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UniStar
NUCLEAR ENERGY

10 CFR 50.4
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August 11, 2011

UN#11-227

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. 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#11-211, from Greg Gibson to Document Control Desk, U.S. NRC, Submittal of Response to RAI No. 301, Other Seismic Category I Structures, dated July 21, 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 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 7.

Reference 2 provided an August 11, 2011 response date for Question 03.08.04–17. The enclosure provides our response to RAI No. 301, Question 03.08.04–17 and includes revised COLA content. A Licensing Basis Document Change Request has been initiated to incorporate these changes into a future revision of the COLA.

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NRO

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 August 11, 2011

Greg Gibson

Enclosure: Response to NRC Request for Additional Information, RAI No. 301, Question 03.08.04–17, 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, 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

GTG/JMR/mdf

Enclosure

Response to NRC Request for Additional Information,
RAI No. 301, Question 03.08.04–17,
Other Seismic Category I Structures,
Calvert Cliffs Nuclear Power Plant, Unit 3

RAI No 301

Question 03.08.04–17

The staff reviewed the RAI response to Question 03.08.04-6 provided in UniStar Letter UN#10-193 dated July 23, 2010 (ML102100480) and found that the RAI response addressed some of the staff's concerns; however, additional information is needed. The RAI response stated that, "In areas where the buried electrical duct banks will be below groundwater table, the buried electrical duct banks will have water-tight construction joints utilizing water stops." This is inconsistent with Subsection 3.8.4.1.8 of the CCNPP Unit 3 FSAR. Clarify this apparent inconsistency. Additionally, explain the extent to which the fluctuation of the ground water table is considered in determining where not to apply water stops in the buried electrical duct banks.

The staff needs the above information to be able to conclude in the SER that there is reasonable assurance that the first COL Item listed in Section 3.8.4.4.5 of CCNPP Unit 3 FSAR has been adequately implemented and addressed in the CCNPP Unit 3 COLA.

Response

In areas where buried safety-related electrical duct banks will be below the projected maximum, steady state, post-construction groundwater level, buried electrical duct banks will have water-tight construction joints utilizing water stops. Additionally, in these areas, the joints between these buried duct banks and manholes will have PVC water stops to prevent water intrusion. COLA FSAR Subsection 3.8.4.1.8, will be revised to reflect these design requirements and resolve any inconsistencies.

The maximum, steady state, post-construction groundwater level is determined using a 3-dimensional groundwater model that incorporates conservative assumptions. The maximum, steady-state, post-construction groundwater level in the Unit 3 powerblock area is projected to be at about elevation 55 feet (NGVD 29). This maximum groundwater level is 30 feet below the finished site grade elevation of 85 feet in the powerblock area. COLA FSAR Subsection 2.4.12.5, provides a brief summary of the post-construction groundwater modeling and relevant conclusions.

The groundwater model was developed to incorporate known site conditions and was calibrated against pre-development groundwater levels derived from the average monthly or quarterly water levels observed in each of 36 on-site groundwater monitoring wells during 2007. The objectives of the calibration effort were: 1) minimization of the differences between groundwater level predictions from the model and the groundwater levels observed in each of the monitoring wells, and 2) optimization of the groundwater flow mass balance. Once the model was fully calibrated against the pre-development conditions, the primary CCNPP Unit 3 facilities, the backfilled power block excavation, recharge zones, and the post-construction topography were incorporated into the model to simulate post-construction groundwater conditions. Of particular importance is the coarse, granular structural backfill in the CCNPP Unit 3 powerblock excavation which will readily collect and discharge groundwater from the site, thereby controlling and stabilizing post-construction groundwater levels. Seven (7) groundwater simulations were conducted with the post-construction model to conservatively determine the steady-state, post-construction groundwater levels, as well as the sensitivity of the model results to differing hydraulic conductivity values, differing rates of areal and sand filter recharge, and differing conditions of base leakage to deeper aquifers. The results of these simulations show the

projected groundwater levels varying from elevation 44.5 to 54.1 feet (NGVD 29) in the Upper Chesapeake aquitard and the Upper Chesapeake aquifer unit beneath the powerblock. At any given point, the model results are relatively insensitive to the broad range of conservative conditions represented by the seven different simulations.

The maximum projected post-construction groundwater level under the powerblock for steady-state conditions is at about elevation 55 feet. Since, this maximum projected groundwater level is based on conservative considerations, the proposed elevation of water stops based on the post-construction groundwater model will adequately account for any small fluctuations in the groundwater table.

COLA Impact

COLA FSAR Section 3.8.4.1.8 will be revised as follows:

~~In areas where the buried electrical duct banks are below the groundwater table, the joints between buried duct banks and manholes have PVC water stops to prevent water intrusion.~~ Buried safety-related electrical duct banks that are located below the projected maximum, steady state, post-construction, groundwater table level have water-tight construction joints utilizing water stops. The joints between these buried duct banks and manholes have PVC water stops to prevent water intrusion.