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UniStar
NUCLEAR ENERGY

10 CFR 50.4
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July 8, 2011

UN#11-181

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 298, Other Seismic Category I Structures

Reference:
1) Surinder Arora (NRC) to Robert Poche (UniStar Nuclear Energy), "FINAL RAI 298 SEB2 5439" email dated March 18, 2011

2) UniStar Nuclear Energy Letter UN#11-169, from Greg Gibson to Document Control Desk, U.S. NRC, Response to Request for Additional Information for the Calvert Cliffs Nuclear Power Plant, Unit 3, RAI 298, Other Seismic Category I Structures, dated May 31, 2011

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 March 18, 2011 (Reference 1). This RAI addresses Other Seismic Category I Structures, as discussed in Section 3.8.4 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 7.

Reference 2 provided a July 8, 2011 response date. The enclosure provides our response to RAI 298, Question 03.08.04-16, and includes revised COLA content. A Licensing Basis Document Change Request has been initiated to incorporate these changes into a future revision of the COLA.

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NRO

Our response does not include any new regulatory commitments. This letter does not contain any sensitive or proprietary information.

If there are any questions regarding this transmittal, please contact me at (410) 470-4205, or Mr. Wayne A. Massie at (410) 470-5503.

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

Executed on July 8, 2011

Greg Gibson

Enclosure: Response to NRC Request for Additional Information RAI 298, Question 03.08.04-16, Other Seismic Category I Structures, Calvert Cliffs Nuclear Power Plant, Unit 3

cc: Surinder Arora, NRC Project Manager, U.S. EPR Projects Branch
Laura Quinn, NRC Environmental Project Manager, U.S. EPR COL Application
Getachew Tesfaye, NRC Project Manager, U.S. EPR DC Application (w/o enclosure)
Charles Casto, 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

GTG/FRP/mdf

Enclosure

Response to NRC Request for Additional Information
RAI 298, Question 03.08.04-16, Other Seismic Category I Structures,
Calvert Cliffs Nuclear Power Plant, Unit 3

RAI No. 298

Question 03.08.04-16

The staff reviewed the RAI response to Question 03.08.04-1 provided in UniStar Letter UN#10-193 dated July 23, 2010 (ML102100480), and found that the RAI responses to Items 1 and 3 of the RAI are adequate and acceptable, however, the following information is needed to address Items 2 and 4 of the RAI:

The RAI response to Item 2 indicated that the interaction of the non-seismic Category I structures with Seismic Category I structures is addressed in the updated CCNPP Unit 3 FSAR Section 3.7.2.8.

Regarding three of the Non-seismic Category I structures, the staff reviewed the update to Rev. 6 of CCNPP Unit 3 FSAR Section 3.7.2.8 provided in UniStar Letter UN#09-519 dated December 29, 2009 (ML100040170 and ML100040171). The staff also reviewed Rev. 7 of CCNPP Unit 3 FSAR Section 3.7.2.8, and found that, between Rev. 7 and the update to Rev.6, there is no change to the discussions in Section 3.7.2.8 on the existing Baffle Wall, the Sheet Pile Wall and the CWS MWIS. Rev. 7 (also the update to Rev. 6) of FSAR Section 3.7.2.8 indicates that (1) the existing Baffle Wall has a separation distance from the Seismic Category I Buried Intake Pipes larger than its height above the bed of the intake area, therefore, its interaction with the Seismic Category I Buried Intake Pipes is not possible; (2) the Sheet Pile Wall will be analyzed using Site SSE to prevent any adverse interaction with the Seismic Category I Buried Intake Pipes; (3) for the CWS MWIS, the embedded concrete structure will be designed to the same requirements as a Seismic Category I structure, therefore, its design methodology meets SRP Section 3.7.2 Acceptance Criterion 8.C, and the above ground steel structure is located such that its potential collapse cannot directly strike any Seismic Category I SSCs.

The staff notes that a subsequent RAI response to Question 14.03.02-7, in UniStar Letter UN#10-259 dated October 26, 2010, provided updated information that (1) the Sheet Pile Wall is located such that its potential collapse cannot impact any Seismic Category I SSCs, therefore, its interaction with the Seismic Category I SSCs is precluded based on SRP 3.7.2 Acceptance Criterion 8.A, and (2) an analysis will be performed to demonstrate that the steel superstructure of the CWS MWIS meets the Acceptance Criterion 8.B of SRP 3.7.2. Since these two acceptance criteria presented in the RAI response to Question 14.03.02-7 are inconsistent with the information presented in Rev. 7 of FSAR Section 3.7.2.8 and summarized in the prior paragraph, the staff requests that the applicant explain the inconsistencies and revise the FSAR accordingly.

The RAI response to Item 4 indicated that both the Nuclear Auxiliary Building (NAB) and the Radioactive Waste Processing Building (RWPB) are considered Radwaste Seismic Structures, are not Seismic Category I structures and are not safety related structures, therefore, a description of the analysis and design results for these structures is not required to be addressed in the FSAR other than for interaction with Seismic Category I structures, which is addressed in Section 3.7.2.8 of the U.S. EPR FSAR.

The staff notes that NAB and RWPB have safety related functions since they belong to waste storage facilities. However, considering that (a) the design of these two structures are within the scope of the EPR design certification, and (b) for these two structures, there is an EPR RAI

requesting that the EPR DC applicant provide in EPR FSAR Section 3.8.4 a description of the design methodology comparable to other Seismic Category I structures, therefore, this part of the RAI will remain open pending the resolution of the EPR RAI.

Response

Subpart 1 - Sheet Pile Wall:

The Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 Seismic Category I Buried Intake Pipes are the nearest Seismic Category I structures, systems, and components (SSCs) to the new Conventional Seismic Sheet Pile Wall, as shown in COLA Revision 7, FSAR Figure 2.4-49. As described in the response to RAI 256, Question 14.03.02-7 Part 5[1] and shown in COLA Revision 7, FSAR Figure 2.4-49, the Sheet Pile Wall is located approximately 30 ft from the North end of the Seismic Category I Buried Intake Pipes. The layout of the Sheet Pile Wall and the separation distance between the Sheet Pile Wall and the Seismic Category I Buried Intake Pipes precludes any potential interaction between the Sheet Pile Wall and the Seismic Category I Buried Intake Pipes, thus meeting the Standard Review Plan (SRP) 3.7.2 Acceptance Criteria 8.A.

COLA Revision 7, FSAR Subsection 3.7.2.8 is updated as shown in attached markups to reflect consistency with this response and the response to RAI 256, Question 14.03.02-7. COLA Revision 7 Part 10 (ITAAC), Appendix B Table 2.4-33, provides the acceptance criteria consistent with the attached update of COLA FSAR Subsection 3.7.2.8.

Subpart 2 – CWS MWIS:

The Circulating Water System (CWS) Makeup Water Intake Structure (MWIS) above ground steel structure will be designed to the same requirements as a Seismic Category I structure, therefore, its design methodology meets SRP Section 3.7.2 Acceptance Criterion 8.C.

Both the reinforced concrete embedded structure of the CWS MWIS and the steel superstructure of the CWS MWIS will be analyzed in the same ITAAC Table 2.4-18 item 1a report. Therefore, ITAAC Table 2.4-18 item 1a will be revised as shown below. The inconsistency in FSAR Section 3.7.2.8 regarding the above ground steel structure will be resolved as shown in the COLA Impact section of the response.

With respect to final two paragraphs of Question 03.08.04-16, discussing Item 4 of a previous question, RAI 144, Question 03.08.04-1, UNE acknowledges that the response as provided in UN#10-193[2] will remain open until the NRC resolves the associated U.S. EPR FSAR RAI question.

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[1] G. Gibson letter to NRC Document Control Desk, "Response to Request for Additional Information for the Calvert Cliffs Nuclear Power Plant, Unit 3, RAI 256, Structural and Systems Engineering - Inspections, Tests, Analyses, and Acceptance Criteria," UN#10-259, dated October 26, 2010.

[2] G. Gibson letter to NRC Document Control Desk, "Response to Request for Additional Information for the Calvert Cliffs Nuclear Power Plant, Unit 3, RAI No. 144, Other Seismic Category I Structures, and RAI No. 145, Foundations" UN#10-193, dated July 23, 2010.

However, UNE maintains the previous response:

> The Nuclear Auxiliary Building (NAB) is considered a Radwaste Seismic structure (designed and analyzed to meet the commitments for RW-IIa structures in Regulatory Guide (RG) 1.143), and is classified as a Seismic Category II structure due to its close proximity to the Nuclear Island. The Radioactive Waste Processing Building (RWPB) is considered a Radwaste Seismic structure and is designed and analyzed to meet the commitments for RW-IIa structures in RG 1.143.
>
> RG 1.206 Section C.I.3.8.4 addresses the design of Seismic Category I structures other than containment. The NAB and RWPB are not Seismic Category I structures and are not safety-related structures. Therefore, a description of the analysis and design results for these structures is not required to be addressed other than for interaction with Seismic Category I structures. Interaction of non-Seismic Category I structures with Seismic Category I structures is addressed in Section 3.7.2.8 of the U.S. EPR FSAR. General arrangement drawings and descriptions of these structures are provided in Section 1.2 of the U.S. EPR FSAR. CCNPP Unit 3 did not depart from the U.S. EPR FSAR for these structures.

Should the U.S. EPR FSAR alter the requirements for the NAB, UNE will address that change as part of the normal reconciliation with the next revision of the U.S. EPR FSAR.

COLA Impact

The following changes will be made to COLA FSAR Section 3.7.2.8:

> **3.7.2.8 Interaction of Non-Seismic Category I Structures with Seismic Category I Systems**
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> . . .
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> The Seismic Category II Circulating Water Makeup Intake Structure is situated between the Seismic Category I Buried Intake Pipes and is comprised of a reinforced concrete embedded structure and an above ground steel structure. The reinforced concrete embedded structure is integrally connected to the Seismic Category I Forebay and is designed to the same requirements as a Seismic Category I structure. The Seismic Category I Buried Intake Pipes are approximately 15 ft (4.6 m) away from the embedded walls of the Circulating Water Makeup Intake Structure. ~~Therefore, there~~There is no possibility of any seismic interaction between the Buried Intake Pipes and the Circulating Water Makeup Intake Structure. Therefore, the design methodology for the reinforced concrete embedded structure meets NUREG-0800 Section 3.7.2, Acceptance Criterion 8.C (NRC, 2007a).
>
> ~~The above ground steel structure is located such that it cannot directly strike any Seismic Category I SSCs. Since the reinforced concrete embedded structure supporting the steel structure is integrally connected to the Seismic Category I Forebay, the reinforced concrete embedded structure is analyzed to demonstrate that the collapse of the steel superstructure does not impair the integrity of Seismic Category I SSCs, nor~~

~~result in incapacitating injury to control room occupants.~~The Circulating Water Makeup Intake Structure above ground steel structure is designed to the same requirements as a Seismic Category I structure. Therefore, its design methodology meets SRP Section 3.7.2 Acceptance Criterion 8.C.

The Conventional Seismic Unit 3 Sheet Pile Wall is located approximately 30 ft (9.1 m) from the north end of the Seismic Category I Buried Intake Pipes. The layout of the Sheet Pile Wall and the separation distance between the Sheet Pile Wall and the Seismic Category I Buried Intake Pipes precludes any potential interaction between the Sheet Pile Wall and the Seismic Category I Buried Intake Pipes.~~The Sheet Pile Wall will be analyzed and designed using conventional seismic codes and standards but will also be analyzed using Site SSE to prevent any adverse interaction with the Seismic Category I Buried Intake Pipes.~~ The existing Baffle Wall is approximately 46 ft (14.0 m) above the bed of the intake area and is located approximately 50 ft (15.2 m) from the north end of the Seismic Category I Buried Intake Pipes. Therefore, the interaction of the Baffle Wall with the Buried Intake Pipes is not possible.

Proposed COLA Part 10 ITAAC Revision:

COLA Part 10 ITAAC is being updated as follows:

Table 2.4-18—{Circulating Water Makeup Intake Structure Inspections, Tests, Analyses, and Acceptance Criteria}

	Commitment Wording	Inspection, Tests, or Analysis	Acceptance Criteria
1	The Circulating Water Makeup Intake Structure does not impact the ability of any safety-related structure, system, or component to perform its safety function following a seismic event.	a. An analysis of the as-designed structure will be conducted.	a. A report exists and concludes that under seismic loads the ~~as~~ as-designed Circulating Water Makeup Intake Structure will not impact the ability of any safety-related structure, system or component to perform its safety function. The report also concludes that the design of the Circulating Water Makeup Intake Structure is to the same requirements as a Seismic Category I structure. ~~The report confirms that the:~~ ~~♦ As-designed reinforced concrete embedded structure of the Circulating Water Makeup Intake Structure is designed to the same requirements as a Seismic Category I structure.~~ ~~♦ Collapse of the as-designed above-grade steel superstructure does not impair the integrity of Seismic Category I structures, systems or components, nor result in incapacitating injury to control room occupants.~~