

Greg Gibson
Senior Vice President, Regulatory Affairs

750 East Pratt Street, Suite 1600
Baltimore, Maryland 21202



10 CFR 50.4
10 CFR 52.79

April 22, 2011

UN#11-142

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. 275, Structural ITAAC

Reference: 1) Surinder Arora (NRC) to Robert Poche (UniStar Nuclear Energy), "FINAL
RAI 275 SEB2 5205" email dated January 21, 2011

2) UniStar Nuclear Energy Letter UN#11-088, 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.
275, Structural ITAAC, Dated February 18, 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 January 21, 2011 (Reference 1). This RAI addresses Structural ITAAC as discussed in Section 14.3 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 an April 29, 2011 date for the response to RAI No. 275, Question 14.03.02-14. The enclosure provides our response to RAI No. 275, Question 14.03.02-14. The response does not include any new regulatory commitments and does not impact COLA content. This letter does not contain any sensitive or proprietary information.

DO96
NRO

Reference 2 provided a July 17, 2011 date for the response to RAI No. 275, Question 14.03.02-13. That scheduled submittal date remains unchanged.

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 April 22, 2011

A handwritten signature in black ink, appearing to read 'Greg Gibson', with a long horizontal line extending to the right.

Greg Gibson

Enclosure: Response to NRC Request for Additional Information RAI No. 275, Question 14.03.02-14, Structural and Systems Engineering - Inspections, Tests, Analyses, and Acceptance Criteria, 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 No. 275, Question 14.03.02-14, Structural and Systems Engineering - Inspections,
Tests, Analyses, and Acceptance Criteria**

Calvert Cliffs Nuclear Power Plant, Unit 3

RAI No. 275

Question 14.03.02-14

The staff reviewed the RAI response to Question 14.03.02-2 F provided in UniStar Letter UN#10-071 dated March 31, 2010 (ML100950110) and found that the RAI responses to Items 1 through 5 of the RAI are adequate. However, the RAI response also indicated that Part 10, "ITAAC," Appendix B, Table 2.4-1 of FSAR, Revision 6 had been updated and a markup to the updated table had been provided in UniStar letter UN#10-027 dated January 29, 2010. The staff reviewed the updated table and found that the following information is needed:

- a. No explanation has been provided for the removal of the commitment requirements regarding quality, gradation, and static and dynamic properties of structural fill from Items 1 and 2 in Part 10, "ITAAC," Appendix B, Table 2.4-1 of FSAR, Revision 6. Provide a technical explanation for the removal of these items or restore these items to the table.
- b. UniStar letter UN#10-027 provided a markup of ITAAC Table 2.4-1, Rev. 6 that added Items 2 through 5 related to the shear wave velocity limit of structural fill material for a variety of structures. Clarify whether these four items cover all Seismic Category I and Seismic Category II-SSE structures that utilize structural fill. If not, explain why not.

The staff needs the information requested above to be able to conclude in the SER that adequate ITAAC is proposed and there is reasonable assurance that adequate ITAAC, including the properties of structural fill material for a variety of structures, as appropriate, will be implemented pursuant to 10 CFR 52.80(a).

Response

Item a

In a letter to the NRC dated June 1, 2009^{1,2}, NEI documented several conclusions from public meetings on December 18, 2008, and May 8, 2009. Conclusion 5 in the meeting summary is as follows:

No additional ITAAC for backfill parameters beyond shear wave velocity and compaction (i.e., those in the Vogtle COLA).

The meeting summary also included the following:

Grain size and other backfill characteristics will be described in the FSAR, along with information regarding the placement and expected performance of proposed backfill materials. If the source material is not known at the COL phase, the applicant must ensure that the backfill material ultimately selected conforms to the characteristics described in the FSAR. In combination with the ITAAC, the FSAR description must be sufficient for the NRC to make a safety finding on the adequacy of the backfill design.

¹ R. Bell (NEI) letter to W. Burton (NRC) "Backfill ITAAC," dated June 1, 2009, ML091590424, and
² "Summary of May 8 Public Meeting on Backfill ITAAC," ML091590429.

The FSAR should include a description of the QC process to be used during construction to ensure that the material delivered and placed conforms to the FSAR description.

The NRC response regarding Conclusion 5, in a letter to NEI dated August 7, 2009³, was that the NRC does not necessarily agree that additional ITAAC will not be needed for backfill parameters other than shear wave velocity and compaction. Instead, NRC left open the possibility that additional ITAAC could be needed to confirm other parameters if the backfill source material is not known or the backfill is not fully characterized at the COL phase.

For Calvert Cliffs Nuclear Power Plant Unit 3, the source of structural fill has been identified. The proposed structural fill has been tested and fully characterized as discussed in COLA FSAR, Revision 7, Section 2.5.4.2, and further addressed in FSAR Section 2.5.4.5. Tables 2.5-41 through 2.5-58 contain summaries of test results for backfill (along with other site soils). In addition, COLA Revision 7, FSAR Section 2.5.4.5.3 discusses specifications regarding backfill inspection and testing before and during placement. One purpose of the construction specification is to ensure the structural fill placed is consistent with the structural fill that was tested and described in the COLA. The quality control process for this safety-related activity combined with Item 1 of COLA Revision 7 Part 10, "ITAAC," Appendix B Table 2.4-1, which confirms the fill is compacted to a minimum of 95 percent of the modified proctor density, is sufficient to control the fill installation. Consequently, additional ITAAC is not required.

The COLA FSAR fully characterizes the backfill and establishes that the proposed structural backfill meets the U.S. EPR FSAR acceptance criteria originally found under Items 1 and 2 in COLA Revision 6 Part 10, "ITAAC," Appendix B Table 2.4-1, with the exception of the coefficient of friction acting on foundation basemats and foundations for Seismic Category I Structures (original item 2c). This exception is discussed in COLA Revision 7, FSAR Section 3.8.5.5, which concludes that the coefficient of friction properties that exist for the backfill and layers beneath the Nuclear Island are acceptable. In addition, a departure for the coefficient of friction is included in COLA Revision 7, Part 7, "Departures and Exemption Requests," Section 1.1.6.

In conclusion, the backfill characteristics have been established and fully characterized and are discussed in the COLA FSAR. The normal quality control process will control the fill placement. Therefore, the acceptance criteria originally found under Items 1 and 2 in Table 2.4-1 of COLA Part 10, "ITAAC," Appendix B, Revision 6, need not be restored in this Table 2.4-1.

Item b

Items 2 through 4 of COLA Revision 7, ITAAC Table 2.4-1 cover the Seismic Category I and Seismic Category II-SSE structures that were anticipated to be founded on more than 5 feet of structural fill.

The other Seismic Category I structures; the Nuclear Island, Forebay, and Ultimate Heat Sink Makeup Water Intake Structure are founded on native material, concrete fill, or minimal leveling fill (less than 5 ft). This is shown in COLA Revision 7, FSAR, Figures 2.5-160 through 2.5-165. In the letter to NRC dated June 1, 2009^{1,2}, NEI documented several conclusions from the public

³ W. Burton (NRC) letter to R. Bell (NEI) "Response to NEI Letter on Backfill ITAAC," dated August 7, 2009, ML092090597.

meetings on December 18, 2008, and May 8, 2009. Conclusion 1 in the meeting summary is as follows:

No shear wave velocity ITAAC is necessary for: (1) Category I structures founded on native material (soil or rock) or on concrete fill, and (2) Category I structures founded on a shallow (≤ 5 feet) soil leveling course.

Therefore, no ITAAC was required for these structures.

As part of the seismic reconciliation activities discussed in a letter dated March 31, 2011⁴, UniStar Nuclear Energy identified that the amount of fill beneath the Nuclear Island, with the inclusion of the waterproof membrane, would exceed five feet. Within that letter UNE identified that a new ITAAC would be created in Table 2.4-1 of COLA Part 10, "ITAAC." The anticipated schedule for that ITAAC is May 31, 2011.

COLA Impact

The COLA FSAR will not be revised as a result of this response.

⁴ G. Gibson (UNE) letter to U.S. NRC Document Control Desk, "Impact of U.S. EPR FSAR RAI Responses on CCNPP Unit 3 FSAR Section 3.7" dated March 31, 2011.