CCNPP3eRAIPEm Resource

From: Arora, Surinder
Sent: Monday, August 26, 2013 8:52 AM
To: Infanger, Paul; UNECC3Project@unistarnuclear.com
Cc: CCNPP3eRAIPEm Resource; Segala, John; Wilson, Anthony; Xu, Jim; Chakrabarti, Samir; Miernicki, Michael; McLellan, Judith
Subject: Final RAI 395 SEB2 7201
Attachments: FINAL RAI 395 SEB2 7201.docx

Paul,

Attached to this email message is Final RAI No. 395 (eRAI No. 7201) pertaining to section 3.7.1 of the FSAR for Combined License Application for CCNPP3. The draft of this RAI was issued to UniStar on August 14, 2013. A clarification phone call requested by UniStar was held on August 21, 2013; however, no changes were required to the draft RAI question based on the clarification phone call. It was mutually agreed that this RAI can be issued as "final" without any changes to the draft question as written. This email, therefore, transmits the "final" version of the RAI.

The schedule that we have established for review of your application assumes that your technically complete response to the RAI question or a schedule for providing the response must be received within 30 days of the final RAI. Please note that if you are providing a response schedule in lieu of the technically complete response, the staff will re-evaluate the completion schedule of the chapter based on your proposed response date.

Additionally, please make sure that your response letter includes a statement whether or not your response contains any sensitive or proprietary information.

Thanks.

SURINDER ARORA, PE
LEAD PROJECT MANAGER,
Calvert Cliffs Unit 3 Project
Office of New Reactors
US Nuclear Regulatory Commission

Phone: 301 415-1421
FAX: 301 415-6406
Email: Surinder.Arora@nrc.gov

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From: Arora, Surinder

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Recipients:
"CCNPP3eRAIPEm Resource" <CCNPP3eRAIPEm.Resource@nrc.gov>
Tracking Status: None
"Segala, John" <John.Segala@nrc.gov>
Tracking Status: None
"Wilson, Anthony" <Anthony.Wilson@nrc.gov>
Tracking Status: None
"Xu, Jim" <Jim.Xu@nrc.gov>
Tracking Status: None
"Chakrabarti, Samir" <Samir.Chakrabarti@nrc.gov>
Tracking Status: None
"Miernicki, Michael" <Michael.Miernicki@nrc.gov>
Tracking Status: None
"McLellan, Judith" <Judith.McLellan@nrc.gov>
Tracking Status: None
"Infanger, Paul" <paul.infanger@unistarnuclear.com>
Tracking Status: None
"UNECC3Project@unistarnuclear.com" <UNECC3Project@unistarnuclear.com>
Tracking Status: None

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Request for Additional Information 395 (eRAI 7201)

Issue Date: 08/26/2013
Application Title: Calvert Cliffs Unit 3 - Docket Number 52-016
Operating Company: UniStar
Docket No. 52-016
Review Section: 03.07.01 - Seismic Design Parameters
Application Section: FSAR 3.7.1

QUESTIONS

03.07.01-19

Follow Up Question to RAI 344, Question 03.07.01-18

In RAI 344, Question 03.07.01-18 the applicant was asked to explain certain inconsistencies in the specified values of shear wave velocities provided with the response to RAI 314, Question 03.07.01-17 (bullet 3) and to clarify structural fill installation requirements as applicable to the Fire Protection Building (FPB) and the Fire Protection Tanks (FPTs). The lack of consistency in shear wave velocity values has been corrected. In addition the applicant has clarified the requirements for the backfill under the FPB and FPTs as being the same as the requirements for the back fill. The staff finds this change to be adequate. However, the staff has other concerns regarding the response which need to be addressed:

1. In part 1 of the response the applicant has provided the backfill low strain best estimate shear wave velocities. These are shown in Figure 1 of the response as the best estimate low strain velocity profile. Since it was not clear from the response, the applicant is requested to describe how the backfill low-strain best estimate shear wave velocities were determined.

2. In part 4 of the response, the applicant describes how the best estimate strain compatible shear wave velocities for the structural backfill were determined from a site response analysis. The acceptance criteria of Standard Review Plan (SRP) 3.7.2 states under special guidelines for soil-structure interaction (SSI) analysis that seismic demands be computed for a minimum of three soil cases; best estimate (BE), lower bound (LB) and upper bound (UB), wherein the upper and lower bound shear modulus is defined in terms of the best estimate value as:

   GLB=GBE / (1+COV)

   GUB=GBE × (1+COV)

   The coefficient of variation (COV) for well-investigated sites should be no less than 0.5 and otherwise should be taken as a value of at least 1.0. The applicant in its response has assumed a COV of 0.5 in establishing the upper and lower bound strain compatible shear wave velocities for the backfill. The requirements for computing seismic demands from three soil cases are part of the conservatisms included in the design process that are intended to provide sufficient design margin to achieve the performance goal of 1x10-5 for nuclear power plants. Since the structural backfill properties used in the response analysis are not based on in-situ field tests, they should be treated as preliminary. Therefore, the applicant is requested to provide the basis for using a COV of 0.5 for determining upper and lower bound shear wave velocities instead of a value of at least 1.0.

3. In part 5 of the response a new acceptance criteria for the shear wave velocity ITAAC is defined and presented in Figure 2 and Table 7. The acceptance criteria for the backfill shear wave velocity values are apparently based on the difference between the BE SSI profile and the LB SSI profile. The response goes on to state that the selected acceptance criteria shear wave velocity profile ensures that that the expected corresponding strain compatible profiles fall within the range used in the SSI analysis of the CCNPP Unit 3 building facilities. The response concludes that a strain-compatible profile that results from a low strain profile that is close to the acceptance criteria defined in Figure 2 will be within the bounds of the CCNPP Unit 3 SSI analysis.

   a. The applicant is requested to explain how the shear wave velocity ITAAC Acceptance Criteria based the difference between the BE SSI profile and LB SSI profile was determined.

   b. The shear wave velocities shown in Figure 2 which comprise the acceptance criteria are less than those of the low-strain best estimate shear wave velocities. Since the applicant has already assumed the minimum SRP COV value of 0.5 in determining the lower bound strain compatible shear wave velocities, the use of the ITAAC acceptance criteria profile in a randomization process to determine strain compatible shear wave velocities can only result in lower bound strain compatible shear wave velocities that are less than the values assumed in the SSI analysis, not greater than these values as stated in the applicant's response. The applicant is therefore requested to provide the basis for its conclusion that a

strain-compatible profile that results from a low strain profile that is close to the acceptance criteria defined in Figure 2 will be within the bounds of the CCNPP Unit 3 SSI analysis.

4. Although founded on native soil, the common basemat intake structure (CBIS) is surrounded by backfill from the basemat up to grade elevation. To ensure the backfill impedance is consistent with that of the surrounding native soil and consistent with the values identified in the response to RAI 304, Question 03.07.01-17, Item 1 (Bullet 1) the applicant is requested to include requirements for the CBIS backfill in the Engineered Fill ITAAC of Table 2.4-1.