NRR-PMDAPEm Resource

From: Wiebe, Joel
Sent: Monday, March 09, 2015 3:49 PM
To: Jessica Krejcie
Subject: Preliminary Containment and Ventilation Branch RAIs for Braidwood UHS LAR

The purpose of preliminary RAIs is to ensure that the RAIs are clear and understandable. If you would like a teleconference to clarify the RAIs, let me know.

In a letter dated August 19, 2014, (Agencywide Documents Access and Management System (ADAMS) Accession Number ML14231A902), pursuant to Section 50.90 of Title 10 of the *Code of Federal Regulations* (10 CFR 50.90), Exelon Generation Company, LLC (EGC or the licensee) submitted a License Amendment Request (LAR) for Braidwood Station Units 1 and 2. Currently, Technical Specification (TS) Surveillance Requirement (SR) 3.7.9.2 states: "Verify average water temperature of Ultimate Heat Sink (UHS) is ≤100°F." The proposed amendment requests the TS SR 3.7.9.2 average water temperature increase to ≤102°F.

During its review of EGC's August 19, 2014, letter, the NRC staff determined that the following information is needed to complete its review of the containment and ventilation analysis. The section references included below refer to Attachment 1 of EGC's August 19, 2015, letter. A response is requested within 30 days.

SCVB-RAI-1

Section 3.5.8 refers to NRC Generic Letter (GL) 96-06 "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions," Section 3.5.8 addresses GL 96-06 concerns for possible water hammer events following either a Loss-Of-Coolant Accident or a Main Steam Line Break concurrent with a Loss Of Offsite Power in the first few minutes post-accident, while the pumps and fans are restarting following load shed.

(a) Provide a description of how and where the postulated water hammer events can take place following the first few minutes post-accident.

(b) What is the gas and how does it cause the voiding described in Section 3.5.8? Describe how this voiding is prevented?

(c) Provide a description of the analysis that determined that an increase in the cooling water temperature from 102°F to 104°F will not cause water hammer events in the system piping considered under GL 96-06.

SCVB-RAI-2

Section 3.6.1 identifies changes to the Mass and Energy (M&E) release by correcting the Steam Generator tube material density and specific heat as discussed in Westinghouse Nuclear Safety Advisory Letter (NSAL)-14-2. However, the LAR does not mention M&E release corrections discussed in NSAL-06-6 and NSAL-11-5. Describe changes in the following containment analyses results using the corrected methodology that incorporates corrections listed in the above three NSALs, (a) containment peak pressure, (b) containment peak gas temperature for Environment Equipment Qualification (EEQ), (c) containment peak wall temperature, (d) containment sump peak water temperature, (e) pump Net Positive Suction Head (NPSH) Available (NPSHA) for the pumps that draw water from the containment sump during recirculation mode of safety injection and containment cooling, and (f) containment minimum pressure analysis for Emergency Core Cooling System performance capability.

SCVB-RAI-3

Section 3.6.1 states:

"However, the SX temperature change coupled with the other changes described above resulted in peak pressure values similar to the current design analysis."

For each of the "other changes", provide a summary whether the change resulted in an increase or decrease in released mass, and an increase or decrease in the released energy.

SCVB-RAI-4

Section 3.6.1 states:

"The Braidwood Station Units were reanalyzed to assess an increase in the water temperature of the UHS to 104°F"

(a) Describe the methodology used for performing the proposed short and long term M&E release reanalysis and how does it differ from the current licensing basis analysis methodology.

(b) Describe the methodology used for performing the proposed short and long term containment pressure analysis for peak pressure, containment peak temperature analysis for EEQ, sump water temperature analysis for pump NPSH. How does the methodology for the proposed analysis differ from the current licensing basis analysis methodology?

(c) Provide a comparison of the inputs and assumptions in the proposed analysis that were changed from the current analysis. Provide justification for those inputs and assumptions in which the conservatism in the proposed analysis is reduced.

(d) Provide the resulting graphs for the most limiting LOCA peak pressure analysis for the double ended hot leg break and double ended pump suction break for both units.

SCVB-RAI-5

Refer to Sections 3.6.2.1 and 3.6.2.2; what methodology is used for the proposed MSLB analysis compared to the current analysis, and is the methodology up to date with all errors corrected?

SCVB-RAI-6

Refer to Section 3.6.2.1; for both units, provide the following information:

(a) Describe the MSLB cases analyzed for containment peak temperature, and provide their comparison with the cases analyzed in the current analysis.

(b) If other than the currently analyzed cases were selected, provide basis for their selection.

(c) Provide a comparison of the inputs and assumptions in the proposed analysis that were changed from the current analysis. Provide justification for those inputs and assumptions in which the conservatism in the proposed analysis is reduced.

(d) Explain why the peak containment temperatures are less in the proposed analysis than in the current analysis.

(e) Provide the graph of the most limiting MSLB peak temperature profile case.

SCVB-RAI-7

Refer to Section 3.6.2.2; for both units, provide the following information:

(a) Describe the MSLB cases analyzed for containment peak pressure, and provide their comparison with the cases analyzed in the current analysis.

(b) Describe the cases in the proposed and the current analysis that resulted in the maximum peak pressures.

(c) If other than the currently analyzed cases were selected, provide basis for their selection.

(d) Provide a comparison of the inputs and assumptions in the proposed analysis that were changed from the current analysis. Provide justification for those inputs and assumptions in which the conservatism in the proposed analysis is reduced.

(e) Provide the graph of the most limiting MSLB peak pressure profile case.

SCVB-RAI-8

NUREG-0800, Standard Review Plan (SRP) Revision 2, July 1981, 6.2.1.5 provides NRC staff review guidance for the minimum containment pressure analysis for emergency core cooling system (ECCS) performance capability. Branch Technical Position CSB 6-1 provides guidance for complying with 10 CFR Part 50, Appendix K, paragraph I.D.2 when calculating the containment pressure response used for evaluating cooling effectiveness during the post-blowdown phase of a LOCA. The Branch Technical Position states that the minimum containment pressure should be calculated by including the effects of containment heat sinks and operation of all pressure-reducing systems. Provide the results of the re-analysis for the minimum containment pressure with the proposed change in the cooling water temperature, including the corrections and revisions to analyses described in your letter dated August 19, 2014.

Alternatively, provide justification why the proposed change in the cooling water temperature, including the corrections and revisions to analyses described in your letter dated August 19, 2014, does not impact the minimum containment pressure analysis.

SCVB-RAI-9

Section 3.4.3 states:

"The long term containment analysis was re-performed and it was demonstrated that the containment pressures and temperatures have been significantly reduced from the calculated peak value at 36 hours after the event. At 36 hours the containment pressure is approximately 30 psi lower than the calculated peak and the containment atmosphere temperature is approximately 80°F lower than the calculated peak. Therefore, the increase in the UHS temperature above 104°F post 36 hours will not result in exceeding any design criteria related to post-LOCA containment requirements."

Describe the analysis performed that demonstrated that an increase in the UHS temperature to 105.2^{o}F at 36 hours post-accident will not result in exceeding the containment design pressure and temperature.

SCVB-RAI-10

Section 3.5.4 states that the engineering evaluation of the main control room chiller condensers was performed for the increased UHS temperature of 105.2°F using design heat loads, design SX cooling flow rates and existing tube plugging values and used reduced fouling factor based on the as-found fouling factors of other heat exchangers in the NRC GL 89-13 program.

(a) Provide a detailed justification for using a reduced fouling factor for proposed evaluation of the main control room chiller condenser.

(b) What was the as-found value of the main control room chiller condenser fouling factor used in the current licensing basis analysis and the value of the fouling factor used in the proposed engineering evaluation.

(c) Provide results of the control room chiller condenser heat transfer performance in the current licensing basis analysis and in the proposed analysis.

Hearing Identifier: NRR_PMDA
Email Number: 1929

Mail Envelope Properties (Joel.Wiebe@nrc.gov20150309154800)

Subject: Preliminary Containment and Ventilation Branch RAIs for Braidwood UHS LAR
Sent Date: 3/9/2015 3:48:31 PM
Received Date: 3/9/2015 3:48:00 PM
From: Wiebe, Joel

Created By: Joel.Wiebe@nrc.gov

Recipients:
"Jessica Krejcie" <Jessica.Krejcie@exeloncorp.com>
Tracking Status: None

Post Office:

Files	**Size**	**Date & Time**
MESSAGE	9283	3/9/2015 3:48:00 PM

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received: