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July 8, 2011

UN#11-206

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 297, Structural and Systems Engineering – Inspections, Tests, Analyses, and Acceptance Criteria
- Reference: 1) Surinder Arora (NRC) to Robert Poche (UniStar Nuclear Energy), "FINAL RAI 297 SEB2 5435" email dated March 1, 2011
 - 2) UniStar Nuclear Energy Letter UN#11-182, 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 297, Structural and Systems Engineering – Inspections, Tests, Analyses, and Acceptance Criteria, dated June 20, 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 1, 2011 (Reference 1). This RAI addresses Structural Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC), as discussed in Section 14.3.2 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 7.

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UN#11-206 Page 2

Reference 2 provided a July 8, 2011 response date. The enclosure provides our response to RAI 297, Question 14.03.02-17.

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

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Greg Gibson

- Enclosure: Response to NRC Request for Additional Information RAI 297, Question 14.03.02-17, Structural ITAAC, 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

Enclosure

Response to NRC Request for Additional Information RAI 297, Question 14.03.02-17, Structural ITAAC, Calvert Cliffs Nuclear Power Plant, Unit 3 Enclosure UN#11-206 Page 2 of 12

RAI No. 297

Question 14.03.02-17

The staff reviewed the response to Question 14.03.02-7 provided in UniStar Letter UN#10-259 dated October 26, 2010 (ML103020475) and found that the responses to Items 1 and 4 of the RAI are adequate. However, the following information is needed to address Items 2, 3 and 5 of the RAI:

Regarding Item 2, for the Circulating Water System (CWS) Makeup Water Intake Structure (MWIS), the RAI response indicated that ITAAC Table 2.4-19 Item 1 had been divided into two parts, one for analysis and one for inspection, and the analysis would demonstrate that the steel superstructure meets the Acceptance Criteria 8.B of SRP 3.7.2. However, as indicated by the response to RAI 03.08.04-1, the latest FSAR Section 3.7.2.8 states that the above ground steel structure of the CWS MWIS is located such that its potential collapse cannot directly strike any Seismic Category I SSCs. The supplemental RAI to RAI 03.08.04-1 requests that the applicant explain the inconsistency. Therefore, the RAI response to this part of Item 2 will remain open pending the resolution of the corresponding item of RAI 03.08.04-1. In addition, the response did not provide the information requested by the RAI 14.03.02-7. The information requested is quoted herewith: "As stated in the original RAI, if criterion B is utilized, the applicant was requested to include as part of the ITAAC the technical basis for the determination that collapse of the non-Category I structure is acceptable. This should include a description of any additional loads imposed on any Category I SSCs that could be impacted and the method used to conclude that these loads are not damaging. Also, any protective shields installed to prevent direct impact on Category I SSCs should be described." Therefore, the staff requests again that the applicant complete the response to this part of the RAI. Without this information, the staff will not be able to conclude that the design methodology for the steel superstructure of the Circulating Water System (CWS) Makeup Water Intake Structure (MWIS) meets the Acceptance Criteria 8.B of SRP 3.7.2.

Regarding Item 3, the staff found that ITAAC tables 2.4-11, 2.4-12 and 2.4-19 for the Seismic Category II Turbine building, Switchgear Building, and CWS MWIS only refer to "seismic event" or "seismic loads". The tables should be revised to include other extreme event loads such as tornado loads and to be consistent with the corresponding wording of "applicable Extreme Environmental loads" in other ITAAC tables such as Table 2.4-35 for Access Building. Similarly, for other Non-seismic Category I structures, ITAAC Tables 2.4-34 and 2.4-36 for Waste Water Treatment Facility and Sheet Pile Wall use the acceptable wording of "Extreme Environmental loads", while Tables 2.4-13 through 2.4-18 and Table 2.4-20 only refer to "seismic event" or "seismic loads". Tables 2.4-34 and 2.4-36 regarding extreme event loads. Also, ITAAC table 2.4-19 for the CWS MWIS should be updated to be consistent with the resolution of Item 2 as discussed above.

Regarding Item 5, the RAI response indicated the Sheet Pile Wall will be designed to satisfy SRP 3.7.2 Acceptance criterion 8.A. However, as indicated by the response to RAI 03.08.04-1, the latest FSAR Section 3.7.2.8 states that the Sheet Pile Wall will be analyzed using site specific SSE to prevent any adverse interaction with the Seismic Category I Buried Intake Pipes. The supplemental RAI to RAI 03.08.04-1 requests that the applicant explain the inconsistency. Therefore, the response to Item 5 will remain open pending the resolution of the corresponding items of RAI 03.08.04-1.

Enclosure UN#11-206 Page 3 of 12

Response

Subpart 1 - Question 14.03.02-17, Item 2, Circulating Water System (CWS) Makeup Water Intake Structure (MWIS):

This question is addressed in the response to RAI 298, UN#11-181¹.

Subpart 2 - Question 14.03.02-17, Item 3, ITAAC Tables Including CWS MWIS ITAAC Table:

ITAAC Tables 2.4-11, -12, -13, -14, -15, -16, -17, -18, and -19 (renumbered since NRC Question issuance) will be revised as shown in the COLA Impact section of the response. These tables will be revised to include other extreme event loads such as tornado loads and to be consistent with the corresponding wording regarding Extreme Environmental loads in other ITAAC tables.

Subpart 3 - Question 14.03.02-17, Item 5, Sheet Pile Wall:

This question is addressed in the response to RAI 298, UN#11-181¹.

COLA Impact

Proposed COLA Part 10 ITAAC Revision:

COLA Part 10 ITAAC is being updated as follows:

¹ UniStar Nuclear Energy Letter UN#11-181, 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 No. 298, Other Seismic Category I Structures, dated July 08, 2011

Commitment Wording	Inspection, Tests, or Analysis	Acceptance Criteria
1 The Switchgear Building is located adjacent to and contiguous with the Turbine Building.	An inspection of the as- built structure will be conducted.	The as-built Switchgear Building is located adjacent to and contiguous with the as- built Turbine Building.
 Turbine Building. The Switchgear Building does not impact the ability of any safety- related structure, system, or component to perform its safety function-following a seismic event under Extreme Environmental Loads. 	 a. An analysis of the Switchgear Building structure design will be performed to determine that it will not impact the ability of any safety- related structure, system, or component to perform its safety-following a seismic event under Extreme Environmental Loads. b. An inspection will be performed of the as-built Switchgear Building, and deviations from the approved design will be analyzed to determine there is no impact on the ability of any safety- related structure, system, or component to perform its safety function following a seismic event under Extreme Environmental Loads, and will be reconciled to the approved design 	 a. A report exists and concludes that under-seismic loads Extreme Environmental Loads the as designed Switchgear Building 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 Switchgear Building is to the same requirements as a Seismic Category I structure. b. A report exists which reconciles deviations during construction and concludes that the as-built Switchgear Building conforms to the approved design and will not impact the ability of any safety-related structure, system, or component to perform its safety function following a seismic event under Extreme Environmental Loads.

Table 2.4-11—{Switchgear Building Inspections, Tests, Analyses, and Acceptance Criteria}

Table 2.4-12—{Warehouse Building Inspections, Tests, Analyses, and AcceptanceCriteria}

Commitment Wording	Inspection, Tests, or Analysis	Acceptance Criteria
1 The Warehouse Building does not impact the	g An inspection of the as- built structure will be	A report exists and concludes that under-seismic loads
related structure,		Loads the as-built
perform its safety		impact the ability of any
function following a seismic event <u>under</u>		safety-related structure, system or component to
Extreme Environmental Loads.		perform its safety function. The report confirms that the
		minimum separation distance
		Building from the nearest
		seismic Category I structure, system or component is

Table 2.4-13---{Security Access Building Inspections, Tests, Analyses, and AcceptanceCriteria}

	Commitment Wording	Inspection, Tests, or Analysis	Acceptance Criteria
1	The Security Access Building does not impact the ability of any safety- related structure, system, or component to perform its safety function following a seismic event under Extreme Environmental Loads.	An inspection of the as- built structure will be conducted.	A report exists and concludes that under-seismic loads <u>Extreme Environmental</u> <u>Loads</u> the as-built Security Access Building will not impact the ability of any safety-related structure, system or component to perform its safety function. The report confirms that the minimum separation distance of the as-built Security Access Building from the nearest Seismic Category I structure, system or component is greater than 200 ft.

Table 2.4-14—{Central Gas Supply Building Inspections, Tests, Analyses, and Acceptance Criteria}

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1	The Central Gas Supply	An inspection of the as-	A report exists and concludes
	Building does not impact	built structure will be	that under- seismic loads
	the ability of any safety-	conducted.	Extreme Environmental
	related structure,		Loads the as-built Central
	system, or component to		Gas Supply Building will not
}	perform its safety		impact the ability of any
	function following a		safety-related structure,
	seismic event under		system or component to
	Extreme Environmental		perform its safety function.
	Loads.		The report confirms that the
			minimum separation distance
			of the as-built Central Gas
			Supply Building from the
			nearest Seismic Category I
			structure, system or
			component is greater than
			1600 ft.

Table 2.4-15—{Grid Systems Control Building Inspections, Tests, Analyses, and Acceptance Criteria}

	Commitment Wording	Inspection, Tests, or Analysis	Acceptance Criteria
1	The Grid Systems Control Building does not impact the ability of any safety-related structure, system, or component to perform its safety function-following a seismic event_under <u>Extreme Environmental</u> Loads.	Analysis An inspection of the as- built structure will be conducted.	A report exists and concludes that under-seismic loads Extreme Environmental Loads the as-built Grid Systems Control Building will not impact the ability of any safety-related structure, system or component to perform its safety function. The report confirms that the minimum separation distance of the as-built Grid Systems Control Building from the nearest Seismic Category I structure, system or
			700 ft.

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Table 2.4-16—{Circulating Water Cooling Tower Structure Inspections, Tests, Analyses, and Acceptance Criteria}

	Commitment Wording	Inspection, Tests, or Analysis	Acceptance Criteria
1	The Circulating Water	An inspection of the as-	A report exists and concludes
	Cooling Tower Structure	built structure will be	that under- seismic loads
	does not impact the	conducted.	Extreme Environmental
	ability of any safety-		Loads the as-built Circulating
	related structure,		Water Cooling Tower
	system, or component to		Structure will not impact the
	perform its safety		ability of any safety-related
	function following a		structure, system or
	seismic event<u>under</u>		component to perform its
	Extreme Environmental		safety function. The report
	Loads.		confirms that the minimum
			separation distance of the as-
			built Circulating Water
			Cooling Tower Structure from
			the nearest Seismic Category
			I structure, system or
			component is greater than 1800 ft.

Table 2.4-17—{Circulating Water Pump Building Inspections, Tests, Analyses, and Acceptance Criteria}

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1	The Circulating Water	An inspection of the as-	A report exists and concludes
	Pump Building does not	built structure will be	that under- seismic loads
1	impact the ability of any	conducted.	Extreme Environmental
	safety-related structure,		Loads the as-built Circulating
	system, or component to		Water Pump Building will not
	perform its safety		impact the ability of any
	function-following-a		safety-related structure,
	seismic event<u>under</u>		system or component to
	Extreme Environmental		perform its safety function.
	Loads.		The report confirms that the
			minimum separation distance
			of the as-built Circulating
i.			Water Pump Building from
			the nearest Seismic Category
			I structure, system or
			component is greater than
			1700 ft.

	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_under Extreme Environmental Loads.	a. An analysis of the as- designed structure will be conducted. b. An inspection will be performed of the as-built Circulating Water Makeup Intake Structure, and deviations from the approved design will be analyzed to determine there is no impact on the ability of any safety- related structure, system, or component to perform its safety function following a seismic event under Extreme Environmental Loads, and will be reconciled to the approved design.	 a. A report exists and concludes that under-seismic loads Extreme Environmental Loads the as-asdesigned 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 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. A report exists which reconciles deviations during construction and concludes that the as-built Circulating Water Makeup Intake Structure conforms to the approved design and will not impact the ability of any safety-related structure, system, or component to perform its safety function following a seismic event under Extreme Environmental Loads.

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 Desalinization /	An inspection of the as-	A report exists and concludes
	Water Treatment	built structure will be	that under- seismic loads
1	Building does not impact	conducted.	Extreme Environmental
	the ability of any safety-		Loads the as-built
	related structure,		Desalinization / Water
	system, or component to		Treatment Building will not
	perform its safety		impact the ability of any
	function following a		safety-related structure,
	seismic event <u>under</u>		system or component to
	Extreme Environmental		perform its safety function.
	Loads.		The report confirms that the
			minimum separation distance
			of the as-built Desalination /
			Water Treatment Building
			from the nearest Seismic
			Category I structure, system
			or component is greater than
			1600 ft.

Table 2.4-19—{Desalinization / Water Treatment Building Inspections, Tests, Analyses, and Acceptance Criteria}