

## CCNPP3eRAIPEm Resource

---

**From:** Arora, Surinder  
**Sent:** Friday, October 01, 2010 2:32 PM  
**To:** 'Poche, Robert'; 'cc3project@constellation.com'; Scott, Roger D  
**Cc:** CCNPP3eRAIPEm Resource; Hawkins, Kimberly; Kazi, Abdul; Colaccino, Joseph; Miernicki, Michael; Biggins, James; Vrahoretis, Susan; Chazell, Russell  
**Subject:** DRAFT RAI 264 SEB2 5094  
**Attachments:** DRAFT RAI 264 SEB2 5094.doc

Rob,

Attached is DRAFT RAI No. 264 (eRAI No. 5094). You have until October 15, 2010, to review this RAI and decide whether you need a conference call to discuss/clarify the question(s) in this RAI before the final issuance of the RAI. After the clarification phone call or on October 15, 2010, the RAI will be finalized and sent to you for a response. You will then have 30 days to provide a technically complete response or an expected response date for the RAI.

Thanks.

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

Phone: 301 415-1421  
FAX: 301 415-6406  
Email: [Surinder.Arora@nrc.gov](mailto:Surinder.Arora@nrc.gov)

**Hearing Identifier:** CalvertCliffs\_Unit3Col\_RAI  
**Email Number:** 26

**Mail Envelope Properties** (B46615B367D1144982B324704E3BCEED305AD1B965)

**Subject:** DRAFT RAI 264 SEB2 5094  
**Sent Date:** 10/1/2010 2:32:13 PM  
**Received Date:** 10/1/2010 2:32:14 PM  
**From:** Arora, Surinder

**Created By:** Surinder.Arora@nrc.gov

**Recipients:**

"CCNPP3eRAIEm Resource" <CCNPP3eRAIEm.Resource@nrc.gov>

Tracking Status: None

"Hawkins, Kimberly" <Kimberly.Hawkins@nrc.gov>

Tracking Status: None

"Kazi, Abdul" <Abdul.Kazi@nrc.gov>

Tracking Status: None

"Colaccino, Joseph" <Joseph.Colaccino@nrc.gov>

Tracking Status: None

"Miernicki, Michael" <Michael.Miernicki@nrc.gov>

Tracking Status: None

"Biggins, James" <James.Biggins@nrc.gov>

Tracking Status:: Response: None : 8/19/2010 7:33:00 AM

"Vrahoretis, Susan" <Susan.Vrahoretis@nrc.gov>

Tracking Status: None

"Chazell, Russell" <Russell.Chazell@nrc.gov>

Tracking Status: None

"Poche, Robert" <Robert.Poche@constellation.com>

Tracking Status: None

"cc3project@constellation.com" <cc3project@constellation.com>

Tracking Status: None

"Scott, Roger D" <roger.scott@unistarnuclear.com>

Tracking Status: None

**Post Office:** HQCLSTR01.nrc.gov

Files	Size	Date & Time
MESSAGE	692	10/1/2010 2:32:14 PM
DRAFT RAI 264 SEB2 5094.doc		47098

**Options**

**Priority:** Standard

**Return Notification:** No

**Reply Requested:** Yes

**Sensitivity:** Normal

**Expiration Date:**

**Recipients Received:**

Request for Additional Information No. 264 (eRAI 5094)  
DRAFT  
10/1/2010

Calvert Cliffs Unit 3  
UniStar  
Docket No. 52-016  
SRP Section: 03.03.02 - Tornado Loads  
Application Section: 03.03.02 - Tornado Loads

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

03.03.02-2

**Introduction**

General Design Criterion 2 (GDC 2) requires that structures, systems and components important to safety, be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunamis, and seiches without loss of capability to perform their intended safety functions. GDC 2 further requires that the design bases reflect appropriate considerations for the most severe natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated in the past.

The Calvert Cliffs Nuclear Power Plant Unit 3 FSAR, Revision 6, Section 3.3.2.3, and the applicant's response to RAI No. 128, Question 3.3.2-1, parts 1 and 2, created an additional concern for the staff.

**Supplementary Question to RAI 128:**

The applicant, in response to RAI 128, Question 3.3.2-1, Part 1, indicated that the heights of many of the non-safety structures listed in Table 1 of the RAI response are not finalized at this time. The applicant is requested to provide the following information:

- a) The heights of all non-safety related structures listed in Table 1 of response to RAI 128 and revised Section 3.3.2.3 of the FSAR.

The staff needs this information to make sure that the heights of non-safety related structures are definitely less than separation distances and in case of collapse, due to the tornado loadings, will not adversely affect the integrity of safety related structures to perform their intended safety functions. This information is needed for the staff to make its safety conclusions and finalize the safety evaluation report.

The FSAR should also be revised to include the responses to this supplementary RAI.

03.03.02-3

**Introduction**

General Design Criterion 2 (GDC 2) requires that structures, systems and components important to safety, be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunamis, and seiches without loss of

capability to perform their intended safety functions. GDC 2 further requires that the design bases reflect appropriate considerations for the most severe natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated in the past.

The Calvert Cliffs Nuclear Power Plant Unit 3 (CCNPP U3) FSAR, Revision 6, Section 3.3.2.3, and the applicant's response to RAI No. 128, Question 3.3.2-1, parts 1 and 2, created additional concerns for the staff.

#### **Supplementary Question to RAI 128:**

In response to RAI 128, Question 3.3.2-1, Part 2, the applicant provided information regarding the design methodology for the non-safety related structures, which are in close proximity to safety related structures. These structures include the Switchgear Building, Forebay and Circulating Water System Makeup Water Intake Structure. Although the applicant indicated that these structures are designed to withstand the tornado loading, due to the applicants' unclear statements in the design methodology section for the aforementioned three structures, the staff requests additional information for each structure as indicated below.

**Switchgear Building (SB):** As the applicant indicated, the structural system for this building will use the engineered pressure relief siding panels to mitigate the effect of tornado loading. The applicant is requested to identify:

- a) How the system is anchored to the SB walls or supports;
- a) How the system is designed to prevent the panels from pulling away from its supports due to the tornado loading impact; and,
- b) What is the mass of the system or panels that could possibly have an adverse affect on safety related structures in the case of an accident the largest wind and tornado loads?

The staff needs this information to ensure that the anchorage and support system are a solid and robust design so that the mass of the panels, generated as a missile by tornado loadings, will not adversely affect the safety related structures.

**Forebay:** The applicant indicated that in order for this structure to mitigate adverse effects on safety related structures, the Forebay is designed to withstand the tornado loadings in a manner similar to the safety related Ultimate Heat Sink Makeup Water Intake Structure (UHS MWIS). The applicant is requested to clarify the meaning of the phrase "in a manner similar" to the design of safety related structures.

The staff wants to clarify, whether this structure is designed as a safety related structure or a non-safety related structure, which probably will have significant differences in resisting the tornado loading that could cause collapse of the structure and as a result have an adverse effect on the safety related structures located in the proximity of Forebay.

**Circulating Water System Makeup Water Intake Structure (CWS MWIS):** The applicant indicated that the CWS MWIS does not have any potential to interact with safety related Intake Pipes, due to the location of a majority of the structure being under nominal grade. However, the concrete portion of this structure is designed to withstand

the tornado loadings in a manner similar to the design of the safety-related UHS MWIS. Clarify the meaning of the phrase “in a manner similar” as indicated also for the Forebay structure. Please also provide information and description of the other non-concrete components of this structure above nominal grade, which could adversely affect safety related structures, and indicate the design methodology considered for the design of these elements and components not indicated in the response to RAI No. 128.

The FSAR should be revised to include the responses to this RAI.

03.03.02-4

### **Introduction**

General Design Criterion 2 (GDC 2) requires that structures, systems and components important to safety, be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunamis, and seiches without loss of capability to perform their intended safety functions. GDC 2 further requires that the design bases reflect appropriate considerations for the most severe natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated in the past.

The Calvert Cliffs Nuclear Power Plant Unit 3 (CCNPP U3) FSAR, Revision 6, Section 3.3.2.3, and the applicant’s response to RAI No. 128, Question 3.3.2-1, parts 1 and 2, created an additional concern for the staff.

### **Supplementary Question to RAI 128:**

In order to address the US EPR FSAR, Rev. 1, COL Item No. 3.3.2, the applicant states in Section 3.3.1, “Wind Loading,” *“A discussion of site-specific structures not designed for wind or tornado loadings is provided in Section 3.3.2.3.”* In the revised paragraph of Section 3.3.2.3, the applicant omitted the referenced discussion.

The staff requests that the applicant clarify how the COL Item No. 3.3.2 is addressed, and provide a justification for eliminating of the wind loading discussion in referenced paragraph of Section 3.3.2.3.

The staff needs this information to clarify whether any wind loadings are considered for the design of non-safety related structures listed in Section 3.3.2.3. The staff will use this information to make their safety conclusions and finalize its safety evaluation report.

The FSAR should be revised to include the responses to this RAI.

03.03.02-5

### **Introduction**

General Design Criterion 2 (GDC 2) requires that structures, systems and components important to safety, be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunamis, and seiches without loss of capability to perform their intended safety functions. GDC 2 further requires that the design bases reflect appropriate considerations for the most severe natural phenomena that have been historically reported for the site and surrounding area, with sufficient

margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated in the past.

The Calvert Cliffs Nuclear Power Plant Unit 3 (CCNPP U3) FSAR, Revision 6, Section 3.3.2.3, and the applicant's response to RAI No. 128, Question 3.3.2-1, parts 1 and 2, created additional concerns for the staff.

**Supplementary Question to RAI 128:**

In response to RAI 128, the applicant struck out the Fire Water Storage Tanks and the Fire Protection Building from Seismic Category II SSE in the revised paragraph of Section 3.3.2.3, which were originally included by the applicant to be designed to remain functional during and following design basis seismic events.

The staff requests that the applicant provide a justification for the above-mentioned changes in the paragraph of Section 3.3.2.3. Also, indicate which seismic category has been used for the design of these structures to remain functional during and following a design basis seismic event.

The staff needs this information to ensure that the functionality of these structures will not be jeopardized by the assumption of improper seismic classification following a design basis seismic event.

The FSAR should be revised to include the responses to this RAI.

03.03.02-6

**Introduction**

General Design Criterion 2 (GDC 2) requires that structures, systems and components important to safety, be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunamis, and seiches without loss of capability to perform their intended safety functions. GDC 2 further requires that the design bases reflect appropriate considerations for the most severe natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated in the past.

The Calvert Cliffs Nuclear Power Plant Unit 3 (CCNPP U3) FSAR, Revision 6, Section 3.3.2.3, and the applicant's response to RAI No. 128, Question 3.3.2-1, parts 1 and 2, created additional confusion and concerns for the staff.

**Supplementary Question to RAI 128:**

In response to RAI 128, the applicant replaced the sentence "*These structures are not located adjacent to safety related structures,*" in the revised paragraph of Section 3.3.2.3 by the sentence "*These structures are distant enough from safety-related structures.*" In the first sentence, the phrase "*located adjacent to*" created RAI No. 128 and in the second sentence, the phrase "*distant enough from*" is not clear.

The staff requests that the applicant clarify whether the non-safety related structures are designed to withstand tornado loadings and verify whether the locations and distances of each of these structures is greater than the heights of the non-safety related structures that could collapse.

This information is necessary for the staff to make their safety conclusions regarding II/I interaction and complete its safety evaluation report.

The FSAR should be revised to include the responses to this RAI.

03.03.02-7

### **Introduction**

General Design Criterion 2 (GDC 2) requires that structures, systems and components important to safety, be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunamis, and seiches without loss of capability to perform their intended safety functions. GDC 2 further requires that the design bases reflect appropriate considerations for the most severe natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated in the past.

The Calvert Cliffs Nuclear Power Plant Unit 3 (CCNPP U3) FSAR, Revision 6, Section 3.3.2.3, and the applicant's response to RAI No. 128, Question 3.3.2-1, parts 1 and 2, created additional concerns for the staff.

### **Supplementary Question to RAI 128:**

In response to RAI 128, Question 3.3.2-1, Part 1, regarding the separation distances between non-safety related structures and safety related structures, the applicant referenced Figures 2.4-2, 2.1-5, 2.4-51 and 9.2-4 and provided separation distances for the 13 structures listed in Table 1. Although the separation distances between the above mentioned structures in Table 1 are adequate, the staff is unable to verify this information from the referenced Figures due to lack of dimensioning and scale drawings. Further, the applicant noted in Figure 2.1-5 of FSAR, Rev.6, "Working with this drawing with 3-P1-0010-00001." The staff assumes this to mean there are other drawings with detailed separation distances. The staff could not find such drawings in the FSAR, Rev.6.

The staff requests that the applicant provide information on referenced drawing 3-P1-0010-00001 and other sources so the staff can verify the separation distances between the non-safety related and safety related structures listed in revised Section 3.3.2.3. The staff needs this information to verify the distances between aforementioned non-safety related structures not designed for tornado loadings, which could adversely affect the safety related structures in its proximity.

The FSAR should be revised to include the responses to this RAI.