



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

January 22, 2015

Mr. George H. Gellrich, Vice President  
Calvert Cliffs Nuclear Power Plant, LLC  
Calvert Cliffs Nuclear Power Plant  
1650 Calvert Cliffs Parkway  
Lusby, MD 20657-4702

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2 -  
REQUEST FOR ADDITIONAL INFORMATION REGARDING PERMANENT  
EXTENSION OF TYPE A AND C LEAK RATE TEST FREQUENCIES LICENSE  
AMENDMENT (TAC NOS. MF4898 AND MF4899)

Dear Mr. Gellrich:

By letter dated September 18, 2014, Calvert Cliffs Nuclear Power Plant, LLC submitted a license amendment request (LAR) for Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2. The proposed LAR revises Technical Specification 5.5.16, "Containment Leakage Rate Testing Program," to allow an increase in the Type A primary containment integrated leak rate test interval from the current 10-year frequency to a maximum of 15 years and extension of the Type C containment isolation valve leakage test frequency from 60 to 75 months.

The Nuclear Regulatory Commission (NRC) staff is reviewing the application and has determined that additional information is needed to complete its review. The specific questions are found in the enclosed request for additional information (RAI). The NRC staff is requesting a response to the RAIs within 45 days of the date of this letter.

If you have any questions regarding this matter, please contact me at (301) 415-1016.

Sincerely,

A handwritten signature in black ink, appearing to read "Nadiyah S. Morgan", with a long horizontal line extending to the right.

Nadiyah S. Morgan, Project Manager  
Plant Licensing Branch I-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-317 and 50-318

Enclosure:  
RAI

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REQUEST FOR ADDITIONAL INFORMATION  
REGARDING PERMANENT EXTENSION  
OF TYPE A AND C LEAK RATE TEST FREQUENCIES  
LICENSE AMENDMENT REQUEST  
CALVERT CLIFFS NUCLEAR POWER PLANT, LLC  
EXELON GENERATION COMPANY, LLC  
CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2  
DOCKET NOS. 50-317 AND 50-318  
(TAC NOS. MF4898 AND MF4899)

By letter dated September 18, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14265A219), Calvert Cliffs Nuclear Power Plant, LLC submitted a license amendment request (LAR) for Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 (Calvert Cliffs). The proposed LAR revises Technical Specification 5.5.16, "Containment Leakage Rate Testing Program," to allow an increase in the Type A primary containment integrated leak rate test (ILRT) interval from in the current 10-year frequency to a maximum of 15 years and extension of the Type C containment isolation valve leakage test frequency from 60 to 75 months. The Nuclear Regulatory Commission (NRC) staff is reviewing the application and has determined that the following additional information is needed to complete its review.

**Probabilistic Risk Assessment (PRA) Licensing (APLA) RAI 1**

In the safety evaluation report for Electric Power Research Institute (EPRI) Technical Report (TR) 1009325, Revision 2, "Risk Impact Assessment of Extended Integrated Leak Rate Testing Intervals," the NRC staff, in part, stated that for licensee requests for a permanent extension of the ILRT surveillance interval to 15 years "[c]apability category I of ASME [American Society of Mechanical Engineers] RA-Sa-2003 shall be applied as the standard, since approximate values of CDF [core damage frequency] and LERF [large early release frequency] and their distribution among release categories are sufficient for use in the EPRI methodology."

Attachment 3 of the LAR states that the 2010 full scope peer review of the internal events PRA model identified three supporting requirements (SRs) that were 'Not Met'. Table 1 of Attachment 3 to the LAR lists the findings from the 2010 peer review, but does not identify the three "Not Met" SRs. Identify which SRs were considered not met. For each SR, summarize why not meeting Capability Category I requirements will have no impact on the ILRT extension application.

### **APLA RAI 2**

Section 5.3.2 of Attachment 3 to the LAR uses the Calvert Cliffs methodology from 2002 in evaluating the impact of steel liner corrosion on the extension of ILRT testing intervals. This assessment was based on two observed corrosion events at North Anna Power Station, Unit 2 and Brunswick Steam Electric Plant, Unit 2.

- a. If there have been additional instances of liner corrosion that could be relevant to this assessment, provide an updated list of observed corrosion events relevant to Calvert Cliffs containment, and an evaluation of the impact on risk results when all relevant corrosion events are included in the risk assessment.
- b. Per EPRI TR-1009325, Revision 2, the risk metrics associated with the ILRT extension application include changes in LERF, population dose, and conditional containment failure probability (CCFP). The steel liner corrosion assessment in Section 5.3.2 of Attachment 3 to the LAR calculates only the change in LERF. Include an estimate of change in population dose and CCFP due to increase in steel liner corrosion likelihood and demonstrate acceptability of the risk results.

### **APLA RAI 3**

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.” The 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 5.3.1 in Attachment 3 to the LAR assesses the potential impact from external events contribution.

- a. The results of the seismic PRA performed for the Individual Plant Examinations for External Events (IPEEE) were used to assess the seismic risk with a reported CDF of  $1.07E-5$ /year for both units. Section 8, “Summary and Conclusions,” of the IPEEE report (Calculation No. RAN 97-031, IPEEE, Calvert Cliffs Nuclear Power Plant, “Individual Plant Examination of External Events,” August 1997) reports seismic CDF values of  $1.29E-5$ /year for Calvert Cliffs 1 and  $1.52E-5$ /year for Calvert Cliffs 2. Justify the use of the  $1.07E-5$ /year seismic CDF value in the external events sensitivity study.
- b. In Section 5.3.1.1 of Attachment 3 to the LAR, the results from the IPEEE fire analysis were used to assess fire risk (CDF of  $1.10E-5$ /year and LERF of  $7.15E-7$ /year for Calvert Cliffs 2). Section 8, “Summary and Conclusions,” of the IPEEE report (Calculation No. RAN 97-031, IPEEE, Calvert Cliffs Nuclear Power Plant, “Individual Plant Examination of External Events,” August 1997) reports a fire CDF of  $9.6E-5$ /year for Calvert Cliffs 2. Justify the use of selected IPEEE Calvert Cliffs 2 fire CDF/LERF values and discuss acceptability of Calvert Cliffs 2 risk results when using the IPEEE fire CDF/LERF.

#### **APLA RAI 4**

Section 5.2.4 of Attachment 3 to the LAR refines the calculation of the Class 3b frequencies for internal events by examining the source term. The conservatism in Class 3b frequency is reduced by analyzing the source term release time and defines an early release as occurring before 6.5 hours, which allows the removal of three accident scenarios from the Class 3b frequency. Elimination of these three scenarios appears to reduce the Class 3b frequency for internal events by a factor of 3 to 5. Section 5.3.1 of Attachment 3 to the LAR indicates that the same approach is used in the calculation of the fire Class 3b frequency in the external events sensitivity study when using the NFPA-805 fire PRA.

- a. Provide the calculated timing of the expected release for each of these three accident scenarios.
- b. Provide the basis for the 6.5 hours delineation between early and late release.
- c. Explain whether releases from these scenarios were included in the analysis to calculate the increase in the total integrated dose risk for all accident sequences.

#### **Mechanical and Civil Engineering (EMCB) RAI 1**

Section 3.8 of the LAR states that, (1) "at Calvert Cliffs, a test pipe was provided for each continuous segment of the bottom liner plate weld chase test channels;" and (2) an analysis of the NRC Information Notice 2014-07, "Degradation of Leak-Chase Channel Systems for Floor Welds of Metal Containment Shell and Concrete Containment Metallic Liner" "is in progress to determine if this issue is applicable to Calvert Cliffs."

Discuss (1) the results of the Calvert Cliffs evaluation relative to the NRC Information Notice 2014-07 and (2) the operating experience, inspection results, and any corrective actions relative to the bottom floor liner plate weld leak chase test channels, including the existing test pipe.

#### **EMCB RAI 2**

Please confirm the following:

- a. There are no planned modifications for Calvert Cliffs that will require a Type A test prior to the next units Type A test proposed in this LAR.
- b. There is no anticipated addition or removal of plant hardware within the containment building which could affect its leak-tightness.

#### **EMCB RAI 3**

Table 3.4.5 of the LAR indicates that the Calvert Cliffs 2 containment moisture barrier seal requires an augmented examination. Section 3.5 "Operating Experience" of the LAR indicates that the augmented examination of moisture barrier seal is due to a crack identified during the 2013 refueling outage.

Discuss the extent of the degradation of the moisture barrier seal and provide information relative to the inspection of the liner area at the wall to floor transition under the moisture barrier seal where the 2013 crack was identified.

#### **EMCB RAI 4**

Section 3.5.2 "Containment Concrete" of the LAR indicates that during the 2005 and 2007 concrete inspections, new tendon grease leakage was identified. Discuss Calvert Cliffs root cause evaluation and corrective actions taken to disposition this inspection finding.

#### **EMCB RAI 5**

Please provide the following information:

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

#### **Containment and Ventilation RAI 1**

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix J, Option B Implementation item #3 states that:

The regulatory guide or other implementation document used by a licensee or applicant for an operating license under this part or a combined license under part 52 of this chapter to develop a performance-based, leakage-testing program must be included, by general reference, in the plant technical specifications.

In addition, in the August 20, 2013, letter from the NRC to Nuclear Energy Institute (NEI) (ADAMS Accession No. ML13192A394), the NRC staff indicated that:

Due to the omission of the limitations and conditions from NEI 94-01, Revision 2 SE into NEI 94-01, Revision 3-A, the NRC will not be able to reference NEI 94-01, Revision 3-A in the update to RG 1.163. Any licensee submissions referencing the TR will require requests for additional information from the NRC to address the limitations and conditions from the NRC SE for NEI 94-01, Revision 2.

Section 2.0, "Detailed Description," of the LAR included a reference to NEI 94-01, Revision 3-A. However, the conditions and limitations contained in NEI 94-01, Revision 2-A, were not incorporated in NEI 94-01, Revision 3-A.

Explain how the 10 CFR 50 Appendix J, Option B Implementation item #3 and NRC concerns stated in the August 20, 2013, letter from the NRC to NEI will be addressed.

January 22, 2015

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Nadiyah S. Morgan, Project Manager  
Plant Licensing Branch I-1  
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**ADAMS ACCESSION NO: ML15014A331**

\*See dated memo

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