



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

March 19, 2015

MEMORANDUM TO: Douglas A. Broaddus, Chief  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

FROM: Richard B. Ennis, Senior Project Manager */RA/*  
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

SUBJECT: PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3,  
DRAFT REQUEST FOR ADDITIONAL INFORMATION (TAC NOS.  
MF5172 AND MF5173)

The attached draft request for additional information (RAI) was transmitted on March 18, 2015, to Mr. Tom Loomis of Exelon Generation Company, LLC (Exelon, the licensee). This information was transmitted to facilitate an upcoming conference call in order to clarify the licensee's amendment request for Peach Bottom Atomic Power Station, Units 2 and 3, dated November 7, 2014. The proposed amendment would revise the Technical Specifications (TSs) associated with the primary containment leakage rate testing program. Specifically, the amendment would extend the frequencies for performance of the Type A containment integrated leakage rate test (ILRT) and the Type C containment isolation valve leakage rate test, required by 10 CFR Part 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors."

The draft RAI was sent to Exelon to ensure that the questions are understandable, the regulatory basis for the questions is clear, and to determine if the information was previously docketed. This memorandum and the attachment do not convey or represent an NRC staff position regarding the licensee's request.

Docket Nos. 50-277 and 50-278

Attachment: Draft RAI

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DATE	03/19/2015

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DRAFT REQUEST FOR ADDITIONAL INFORMATION  
REGARDING PROPOSED LICENSE AMENDMENT  
PRIMARY CONTAINMENT LEAKAGE RATE TESTING PROGRAM  
EXELON GENERATION COMPANY, LLC  
PEACH BOTTOM ATOMIC POWER STATION - UNITS 2 AND 3  
DOCKET NOS. 50-277 AND 50-278

By letter dated November 7, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14315A084), Exelon Generation Company, LLC (Exelon, the licensee) submitted a license amendment request for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3. The proposed amendment would revise the Technical Specifications (TSs) associated with the primary containment leakage rate testing program. Specifically, the amendment would extend the frequencies for performance of the Type A containment integrated leakage rate test (ILRT) and the Type C containment isolation valve leakage rate test, required by 10 CFR Part 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors."

The Nuclear Regulatory Commission (NRC) staff has reviewed the information the licensee provided that supports the proposed amendment and would like to discuss the following issues to clarify the submittal.

**PRA Licensing Branch (APLA)**

Reviewer: Todd Hilsmeier

**APLA-RAI-1**

Section 4.2.7 of EPRI TR-1009325, Revision 2-A states that "[w]here possible, the analysis should include a quantitative assessment of the contribution of external events (for example, fire and seismic) in the risk impact assessment for extended ILRT intervals." EPRI TR-1009325, Revision 2-A further states that the "assessment can be taken from existing, previously submitted and approved analyses or another alternate method of assessing an order of magnitude estimate for contribution of the external event to the impact of the changed interval."

Section 5.7.1 in Attachment 3 of the license amendment request (LAR) assesses the fire risk and states that "the reported fire PRA CDF value is  $4.4\text{E-}5/\text{yr}$  or approximately a factor of 11.9 higher than the current internal events CDF values." Section 5.7.1 further states that "a better estimate of the LERF from scenarios more applicable to the fire PRA results would be about 43% [ATWS scenarios contribute 23.0% to the LERF total and ISLOCA scenarios contribute 19.7% to the LERF total] less than the total internal events value of  $4.74\text{E-}7/\text{yr}$ , or  $2.72\text{E-}07/\text{yr}$ . If the multiplier of 11.9 is used on this LERF value, then the total LERF estimate for the Fire PRA model is  $3.22\text{E-}06/\text{yr}$ ." The licensee's approach to estimate the total LERF due to fire is the same as the following:

- 1) Multiplying the fire PRA CDF (i.e.,  $4.4\text{E-}5/\text{yr}$ ) by a conditional containment failure probability (CCFP) representative of the fire scenarios.
- 2) The CCFP is equal to the internal events LERF (excluding ATWS and ISLOCA scenarios) (i.e.,  $2.72\text{E-}07/\text{yr}$ ) divided by the total internal events CDF (which includes the ATWS and ISLOCA scenarios) (i.e.,  $3.69\text{E-}6/\text{yr}$ ). In this case the CCFP would be about 0.073.

However, the associated CCFP in the licensee's approach does not seem to be appropriate in that if the ATWS/ISLOCA scenarios are excluded in the numerator of CCFP, then the same scenarios should be excluded from the denominator of CCFP. By including the ATWS/ISLOCA scenarios in the denominator of CCFP, the CCFP is artificially reduced, resulting in an underestimation of total fire LERF. If the ATWS/ISLOCA scenarios were excluded from the denominator of CCFP, then the increase in CCFP could potentially, considering ATWS's significant contribution to CDF in NUREG-1150, cause total LERF in Table 5.7-4 in Attachment 3 of the LAR to exceed the Regulatory Guide 1.174 criterion of less than  $1.0\text{E-}5/\text{yr}$ . This issue is also applicable to the calculation of the seismic LERF in Section 5.7.2 in Attachment 3 of the LAR. Considering the NRC staff comments above, justify that the total LERF in Table 5.7-4 in Attachment 3 of the LAR is less than the Regulatory Guide 1.174 criterion of  $1.0\text{E-}5/\text{yr}$  for total LERF due to internal and external events.

#### **APLA-RAI-2**

Section 4.4 in Attachment 3 of the LAR uses the Calvert Cliffs Nuclear Power Plant methodology in evaluating the impact of liner corrosion on the extension of ILRT testing intervals. In addition to the two observed corrosion events at North Anna Power Station, Unit 2 and Brunswick Steam Electric Plant, Unit 2, the licensee identifies two more events that "have occurred in recent years (based on a data search covering approximately nine years documented in Reference [21])." It is not clear what date range the nine year data search covers, because Reference 21 in Section 8.0 of Attachment 3 of the LAR seems to be incorrect as it refers to the Individual Plant Examination for External Events dated May 1996. Regarding the data search covering approximately 9 years, please list the correct reference for this report and provide the date range of the data search. Also, indicate if there have been any additional instances of liner corrosion since this data search that could be relevant to this assessment, and, if so, describe its impact on the LAR risk results.

**Mechanical and Civil Engineering Branch (EMCB)**

Reviewer: Farhad Farzam

**EMCB-RAI-1**

Please discuss the highlights of IWE inspections of the accessible surface areas of the PBAPS Units 2 and 3 containments, performed after the last Type A test, and any corrective action taken to disposition the findings.

**EMCB-RAI-2**

As stated in the LAR, the PBAPS in-service inspection programs contain requirements to evaluate the acceptability of the inaccessible areas, if such conditions were identified, in accordance with 10 CFR 50.55a(b)(2)(ix)(A).

Please provide information of instances, during implementation of the PBAPS in service inspection programs, where existence of or potential for degraded conditions in inaccessible areas were identified and evaluated based on conditions found in accessible areas, as required by 10 CFR 50.55a(b)(2)(ix)(A). If there were any instances of such conditions, discuss the findings and corrective actions taken to disposition the findings. Also, please identify the specific areas of the PBAPS Units 2 and 3 containments that are inaccessible and susceptible to degradation.

**EMCB-RAI-3**

It is stated in the LAR that in the second containment in-service inspection interval, the wetted and submerged suppression chamber (torus) surface areas are designated as augmented examination areas and will require 100 percent visual examination during each inspection period. It is also stated that the torus submerged areas were coated in 2012 for Unit 2 and 2013 for Unit 3 in order to arrest further pitting. Please provide the results of recent inspections of the torus and discuss any corrective action taken to disposition the findings.

**EMCB-RAI-4**

Please provide PBAPS operating experience relative to the inspection of the drywell internal moisture barrier at the juncture of the containment wall and the concrete floor.

**EMCB-RAI-5**

PBAPS Updated Final Safety Analysis Report (UFSAR), Section 12.2.1 states that (1) the foundation of the reactor building consists of a monolithic concrete mat supported on sound rock; and (2) this foundation mat also supports the primary containment and its internals, including the reactor vessel pedestal.

PBAPS UFSAR, Appendix Q, Section Q.1.16, states that the PBAPS structural monitoring program complies with 10 CFR 50.65 and utilizes visual inspections in managing aging effects for concrete and grout in accessible areas. Please provide PBAPS operating experience, including inspection intervals, relative to the inspection of concrete components, and any corrective action taken to disposition the findings. Also, please discuss whether existence of or

potential for degraded conditions in inaccessible concrete areas were identified and evaluated based on conditions found in accessible areas.

#### **EMCB-RAI-6**

Section 9.2.3.2 of NEI 94-01, Revision 2-A, and Condition 2 in Section 4.1 of the NRC safety evaluation for topical report NEI 94-01, Revision 2 require supplemental general visual inspections of accessible interior and exterior surfaces of the containment for structural deterioration that may affect the containment leak-tight integrity. These inspections must be conducted prior to each Type A test and during at least three other outages before the next Type A test if the interval for the Type A test has been extended to 15 years.

Based on the information provided in the LAR, the last Unit 3 Type A test was performed in October 2005, and the upcoming Unit 2 Type A test will be performed no later than October 2015. Please provide a schedule for a typical 15 year interval (between the last Type A test and the proposed next Type A test), in a tabular format, of the in service inspections of PBAPS Units 2 and 3 containments that were, and will be performed, and explain how it meets the requirements in Section 9.2.3.2 of NEI 94 01, Revision 2-A, and Condition 2 in Section 4.1 of the NRC safety evaluation for topical report NEI 94-01, Revision 2.

#### **EMCB-RAI-7**

Section 3.4.1 of the LAR discusses PBAPS safety related coating inspection program. Please discuss the highlights of findings from PBAPS recent inspections of the primary containment protective coating and any actions taken to disposition them.

#### **EMCB-RAI-8**

Please provide the following information:

- a) Percent of the total number of Type B tested components that are on a 120-month extended performance-based test interval.
- b) Percent of the total number of Type C tested components that are on a 60 month extended performance-based test interval.