CCNPP3eRAIPEm Resource

From: Arora, Surinder
Sent: Monday, February 13, 2012 9:17 AM
To: Infanger, Paul; UNECC3Project@unistarnuclear.com
Cc: CCNPP3eRAIPEm Resource; Segala, John; Jeng, David; Wilson, Anthony; Vrahoretis, Susan; Thomas, Brian; Miernicki, Michael; McLellan, Judith
Subject: Draft RAI 339 SEB2 6317
Attachments: Draft RAI 339 SEB2 6317.doc

Paul,

Attached is DRAFT RAI No. 339 (eRAI No. 6317). You have until February 27, 2012 to review it and decide whether you need a conference call to discuss the RAI before the final issuance. After the phone call or after February 27, 2012, the RAI will be finalized and sent to you for your response. You will then have 30 days to provide a technically complete response or an expected response date for the RAI.

Thanks

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From: Arora, Surinder

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Request for Additional Information No. 339 (eRAI 6317)
DRAFT
2/13/2012

Calvert Cliffs Unit 3
UniStar
Docket No. 52-016
SRP Section: 03.08.04 - Other Seismic Category I Structures
Application Section: FSAR 3.8.4

QUESTIONS for Structural Engineering Branch 2 (ESBWR/ABWR Projects) (SEB2)

03.08.04-33

Follow Up to RAI 301, Question 03.08.04-18:

The staff reviewed the response to RAI 301, Question 03.08.04-18 provided in UniStar Letter UN#11-227 dated October 31, 2011 (ML11307A243). Based on this response and CCNPP Unit 3 FSAR Revision 7, the staff understands that, for the design and analysis method for the Forebay and the UHS MWIS, as discussed in FSAR Section 3.8.4.4.7: (1) the complex frequency response analysis method is used for the seismic SSI analysis to obtain accelerations, and the SRSS method is used to combine the accelerations due to three components of earthquake motion to obtain maximum nodal accelerations, (2) the maximum nodal accelerations are applied to the static FE model to obtain member forces due to seismic loads, and the design member forces due to seismic loads are calculated using the SRSS method. Based on a review of U.S. EPR FSAR Revision 3, the major difference between EPR and CCNPP methods to determine the design member forces due to seismic loads is that the EPR DC application uses algebraic summation to combine the accelerations due to three components of earthquake motion for all seismic Category I structures. Furthermore, in the EPR DC application, confirmatory analyses were performed to verify the conservatism of the EPR method to determine the design member forces due to seismic loads.

Since the CCNPP method is different than the EPR method, which has been accepted by the staff, provide the technical basis to demonstrate that the CCNPP method to determine the design member forces due to seismic loads for the design and analysis for the Forebay and the UHS MWIS is at least as conservative as the EPR method, or more detailed methods which utilize time history analysis or response spectrum analysis. Guidance on the need for justification for the use of equivalent static load methods for seismic analysis is discussed in SRP Acceptance Criteria 3.7.2.II.1.B.i.
In addition, since CCNPP Unit 3 no longer follows the EPR method to combine accelerations, any CCNPP Unit 3 FSAR reference to the EPR FSAR regarding use of the the EPR methods should be updated, and, a detailed description of the methodology utilized by CCNPP Unit 3 should be included in the applicable section of the CCNPP Unit 3 FSAR.

The staff needs the above information to be able to determine whether FSAR Section 3.8.4.4.7 is consistent with SRP Acceptance Criteria 3.7.2.II.1.B.i and 3.8.4.II.4.

03.08.04-34

Follow Up to RAI 301, Question 03.08.04-20:

In RAI 301, Question 03.08.04-20, the staff requested that the applicant provide additional information on (1) the exclusion of soil load/lateral earth pressure (H) in the load combinations listed in FSAR Section 3.8.5.3 for bearing pressure evaluation, and (2) the large differences in maximum bearing pressure and bearing capacities between Revision 6 and Revision 7 of the CCNPP Unit 3 FSAR, for the design of the UHS Makeup Water Intake Structure (MWIS).

The staff reviewed the response to RAI 301, Question 03.08.04-20 provided in UniStar Letter UN#11-278 dated November 4, 2011 (ML11314A040). Regarding the bearing pressure calculation, the staff determined that additional information is needed to resolve this RAI item. Since the RAI response indicates that the maximum bearing pressures (static and dynamic) of the CBIS are the maximum of the average pressures under each of the three intake structures (the UHS MWIS, the Forebay and the Circulating Water Makeup Intake Structure), they are not the localized pressures such as the pressures at the toe of the CBIS basemat. The staff requests that the applicant provide the values of the maximum pressures considering all locations of the CBIS basemat design (e.g., maximum pressures that may occur at the toe/edge/corner of the basemat) under worst-case static and dynamic loads. This would represent the localized maximum soil bearing pressure, not the maximum of the average of pressures under each of the three intake structures. Furthermore, explain how these presures are obtained, e.g., how the soil springs are developed, what the differences are between soil springs for static and dynamic pressures, and how the dynamic pressures from the STAAD Pro FE model analysis compare with the pressures from the SSI analysis, etc. In addition, explain whether the CCNPP Unit 3 bearing capacities provided in Table 3.8-3, as well as those in Table 2.5-65, of the FSAR Revision 7, are the bearing capacities for localized pressure. If they are bearing capacities for localized pressure, explain why the calculated average pressures of the CBIS are compared with the bearing capacities for localized pressure. If they are bearing capacities for average pressure, explain why in Table 2.0-1 of the CCNPP Unit 3 FSAR Revision 7 the CCNPP Unit 3 bearing capacities are compared with the U.S. EPR bearing capacities for localized pressure.

The staff needs the information to determine whether the foundation design of the seismic Category I structures is consistent with SRP Acceptance Criteria 3.8.5.II.2 and 4 and has been adequately addressed in the CCNPP Unit 3 FSAR.