issuance.

iv. Changes to the watershed and local area since license issuance;

Response:

- See Section 2.5 of Enclosure 1 for a description of changes to the watershed and local area since license issuance.

v. Current licensing basis flood protection and pertinent flood mitigation features at the site;

Response:

- See Section 2.6 of Enclosure 1 for a description of Current Licensing Basis (CLB) flood protection and pertinent flood mitigation features at the site.

vi. Additional site details, as necessary, to assess the flood hazard (i.e., bathymetry, walkdown results, etc.)

Response:

- See Reference 10 for results of the flooding walkdowns.
- See Sections 3.1.1, 3.2.1, and 3.2.2 of Enclosure 1 for additional site and watershed information used to assess the flood hazard.

b. Evaluation of the flood hazard for each flood causing mechanism, based on present-day methodologies and regulatory guidance. Provide an analysis of each flood causing mechanism that may impact the site including local intense precipitation and site drainage, flooding in streams and rivers, dam breaches and failures, storm surge and seiche, tsunami, channel migration or diversion, and combined effects. Mechanisms that are not applicable at the site may be screened-out; however, a justification should be provided. Provide a basis for inputs and assumptions, methodologies and models used including input and output files, and other pertinent data.

Response:

A description of the flood hazard reevaluation for each flood causing mechanism and the basis for inputs, assumptions, methodologies, and models are referenced below. Per NRC/NEI public meeting dated January 16, 2013, input-output files are not included with this submittal package but are available upon request.

- Local Intense Precipitation (LIP) and Site Drainage: See Section 3.1 of Enclosure 1.
- Flooding in Streams and Rivers: See Sections 3.2 of Enclosure 1.
- Dam Breaches and Failures: See Section 3.3 of Enclosure 1.
- Storm Surge: See Section 3.4 of Enclosure 1.
- Seiche: See Section 3.4 of Enclosure 1.
- Tsunami: See Section 3.5 of Enclosure 1.
- Ice-Induced Flooding: See Section 3.7 of Enclosure 1.
- Channel Migration or Diversion: See Section 3.8 of Enclosure 1.
- Combined Effects (including wind-waves and runup effects): See Section 3.6 of Enclosure 1.
- Other Associated Effects (i.e. hydrodynamic loading, including debris; effects caused by sediment deposition and erosion; concurrent site conditions; and groundwater ingress) are addressed in the respective flood-causing mechanism sections and Sections 3.10 and 4 of Enclosure 1.
- Flood Event Duration Parameters (i.e. warning time, period of site preparation, period of inundation, and period of recession) are addressed in the respective flood-causing mechanism sections and Sections 3.10 and 4 of Enclosure 1.

- Error/Uncertainty analysis for the governing flood scenarios is addressed in Section 3.9 of Enclosure 1.

c. Comparison of current and reevaluated flood causing mechanisms at the site. Provide an assessment of the current design basis flood elevation to the reevaluated flood elevation for each flood causing mechanism. Include how the findings from Enclosure 4 of the 50.54(f) letter (i.e., Recommendation 2.3 flooding walkdowns) support this determination. If the current design basis flood bounds the reevaluated hazard for all flood causing mechanisms, include how this finding was determined.

Response:

A complete comparison of the current design basis and reevaluated flood hazards is provided in Section 4 of Enclosure 1, which describes how the bounding determination was made for the applicable flood-causing mechanisms. Rock Run Creek flooding, sunny-day dam failure, storm surge, seiche, tsunami, ice-induced flooding, channel migration or diversion, and combination H.2 (seismic dam failure) of Reference 7 for the Susquehanna River were either determined to be completely bounded by the current design basis or other flood-causing mechanisms. Peach Bottom Atomic Power Station (PBAPS) is considered potentially exposed to the flood hazards listed below. Some individual flood-causing mechanisms (i.e. "Flooding in Streams and Rivers", and "Dam Breaches and Failures") are addressed in one or more of the combined-effect floods.

1. Local Intense Precipitation (LIP)

   LIP is not addressed in the PBAPS Current License Basis (CLB). The maximum water surface elevation (WSEL) is 135.91 (ft-NAVD88), and is above the protection elevation 134.87 (ft-NAVD88) for several doors. The associated effects including maximum hydrodynamic and hydrostatic loading, duration, and warning time are not addressed in the CLB, as described in Sections 3.10 and 4 of Enclosure 1. Other associated effects including debris impact loading, wind wave and runup effects, groundwater ingress, and sediment deposition and erosion are not applicable, as described in Sections 3.10 and 4 of Enclosure 1.

2. Combination in Section H.1 of Reference 7, Probable Maximum Flood (including hydrologic dam failure) along the Susquehanna River

   The re-evaluated still water and wind wave runup elevations for the Probable Maximum Flood (including hydrologic dam failures), 127.49 and 130.24 (feet-NAVD88), respectively, are bounded by the corresponding CLB elevations of 131.87 and 136.77 (feet-NAVD88). River Flooding Associated Effects are not addressed in the PBAPS UFSAR. However, a limited evaluation, documented in Technical Evaluation No. 2522427-03, determined that hydrostatic and hydrodynamic loads are addressed and bounded by the PBAPS design basis (calculations).

d. Interim evaluation and actions taken or planned to address any higher flooding hazards relative to the design basis, prior to completion of the integrated assessment described below, if necessary.

Response:

Per Enclosure 2 of Reference 1, an Integrated Assessment is required for plants where the current design basis floods do not bound the reevaluated hazard for all flood causing mechanisms. Reference 8 presents four approaches for performing an Integrated Assessment based on the results of the flood hazard reevaluation.

Scenario 1 - Reevaluated Hazard Bounded by Design Basis
Scenario 2 - Only Local Intense Precipitation
Scenario 3 - All Permanent and Passive Flood Protection
Scenario 4 - Integrated Assessment Required

An Integrated Assessment is not necessary in Scenario 1. Limited evaluations can be conducted and submitted with the Flood Hazard Reevaluation Report under Scenarios 2 and 3 that only address specific sections of the Integrated Assessment Interim Staff Guidance (Reference 9). Licensees in Scenario 4 and those not including limited evaluations in the Flood Hazard Reevaluation Report under Scenarios 2 and 3 are required to perform a full Integrated Assessment.

Per "Part c" above, the current design basis flood bounds the reevaluated hazard for all flood causing mechanisms except LIP. Therefore, Scenario 2 (above) applies. Reference 8 states (regarding Scenario 2):

If local intense precipitation is the only portion of the reevaluated hazard that is not bounded by the current design basis, the licensee can limit the evaluation to only the site drainage. This evaluation should be performed using Section A.1.1.6 of Appendix A to the integrated assessment interim staff guidance (ISG) and the application of guidance contained in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [light-water reactor] Edition." The results of this evaluation should be submitted with the hazard report.

Peach Bottom Atomic Power Station opted to perform a limited evaluation of the effects of the LIP flood and summarize the results with this submittal. The focus of the limited evaluation is to determine the impact of LIP on safety-related structures, systems, and components (SSCs) and if additional compensatory measures are needed to maintain plant safety.

Engineering Technical Evaluation No. 2522427-03 was prepared to analyze the ingress volume of floodwater entering the doors to the reactor buildings. This evaluation reviewed the amount of water that could enter the rooms through secondary containment doors and compared it to safety-related sump pump capacity and the allowable volume in the impacted Reactor Building Rooms. The results of the evaluation showed that there is no effect on safety related SSCs during the LIP flood and no compensating actions are necessary.

Interim Actions

No interim actions are required since the limited evaluation, discussed above, demonstrates that the reevaluated LIP flood and river flood associated effects do not impact plant safety under current configuration.

e. Additional actions beyond Requested Information item 1.d taken or planned to address flooding hazards, if any.

Response:

- None required.

This letter contains no new regulatory commitments and no revision to existing regulatory commitments.

If you have any questions regarding this submittal, please contact Ron Gaston at (630) 657-3359.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 12th day of August 2015.

Respectfully submitted,

James Barstow
Director - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Enclosures:

1. Peach Bottom Atomic Power Station, Flood Hazard Reevaluation Report, Revision 0
2. CD-R labeled: "Peach Bottom Atomic Power Station, Flood Hazard Reevaluation, Pertinent Site Data"
   Document Components:
   Pertinent Site Data (requires AutoCAD or similar program)

cc: Director, Office of Nuclear Reactor Regulation (w/o Enclosure 2)
Regional Administrator – NRC Region I (w/o Enclosure 2)
NRC Senior Resident Inspector – Peach Bottom Atomic Power Station
NRC Project Manager, NRR – Peach Bottom Atomic Power Station
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