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UniStar NUCLEAR ENERGY

10 CFR 50.4
10 CFR 52.79

April 11, 2013

UN#13-035

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 301, Other Seismic Category I Structures

References:
1) Surinder Arora (NRC) to Robert Poche (UniStar Nuclear Energy), "FINAL RAI No. 301 SEB2 5566" email dated April 14, 2011

2) UniStar Nuclear Energy Letter UN#13-006, from Mark T. Finley to Document Control Desk, U.S. NRC, Updated RAI Closure Plan, dated January 30, 2013

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 (UNE), dated April 14, 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 9.

Reference 2 indicated that a response to RAI 301, Question 03.08.04-21 would be provided to the NRC by April 12, 2013. The enclosure provides our response to RAI 301, Question 03.08.04-21.

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

As this RAI response does not impact any earlier RAI responses or require a revision to the COLA FSAR, a Table of Changes is not included.

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NRO

If there are any questions regarding this transmittal, please contact me at (410) 369-1907 or Mr. Wayne A. Massie at (410) 369-1910.

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

Executed on April 11, 2013

Mark T. Finley

Enclosure: Response to NRC Request for Additional Information RAI No. 301, Question 03.08.04-21, 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-Willingham, NRC Environmental Project Manager, U.S. EPR COL Application
Amy Snyder, NRC Project Manager, U.S. EPR DC Application, (w/o enclosure)
Patricia Holahan, Acting Deputy Regional Administrator, NRC Region II, (w/o enclosure)
Silas Kennedy, U.S. NRC Resident Inspector, CCNPP, Units 1 and 2,
David Lew, Deputy Regional Administrator, NRC Region I (w/o enclosure)

Enclosure

Response to NRC Request for Additional Information
RAI No. 301, Question 03.08.04-21,
Other Seismic Category I Structures,
Calvert Cliffs Nuclear Power Plant, Unit 3

RAI No. 301

Question 03.08.04-21

SRP Section 3.8.5.I.5 states that the foundation design should include the design limits imposed on the various parameters that serve to quantify the structural behavior of each foundation, emphasizing the extent of compliance with the allowable limits delineated in the SRP acceptance criteria 3.8.5.II.5. Rev. 7 of Calvert Cliffs Unit 3 FSAR Section 3.8.5.5 provides updated information about the structural acceptance criteria for foundations. The staff's review of this section found that this section is not clear as to how the sliding analysis is performed for each Seismic Category I structure. Provide a detailed description of the sliding analysis for each Seismic Category I structure. The description should include the values of itemized lateral forces applied and values of itemized shear resistance calculated for all applicable load combinations. Explain how the contribution of soil adhesion to overall soil shear resistance is considered and combined with the contribution to the soil shear resistance derived from soil internal friction. Also, explain whether the postulated maintenance condition, discussed in the last paragraph of Page 3-173, is considered in the sliding analysis and floating analysis. During this maintenance condition, interior or exterior below-grade cells may be empty. Furthermore, explain whether a zero snow load case is considered for the SSE case in the sliding analysis.

The staff needs the information to determine whether the foundation design of the Seismic Category I structures is consistent with SRP Acceptance Criteria 3.8.5 II.5 and has been adequately addressed in the CCNPP Unit 3 FSAR.

Response

The seismic hazard at the Calvert Cliffs Nuclear Power Project (CCNPP) Unit 3 has been redefined after the incorporation of the 2012 Central and Eastern United States (CEUS) Seismic Source Characterization (SSC). Therefore, the seismic soil structure interaction (SSI) analysis of the Common Basemat Intake Structure (CBIS), and subsequent stability analyses, are being revised. The stability analysis for the CBIS considers the maintenance condition by assuming a case in which the CBIS is empty. Conservatively, for the stability analysis, snow loads are incorporated into the driving seismic pressures, but not in the static resisting bearing pressures. Furthermore, snow loads are less than 5% of the overall load, and therefore do not impact the outcome of the analysis.

The details and results of the stability analysis, including the maintenance condition and associated Combined License Application (COLA) markups, will be provided as part of the responses to request for additional information (RAI) 343, RAI 339, and RAI 315 Question 03.07.02-64. The schedule for these RAIs was provided in UNE letter UN#13-006[1].

The adhesion contribution to the overall shear resistance corresponds to the product of the basemat area and the adhesion coefficient. The stability analysis conducted for each time step considers the same adhesion contribution at every time step over the area of the CBIS. The friction angle contribution depends on the vertical stress at a given location across the CBIS. Since the dynamic vertical stresses (not the static restoring bearing pressures) at a given location vary by time, the friction angle contribution, ($\sigma_v \tan\phi$) is evaluated at each node of the SASSI model base and at every time step.

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[1] UniStar Nuclear Energy Letter UN#13-006, from Mark T. Finley to Document Control Desk, U.S. NRC, Updated RAI Closure Plan, dated January 30, 2013

For the CCNPP Unit 3 generic Seismic Category I structures, the detailed description of the stability analyses, including sliding, will be provided as part of the response to RAI 315 Question 03.07.02-64.

COLA Impact

Revision to the COLA FSAR is not required as a result of this response.