Exelon Generation®

200 Exelon Way
Kennett Square, PA 19348
www.exeloncorp.com

10 CFR 50.90
10 CFR 2.390

August 29, 2013

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

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: Extended Power Uprate License Amendment Request – Supplement 10
Response to Request for Additional Information

References:
1. Exelon letter to the NRC, "License Amendment Request - Extended Power Uprate," dated September 28, 2012 (ADAMS Accession No. ML122860201)
2. NRC letter to Exelon, "Request for Additional Information Regarding License Amendment Request for Extended Power Uprate (TAC Nos. ME9631 AND ME9632)," dated July 1, 2013 (ADAMS Accession No. ML13178A331)
3. Exelon letter to the NRC, "Extended Power Uprate License Amendment Request – Supplement 7, dated July 31, 2013

In accordance with 10 CFR 50.90, Exelon Generation Company, LLC (EGC) requested amendments to Renewed Facility Operating License Nos. DPR-44 and DPR-56 for Peach Bottom Atomic Power Station (PBAPS) Units 2 and 3, respectively (Reference 1). Specifically, the proposed changes would revise the Renewed Operating Licenses to implement an increase in rated thermal power from 3514 megawatts thermal (MWt) to 3951 MWt. During their technical review of the application, the NRC Staff identified the need for additional information. Reference 2 provided the Request for Additional Information (RAI). The EGC responses to those RAIs, with the exception of SCVB RAI-21 and SCVB RAI-25, were provided in Reference 3. This letter provides responses to SCVB RAI-21 and SCVB RAI-25.

EGC has reviewed the information supporting a finding of no significant hazards consideration and the environmental consideration provided to the U. S. Nuclear Regulatory Commission in Reference 1. The supplemental information provided in this submittal does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration. Further, the additional information provided in this

submittal does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

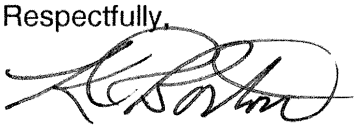
In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), EGC is notifying the Commonwealth of Pennsylvania and the State of Maryland of this application by transmitting a copy of this letter to the designated State Officials.

There are no regulatory commitments contained in this letter.

Should you have any questions concerning this letter, please contact Mr. David Neff at (610) 765-5631.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 29th day of August 2013.

Respectfully,



Kevin F. Borton
Manager, Licensing – Power Uprate
Exelon Generation Company, LLC

Attachments:
1. Response to Request for Additional Information – SCVB RAI-21 and RAI-25
2. Revisions to PUSAR Sections 2.5.3.3 and 2.6.1.5

cc: USNRC Region I, Regional Administrator w/attachments
USNRC Senior Resident Inspector, PBAPS w/attachments
USNRC Project Manager, PBAPS w/attachments
R. R. Janati, Commonwealth of Pennsylvania w/attachments
S. T. Gray, State of Maryland w/attachments

Attachment 1

Peach Bottom Atomic Power Station Units 2 and 3

Supplement 10 to Extended Power Uprate License Amendment Request

NRC Docket Nos. 50-277 and 50-278

Response to Request for Additional Information – SCVB RAI-21 and RAI-25

Response to Request for Additional Information

Containment and Ventilation Branch

By letter dated September 28, 2012, Exelon Generation Company, LLC (Exelon) submitted a license amendment request for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3. The proposed amendment would authorize an increase in the maximum power level from 3514 megawatts thermal (MWt) to 3951 MWt. The requested change, referred to as an extended power uprate (EPU), represents an increase of approximately 12.4 percent above the current licensed thermal power level.

The NRC staff has reviewed the information supporting the proposed amendment and by letter dated July 1, 2013 (ADAMS Accession No. ML13178A331) has requested information to clarify the submittal. The responses to all questions in that request, except SCVB RAI-21 and SCVB RAI-25, were submitted on July 31, 2013. During conference calls between Mr. Borton of EGC and Mr. Ennis of the NRC, conducted on June 27 and July 15, 2013, it was agreed that EGC would provide responses to SCVB RAI-21 and SCVB RAI-25 by August 30, 2013. The responses to those questions are provided below.

SCVB RAI-21

Section 2.6.1.5 of the PUSAR states:

> Under EPU conditions, sufficient overpressure in the cooling water lines is maintained, thereby preventing water hammer under [design-basis accident] DBA conditions.

Please describe in more detail what kind of water hammer could potentially occur in the cooling water lines and how it is prevented.

RESPONSE

The potential exists for a water hammer event in the drywell chilled water system (DCWS) piping in containment when the post DBA containment conditions result in heating of the water in the containment air coolers to saturation temperature prior to water flow being re-established.

An EPU evaluation determined that the water in the containment air coolers will not reach saturation temperature in the short time before the fluid pressure is increased and flow re-established to the containment air coolers. Since steam voids are avoided, a water hammer event is prevented.

During this EPU evaluation, an issue with the original Generic Letter 96-06 response was identified which affects PUSAR Sections 2.5.3.3 and 2.6.1.5. The original analysis did not utilize the peak drywell temperature under all DBA conditions. The identified issue is documented in the corrective action process. The revised PUSAR sections are provided in Attachment 2 to this submittal.

SCVB RAI-25

For an "Appendix R Fire" event, Regulatory Guide (RG) 1.189 Revision 2 provides guidance regarding consideration of spurious equipment actuation due to fire-induced failure of associated circuits to prevent the loss of safe shutdown capability including the loss of containment cooling function. This RG endorses the approach outlined in Chapter 4 of NEI 00 01 Revision 2 which relies on the Expert Panel Process and the Generic List of Multiple Spurious Operations (MSOs) contained in Appendix G to that document. It provides an acceptable methodology for the identification of multiple spurious actuations that may affect safe shutdown success path systems, structures, and components, when applied in conjunction with RG 1.189.

Consistent with the guidance in RG 1.189 and NEI 00-01 Appendix G, Revision 2, please provide a discussion of the EPU evaluation of fire-induced MSOs and prevention of the loss of safe shutdown and containment cooling capability during an Appendix R Fire event. Also address the PBAPS applicable plant-specific scenarios listed in Table G-1 of NEI 00-01 Revision 2.

RESPONSE

Current Licensed Thermal Power (CLTP) MSO scenarios at PBAPS were evaluated as part of a voluntary industry initiative in accordance with NEI-00-01, Chapter 4 and Table G-1. The evaluation included PBAPS applicable plant-specific scenarios consistent with the guidance within NEI-00-01. For EPU the fire areas and Fire Safe Shut-Down (FSSD) Methods (A, B, C and D) remain unchanged from those considered in the CLTP MSO evaluations and described in the PBAPS Fire Protection Program (FPP).

Evaluation of the CLTP MSO scenarios was performed for EPU to ensure that fire-induced MSOs will not result in loss of safe shutdown and loss of containment cooling capability during an Appendix R fire event. This evaluation concluded that MSO scenario coping capability will be maintained at EPU conditions because either, (1) the MSO scenario conclusions are not affected by EPU; or (2) the MSO scenarios affected by EPU and/or EPU modifications have been identified and the necessary associated hardware and/or procedure changes to ensure coping capability will be implemented as part of EPU implementation. If there are any additional EPU impacts, the EGC configuration control process will ensure that the MSO coping capability will be maintained, including any new MSO scenarios introduced by the EPU and/or EPU modification(s).

Attachment 2

Peach Bottom Atomic Power Station Units 2 and 3

Supplement 10 to Extended Power Uprate License Amendment Request

NRC Docket Nos. 50-277 and 50-278

Revisions to PUSAR Sections 2.5.3.3 and 2.6.1.5

Revisions to PUSAR Sections 2.5.3.3 and 2.6.1.5
PBAPS EPU LAR dated September 28, 2012 Attachments 4 and 6
(Changes are denoted by **bold** and ~~strikethrough~~)

2.5.3.3 Reactor Auxiliary Cooling Water System

Reactor Building Closed Cooling Water System

The RBCCW heat loads are mainly dependent on the reactor vessel temperature and/or flow rates in the systems cooled by the RBCCW. The flow rates in the systems cooled by the RBCCW (e.g., Reactor Recirculation and RWCU pumps cooling) do not change due to power uprate and therefore, are not affected by power uprate. The only significant increase in heat load due to EPU is an increase in SFP Cooling heat load. The normal cooling water supply for the SFP is provided by the SW system and not the RBCCW system. The RBCCW heat load during SFP cooling for normal refueling is 17.5 MBTU/hr at CLTP. This load would increase to 27.0 MBTU/hr at EPU, which remains below the RBCCW system heat exchanger capacity of 51.0 MBTU/hr for two heat exchanger operation for SFP Cooling. This SFP Cooling heat load occurs during refueling when other RBCCW loads are offline or significantly reduced. Therefore, the increase in SFP Cooling heat load does not increase RBCCW system heat loads beyond system design. The operation of the remaining equipment cooled by the RBCCW (e.g., sample coolers and drain coolers) is not power dependent and is not affected by power uprate. There are negligible changes to system operating temperatures and pressures as a result of EPU. There are no changes to RBCCW system operation. The RBCCW system contains sufficient redundancy in pumps and heat exchangers to ensure that adequate heat removal capability is available during normal operation. Sufficient heat removal capacity is available to accommodate the small increase in heat load due to EPU.

~~The PBAPS response to GL 96-06 credited the RBCCW head tank with maintaining an overpressure on the containment air coolers to prevent water hammer under DBA conditions.~~ Evaluation of the impact of EPU on the RBCCW system, the DW ventilation system, and the reactor building ventilation system indicates that an overpressure in the cooling water lines will ~~still be maintained, thereby~~ prevent~~ing~~ water hammer under DBA conditions.

Therefore, the RBCCW system meets all CLTP dispositions.

2.6.1.5 Generic Letter 96-06

GL 96-06 identified potential problems with equipment operability and containment integrity during DBA conditions as a result of (1) water hammer and/or two-phase flow conditions in cooling water systems serving the containment air coolers and (2) thermally induced overpressurization of isolated piping sections in containment.

The PBAPS response to GL 96-06 credited the maintenance of sufficient overpressure in the cooling water lines with preventing steam from forming during the design-basis scenarios of interest. Under EPU conditions, sufficient ~~over~~pressure in the cooling water lines ~~is maintained, thereby~~ **exists** to prevent~~ing~~ water hammer under DBA conditions.

The PBAPS response to GL 96-06 also included the installation of relief valves on lines penetrating primary containment that were susceptible to thermally induced over-pressurization during DBA conditions. The relief valve sizing was based on a DW temperature **that is the**

same as ~~significantly higher than~~ that expected under EPU conditions. In addition, the relief valve installed capacity was much greater than the required capacity. As a result, the slight increase in DW temperature with EPU does not affect the adequacy of the previous corrective action.

Therefore, ~~the existing~~ PBAPS ~~response to~~ **has addressed the concerns of** GL 96-06 ~~remains valid~~ for EPU, and all CLTR dispositions are met.