

## CCNPP3eRAIPEm Resource

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**From:** Arora, Surinder  
**Sent:** Thursday, September 13, 2012 11:13 AM  
**To:** Infanger, Paul; UNECC3Project@unistarnuclear.com  
**Cc:** CCNPP3eRAIPEm Resource; Segala, John; Wilson, Anthony; Thomas, Brian; Jeng, David; Miernicki, Michael; McLellan, Judith  
**Subject:** CCNPP3 - Final RAI 369 SEB 6612  
**Attachments:** FINAL RAI 369 SEB 6612.doc

Paul,

Attached is Final RAI No. 369 (eRAI No. 6612) pertaining to section 3.8.5 of the Calvert Cliffs Unit 3 FSAR. The draft of this RAI was sent to you on August 14, 2012. A clarification phone call requested by UniStar on the draft question was held on September 11, 2012. As a result of this call, the last statement of Item 1 of the draft RAI question was modified. No other changes were required to the draft RAI question. This email, therefore, transmits the RAI as "final" for providing your response.

The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a schedule date for submitting your technically correct and complete response will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the review schedule.

Your response letter should also include a statement confirming that the response does or does not contain any sensitive or proprietary information.

Thanks.

**SURINDER ARORA, PE**  
**PROJECT MANAGER,**  
**Office of New Reactors**  
**US Nuclear Regulatory Commission**

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**From:** Arora, Surinder

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## Request for Additional Information 369 (eRAI 6612)

DRAFT

Issue Date: 8/14/2012

Application Title: Calvert Cliffs Unit 3 - Docket Number 52-016

Operating Company: UniStar

Docket No. 52-016

Review Section: 03.08.05 - Foundations

Application Section: FSAR 3.8.5

### QUESTIONS

03.08.05-11

#### **Followup RAI for RAI 308, Question 03.08.05-9**

In RAI 308, Question 03.08.05-9, the staff requested that the applicant explain how the new and updated COL Items regarding settlements of the Emergency Power Generating Buildings (EPGBs) and the Essential Service Water Buildings (ESWBs) will be addressed and what site-specific conditions will be considered, and provide information on the methodology and procedures used for the settlement evaluation of the Common Basemat Intake Structure (CBIS) foundation.

The staff reviewed the Part 1 RAI response to RAI 308 Question 03.08.05-9 provided in UniStar letter UN#12-036 dated April 18, 2012 (ML12111A113).

The RAI response addressed the RAI question regarding models, methodology and procedures utilized in the site-specific settlement analysis of the EPGBs and the RAI question regarding the methodology and procedures used for the settlement evaluation of the CBIS foundation. However, to ensure that the COL items related to the settlement of the EPGBs are adequately addressed and site-specific conditions are adequately considered in the settlement analyses of the EPGBs and the CBIS, the staff requests that the applicant provide the following information:

1. The RAI response stated that, for the EPGB settlement analyses, the maximum angular distortion predicted by the site-specific analysis is less than the maximum angular distortion of the EPR analysis in every slab design area for the softest soil case in U.S. EPR FSAR Table 3.7.1-8. It is noted that both U.S. EPR FSAR Section 3.8.5.4.3 and AREVA response to EPR FSAR RAI 354 Question 03.08.05-22, Supplement 34, referred to the soft soil case shown in EPR FSAR Table 3.7.1-6 for the EPR EPGB settlement analysis. EPR Section 3.7.2.4.1 explains that the soft soil case in Table 3.7.1-6 is the same as the soft soil case in Table 3.7.1-8, but has backfill layers above a certain elevation. To clarify the difference between the two EPGB settlement analyses, explain whether the site-specific soil input data are the same as those used in the EPR analysis. If they are not the same, explain the difference(s) between the two sets of soil input data. Also explain whether the effects of backfill layers are considered in the site-specific settlement analysis of the EPGBs. In addition, explain what is meant by the phrase "slab design area", and provide quantitative evidence to demonstrate that for all areas of the EPGB slabs the EPR EPGB differential settlement envelops the corresponding site-specific settlement.

2. CCNPP Unit 3 FSAR Section 2.5.4.10.2 discusses a site-specific settlement analysis of the CCNPP Powerblock Area. The analysis was performed simultaneously for the Nuclear Island (NI) and adjacent facilities, including the EPGBs and the ESWBs. It is indicated that the analysis considers two construction steps for the EPGBs (see CCNPP Unit 3 FSAR Figure 2.5-187) and site-specific conditions including those described in the RAI response, as well as backfill steps, irregular thickness of the subsurface strata, and the symmetry in surface topography, etc. To ensure that site-specific conditions are adequately considered in the site-specific EPGB settlement analysis, explain the difference(s) between the site-specific settlement analysis discussed in CCNPP Unit 3 FSAR Section 2.5.4.10.2 and the one discussed in the RAI response for CCNPP Unit 3 FSAR Section 3.8. Provide comparisons of the results between the EPGB differential settlement contours obtained by the two analyses. Also, explain in detail whether and how each of the site-specific conditions discussed in FSAR Section 2.5.4.10.2 is considered in the site-specific EPGB settlement analysis discussed in the RAI response. If any of the

site-specific conditions is not considered, provide the technical justification in detail for not doing so. In addition, lateral variation of soil properties could have significant effect on the differential settlement and hence the resulting member forces of a foundation mat. Therefore, explain in detail whether and how the effect of the lateral variation of soil properties within a subsurface stratum has been considered in the site-specific EPGB settlement analysis. If not done, provide the technical justification for not doing so. For the CBIS settlement analysis, provide similar discussions on the consideration of site-specific conditions, including the lateral variation of soil properties.

3. The updated U.S. EPR Tier 2 Table 1.8-2 COL Item 3.8-13 requires that CCNPP identify site-specific settlement monitoring requirements for Seismic Category I foundations based on site-specific soil conditions. To ensure that the COL Item 3.8-13 is adequately addressed for the EPGBs, explain how the settlement monitoring program described in CCNPP Unit 3 FSAR Revision 7 Sections 2.5 and 3.8 is capable of providing actual EPGB settlement contours similar to those shown in U.S. EPR FSAR Tier 2, Figure 3.8-135. Otherwise, identify a more detailed site-specific monitoring program, and revise the FSAR accordingly. Similarly for the CBIS, actual differential settlements should be monitored, documented and compared with the predicted values, so as to ensure that the CBIS design member forces due to differential settlements will not be exceeded by actual values. Therefore, provide discussions on the monitoring program for the CBIS similar to those for the EPGBs. The staff needs the information to be able to conclude in the SER that there is reasonable assurance that the foundation design of the Seismic Category I structure is consistent with SRP Acceptance Criteria 3.8.5.II.4, and has been adequately addressed in the CCNPP Unit 3 FSAR.