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UniStar
NUCLEAR ENERGY

10 CFR 50.4
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December 11, 2009

UN#09-495

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. 171, Ultimate Heat Sink - Raw Water Supply System

References:
1) Surinder Arora (NRC) to Robert Poche (UniStar Nuclear Energy), "FINAL RAI No 171 SBPA 2674," email dated September 29, 2009

2) UniStar Nuclear Energy Letter UN#09-483, from Greg Gibson to Document Control Desk, U.S. NRC, Submittal of Response to RAI No. 171, Ultimate Heat Sink - Raw Water Supply System, dated November 19, 2009

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 September 29, 2009 (Reference 1). This RAI addresses Ultimate Heat Sink - Raw Water Supply System as discussed in Section 9.2 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 schedule for the expected response dates for Questions 09.02.05-2 and 09.02.05-3.

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The enclosure provides our response to RAI No. 171, Question 09.02.05-3, 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.

The response to RAI No. 171, Question 09.02.05-3 does not include any new regulatory commitments. The response to RAI No. 171, Question 09.02.05-3 does not contain any sensitive or proprietary information.

UniStar Nuclear Energy requires additional time to finalize the response to RAI 171, Question 09.02.05-2. The response for Question 09.02.05-2 will be provided to the NRC by January 22, 2010.

If there are any questions regarding this transmittal, please contact me at (410) 470-4205, or Mr. Michael J. Yox at (410) 495-2436.

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

Executed on December 11, 2009

Greg Gibson

Enclosure: Response to NRC Request for Additional Information RAI No. 171, Question 09.02.05-3, Ultimate Heat Sink - Raw Water Supply System, 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/JMR/mdf

Enclosure

Response to NRC Request for Additional Information
RAI No. 171, Question 09.02.05-3,
Ultimate Heat Sink - Raw Water Supply System,
Calvert Cliffs Nuclear Power Plant, Unit 3

RAI No. 171

Question 09.02.05-3

General Design Criteria (GDC) 4, "Environmental and Dynamic Effects Design Bases," requires, in part, that structures, systems and components (SSCs) important to safety shall be designed to accommodate the effects of environmental conditions associated with normal operation, maintenance, testing, and postulated accidents. Standard Review Plan (SRP) 10.4.5, "Circulating Water System," provides guidance stating that, although the Circulating Water System (CWS) is not safety related, GDC 4 establishes CWS design limits that will minimize the potential for flooding of systems and components important to safety. SRP 10.4.5, Acceptance Criteria 1, states that "means should be provided to prevent or detect and control flooding of safety-related areas so that the intended safety function of a system or component will not be precluded due to leakage from the CWS."

For the non-safety-related raw water supply system (RWSS), this requires that the potential of flooding resulting from RWSS will not adversely affect SSCs important to safety to perform their safety function.

In Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3, FSAR Section 9.2.9.4, "Safety Evaluation," the applicant states that with respect to potential flooding caused by failures of piping or components, the raw water delivery piping and the desalinization plant are located remote from any safety related systems or equipment, except for the lines connecting to the ESWS cooling tower basins. Failures other than at the tower basin connections will not adversely impact safety functions because intervening topography and the plant storm water controls are designed to divert surface water flow, including that which would result from catastrophic failure of the desalinated water storage tank. The connections to the tower basins are made through safety-related motor operated valves, thereby assuring basin integrity under accident conditions. Potential leakage from the desalinated water lines in the essential service water pump houses is controlled, collected and routed away by the floor drains in those structures. These floor drain lines include check valves where necessary to prevent possible backflow from causing flooding that could adversely affect the safety related equipment.

The staff found that the drawing information provided in CCNPP Unit 3 FSAR Figure 1.1-3, "Site Area Map," Figure 9.2-3, "Normal Makeup, UHS Makeup, Blowdown & Chemical Treatment," and Figure 9.2-7, "Raw Water and Desalinated Water Supply," is not in sufficient detail to verify the flooding analysis presented in FSAR Section 9.2.9.4. The applicant is requested to describe the layout and provide adequate drawings of the RWSS to include desalinated water storage tank, and transfer pumps, and their relationship to the four ESWS cooling towers and ESWS pump house, including the location of the safety-related motor operated valves between the desalinization plant and the ESWS cooling tower basins related to flooding consequences.

Response

CCNPP Unit 3 FSAR Figure 1.1-3, Site Area Map, does not show grading details; however, it does show the desalination/water treatment building as "desalinization structure". FSAR Figures 2.1-1, Site Area Map, and 2.5-129, Site Grading Plan, show the unlabeled desalinization structure and the desalinated water storage tanks outside of the building, and the grading around the building, and the desalinated water storage tanks, to assess overall proximity. The intervening topography and the plant storm water controls are designed to divert

surface water flow, including that which would result from catastrophic failure of the desalinated water storage tanks.

FSAR Figure 9.2-3, Normal Makeup, Emergency Makeup, Blowdown & Chemical Treatment, shows that there is normal makeup to the Essential Service Water System (ESWS) from the Raw Water Supply System (RWSS) desalination process.

The attached revised FSAR Figure 9.2-7, Raw Water and Desalinated Water Supply, includes the desalinated water storage tanks and two 100% capacity desalinated water transfer pumps in order to discern the relationship of the RWSS components to the four ESWS pumphouse/cooling towers. The figure shows that the desalinated water transfer pumps are located in the Desalination/Water Treatment Building. The automated isolation valves, including the safety-related motor operated valves for the ESWS, are also shown in this figure. These safety-related motor operated valves are located inside the respective ESWS pumphouse buildings.

The internal flooding protective measures for Seismic Category I structures, including the ESWS Pump Buildings, are addressed in US EPR FSAR Section 3.4.1. The internal flooding event analysis for the ESWS pumphouse buildings is described in US EPR FSAR Section 3.4.3.9. External flooding protection design requirements are addressed in US EPR FSAR Section 3.4.2, as supplemented by CCNPP Unit 3 COLA FSAR Section 3.4.2.

CCNPP Unit 3 COLA FSAR Section 9.2.9.4 will be revised as shown below.

COLA Impact

The CCNPP Unit 3 FSAR Sections 9.2.9.3 and 9.2.9.4 will be revised and Figure 9.2-7 will be replaced as shown below in a future revision of the COLA.

9.2.9.3 Component Descriptions

Desalinated Water Storage Tank
~~This is a 600,000~~ There are two 300,000 gallon (~~2.3~~ 1.14 million liter) tanks, which ~~is~~ are sized for 8 hours of storage at the maximum desalinated water production rate of 1225 gpm (4637 lpm). The tanks ~~is~~ are equipped with level sensors, a vent, a drain and an overflow line.

9.2.9.4 Safety Evaluation

Raw water supply and the desalinization plant provide no safety-related function. Therefore, no safety evaluation is required with respect to plant design basis events.

There is no connection between raw water supplied to the desalinization plant, or the desalinization plant itself, and components or other systems that have the potential to carry radiological contamination. This complies with Criterion 60 of Appendix A to 10 CFR 50 (CFR, 2008).

With respect to potential flooding caused by failures of piping or components, the raw water delivery piping and the desalinization plant are located remote from any safety related systems or equipment, except for the lines connecting to the ESWS cooling tower basins. Failures ~~other~~

~~than at the tower basin connections~~ will not adversely impact safety functions because intervening topography and the plant storm water controls are designed to divert surface water flow, including that which would result from catastrophic failure of the desalinated water storage tanks. ~~The connections to the tower basins are made through safety-related motor operated valves, thereby assuring basin integrity under accident conditions. Potential leakage from the desalinated water lines in the essential service water pump houses is controlled, collected and routed away by the floor drains in those structures. These floor drain lines include check valves where necessary to prevent possible backflow from causing flooding that could adversely affect the safety related equipment.~~ The system boundary from the nonsafety-related RWSS to the safety-related ESWS occurs at the ESWS isolation valve located in the pumphouse buildings.

Evaluation of the impact of a failure of the nonsafety-related RWSS piping on the ESWS pumphouse buildings and ESWS cooling towers indicates that the RWSS piping has no impact on the ability of the ESWS pumphouse buildings and ESWS cooling towers to meet their intended safety function.

Figure 9.2-7 - {Raw Water and Desalinated Water Supply}