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

December 14, 2011

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3 - SUPPLEMENTAL INFORMATION NEEDED FOR ACCEPTANCE OF REQUESTED LICENSING ACTION RE: USE OF NEUTRON ABSORBING INSERTS IN UNITS 2 AND 3 SPENT FUEL POOL STORAGE RACKS (TAC NOS. ME7538 AND ME7539)

Dear Mr. Pacilio:

By letter to the Nuclear Regulatory Commission (NRC) dated November 3, 2011,[1] Exelon Generation Company, LLC, submitted a license amendment request for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3. The proposed amendment would modify the Technical Specifications (TS) to include the use of neutron absorbing spent fuel pool rack inserts for the purpose of criticality control in the spent fuel pools at PBAPS, Units 2 and 3.

The purpose of this letter is to provide the results of the NRC staff's acceptance review of this amendment request. The acceptance review was performed to determine if there is sufficient technical information in scope and depth to allow the NRC staff to complete its detailed technical review. The acceptance review is also intended to identify whether the application has any readily apparent information insufficiencies in its characterization of the regulatory requirements or the licensing basis of the plant.

Consistent with Section 50.90 of Title 10 of the *Code of Federal Regulations* (10 CFR), an amendment to the license (including the technical specifications) must fully describe the changes requested, and following as far as applicable, the form prescribed for original applications. Section 50.34 of 10 CFR addresses the content of technical information required. This section stipulates that the submittal address the design and operating characteristics, unusual or novel design features, and principal safety considerations.

The NRC staff has reviewed your application and concluded that the information delineated in the enclosure to this letter is necessary to enable the NRC staff to make an independent assessment regarding the acceptability of the proposed amendment request in terms of regulatory requirements and the protection of public health and safety and the environment.

In order to make the application complete, the NRC staff requests that Exelon supplement the application to address the information requested in the enclosure by December 28, 2011. This will enable the NRC staff to complete its detailed technical review. If the information responsive to the NRC staff's request is not received by the above date, the application will not be accepted

[1] Agencywide Documents Access and Management System (ADAMS) Accession No. ML113081441.

for review pursuant to 10 CFR 2.101, and the NRC staff will cease its review activities associated with the application. If the application is subsequently accepted for review, you will be advised of any further information needed to support the NRC staff's detailed technical review by separate correspondence.

The requested information and associated time frame was discussed with Mr. Thomas Loomis of your staff on December 8, 2011. During this teleconference, Exelon representatives stated that the "structural analysis" referred to in Attachment 1, Section 3.5, "Structural," of the November 3, 2011, submittal had been completed. In addition, Exelon representatives stated that the rack insert clean pool testing associated with the demonstration program is complete. Additional demonstration program testing is being performed at Peach Bottom to facilitate the installation. The NRC staff requested that the structural analysis issuance date and associated document number, as well as the completion date for the referenced testing, be included in the licensee's response. Mr. Loomis stated that the completion information for the structural analysis and clean pool testing would be provided with the response as requested.

If you have any questions, please contact me, at (301) 415-3204.

Sincerely,

John D. Hughey, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-277 and 50-278

Enclosure: As stated

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OFFICE OF NUCLEAR REACTOR REGULATION

ACCEPTANCE REVIEW – UNACCEPTABLE WITH OPPORTUNITY TO SUPPLEMENT

LICENSE AMENDMENT REQUEST

USE OF NUETRON ABSORBING SPENT FUEL POOL RACK INSERTS

EXELON GENERATION COMPANY, LLC

PSEG NUCLEAR, LLC

PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3

DOCKET NOS. 50-277 AND 50-278

By letter to the Nuclear Regulatory Commission (NRC) dated November 3, 2011,[1] Exelon Generation Company, LLC, submitted a license amendment request for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3. The proposed amendment would modify the Technical Specifications (TS) to include the use of neutron absorbing spent fuel pool rack inserts for the purpose of criticality control in the spent fuel pools at PBAPS, Units 2 and 3.

The acceptance review is performed to determine if there is sufficient technical information in scope and depth to allow the NRC staff to complete its detailed technical review. The acceptance review is also intended to identify whether the application has any readily apparent information insufficiencies in its characterization of the regulatory requirements or the licensing basis of the plant.

The NRC staff has reviewed your application and concluded that the information delineated below is necessary to enable the NRC staff to make an independent assessment regarding the acceptability of the proposed amendment request in terms of regulatory requirements and the protection of public health and safety and the environment. In order to make the application complete, the NRC staff requests that Exelon supplement the application to address the requests for additional information (RAIs) below by December 28, 2011. This will enable the NRC staff to complete its detailed technical review.

Structural Analysis:

Attachment 1, Section 3.5, "Structural," of the November 3, 2011, submittal includes the following:

> A structural analysis is being performed to show that the in-service loads on the NETCO-SNAP-IN rack insert during normal and seismic conditions are insufficient to cause an operational failure of the rack insert.

and,

> The stress on the structure of the existing spent fuel pool storage racks due to the force exerted from the rack insert is being evaluated. The calculated stress

[1] Agencywide Documents Access and Management System (ADAMS) Accession No. ML113081441.

> will be below the allowable stress of the spent fuel pool storage racks, and is, therefore, acceptable.

Attachment 1, Section 4.3, "No Significant Hazards Consideration," of the November 3, 2011, submittal includes the following in response to question No. 2 regarding the spent fuel pool inserts:

> These devices do not add any limiting structural loads or affect the removal of decay heat from the assemblies.

The licensee's statements above indicate that the structural integrity of the proposed spent fuel pool rack inserts has been presumed acceptable prior to completion of the technical analysis that would support that conclusion.

RAI 01: Summarize the results of the structural analysis related to the spent fuel pool rack inserts and the spent fuel pool racks that supports the technical acceptability asserted in Section 3.5 and Section 4.3 of Attachment 1 of the November 3, 2011, submittal, as well as any necessary changes to the "No Significant Hazards Consideration" contained in Section 4.3. This summary should demonstrate that the structural design basis criteria associated with the racks and rack inserts will be satisfied following installation of the NETCO-SNAP-IN® neutron absorbing inserts. Additionally, discuss the interface between the insert and the spent fuel racks, and specifically discuss how the NETCO-SNAP-IN® inserts are supported at this interface. Further, please address the effects of design basis loading combinations on the adequacy of the insert support at the interface.

Seismic Analysis:

Attachment 1, Section 3.6, "Seismic," of the November 3, 2011, submittal includes the following:

> The calculation documents that the weight of the insert combined with the weight of a channeled PBAPS fuel assembly is less than the weight used in the original PBAPS Westinghouse spent fuel pool storage rack design, and is thus bounded by the Westinghouse design. Therefore the structural integrity of the Reactor Building, spent fuel pool, and storage racks is not compromised.

Attachment 1, Section 3.1.3, "Proposed Method for Mitigation of Boraflex Degradation," of the November 3, 2011, submittal includes the following:

> The rack insert is designed to become an integral part of the spent fuel storage rack once it has been installed.

PBAPS Units 2 and 3 Updated Final Safety Analysis Report, Section 10.3.4.1.3, "Base Support Assembly," states,

> The high density spent fuel storage racks are seismic Category I equipment as defined in NRC Regulatory Guide 1.13. These racks are designed to withstand the effects of a maximum credible earthquake and remain functional, in

> accordance with NRC Regulatory Guide 1.29 and the *Code of Federal Regulations*, Title 10, Part 100.

and,

> The results of the seismic and structural analyses are interrelated as the loads of the seismic analysis are used in the structural analysis to calculate stresses. The resulting margins of safety are positive and satisfy the requirements of the ASME [American Society of Mechanical Engineers] Code.

The seismic assessment presented in Attachment 1, Section 3.6, of the licensee's submittal does not address any potential impact on the functionality of the spent fuel pool storage racks associated with the structural integrity of the inserts under seismic loadings. Specifically, there is no information regarding the effect of the installation of the NETCO-SNAP-IN® inserts on the hydrodynamic behavior of the modified (i.e., with inserts installed) racks nor the effect of the rack inserts on the revised fuel-to-rack impact loads during seismic excitation.

RAI 02: With respect to the seismic analyses performed to support the license amendment request associated with the neutron absorber inserts at PBAPS, please summarize the results of the revised seismic analysis and address how the inserts meet Seismic Category I requirements as an integral part of the spent fuel pool storage racks.

RAI 03: As stated in Section 3.4.1 of the LAR submittal, the installation of the NETCO-SNAP-IN® inserts reduces the clearance between the spent fuel rack cell and the spent fuel bundle within the rack. No information is provided in the LAR submittal regarding the effect of this reduced clearance on the impact forces between the rack and fuel bundle generated during a seismic event. Consistent with the design and licensing basis requirements related to the PBAPS spent fuel racks, please provide information which demonstrates that the loads induced on a fuel assembly, when considering the inclusion of the NETCO-SNAP-IN® inserts, does not lead to damage of the fuel.

Retention Forces

Section 3.4.3 and Section 3.4.4 of the LAR submittal states that a demonstration program will be used in evaluating whether the NETCO-SNAP-IN® inserts will dislodge during fuel assembly placement and removal.

RAI 04: Please provide a technical justification regarding the lack of prior completion of retention force testing for the PBAPS NETCO-SNAP-IN® spent fuel rack inserts. This justification should demonstrate that there is reasonable assurance that the NETCO-SNAP-IN® inserts will exhibit adequate performance such that the insertion, drag and withdraw forces imposed on these inserts will not induce a condition which would prevent the inserts from performing their intended safety function.

Spent Fuel Pool Criticality Analyses:

In Attachments 7 and 8 of the November 3, 2011, submittal the licensee included Global Nuclear Fuel (GNF) reports NEDO-33672[2] and NEDO-33686,[3] respectively, to provide the technical basis for the amendment request. Attachment 1, Section 3.2.1, "Criticality Evaluation for Final Spent Fuel Pool Configuration," of the November 3, 2011, submittal notes that the NRC has previously approved the use of the MCNP-05P/TGBLA06 code package for use in a similar spent fuel pool criticality analysis. The licensee referenced GNF Report NEDO-33374-A, "Safety Analysis Report for Fuel Storage Racks Criticality Analysis for ESBWR [Economic Simplified Boiling Water Reactor] Plants," Revision 4, September 2010,[4] as supporting NRC approval. However, based on the acceptance review, the NRC staff noted that the treatment of the code validation uncertainties for the GNF analysis has changed from the previously accepted approach contained in GNF Report NEDO-33374-A.

RAI 05: In order to proceed with the review of the submittal, the NRC staff requests that the licensee provide a technical basis for the change in the analytical approach regarding the treatment of the code validation uncertainties.

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[2] Global Nuclear Fuel, NEDO-33672, "Peach Bottom Atomic Power Station: Fuel Storage Criticality Safety Analysis of Spent Fuel Storage Racks with Rack Inserts," September 2011, Revision 0 (Non- Proprietary Version).

[3] Global Nuclear Fuel, NEDO-33686, "Peach Bottom Atomic Power Station: Fuel Storage Criticality Safety Analysis of Spent Fuel Storage Racks with Boraflex," September 2011, Revision 0 (Non-Proprietary Version).

[4] ADAMS Accession No. ML102860687.

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If you have any questions, please contact me, at (301) 415-3204.

Sincerely,
/ra/
John D. Hughey, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
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Docket Nos. 50-277 and 50-278

Enclosure: As stated

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