



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

August 8, 2016

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   
Plant Licensing Branch I-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

SUBJECT: LIMERICK GENERATING STATION, UNITS 1 AND 2, DRAFT  
REQUEST FOR ADDITIONAL INFORMATION (TAC NOS. MF7585  
AND MF7586)

The attached draft request for additional information (RAI) was transmitted on July 27, 2016, to Ms. Stephanie Hanson of Exelon Generation Company, LLC (Exelon, the licensee). This information was transmitted in order to clarify the licensee's relief request I4R-01 dated April 13, 2016, for Limerick Generating Station (LGS), Units 1 and 2.

On August 8, 2016, the licensee indicated that a clarification call to discuss the RAI was not needed. Exelon has agreed to provide a response to RAI by September 23, 2016.

This memorandum and the attachment do not convey or represent an NRC staff position regarding the licensee's request.

Docket Nos. 50-352 and 50-353

Attachment: Draft RAI

DRAFT REQUEST FOR ADDITIONAL INFORMATION  
REGARDING PROPOSED RELIEF REQUEST I4R-01  
EXELON GENERATION COMPANY, LLC  
LIMERICK GENERATING STATION, UNITS 1 AND 2  
DOCKET NOS. 50-352 AND 50-353

By letter dated April 13, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16104A122), Exelon Generation Company, LLC (Exelon) submitted relief requests associated with the fourth 10-year inservice inspection interval for Limerick Generating Station (LGS), Units 1 and 2. Specifically, Exelon submitted relief requests I4R-01, I4R-02, I4R-05, I4R-06, I4R-07, I4R-08, I4R-09, I4R-10, I4R-11, I4R-12, and I4R-13. By letter dated May 11, 2016 (ADAMS Accession No. ML16132A441), Exelon provided supplemental information regarding relief request I4R-01.

With respect to relief request I4R-01, the Nuclear Regulatory Commission (NRC) staff has reviewed the information the licensee provided that supports the proposed relief request and would like to discuss the following issues to clarify the submittal.

**PRA Licensing Branch (APLA)**

Reviewer: Todd Hilsmeier

**APLA-RAI-01**

**Background**

The technical adequacy of the probabilistic risk assessment (PRA) used in developing LGS Units 1 and 2 relief request (RR) I4R-01 is based on Electric Power Research Institute (EPRI) Topical Report (TR) 1021467-A, "Nondestructive Evaluation: Probabilistic Risk Assessment Technical Adequacy Guidance for Risk-Informed In-Service Inspection Programs," dated June 2012 (ADAMS Accession No. ML12171A450). As discussed in a letter from the NRC to EPRI dated January 18, 2012 (ADAMS Accession No. ML11325A375), the NRC staff found that TR 1021467 was acceptable for referencing in licensing applications for risk-informed inservice inspection (RI-ISI) programs to the extent specified in the staff's safety evaluation enclosed with the letter (ADAMS Accession No. ML11325A340).

EPRI TR 1021467-A uses the guidance in Regulatory Guide (RG) 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," Revision 2. RG 1.200 endorses, with clarifications and qualifications, American Society of Mechanical Engineers (ASME)/American Nuclear Society (ANS) PRA standard ASME/ANS RA-Sa-2009. Section 1-5.4 of the PRA Standard defines PRA maintenance and PRA upgrades and states:

- “Changes in PRA inputs or discovery of new information identified pursuant to 1-5.3 shall be evaluated to determine whether such information warrants PRA maintenance or PRA upgrade. (See Section 1-2 for the distinction between PRA maintenance and PRA upgrade.)” [Appendix 1-A of the PRA Standard provides additional information and examples on PRA maintenance and PRA upgrade.]
- “Upgrades of a PRA shall receive a peer review in accordance with the requirements specified in the Peer Review Section of each respective Part of this Standard, but limited to aspects of the PRA that have been upgraded.”

Based on Attachment 1 of RR I4R-01, the NRC staff’s understanding of the development of the internal events (including internal flooding) PRA for LGS Units 1 and 2 is summarized below:

- In October 2005, a full-scope peer review was performed for the LGS internal events PRA (Version 2004B) against the supporting requirements in PRA standard ASME/ANS RA-S-2002 and the clarifications and qualifications in RG 1.200, Revision 0.
- Based on the discussions in Table 1 in Attachment 1 of RR I4R-01 (e.g., Supporting Requirements DA-C7, QU-B4, QU-B9, QU-D4, QU-F5, QU-F6), a PRA update was performed in 2008, which included conversion to the use of CAFTA PRA software.
- In May 2008, the LGS internal flooding PRA was peer reviewed against the supporting requirements in PRA standard ASME/ANS RA-Sc-2007 and the clarifications and qualifications in RG 1.200, Revision 1.
- In January 2014, the most recent update of the LGS internal events PRA (Versions LG113A and LG213A) was completed.
- Plant changes made since the last PRA update in January 2014 have been reviewed and determined to not have a significant PRA impact.

#### Question

Based on the discussion above, changes have been made to the internal events PRA since the full-scope peer review in 2005 (e.g., the PRA updates in 2008 and 2014). It is not clear whether these PRA changes are considered PRA upgrades and whether these upgrades, if any, have been peer reviewed. Therefore, it is uncertain that the latest LGS internal events PRA (i.e., LG113A and LG213A) meets the PRA technical adequacy guidance in EPRI TR 1021467-A. The NRC staff requests that the licensee provide the following additional information:

1. Describe the changes made to the internal events PRA since the full-scope peer review in 2005. This description should be of sufficient detail to assess whether these changes are PRA maintenance or PRA upgrades as defined in Section 1-5.4 of the PRA Standard. Since the following may indicate a PRA upgrade, include in your discussion: any new methodologies, changes in scope that impacts the significant accident sequences or the significant accident progression sequences, changes in capability that impacts the significant accident sequences or the significant accident progression sequences.

2. Indicate, and provide justification, whether the changes described in Part 1 are PRA maintenance or PRA upgrades as defined in Section 1-5.4 of the PRA Standard.
3. Indicate whether focused-scope peer review(s) has been performed for those PRA upgrades identified in Part 2. As applicable, provide a list of the facts and observations (F&Os) from the peer review(s) that do not meet the appropriate Capability Category in accordance with EPRI TR 1021467-A, and explain how the F&Os were dispositioned for this application. If a focused-scope peer review(s) was not performed for these PRA upgrades, then provide a qualitative or quantitative evaluation (e.g., sensitivity or bounding analysis) of its effect until a focused-scope peer review can be completed.

### **APLA-RAI-02**

Attachment 1 of RR I4R-01 explains that a full-scope peer review was performed for the LGS internal events PRA in October 2005 against the supporting requirements (SRs) in PRA standard ASME/ANS RA-S-2002 and the clarifications and qualifications in RG 1.200, Revision 0. Differences exist between the SRs in PRA standard ASME/ANS RA-S-2002, as qualified by RG 1.200, Revision 0, and the SRs in ASME/ANS RA-Sa-2009, as qualified by RG 1.200, Revision 2. In accordance with RG 1.200, Revision 2, it is expected that the differences between the current version of the PRA standard (i.e., ASME/ANS RA-Sa-2009) and the earlier version of the standard used in the internal events PRA peer review (i.e., ASME/ANS RA-S-2002,) be identified and addressed (i.e., perform a gap assessment). While Table 1 in Attachment 1 of RR I4R-01 provides the SRs cross references between the 2002 and 2009 ASME/ANS PRA Standards (i.e., the first column in Table 1), the licensee did not appear to address the additional changes between the standards that would require re-evaluation of the PRA against the ASME/ANS PRA Standard. In addition, on Page 10 of RR I4R-01, the licensee indicates that any unaddressed gaps between the PRA and current PRA standards will be reviewed for consideration during the next LGS PRA update, but are judged to have low impact on the PRA model and its results; however, it's not clear what these gaps are and how they were determined to have a low impact.

The NRC staff requests that the licensee provide a gap assessment of the internal events PRA against ASME/ANS RA-Sa-2009, as qualified by RG 1.200, Revision 2. Note, Section 3.3, "Gap Assessment for PRAs Reviewed Against RG 1.200, Revision 1," of NEI 05-04, Revision 3, provides guidance on performing a gap assessment.

### **Vessels and Internals Integrity Branch (EVIB)**

Reviewer: Roger Kalikian

### **EVIB-RAI-1**

#### **Background**

Relief Request I4R-01 states that the Fourth 10-year Interval RI-ISI Program, for LGS units 1 and 2, will be a continuation of the Third 10-year Interval RI-ISI Program which was authorized by NRC letter dated March 11, 2008 (ADAMS Accession No. ML080500584). In its review of the Third Interval RI-ISI program, the NRC staff requested that the licensee supply additional information related to total number of welds included in the RI-ISI program, along with the number of examinations that are projected to be performed, and compare those with the ASME Code required examinations performed, as well as provide any changes from previous RI-ISI

programs. Exelon's response dated November 8, 2007 (ADAMS Accession No. ML073170370) provided a summary of the requested information, the current Relief Request I4R-01, does not provide the level of detail that was previously provided.

Question

Provide summary tables for Limerick Units 1 and 2, which include the total weld population in-scope of the proposed RI-ISI Program, the welds that were examined during the Third Interval RI-ISI Program, and those that are projected to be examined during the Fourth Interval RI-ISI Program. The summary tables and the accompanying information should be consistent with information provided previously by Exelon letter dated November 8, 2007 (ADAMS Accession No. ML073170370). The information should also provide a summary of any deviations from the planned inspections, and the reasons for those changes.

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**ADAMS Accession No.: ML16221A671**

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