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

June 14, 2017

Mr. Bryan C. Hanson
Senior Vice President
Exelon Generation Company, LLC
President and Chief Nuclear Officer (CNO)
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2, REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST TO REVISE SUPPRESSION POOL SWELL DESIGN ANALYSIS (CAC NOS. MF8702 AND MF8703)

Dear Mr. Hanson:

By letter dated October 27, 2016, Exelon Generation Company, LLC (the licensee) submitted an amendment request for the LaSalle County Station, Units 1 and 2. The proposed amendment would revise the suppression pool swell analysis for a design basis loss-of-coolant accident (LOCA). The licensee stated that the changes are necessary because the current analysis determining the suppression pool swell response to a LOCA was determined to be non-conservative.

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed your application and has determined that additional information is required to complete the review. The specific information requested is addressed in the enclosure to this letter. During the telephone call on June 13, 2017, between the NRC staff and the licensee for clarification of these requests for additional information, it was agreed that the licensee will provide the responses no later than July 31, 2017.

The NRC staff considers that timely responses to requests for additional information help ensure sufficient time is available for staff review and contribute toward the NRC's goal of efficient and effective use of staff resources.

If you have any questions, please call me at 301-415-3308.

Sincerely,

B.K. Vaidya

Bhalchandra Vaidya, Project Manager
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-373 and 50-374

Enclosure: As stated

SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2, REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST TO REVISE SUPPRESSION POOL SWELL DESIGN ANALYSIS (CAC NOS. MF8702 AND MF8703) DATED JUNE 14, 2017

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REQUEST FOR ADDITIONAL INFORMATION

REGARDING LICENSE AMENDMENT REQUEST FOR

REVISIONS TO SUPPRESSION POOL SWELL DESIGN ANALYSIS -

LA SALLE COUNTY STATION (LSCS), UNITS 1 AND 2

DOCKET NOS. 50-373 AND 50-374

(CAC NOS. MF8702 AND MF8703)

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the information provided in the license amendment request and determined that additional information is required in order to complete its review. The NRC staff requests responses to the request for additional information (RAI) to evaluate compliance with the applicable regulatory requirements and criteria in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, General Design Criteria (GDC) 4 and GDC 50, Standard Review Plan, 6.2.1.1.C, NUREG-0487, Supplement 2, "MARK II Containment Lead Plant Program Load Evaluation and Acceptance Criteria," published February 1981, and NUREG-0808, "MARK II Containment Program Load Evaluation and Acceptance Criteria," Appendix A, published August 1981. The RAIs are provided below.

SRXB - RAI 1

Reference 1, Table 5, Attachment 1, second column of item 4 states:

> *TRACG represents a change in methodology, it does not change conservatisms.*

Please provide reasons why the conservatism is not changed in using TRACG [*GEH Proprietary Version of the Transient Reactor Analysis Code (TRAC), GEH Computer Code for Best Estimate BWR Transient and Accident Analysis Calculations*] which is the best-estimate methodology compared to using the current conservative M3CPT [*Mark III Containment Pressure and Temperature; GEH Computer Code M3CPT for Short-term DBA-LOCA [loss-of-coolant accident] Containment Response Analysis*] methodology for mass and energy release analysis for a design basis accident (DBA) LOCA.

SXRB - RAI 2

Reference 1, Section 4.4, Attachment 1, stated all systems, structures, and components (SSCs) affected were not assessed, instead a representative sample of low margin SSC were selected. Provide the following information:

(a) Further explanation on the basis of selection of the SSCs (i.e., low margin of which parameter) for analyzing structural impacts,

(b) Specify the systems to which the piping, associated supports and penetrations that are analyzed belong to, and any special reasons for selecting these systems.

(c) \What is total number of SSCs that are affected and how many were selected for structural re-analysis,

(d) Maximum and minimum value of percentage in stress margins in the SSCs selected for structural analysis,

(e) Revised (new) maximum and minimum percentage in the stress margin in the SSCs structurally analyzed,

(f) Justification as to why the SSCs not structurally analyzed will have adequate stress margin.

SXRB - RAI 3

Reference 1, item 2 of Table 6 in Attachment 1, Section 6.2.2, and Tables 6-1 through 6-4 in Attachment

(a) Explain how the 0.7 ft [foot] adder to the PICSM [*General Electric-Hitachi pool swell response code*] predicted pool swell height which accounts for the difference between initial pre-LOCA elevation and initial PICSM elevation which corresponds to the elevation after vent clearing was determined.

(b) In Tables 6-1 through 6-4, explain if the 0.7 ft adder is included in the data for pool swell elevation above initial elevation.

SXRB - RAI 4

Reference 1, Note 3 in Table 4-1, Attachment 2. Explain the basis for selecting feedwater temperature reduction of 100 °F (degree Fahrenheit) from its normal operating temperature 428.5 °F at the current licensed thermal power. Provide justification that the 100 °F reduction is conservative.

SXRB - RAI 5

Reference 1, Section 4.3.1, Attachment 2, states:

> *Other plant performance improvement and equipment out of service options identified in Reference 1 [GE Hitachi Nuclear Energy, "Safety Analysis Report for LaSalle County Station Units 1 and 2 Thermal Power Optimization," NEDC-33485P, Revision 0, January 2010, ADAMS Accession No. ML100321327] have no effect on the RSLB [*Recirculation Suction Line Break*] mass and energy release analyses. The current analysis, therefore, continues to support all flexibility and equipment out of service options.*

Table in Section 1.3.2 of NEDC-33485P, Revision 0, shows several performance improvement and equipment out-of-service (OOS) features currently licensed at LSCS are acceptable at the thermal power optimization (TPO) reactor thermal power (RTP) level. Explain how it is

determined that these features have no effect on the RSLB Mass and Energy (M&E) release analysis.

SXRB - RAI 6

Reference 1, assumption (ii), Section 6.1.1 in Attachment 2. The PICSM analysis for cases 3 and 4, assumes a constant value of steam/air ratio (air fraction = 0.61 as per Figure 7-1 in Attachment 2) after the initial air in the downcomer vent is purged. The value assumed is at the time (0.87 seconds as per Figure 7-1 in Attachment 2) when all air in the downcomer vent is purged. Describe the analysis that resulted in the graph shown in Figure 7-1, "Drywell Air Fraction (Air Mass/(Air Mass+ Steam Mass))."

SXRB - RAI 7

Reference 1, Section 6.1.1, Attachment 2, assumption 3, states:

> The mass flow rate of non-condensables into the bubble is calculated assuming adiabatic flow through a duct with friction.

(a) Clarify which duct (i.e., downcomer vent or other) is meant to be feeding the non-condensables into the bubble.

(b) What is the assumed value of frictional loss coefficient and how is it determined?

(c) Justify the assumption of adiabatic flow with friction is conservative.

SXRB - RAI 8

Reference 1, Section 6.1.1, Attachment 2, assumption 6, states:

> *Following vent clearing, the water above the exit of the vent (equal to the initial vent submergence plus the pool displacement due to vent clearing) accelerates as a slug of constant thickness.*

The water column in the downcomer vent cleared during a LOCA is cylindrical in shape having its diameter same as the vent diameter and length equal to the length of the water column. Describe the geometric shape of the slug assumed in the above assumption and how its dimensions are determined from the dimensions of the initial water column in the vent. Provide the basis for assuming a constant thickness of the slug.

SXRB - RAI 9

Reference 1, Section 6.1.1, Attachment 2, assumption 7, states:

> *Frictional losses between the water and the confining walls are negligible.*

Describe which confining walls are referred to in the above assumption.

SXRB - RAI 10

Reference 1, Section 6.1.1, Attachment 2, assumption 10, states:

The air velocity in the DW [drywell] is sufficiently small so that static and stagnation conditions are equivalent.

Specify with justification at what time during the transient, the air velocity in the drywell is assumed sufficiently small so that its velocity head is negligible.

SXRB - RAI 11

The drywell pressure response described in Reference 1, Section 5.0, Attachment 2, used TRACG for M&E analysis, and M3CPT code for drywell pressure analysis and the assumption and inputs listed in Section 5.1.1 and Appendix A, respectively. Provide the following information:

(a) Computer codes used in the analysis of record (AOR) for calculation of "P_a (pressure absolute."

(b) Differences in the inputs and assumptions for M&E and drywell pressure response between the AOR and the proposed analysis with justification in the inputs and assumptions for which the conservatism in the proposed analysis is reduced.

(c) In case the peak drywell pressure calculated using the assumptions and inputs in the proposed analysis results in a greater value than its current P_a, please explain and justify why P_a is not being revised.

SXRB - RAI 12

In Reference 1, Attachment 2, refer to Figures 5-1, 6-3, and 6-3A,

(a) Figure 5-1; describe the analysis to which the graphs labelled "LSCS Design Calculation 3C7-1075-001" and "LAMB CLTP 100P 100F" belong.

(b) Figures 6-3 and 6-3A; describe the analysis to which the graphs labelled "LSCS Design Calculation 3C7-1075-001 R6" belong.

SXRB - RAI 13

In Reference 1, Attachment 2, refer to Figure 5-1. Provide reasons for the discontinuity (drastic reversal of slope) in the graph labelled "LSCS Design Calculation 3C7-1075-001," and why does it differ from other graphs shown in this figure, with respect to its reversal of slope after vent clearing.

REFERENCES

1. Letter from Exelon Generation Company, LLC to NRC dated October 27, 2016, "License Amendment Request to Revise Suppression Pool Swell Design Analysis," (Agencywide Documents Access and Management System (ADAMS) Package Accession No. ML16305A295).