NRR-PMDAPEm Resource

From: Lingam, Siva
Sent: Tuesday, January 14, 2014 7:16 AM
To: Mackaman, Clyde Douglas (cdmackaman@tva.gov)
Cc: Quichocho, Jessie; Dennig, Robert; Sallman, Ahsan; Bucholtz, Kristy
Subject: RE: Sequoyah 1 and 2 - RAIs for LAR Re: Modification of Ice Condenser TS to Address Rev in Westinghouse Mass and Energy Release Calculation (SQN-TS-12-04) (TAC Nos. MF2446 and MF2447)

By letter dated July 3, 2013, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13199A281) (Reference 1) , Tennessee Valley Authority (TVA or the licensee) requested an amendment to Operating Licenses (OLs) DPR-77 and DPR-79 for the Sequoyah Nuclear Plant (SQN), Units 1 and 2 respectively in the form of changes to the Technical Specifications (TSs). The licensee's proposed changes would revise the SQN Units 1 and 2 Technical Specifications (TSs) 3/4.6.5, "Ice Condenser," by increasing the ice weight to address the issues identified in Westinghouse's Nuclear Safety Advisory Letter (NSAL)-11-5, 'Westinghouse LOCA Mass and Energy Release Calculation Issues," (Reference 2) and NSAL-06-6, "LOCA Mass and Energy Release Analysis," (Reference 3).

The Nuclear Regulatory Commission (NRC) staff has reviewed the information the licensee provided that supports the proposed amendment and would like to request the licensee's responses within 30 days from the date of this e-mail to the following issues to complete its review:

RAI-1

Reference 1, Attachment 5 to Enclosure, Section 1.0 states:

> *"In addition, for a comprehensive reconciliation of all issues relative to the LOCA mass and energy release analysis of record (AOR) all appropriate corrections relative to NSAL-06-6 (Reference 10) were also addressed."*

Provide a discussion of issues described in NSAL-06-6 that are resolved in the containment integrity reanalysis documented in Attachment 5.

RAI-2

Reference 3, states:

> *"The issues were evaluated for ice condenser plants where the containment pressure is controlled by the melting of the ice inside containment. Instead of applying the impact in a pressure increase, the penalty was converted into an energy value. Benefits were found in the calculation of the SG secondary mass, and other analysis inputs, that were greater than the additional energy."*

Please explain how the impact on containment peak pressure is prevented and the penalty converted into energy.

RAI-3

Reference 1, Attachment 5 to its Enclosure, Table 1-2 provides the decay heat data in the proposed analysis. Reference 4, Enclosure 4, Table 1-2 lists the currently used decay heat data. Comparing the data used for the current and the proposed analysis, it is noted that the for the first 10,000 seconds the decay heat is less in the proposed analysis than in the current analysis. Please note that the conservatism in the decay heat is important during the first 10,000 seconds because as per Reference 1, Attachment 5, Appendix D, the peak containment pressure of 11.33 psig occurs at about 6371 seconds.

(a) Please explain why the decay heat for the first 10,000 seconds is less in the proposed decay heat data than from the currently used data.

(b) Please list all the differences between the assumptions used for the decay heat calculation in the current and proposed analysis and justify if the assumptions used in the proposed analysis are less conservative.

RAI-4

Reference 1, Attachment 5 to Enclosure, Section 2.2 input assumption 5 states the accumulator nitrogen mass of 3479 lbs is included in the calculation. In the current analysis in Reference 4, Enclosure 4, Section 2.2 input assumption 5 states the accumulator mass of 3676 lbs is included in the calculation. A reduction in the nitrogen mass added to the containment may reduce the conservatism in the containment peak pressure analysis. In case the conservatism is reduced, please explain and justify the reason for the difference in the nitrogen mass added to the containment in the proposed and the current analysis.

RAI-5

Reference 1, Attachment 5 to Enclosure, Section 2.2, referring to input assumption number 11, please explain the differences in the upper containment volume used in the current and the proposed analysis and how these volumes are related with their initial temperatures used in the analysis. In case the conservatism in the proposed analysis is reduced by using initial temperature of 80^{o}F in the upper compartment, please justify the use of a lower temperature in the proposed analysis instead of using the current analysis initial temperature assumption of 85^{o}F, which is the lower limit specified in TS Limiting Condition of Operation (LCO) 3.6.1.5.

RAI-6

Reference 1, Attachment 5 to Enclosure, Table 2-1, under “Ice Condenser” item number 17, provide justification for reducing the thickness of containment wall panels and containment shell steel from 0.4625 ft used in the current analysis to 0.0625 ft used in the proposed analysis. Is this conductor exposed to the outside containment temperature?

RAI-7

Reference 1, Attachment 5 to Enclosure, Appendix A, under the heading “LOCA Mass and Energy Release Phase”, please reconsider defining “Blowdown” which states:

> *“Blowdown - the period of time from accident initiation (when the reactor is at steady state operation) to the time that the RCS and containment reach an equilibrium state at containment design pressure.”*

The containment peak pressure should be less than its design pressure during an accident. As per the above definition, the **containment pressure** has reached the containment **design pressure** at the end of blowdown period.

RAI-8

Please provide a discussion regarding the impact on the NPSH analysis for the pumps that draw water from the containment sump during the recirculation mode of operation during the postulated accidents. Reference 1 does not provide any information on this analysis.

REFERENCES

1. Letter from TVA to NRC dated July 3, 2013, “Application to Modify Ice Condenser Technical Specifications to Address Revisions in Westinghouse Mass and Energy Release Calculation (SQN-TS-12-04)”, (ADAMS Accession Number ML13199A281)

2. NSAL-11-5, "Westinghouse LOCA Mass and Energy Release Calculation Issues," July

26, 2011 (ADAMS Accession Number ML13239A479)

3. NSAL-06-6, "LOCA Mass and Energy Release Analysis," June 6, 2006.

4. Letter from TVA to NRC dated September 12, 2001, “Sequoyah Nuclear Plant (SQN) -Units 1 And 2 - Technical Specification (TS) Change No. 01-04, Revised Ice Weight”

ADAMS Accession Number ML13226A074

From: Lingam, Siva
Sent: Monday, August 12, 2013 4:25 PM
To: Mackaman, Clyde Douglas (cdmackaman@tva.gov)
Cc: Broaddus, Doug; Dennig, Robert; Sallman, Ahsan; Bucholtz, Kristy
Subject: Sequoyah 1 and 2 - Acceptance Review of License Amendment Request Regarding Modification of Ice Condenser Technical Specifications to Address Revisions in Westinghouse Mass and Energy Release Calculation (SQN-TS-12-04) (TAC Nos. MF2446 and MF2447)

By letter dated July 3, 2013 (ADAMS Accession No. ML13199A281), Tennessee Valley Authority submitted a license amendment request (LAR) for Sequoyah Nuclear Plant, Units 1 and 2. The LAR would revise the Technical Specifications (TSs) 3/4.6.5, “Ice Condenser.” The proposed changes would revise TS Limiting Condition for Operation 3.6.5.1.d and TS Surveillance Requirement 4.6.5.1.d.2 to raise the overall ice condenser ice weight from 2,225,880 pounds (lbs) to 2,540,808 lbs and to raise the minimum TS ice basket weight from 1145 lbs to 1307 lbs, respectively. These changes are necessary to address the issues raised in Nuclear Safety Advisory Letter (NSAL) 11-5, “Westinghouse LOCA [loss-of-coolant accident] Mass and Energy Release Calculation Issues.” The issues identified in NSAL 11-5 affected plant-specific LOCA mass and energy release calculation results that are used as input to the containment integrity analyses. The basis for the proposed changes is provided in WCAP-12455, Revision 1, Supplement 2R, “Tennessee Valley Authority Sequoyah Nuclear Plant Units 1 and 2 Containment Integrity Reanalyses Engineering Report.” The purpose of this e-mail is to provide the results of the NRC staff’s acceptance review of this LAR. The acceptance review was performed to determine if there is sufficient technical information in scope and depth to allow the NRC staff to complete its detailed technical review. The acceptance review is also intended to identify whether the application has any readily apparent information insufficiencies in its characterization of the regulatory requirements or the licensing basis of the plant.

The NRC staff has reviewed your application and concluded that it does provide technical information in sufficient detail to enable the NRC staff to complete its detailed technical review and make an independent assessment regarding the acceptability of the proposed LAR in terms of regulatory requirements and the protection of public health and safety and the environment. Given the lesser scope and depth of the acceptance review as compared to the detailed technical review, there may be instances in which issues that impact the NRC staff’s ability to complete the detailed technical review are identified despite completion of an adequate acceptance review. If additional information is needed, you will be advised by separate correspondence.

If you have any questions, please contact me.

Siva P. Lingam
U.S. Nuclear Regulatory Commission
Project Manager (NRR/DORL/LPL2-2)
Sequoyah Nuclear Plant
St. Lucie Plant
Location: O8-D5; Mail Stop: O8-G9a
Telephone: 301-415-1564; Fax: 301-415-1222
E-mail address: siva.lingam@nrc.gov

Hearing Identifier: NRR_PMDA
Email Number: 1023

Mail Envelope Properties (Siva.Lingam@nrc.gov20140114071500)

Subject: RE: Sequoyah 1 and 2 - RAIs for LAR Re: Modification of Ice Condenser TS to Address Rev in Westinghouse Mass and Energy Release Calculation (SQN-TS-12-04) (TAC Nos. MF2446 and MF2447)
Sent Date: 1/14/2014 7:15:34 AM
Received Date: 1/14/2014 7:15:00 AM
From: Lingam, Siva

Created By: Siva.Lingam@nrc.gov

Recipients:
"Quichocho, Jessie" <Jessie.Quichocho@nrc.gov>
Tracking Status: None
"Dennig, Robert" <Robert.Dennig@nrc.gov>
Tracking Status: None
"Sallman, Ahsan" <Ahsan.Sallman@nrc.gov>
Tracking Status: None
"Bucholtz, Kristy" <Kristy.Bucholtz@nrc.gov>
Tracking Status: None
"Mackaman, Clyde Douglas (cdmackaman@tva.gov)" <cdmackaman@tva.gov>
Tracking Status: None

Post Office:

Files	**Size**	**Date & Time**
MESSAGE	9654	1/14/2014 7:15:00 AM

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