NRR-DMPSPEm Resource

From: Wiebe, Joel
Sent: Thursday, July 12, 2018 7:48 AM
To: 'ken.nicely@exeloncorp.com' (ken.nicely@exeloncorp.com)
Cc: Kuntz, Robert
Subject: Preliminary Request for Additional Information Regarding Clinton Revised Alternate Source Term (EPID: L-2018-LLA-0004)

Ken,

The purpose of providing a preliminary request for additional information is to ensure the request is clear and understandable. If a clarification call is needed, let me and Rob Kuntz (301-415-3733) know within one week of the date of this e-mail. I will be out of the office from July 19 through July 30, returning on July 31. A response is requested within 30 days.

Joel

REQUEST FOR ADDITIONAL INFORMATION
LICENSE AMENDMENT REQUEST TO INCORPORATE
REVISED ALTERNATIVE SOURCE TERM
DOSE CALCULATION
CLINTON POWER STATION, UNIT 1
DOCKET NO. 50-461

The current loss of coolant accident (LOCA) dose calculation for Clinton Power Station, Unit 1 (CPS) is based on alternative source term (AST) methodology in accordance with 10 CFR 50.67, "Accident source term,", that was approved by NRC letter dated September 19, 2005 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML052570461) (Amendment 167 to CPS license NPF-62). The current CPS Updated Safety Analysis Report (USAR) reflects the changes approved by Amendment 167. By letter dated January 9, 2018 (ADAMS Accession No. ML18009B037), Exelon Generation Company, LLC (EGC) proposed changes to the analysis of record in the USAR. The changes proposed include a revision to the analysis methodology pertaining to mixing of activity in the secondary containment and a lower acceptance criteria for primary containment to secondary containment leakage through the feedwater penetration. The NRC staff requires additional information to complete its review.

RAI SCPB-1

Enclosure 2 to Exelon's January 9, 2018, letter contains a markup of the revised USAR and the Technical Specification (TS) bases pages. The markup in USAR page 15.6-10 contains a new item (6) added to Section 15.6.5.5.1.2 "Fission Product Transport to the Environment." Item (6) states "Credit is taken for mixing primary containment leakage in 50% of the secondary containment volume in accordance with RG [Regulatory Guide] 1.183, Appendix A, Section 4.4."

RG 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Plants," Appendix A, Section 4.4, states in part:

> Credit for dilution in the secondary containment may be allowed when adequate means to cause mixing can be demonstrated. Otherwise, the leakage from the primary containment should be assumed to be transported directly to exhaust systems without mixing. Credit for mixing, if found to be appropriate, should generally be limited to 50%."

Provide information to demonstrate the means available to cause mixing of primary containment leakage with the secondary containment volume and a description of any supporting review/analysis performed at CPS to justify the 50% mixing assumption within secondary containment.

RAI SCPB-2

By letter dated June 21, 1996 (ADAMS Accession No. ML020990619), the NRC staff approved CPS adoption of Option B "Performance Based Testing Requirements" of Appendix J to 10 CFR 50 "Primary Reactor Containment Leakage Rate Testing for Water Cooled Power Reactors." The exemptions to the requirements 10 CFR Part 50, Appendix J, are stated in Section 2.D of the CPS facility Operating License.

CPS TS 5.5.13, "Primary Containment Leakage Rate Testing," states in part that "A program shall be established to implement the leakage rate testing of the primary containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in NEI 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR 50, Appendix J," Revision 3-A, dated July 2012 [ADAMS Accession No. ML12221A202], and the conditions and limitations specified in NEI 94-01, Revision 2-A, dated October 2008 [ADAMS Accession No. ML100620847], as modified by the following exception: (1) Bechtel Topical Report BN-TOP-1 is also an acceptable option for performance of Type A tests."

Appendix J to 10 CFR 50, Option B, Section III.B, "Performance-Based Requirements for Type B and C Tests," requires pneumatic tests to measure containment isolation valve leakage rates.

NEI 94-01, Revision 3-A, Section 8.0 "Testing Methodologies for Type A, Type B and Type C Tests" states that, "Type A, Type B and Type C tests should be performed using the technical methods and techniques specified in ANSI/ANS-56.8–2002, "Containment System Leakage Testing Requirements," or other alternative testing methods that have been approved by the NRC." Section 2, "Definitions" of ANSI/ANS-56.8-2002 defines Type C test as "A pneumatic test to measure leakage rates from containment isolation valves, which are potential gaseous leakage pathways from containment during a design-basis LOCA."

Section 2, "Detailed Description," in Attachment 1 to EGC's January 9, 2018, letter states that changes to the current LOCA dose calculation includes a reduction to the feedwater isolation valve liquid leakage from 2.0 gallons per minute (gpm) to 1.5 gpm, and a reduction in the feedwater isolation valve air leakage from 10.98 cubic feet per minute (cfm) to 8.64 cfm. Based on the USAR markup (page 15.6-10, Item 4) provided in Enclosure 2 to the LAR, the containment atmosphere leakage through the feedwater penetration applies in the first 1 hour and the liquid leakage through the feedwater penetration applies for the duration of the accident after 1 hour. The letter contains an associated change to Surveillance Requirement (SR) 3.6.1.3.11. Currently, the SR requires verification that the combined leakage rate from both primary containment feedwater penetrations is ≤ 2 gpm. EGC's January 9, 2018, letter proposes to reduce the combined leakage to ≤ 1.5 gpm. The frequency of the surveillance is "in accordance with the primary containment leakage rate testing program."

Appendix J testing program only provides for pneumatic testing program, therefore, it is not clear what method or interval requirements the licensee would apply to the liquid leakage testing performed at CPS for this SR.

Describe the Appendix J leakage tests currently performed to satisfy the requirements of SR 3.6.1.3.11 and TS 5.5.13. If the tests, including the test medium, are different from the approved methods in Appendix J to 10 CFR 50 and ANSI/ANS-56.8-2002, describe where the exemptions/exceptions are explicitly stated in the CPS license documents including any prior staff approval obtained for such exemptions/exceptions.

Explain if the reduced liquid and containment atmosphere leakage values proposed by EGC's January 9, 2018, letter are already supported by recent historical results of Appendix J testing or if new testing would be necessary.

RAI RMET/RHM-1

In its January 9, 2018, letter, EGC states that no credit is taken for the dual, separated outside air intake design feature for evaluating the radiological consequences of design basis accidents (DBAs). Section 3.3.2.1 of RG 1.194, "Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants," dated June 2003 (ADAMS Accession No. ML15268A488), states that for dual outside air intakes in different wind direction windows which cannot be isolated by design, the χ/Q values for the limiting (least favorable) outside air intake should be calculated for each time interval.

Table 1 in the Safety Evaluation related to Amendment 167 (ADAMS Accession No. ML052570461) documents the staff's review and acceptance of the χ/Q values used in the current AST dose analysis. Those χ/Q values, along with the revised design basis χ/Q values proposed for use in this LAR, are listed in Table 1:

Table 1: Filtered Intake Control Room χ/Q Values (sec/m^3)

	Current Design Basis			
Time Period	**West Intake**	**East Intake**	**Most Favorable Intake Divided by 4**	**Proposed Revised Design Basis**
0 - 2 hours	9.45E-04	9.75E-04	2.36E-04	9.45E-04
2 - 8 hours	7.58E-04	7.09E-04	1.77E-04	7.58E-04
8 - 24 hours	3.28E-04	2.93E-04	7.33E-05	3.28E-04
24 - 96 hours	2.61E-04	2.13E-04	5.33E-05	2.61E-04
96 - 720 hours	1.85E-04	1.79E-04	4.48E-05	1.85E-04

Table 1 shows that for the proposed revised design basis, the most favorable χ/Q value was selected for the 0-2 hour time period whereas the least favorable χ/Q values were selected for the remaining time periods.

Provide justification for why the χ/Q value for the limiting (least favorable) outside air intake was not used for 0-2 hour time interval for the post-LOCA control room dose calculations as suggested in RG 1.194.

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