

Greg Gibson
Vice President, Regulatory Affairs

750 East Pratt Street, Suite 1600
Baltimore, Maryland 21202



10 CFR 50.4
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March 21, 2011

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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. 295, Stability of Subsurface Materials and Foundations

Reference: Surinder Arora (NRC) to Robert Poche (UniStar Nuclear Energy), "FINAL
RAI 295 RGS2 5398" email 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 February 18, 2011 (Reference). This RAI addresses Stability of Subsurface Materials and Foundations, as discussed in Sections 2.5.4 and 2.5.5 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.

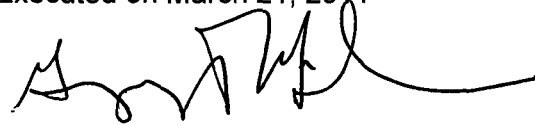
The Enclosure provides our response to RAI No. 295, Question 02.05.04-30. Our response does not include any new regulatory commitments and does not impact COLA content. This letter does not contain any sensitive or proprietary information.

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NRD

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 21, 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. 295,
Question 02.05.04-30, Stability of Subsurface Materials and Foundations,
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. 295, Question 02.05.04-30, Stability of Subsurface Materials and Foundations,

Calvert Cliffs Nuclear Power Plant Unit 3

RAI 295

Question 02.05.04-30

The response to RAIs 2.5.4-11 and 2.5.5-1, regarding the post-construction elevation of the groundwater table, states that the analyses presented in FSAR Sections 2.5.4 and 2.5.5 were based on a groundwater elevation level of 55 ft. However Section 2.4.12.5 of FSAR Revision 7 states that the post-construction "water table in the power block area will be well below the site grade level. In all simulations, the water table in the power block area was more than 25 ft [7.6 m] below the site grade level of 85 ft [26 m] (NGVD 29)." This conclusion indicates that the maximum post-construction groundwater is approximately elevation 60 ft. In accordance with 10 CFR 100.23, please discuss the impact of the higher groundwater level on site seismic response, SSI, settlement, lateral earth pressure and slope stability analyses, and on the foundation/structure and slope stabilities at the site.

Response

COLA FSAR Figure 2.4-96 (reproduced below with annotation) shows the modeled post-construction groundwater elevations for the CCNPP Unit 3 power block area. The 60 ft contour is at the edge of the excavation. The groundwater elevation is at 55 ft or less beneath the safety-related structures except for Emergency Service Water Building (ESWB) 4. From COLA FSAR Figure 2.4-96 it can be seen that the groundwater elevation at ESWB 4 is slightly higher than elevation 55 ft, but below elevation 60 ft. The ESWB structures have a foundation depth of 22 ft, equivalent to an elevation of 63 ft.

The model for the ESWB structures utilized four foot thick layers at this elevation, so the difference does not affect the development of the Foundation Input Response Spectra (FIRS) for the ESWBs. Further, the Soil-Structure Interaction (SSI) analysis was performed with the Site Safe Shutdown Earthquake (SSE) as input motion. The Site SSE was shown in COLA FSAR Section 3.7 to bound the FIRS. Thus, the small difference in groundwater elevation associated increase in compressional wave velocity in a very thin soil layer at ESWB 4 does not affect the SSI analysis.

The minor difference in groundwater elevation will have no impact on settlement, which occurs primarily during the construction. The 55 ft groundwater elevation is the most representative value for the extent of the power block area for the finite element model used for the integrated settlement calculations of all the buildings.

Because ESWB 4 is above the surface of the water table, the groundwater elevation does not affect the sliding and overturning analyses.

The only slope in the power block area that is affected by groundwater level is west of the Fire Protection building and tanks and Nuclear Island (plant north in COLA FSAR Figure 2.4-96). The modeled groundwater elevation in this area is less than the 55 ft used in the slope stability analysis.

COLA Impact

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

FSAR Figure 2.4-96 — {Modeled Post-Construction Elevation of the Water Table around the Unit 3 Power Block Area}

