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10 CFR 50.4  
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June 18, 2009

UN#09-285

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Subject: UniStar Nuclear Energy, NRC Docket No. 52-016  
Response to Request for Additional Information for the  
Calvert Cliffs Nuclear Power Plant, Unit 3,  
RAI No. 113, Seismic System Analysis

- References:
- 1) John Rycyna (NRC) to Robert Poche (UniStar Nuclear Energy), "RAI No 113 SEB 2575.doc (PUBLIC)" email dated April 30, 2009
  - 2) UniStar Nuclear Energy Letter UN#09-258, from Greg Gibson to Document Control Desk, U.S. NRC, Submittal of Response to RAI No. 113, Seismic System Analysis, dated June 1, 2009

The purpose of this letter is to respond to the request for additional information (RAI) identified in the NRC e-mail correspondence to UniStar Nuclear Energy, dated April 30, 2009 (Reference 1). This RAI addresses Seismic System Analysis, as discussed in Section 3.7.2 of the Final Safety Analysis Report (FSAR), as submitted in Part 2 of the Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 Combined License Application (COLA), Revision 4.

Reference 1 requested UniStar Nuclear Energy to respond to the RAI within 30 days. Reference 2 stated that a response to RAI 113, Question 03.07.02-27 would be provided by June 19, 2009. The enclosure provides our response to RAI 113, Question 03.07.02-27, and includes revised COLA content. A Licensing Basis Document Change Request has been

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initiated to incorporate these changes into a future revision of the COLA. Our response to RAI 113, Question 03.07.02-27 does not include any new regulatory commitments.

If there are any questions regarding this transmittal, please contact me at (410) 470-4205, or Mr. Michael J. Yox at (410) 495-2436.

*I declare under penalty of perjury that the foregoing is true and correct.*

Executed on June 18, 2009

Christian Clement  
for Greg Gibson 

Greg Gibson

Enclosure: Response to NRC Request for Additional Information, RAI 113, Question 03.07.02-27, Seismic System Analysis, Calvert Cliffs Nuclear Power Plant, Unit 3

cc: John Rycyna, NRC Project Manager, U.S. EPR COL Application  
Laura Quinn, NRC Environmental Project Manager, U.S. EPR COL Application  
Getachew Tesfaye, NRC Project Manager, U.S. EPR DC Application (w/o enclosure)  
Loren Plisco, Deputy Regional Administrator, NRC Region II (w/o enclosure)  
Silas Kennedy, U.S. NRC Resident Inspector, CCNPP, Units 1 and 2  
U.S. NRC Region I Office

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**Enclosure**

**Response to NRC Request for Additional Information,  
RAI No. 113, Question 03.07.02-27, Seismic System Analysis,  
Calvert Cliffs Nuclear Power Plant, Unit 3**

**RAI No. 113**

**Question 03.07.02-27**

Please clarify how locations are selected within the Ultimate Heat Sink (UHS) Make-up Water Intake Structure (MWIS) floors, or within the UHS Electrical Building (EB) for the development of in-structure response spectra (ISRS) which are required for the qualification of equipment, components, and piping. In addition, it was stated during the structural audit that the ISRS developed as part of the U.S.EPR certified design would be used to qualify piping systems located within EPR standard design structures for Calvert Cliffs. COL Information Item 3.9-10 of the U.S. EPR FSAR states that pipe stress and support analysis will be performed by a COL applicant that references the U.S. EPR design certification. Please clarify the source of the input structure response spectra for this analysis. In addition to providing information on how locations within the UHS MWIS and UHS EB are selected for the generation of ISRS, please provide additional information confirming that the Certified Design ISRS documented in the U.S. EPR FSAR are used for the qualification of piping and pipe supports within the buildings of the U.S. EPR Certified Design. Please also address the same question for seismic Category I equipment and components.

**Response**

Issue 1: Clarify the selection of locations for generation of In-Structure Response Spectra (ISRS) for Ultimate Heat Sink (UHS) Makeup Water Intake Structure (MWIS) and UHS Electrical Building (EB) which are required for the qualification of equipment, components, and piping.

The locations for ISRS are selected based on the locations of safety-related equipment or components. The ISRS for the UHS MWIS are developed at two nodes of the GT STRUDL model matching the location of exterior and interior safety-related pumps at operating deck level (Elev. 11'-6"). The broadened ISRS, shown in FSAR Figures 3.7-39 to 3.7-41, are the envelope of the ISRS generated at the two nodes.

For UHS EB, the safety-related equipment and components are anchored to the basemat (Elev. -5'-6"). The locations of these equipment and components are selected for generation of ISRS. The ISRS for the UHS EB are determined from the System for Analysis of Soils Structure Interaction (SASSI) analysis. The SASSI analysis of UHS EB will be performed to include the structure-soil-structure interaction (SSSI) effect from UHS MWIS.

As the locations of safety-related piping, equipment and components for UHS MWIS and UHS EB are finalized, supplemental ISRS will be generated, in accordance with RG 1.122, at additional locations for each structure during detailed design.

Issue 2: Clarify the source of the ISRS for the pipe stress and support analysis within the U.S.EPR Certified Design and within the Site Specific Design at CCNPP Unit 3.

The ISRS is generated from the soil cases defined in the U.S. EPR Certified Design FSAR Section 3.7.1 and is used for pipe stress and support analysis on systems within the scope of the U.S. EPR certified design for Category I structures. Site-specific ISRS defined in FSAR Section 3.7.2.5 for the UHS MWIS and UHS EB is used for the pipe stress and support analysis of site-specific systems within these structures. These site-specific ISRS are based on the

foundation input response spectra for site-specific structures discussed in Section 3.7.1.1.1. This information will be added to CCNPP3 FSAR Section 3.12.5.1.

Issue 3: Clarify the source of the ISRS for the seismic Category I equipment and components within the U.S. EPR Certified Design and within the Site Specific Design at CCNPP Unit 3.

Seismic Category I equipment and components utilize the same ISRS as described in the response to Issue 2.

### **COLA Impact**

FSAR Section 3.12.5.1 will be updated as follows in a future COLA revision:

### **3.12.5 PIPING STRESS ANALYSIS CRITERIA**

#### **3.12.5.1 Seismic Input Envelope versus Site-specific Spectra**

{The site-specific seismic response is within the parameters of U.S. EPR FSAR Section 3.7.2 as discussed in Section 3.7.2. The In-Structure Response Spectra (ISRS) is generated from the soil cases defined in the U.S. EPR FSAR Section 3.7.1 and is used for pipe stress and support analysis on systems within the scope of the U.S. EPR FSAR certified design for Category I structures. Site-specific ISRS defined in FSAR Section 3.7.2.5 for the UHS MWIS and UHS EB is used for the pipe stress and support analysis of site-specific systems within these structures. These site-specific ISRS are based on the foundation input response spectra for site-specific structures discussed in Section 3.7.1.1.1.}