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

July 29, 2014

MEMORANDUM TO: Robert G. Schaaf, Acting 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: LIMERICK GENERATING STATION, UNITS 1 AND 2, DRAFT REQUEST FOR ADDITIONAL INFORMATION (TAC NOS. MF3198 AND MF3199)

The enclosed draft request for additional information (RAI) was transmitted on July 29, 2014, to Mr. Frank Mascitelli 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 Limerick Generating Station (LGS), Units 1 and 2 dated December 6, 2013. The proposed amendment would revise Technical Specification (TS) setpoints and allowable values for certain area temperature instrumentation associated with the leak detection system (LDS).

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 enclosure do not convey or represent an NRC staff position regarding the licensee's request.

Docket Nos. 50-352 and 50-353

Enclosure: Draft RAI

July 29, 2014

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DATE	7/29/14

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DRAFT REQUEST FOR ADDITIONAL INFORMATION

REGARDING PROPOSED LICENSE AMENDMENT

LEAK DETECTION SYSTEM

EXELON GENERATION COMPANY, LLC

LIMERICK GENERATING STATION, UNITS 1 AND 2

DOCKET NOS. 50-352 AND 50-353

By application dated December 6, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13343A024), Exelon Generation Company, LLC (Exelon, the licensee), submitted a license amendment request for Limerick Generating Station, Units 1 and 2. The proposed amendment would revise Technical Specification (TS) setpoints and allowable values for certain area temperature instrumentation associated with the leak detection system (LDS).

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.

Containment and Ventilation Branch (SCVB)
Reviewer: Shie-Jeng Peng

SCVB-RAI-1: 25 gpm Leak

Attachment 1 to the application dated December 6, 2013, refers to the design basis 25 gallon per minute (gpm) leak in a number of places as a "steam leak." In the last paragraph on page 6 of Attachment 1 to the application, the licensee states that the equivalent leakage from a 25-gpm leak is calculated as 3.33 pounds mass per second (lbm/sec) (i.e., based on liquid water density).

It appears that the 25 gpm leak is considered as pure steam but with liquid density. In this case, the mass and energy used for the calculation of room heat up would be unrealistically high and non-conservative for a leak detection setpoint. Please justify the appropriateness of the assumptions.

Provide the mass flow rate (lbm/sec) and flow enthalpy of the leak as well as the pressure and temperature for the leak source for all cases used in the leak detection Calculation-1001 Revision 5.

Enclosure

SCVB-RAI-2: Analysis Conditions

In the graphs presented in Attachment 3 to the application, the low room temperature reflecting winter conditions has been taken into account as an initial condition in the room temperature calculation. However, it is not clear if the winter temperature has also been used as a boundary condition in that the surrounding and/or extended rooms are subject to a cold environment where the winter temperature should be applied as boundary condition. Furthermore, it is not known if the internal structures (if existing) in the room have been modeled as heat sink that will also lower the room temperature.

Have the cold ambient temperature, heat sinks, and associated steam condensation been considered in the calculation? If not, justify why. In addition, have factors, other than weather conditions that will potentially affect the room temperature, also been considered and evaluated to assure the leak detection system's detectability (e.g., cooler operation, ventilation system changes, opening a new flow path or increasing flow area from the room to the other rooms)?

SCVB-RAI-3: Licensing Design Basis of Leak Rate to Determine Leak Detectability

Raising the leak detection alarm limit to 35 gpm reduces the time an operator has to isolate the leak before the conditions become hazardous. Please provide and evaluate the proposed 35 gpm leak against the original design basis for leakage detection capability as specified in General Electric design specifications (discussed in the second paragraph on page 6 of Attachment 1). Otherwise, address the concerns as described above.

SCVB-RAI-4: Leak Detection vs. Leak Source

Please describe the location of the leak detection instrument in relation to possible sources of leakage (i.e. distance).

SCVB-RAI-5: Calculation and Supporting Documents

To facilitate the review, please submit Calculation-1001 (Attachment 1, Section 6.0, Reference 2) and its major supporting references or documents.

Instrumentation and Controls Branch (EICB)
Reviewer: Deidre Spaulding

EICB-RAI-1: Turbine Enclosure Main Steam Line Tunnel Design Basis Change

As discussed on page 6 of Attachment 1 to the application, the licensee proposes to change the design basis from a 25-gpm to a 35-gpm equivalent steam leak during winter operations for the turbine enclosure main steam line (MSL) tunnel. The calculated temperature response curve for a 25-gpm leak in this area was provided in Attachment 3 to the application, however, the temperature response curve was not provided for the 35-gpm leak. Please provide the temperature response curve and description of "Turbine Enclosure MSL Tunnel Steam Leak"

with a 35-gpm equivalent steam leak. In addition, please provide the current analytical limit (AL) as well as the proposed new AL values.

EICB-RAI-2: Accuracy and Drift

Section 3.0 of Attachment 1 to the application indicates that the setpoint methodology for Limerick is based, in part, on General Electric (GE) Topical Report NEDC-31366P-A[1], "General Electric Instrument Setpoint Methodology" dated September 1996.

Section 4.4, "NRC Open Item 5.4 - Expanding Manufacturers Performance Specifications" in topical report NEDC-31366P-A discusses the results of a GE evaluation of field data on performance of Rosemount transmitters and trip units in relation to the design assumptions for drift contained in Sections 1.0 and 2.0 of the topical report. Section 2 of the topical report provides the methodology used by GE to validate instrument accuracy and drift values against system requirements. As stated in Section 2.1 of the topical report, the accuracy and drift methodology is based on the use of Rosemount (1151, 1152-T0280, 1153 Series B, 1154) or Gould (3018, 3200, 3218) transmitters with Rosemount (510) trip units.

Page 9 of the NRC staff's safety evaluation (SE) for topical report NEDC-31336P-A provides an evaluation of the information in Section 4.4 of the topical report. The staff stated, in part, that:

> Where instruments are used that are different from those presented in Section 2 of NEDC-31336, the licensee must demonstrate that instrument performance can be quantified either through vendor data or plant specific surveillance test data. The licensee must confirm that the observed measurements of instrument performance are bounded by the design allowances used in the plant specific analysis, for the chosen calibration interval, in accordance with the criteria stated in NEDC-31366.

The NRC staff notes that the specific line break detection applications that are the subject of this amendment request are not covered among the 25 specific instrument setpoint descriptions discussed in Section 3.0 of NEDC-31366P-A. In addition, the temperature elements and temperature indicating switches in the instrument loops, associated with this amendment request, are of different manufacturers and model numbers than those contained in Section 2 of NEDC.

Please provide information to demonstrate that the instrument accuracy and drift values, for the temperature elements and temperature indicating switches are bounded by the design allowances used in the plant-specific analysis, for the chosen calibration intervals, consistent with the criteria stated in NEDC-31366P-A.

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1 GE topical report NEDC-31336P-A is a non-public, proprietary version of the GE setpoint methodology (ADAMS Accession No. ML072950103). A public version of the methodology is available as GE topical report NEDO-31336-A (ADAMS Accession No. ML073450560).

EICB-RAI-3: Temperature and Humidity Environmental Conditions

The temperature elements, associated with the proposed amendment, will be subjected to elevated temperature and humidity environmental conditions during the timeframe in which they are required to perform their leak detection functions. Attachment 4 to the application provides the instrument loop uncertainty calculation for the associated instrument loops.

Section 6.2.7 of the calculation lists the “Device Accuracy Temperature” uncertainty “ATE” value for the temperature elements as being 0.00000. Section 6.2.8 lists the “Device Humidity” uncertainty “HE” value as 0.00000. The calculation states that the temperature and humidity effects are based on vendor specifications.

Please confirm that under the elevated temperature and humidity conditions that will be present when the instrument channel must be available to perform its required functions, the instrument performance is enveloped within the vendor’s stated accuracy effects (e.g., calculation Section 6.2.1), including the performance effects of the instruments under steam and degraded insulation resistance.