Greg Gibson
Vice President, Regulatory Affairs

750 East Pratt Street, Suite 1600
Baltimore, Maryland 21202

UniStar
NUCLEAR ENERGY

10 CFR 50.4
10 CFR 52.79

March 26, 2010

UN#10-078

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. 182, System Quality Group Classification

References:
1) Surinder Arora (NRC) to Robert Poche (UniStar Nuclear Energy), "FINAL RAI No. 182 EMB2 2247" email dated October 2, 2009

2) UniStar Nuclear Energy Letter UN#10-062, from Greg Gibson to Document Control Desk, U.S. NRC, Response to RAI No. 182, System Quality Group Classification, dated March 12, 2010

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 October 2, 2009 (Reference 1). This RAI addresses System Quality Group Classification, as discussed in Section 3.2.2 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 6.

Reference 2 provided a March 26, 2010 schedule for the response for RAI 182, Question 03.02.02-2. The enclosure provides our response to RAI 182, Question 03.02.02-2. Our response includes revised COLA content and does not include any new regulatory commitments. A Licensing Basis Document Change Request has been initiated to incorporate these changes into a future revision of the COLA.

This letter does not contain any sensitive or proprietary information.

DD96
NRO

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 March 26, 2010

Greg Gibson

Enclosure: Response to NRC Request for Additional Information, RAI No. 182, Question 03.02.02-2, System Quality Group Classification, 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)
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

GTG/RDS/mdf

Enclosure

Response to NRC Request for Additional Information
RAI No. 182, Question 03.02.02-2,
System Quality Group Classification,
Calvert Cliffs Nuclear Power Plant, Unit 3

RAI No 182

Question 03.02.02-2

ITAAC are included in the FSAR for as-built inspections of certain important to safety site-specific SSCs including seismic Category I SSCs, certain SSCs that are classified as seismic Category II and for seismic Category I structures that could be adversely affected by adjacent Non-Seismic (NSC) structures. For site-specific SSCs that are defined as risk-significant, clarify what ITAAC is in place to verify that the as-built SSC is consistent with the quality group classification. Specifically clarify if there are any important to safety SSCs classified as seismic Category II or Conventional Seismic (CS) that are not selected for ITAAC and, if so, clarify why an ITAAC is not needed.

Response

Site-specific structures, systems and components (SSCs) are identified in Table 3.2-1 with their seismic category (SC), safety classification, and quality group classification. As part of the response to NRC RAI 182, Question 03.03.02-3[1], structures listed in COLA FSAR Table 3.2-1 were updated to reflect the U.S. EPR FSAR Table 3.2.2-1 and RG 1.26 quality group classification. Site-specific SSCs that are considered for ITAAC are identified in FSAR Table 14.3-2. The associated ITAAC are provided in COLA Part 10, Appendix B, Tables 2.4-1 and 2.4-7 through 2.4-31.

ITAAC in COLA Part 10, Appendix B will be updated as indicated for the following structures in a future COLA revision:

- Update Table 2.4-33, ITAAC for Forebay (provided in response to RAI 118, Question 14.03.02-2, Part I[2]), change Forebay Seismic Category from Seismic Category II to Seismic Category I.
- Add New Table 2.4-34 as ITAAC for Conventional Seismic Waste Water Treatment Facility.
- Add New Table 2.4-35 as ITAAC for Seismic Category II Access Building.
- Add New Table 2.4-36 as ITAAC for Conventional Seismic Sheet Pile Wall.

Conventional Seismic (CS) Circulating Water System Retention Basin is an in-ground basin and has not been selected for ITAAC because it cannot impact any Seismic Category I SSC.

Site-specific structures are listed in Table 14.3-2 under "Structure". ITAAC for structures listed in FSAR Table 14.3-2, including Seismic Category II and Conventional Seismic structures, except the CS Circulating Water System Retention Basin, are provided in COLA Part 10, Appendix B, as supplemented by new Tables 2.4-34, 2.4-35 and 2.4-36.

Additional ITAAC for site-specific Fire Protection System and Components that are classified as NS-AQ, Quality Group D and Seismic Category II or Seismic Category II-SSE are provided in

---

1 G. Gibson (UniStar Nuclear Energy) to Document Control Desk (U.S. NRC), Letter UN#10-062, Response to RAI 182, System Quality Group Classification, dated March 12, 2010.

2 G. Gibson (UniStar Nuclear Energy) to Document Control Desk (U.S. NRC), Letter UN#09-496, Response to RAI 118, ITAAC, dated December 4, 2009. (ML093421236)

COLA Part 10, Appendix B, Tables 2.4-26 and 2.4-27, as indicated in the response to NRC RAI 180, Question 09.05.01-41[3].

ITAAC for applicable site-specific systems and components considered important to safety that are seismic Category II or Conventional Seismic (CS) are provided in COLA Part 10, Appendix B, Tables 2.4-21 through 2.4-31. There are no important to safety systems or components classified as Seismic Category II or Conventional Seismic (CS) that are not selected for ITAAC.

COLA Impact

Part 2 FSAR, Section 3.3.2 (as provided in response to RAI 128, Question 03.03.02-1[4]) will be updated as follows in a future COLA revision:

3.3.2 TORNADO LOADINGS

The U.S. EPR FSAR includes the following COL Item in Section 3.3.2:

> A COL applicant that references the U.S. EPR design certification will demonstrate that failure of site-specific structures or components not included in the U.S. EPR standard plant design, and not designed for tornado loads, will not affect the ability of other structures to perform their intended safety functions.

This COL Item is addressed as follows:

A discussion of site-specific structures not designed for ~~wind or~~ tornado loadings is provided in Section 3.3.2.3.

3.3.2.1 Applicable Tornado Design Parameters

{No departures or supplements.}

3.3.2.2 Determination of Tornado Forces on Structures

No departures or supplements.

3.3.2.3 Effect of Failure of Structures or Components Not Designed for Tornado Loads

{Non-safety-related structures located on the site and not included in U.S. EPR FSAR Section 3.3.2.3 include:

- Fire Protection Water Tanks
- Fire Protection Building

---

3 G. Gibson (UniStar Nuclear Energy) to Document Control Desk (U.S. NRC), Letter UN#09-519, Update to CCNPP Unit 3 FSAR Section 3.7 and Response to RAI Sets 19, 25, 58, 63, 65, 112, 113, 139, 158, 159, 167, 168, 179, 180, 181, and 193, dated December 29, 2009.

4 G. Gibson (UniStar Nuclear Energy) to Document Control Desk (U.S. NRC), Letter UN#09-378, Response to RAI 128, Tornado Loads, dated September 10, 2009. (ML092570248)

- Storage / Warehouse
- Central Gas Supply Building
- Security Access Facility
- Switchgear Building
- Grid Systems Control Building
- Circulating Water System Cooling Tower
- Circulating Water System Pump Building
- Circulating Water System Makeup Water Intake Structure
- Circulating Water System Retention Basin
- Desalinization/Water Treatment Plant
- Waste Water Treatment Plant
- ~~Forebay~~Sheet Pile Wall
- Demineralized Water Tanks

Except for the Switchgear Building, Sheet Pile Wall,~~Forebay,~~ and ~~concrete portion of the~~ Circulating Water System (CWS) Makeup Water Intake Structure (MWIS), the non-safety-related buildings are miscellaneous steel and concrete structures, which are not designed for tornado loadings. These structures are distant enough from safety-related structures that their collapse due to tornado loadings would not result in adverse interaction with any safety-related structure. During detailed design of such structures, their heights and separation distances from safety-related structures will be maintained such that the failure of these structures due to tornado loadings will not affect the ability of safety-related structures to perform their intended safety functions. Missiles generated by the collapse of these structures during tornado loadings are enveloped by the design basis tornado missile loads described in U.S. EPR FSAR Section 3.5.1.4.

The Switchgear Building, Sheet Pile Wall, and ~~Forebay~~CWS MWIS have potential for interaction with safety-related structures and are designed to withstand the effects of tornado loadings~~.~~ as described below:

The structural system of the Switchgear Building ~~will use~~ employs engineered pressure relief siding panels to mitigate the effects of tornado loadings.

For the Sheet Pile Wall, under tornado loads, maximum relative displacements between Sheet Pile Wall and the nearest SC I SSC will be kept below the separation

distance between the Sheet Pile Wall and the nearest SC I SSC with an appropriate safety factor.

~~Conservatively, the~~ Reinforced concrete portion of CWS MWIS is designed for tornado loadings. Should collapse of the above ground steel structure occur, it cannot directly impact any SC I SSC. Since the reinforced concrete portion supporting the steel structure is integrally connected to SC I Forebay Structure, the reinforced concrete portion will be analyzed to demonstrate that the collapse of the steel structure due to tornado loads does not impair the integrity of SC I SSCs.}

FSAR Table 14.3-2 (as provided in response to RAI 118, Question 14.03.02, Part I[2]) will be updated as follows in a future COLA revision:

Table 14.3-2—{Site Specific SSC ITAAC Screening Summary}

Site-Specific Structure, System, or Component	U.S. EPR Interface	Selected for ITAAC
Structure		
Fire Protection Building	Yes	Yes
Switchgear Building	Yes	Yes
Turbine Building	Yes	Yes
~~Access Building~~ Security Access Building	Yes	Yes
UHS Makeup Water Intake Structure, including CCNPP Unit 3 Forebay ~~Structure~~	Yes	Yes
UHS Electrical Building	Yes	Yes
Warehouse Building	Yes	Yes
Central Gas Supply Building	Yes	Yes
Grid Systems Control Building (i.e., Control House)	Yes	Yes
Circulating Water System Cooling Tower Structure	Yes	Yes
Circulating Water System Pump Building	Yes	Yes
Circulating Water System Makeup Water Intake Structure	Yes	Yes
Circulating Water System Retention Basin	No	No
Desalinization / Water Treatment Building (i.e., Desalinization Plant)	Yes	Yes
Waste Water Treatment ~~Plant~~ Facility	~~No~~ Yes	~~No~~ Yes
Buried Ductbanks	Yes	Yes
Buried Pipe	Yes	Yes
Structural Fill and Backfill under Seismic Category I and SC II-SSE structures	Yes	Yes
Access Building	Yes	Yes
Sheet Pile Wall	Yes	Yes
Component		
~~Buried Ductbanks~~	~~Yes~~	~~Yes~~
~~Buried Pipe~~	~~Yes~~	~~Yes~~
New and Spent Fuel Storage Racks	Yes	Yes

COLA Part 10, Appendix B, Table 2.4-33 (provided in response to RAI 118, Question 14.03.02, Part I[2]) will be updated as follows in a future COLA revision:

Table 2.4-33—{Forebay Structure Inspections, Tests, Analyses, and Acceptance Criteria}

	Commitment Wording	Inspection, Test, or Analysis	Acceptance Criteria
1	The Forebay Structure is Seismic Category ~~II~~ I and is designed to withstand structural design basis loads and load combinations per FSAR Section 3.8.4.3.	a. An analysis will be performed to determine that the Forebay Structure ~~is Seismic Category II and~~ is designed to withstand structural design basis loads and load combinations per FSAR Section 3.8.4.3.	a. A report exists that concludes the as-built Forebay Structure is capable of withstanding the structural design basis loads in accordance with the Structural Acceptance Criteria referenced in FSAR Section 3.8.4.5.
		b. An inspection of the as-built Forebay Structure will be conducted.	b. A report exists that concludes the as-built Forebay Structure agrees with construction drawings and deviations from the approved design are reconciled
2	For the Forebay Structure below grade concrete foundation and walls, a low water to cement ratio concrete mixture will be utilized.	Tests will be conducted to ensure the concrete meets the low water to cement ratio limit.	A report exists that concludes the concrete utilized to construct the as-built Forebay Structure below grade concrete foundation and walls have a maximum water to cementitious materials ratio of 0.45.

COLA Part 10, Appendix B, will be supplemented with the addition of Tables 2.4-34, 2.4-35 and 2.4-36, as shown below in a future COLA revision:

Table 2.4-34—{Waste Water Treatment Facility Inspections, Tests, Analyses, and Acceptance Criteria}

	Commitment Wording	Inspection, Test, or Analysis	Acceptance Criteria
1	The Waste Water Treatment Facility (WWTF) will not impact the ability of any safety-related structure, system or component to perform its safety function under Extreme Environmental Loads specified in FSAR Section 3.8.4.3.	a. An analysis of the Waste Water Treatment Facility will be performed to determine that it will not impact the ability of any safety-related structure system or component to perform its safety function under Extreme Environmental Loads. b. An inspection of the as-built Waste Water Treatment Facility will be performed.	a. A report exists that concludes that under Extreme Environmental Loads, the collapse of the Waste Water Treatment Facility will not impact the ability of any safety-related structure, system or component to perform its safety function. The interaction under Extreme Environmental Load is precluded based on Acceptance Criteria 8.A of SRP 3.7.2, and 4.A of SRP 3.3.2. The report confirms that separation distance of the Waste Water Treatment Facility, approximately 1300 feet, as depicted in FSAR Figure 2.4-2, from the nearest safety-related structure, system or component, exceeds the height of the Waste Water Treatment Facility. b. A report exists that concludes that the as-built Waste Water Treatment Facility agrees with construction drawings and deviations from the approved design are reconciled.

Table 2.4-35—{Access Building Inspections, Tests, Analyses, and Acceptance Criteria}

	Commitment Wording	Inspection, Test, or Analysis	Acceptance Criteria
1	The Access Building (AB) will not impact the ability of any safety-related structure, system or component to perform its safety function under applicable Extreme Environmental Loads specified in FSAR Section 3.8.4.3.	a. An analysis of the Access Building will be performed to determine that it will not impact the ability of any safety-related structure, system or component to perform its safety function under Extreme Environmental Loads. b. An inspection of the as-built Access Building will be performed.	a. A report exists that concludes that under applicable Extreme Environmental Loads, the Access Building will not collapse and 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 Access Building from the nearest safety-related Structure, System or Component, is sufficient to preclude interaction.. b. A report exists that concludes that the as-built Access Building agrees with construction drawings and deviations from the approved design are reconciled.
2	For the Access Building, below grade concrete foundation and walls, a low water to cement ratio concrete and improved concrete mixture design will be utilized.	Tests will be conducted to ensure the concrete meets specific parameters.	A report exists that concludes the concrete utilized to construct the as-built Access Building below grade concrete foundation and walls have a maximum water to cementitious materials ratio of 0.45.

Table 2.4-36—{Sheet Pile Wall Inspections, Tests, Analyses, and Acceptance Criteria}

	Commitment Wording	Inspection, Test, or Analysis	Acceptance Criteria
1	The Sheet Pile Wall will not impact the ability of any safety-related structure, system or components to perform its safety function under Extreme Environmental Loads specified in FSAR Section 3.8.4.3.	a. An analysis of the Sheet Pile Wall will be performed to determine that it will not impact the ability of any safety-related structure, system or component to perform its safety function under Extreme Environmental Loads. b. An inspection of the as-built Sheet Pile Wall will be performed.	a. A report exists that concludes that under applicable Extreme Environmental Loads, the Sheet Pile Wall will not collapse and 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 Sheet Pile Wall from the nearest safety-related Structure, System or Component, is sufficient to preclude interaction. b. A report exists that concludes that the as-built Sheet Pile Wall agrees with construction drawings and deviations from the approved design are reconciled.