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UniStar
NUCLEAR ENERGY

10 CFR 50.4
10 CFR 52.79

April 30, 2013

UN#13-055

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 287, Ultimate Heat Sink

References:
1) Surinder Arora (NRC) to Robert Poche (UniStar Nuclear Energy), "FINAL RAI No. 287 SBPA 5324" email dated January 13, 2011

2) UniStar Nuclear Energy Letter UN#13-006, from Mark T. Finley to Document Control Desk, U.S. NRC, Calvert Cliffs Nuclear Power Plant, Unit 3 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, dated January 13, 2011 (Reference 1). This RAI addresses Ultimate Heat Sink, as discussed in Section 09.02.05 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 287, Question 09.02.05-19 would be provided to the NRC by April 30, 2013. Enclosure 1 provides our response to RAI No. 287, Question 09.02.05-19, 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.

Enclosure 2 provides a Table of Changes to the COLA associated with this RAI 287 response.

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

D096
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 30, 2013

Mark T. Finley

Enclosures:

1) Response to NRC Request for Additional Information RAI No. 287, Question 09.02.05-19, Ultimate Heat Sink, Calvert Cliffs Nuclear Power Plant, Unit 3

2) Table of Changes to CCNPP Unit 3 COLA Associated with Response to RAI No. 287

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 enclosures)
Patricia Holahan, Acting Deputy Regional Administrator, NRC Region II, (w/o enclosures)
Silas Kennedy, U.S. NRC Resident Inspector, CCNPP, Units 1 and 2,
David Lew, Deputy Regional Administrator, NRC Region I (w/o enclosures)

Enclosure 1

Response to NRC Request for Additional Information
RAI No. 287, Question 09.02.05-19,
Ultimate Heat Sink,
Calvert Cliffs Nuclear Power Plant, Unit 3

RAI No. 287

Question 09.02.05-19

The following EPR COL Information Items need to be addressed by the COL applicant in Section 9.2.5. Presently, CCNPP Unit 3 FSAR does not address these items.

Added by EPR FSAR Revision 2 (RAI 175 Supplement 2 Q9.2.5-20 – ML092120680)
9.2-5; A COL applicant that references the U.S. EPR design certification will provide a description of materials that will be used for the UHS at their site location, including the basis for determining that the materials being used are appropriate for the site location and for the fluid properties that apply.

To be added by EPR FSAR Revision 3 (RAI 351 Q9.2.5-29 response)
9.2-6; A COL applicant that references the U.S. EPR design certification will confirm by analysis of the highest average site-specific wet bulb and dry bulb temperatures over a 72-hour period from a 30-year hourly regional climatological data set that the site-specific evaporative and drift losses for the UHS are bounded by the values presented in Table 9.2.5-3.

To be added by EPR FSAR Revision 3 (RAI 351 Q9.2.5-29 response)
9.2-7; A COL applicant that references the U.S. EPR design certification will confirm that the maximum UHS cold-water return temperature of 95°F is met by an analysis that confirms that the worst combination of site-specific wet bulb and dry bulb temperatures over a 24-hour period from a 30-year hourly regional climatological data set are bounded by the values presented in Table 9.2.5-4

To be added by EPR FSAR Revision 3 (RAI 351 Q9.2.5-29 response)
9.2-8; A COL applicant that references the U.S. EPR design certification will confirm that the UHS makeup capacity is sufficient to meet the maximum evaporative and drift water loss after 72 hours through the remainder of the 30-day period consistent with RG 1.27.

To be added by EPR FSAR Revision 3 (RAI 351 Q9.2.5-24 response)
9.2-9; A COL applicant that references the U.S. EPR design certification will compare site-specific chemistry data for normal and emergency makeup water to the parameters in Table 9.2.5-5. If the specific data for the site fall within the assumed design parameters in Table 9.2.5-5, then the U.S. EPR standard design is bounding for the site. For site-specific normal and emergency makeup water data or characteristics that are outside the bounds of the assumptions presented in Table 9.2.5-5, the COL applicant will provide an analysis to confirm that the U.S. EPR UHS cooling towers are capable of removing the design basis heat load for a minimum of 30 days without exceeding the maximum specified temperature limit for ESWS and minimum required basin water level.

Response

Response to Address COL Item 9.2-5 in the COLA:

COL Item 9.2-5 states, "A COL applicant that references the U.S. EPR design certification will provide a description of materials that will be used for the UHS at their site location, including the basis for determining that the materials being used are appropriate for the site location and for the fluid properties that apply."

The Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 Ultimate Heat Sink (UHS) Makeup Water System is a safety-related system designed to ASME Code Section III, Class 3 requirements. The system is designed to provide a backup source of makeup water to the UHS Cooling Tower basin starting 72 hours post-accident, when the normal source of makeup water is unavailable and the post-accident basin storage volume requires replenishment. The UHS Makeup Water System is designed to be a wet layup configuration. During plant normal operation and shutdown/cooldown conditions, the UHS Makeup Water System is in a standby mode. During standby mode, the UHS Makeup Water piping is filled with brackish water from Chesapeake Bay. Considering the potential for performance degradation and subsequent system failure due to silting, erosion, corrosion, and the presence of organisms that may subject the system to microbiological influenced corrosion as well as macro fouling, the UHS Makeup Water System piping, valve, and fitting materials are super austenitic stainless steel. Super austenitic stainless steel is compatible with the brackish water of Chesapeake Bay. The description and basis of the materials used for the UHS Makeup Water System is described in the COLA FSAR Subsection 9.2.5.3.2. Also, this material description and associated FSAR markup of material have been provided in the response to RAI 332, Q09.02.05-22[1].

Response to Address COL Item 9.2-6 in COLA:

COL Item 9.2-6 states, "A COL applicant that references the U.S. EPR design certification will confirm by analysis of the highest average site-specific wet bulb and dry bulb temperatures over a 72-hour period from a 30-year hourly regional climatological data set that the site-specific evaporative and drift losses for the UHS are bounded by the values presented in Table 9.2.5-3."

The evaporation losses of the CCNPP Unit 3 UHS Cooling Tower are based on meteorological conditions that exist considering the highest average site-specific wet bulb and dry bulb temperatures over a 72 hours period from a 30 years hourly regional climatological data set. For the CCNPP Unit 3 UHS Cooling Tower, the worst meteorological conditions resulting in maximum evaporation loss over a 72 hour period are shown in COLA FSAR Subsection 9.2.5.3.3, as a comparison table of U.S. EPR Table 9.2.5-3 and the Calvert Cliffs site-specific values of wet bulb and dry bulb temperatures. The U.S. EPR and CCNPP Unit 3 use the same 72 hour period of temperature data to determine maximum evaporation of water from the UHS. Therefore, the worst CCNPP Unit 3 meteorological conditions resulting in maximum evaporation loss of water for the UHS over a 72 hour period are bounded by U.S. EPR FSAR Table 9.2.5-3. As a result of changes made to the U.S. EPR UHS heat load, drift and evaporation losses were re-calculated using the meteorological conditions in U.S. EPR Table 9.2.5-3. This analysis is the same analysis used for CCNPP Unit 3. Therefore CCNPP Unit 3 is bounded by the U.S. EPR analysis. The drift loss value is independent of ambient environmental conditions. The analysis of the Ultimate Heat Sink indicates that drift loss from UHS Cooling Tower is 0.005% of the cooling water flow rate. However, consistent with the U.S. EPR FSAR, a conservative number of 0.010% is used to determine the drift loss in the CCNPP Unit 3 UHS cooling tower for the first 72 hours post DBA. Therefore, the CCNPP Unit 3 UHS Cooling Tower drift loss over a 72 hours period is bounded by the value presented in U.S. EPR FSAR Table 9.2.5-3.

[1] UniStar Nuclear Energy Letter UN#12-154, from Mark T. Finley to Document Control Desk, U.S. NRC, Response to Request for Additional Information for the Calvert Cliffs Nuclear Power Plant, Unit 3, RAI 332, Ultimate Heat Sink, dated December 20, 2012

Response to Address COL Item 9.2-7 in the COLA:

COL Item 9.2-7 states, "A COL applicant that references the U.S. EPR design certification will confirm that the maximum UHS cold-water return temperature of 95°F is met by an analysis that confirms that the worst combination of site-specific wet bulb and dry bulb temperatures over a 24-hour period from a 30-year hourly regional climatological data set are bounded by the values presented in Table 9.2.5-4."

This COL Item 9.2-7 as stated in RAI 287 Q09.02.05-19 is based on U.S. EPR FSAR Revision 3. However, U.S. EPR FSAR Revision 3 COL Item 9.2-7 was renumbered as COL Item 9.2-11 in U.S. EPR FSAR Revision 4. Therefore, the U.S. EPR FSAR COL Item 9.2-11 is addressed below.

An analysis of the Ultimate Heat Sink (UHS) evaluated the 30 years of meteorological data for Patuxent River Naval Air Station [Data location PAX NAS] (11 miles from CCNPP Unit 3) and determined the worst 24-hour meteorological conditions for minimum water cooling to be used in determining the maximum UHS Cooling Tower basin water temperature. The worst 24-hour meteorological conditions considered for the U.S. EPR design are presented in U.S. EPR FSAR Table 9.2.5-4. A comparison of the CCNPP Unit 3 worst 24-hour meteorological conditions from 30 years meteorological data set is provided in COLA Section 9.2.5.3.3. This comparison table shows that the CCNPP Unit 3 conditions in CCNPP COLA Revision 9 were identical to those in the U.S. EPR FSAR Revision 4 Table 9.2.5-4.

As a result of the revision of the UHS heat load, the UHS cooling tower basin peak temperatures and drift and evaporation losses were re-calculated using the worst case meteorology. The revised peak heat load occurs sooner (approximately seven hours earlier) than in the previous analysis and no longer corresponds to the peak wet bulb temperature as presented in U.S. EPR FSAR Table 9.2.5-4. Therefore, the 24-hour temperature sequence in U.S. EPR FSAR Table 9.2.5-4 is no longer conservative. In the CCNPP Unit 3 COLA markups, the same 24-hour profile is used but the values are shifted so that the peak wet bulb temperature is aligned to the time of the peak heat load. This results in a difference between the U.S. EPR FSAR Table 9.2.5-4 and CCNPP Unit 3 data listed in COLA Section 9.2.5.3.3 temperature tables. Therefore, this results in a departure from the U.S. EPR FSAR.

The CCNPP Unit 3 analysis methodology is the same as is used for the U.S. EPR FSAR. As a result of the revision of the UHS heat load, the U.S. EPR FSAR Table 9.2.5-4 requires revision to be consistent with the analysis. However, until the U.S. EPR FSAR is revised, there will be a discrepancy between the temperature tables. However, this departure is expected to be eliminated when U.S. EPR FSAR Table 9.2.5-4 is updated in a future revision. The departure will be maintained in the CCNPP COLA until the discrepancy is eliminated.

The revised Section 9.2.5.3.3 temperature table in is included in the COLA Impact section of this response. This temperature data provides the worst combination of site-specific wet bulb and dry bulb temperatures over a 24-hour period from a 30-year hourly regional climatological data. This analysis concluded that for the duration of the Design Basis Accident (DBA), the maximum UHS Cooling Tower basin cold-water return temperature does not exceed the UHS cooling tower basin design of 95°F.

Response to Address COL Item 9.2-8 in the COLA:

COL Item 9.2-8 states, "A COL applicant that references the U.S. EPR design certification will confirm that the UHS makeup capacity is sufficient to meet the maximum evaporative and drift water loss after 72 hours through the remainder of the 30-day period consistent with RG 1.27."

The CCNPP Unit 3 UHS Makeup Water System provides ≥ 300 gpm of makeup water to the UHS Cooling Tower basin starting 72 hours post DBA. The CCNPP Unit 3 UHS Makeup Water pumps are sized to provide a maximum of approximately 750 gpm to the UHS Cooling Tower basin. This flow is sufficient to provide the minimum required flow even when the intermittent traveling screen wash and the intermittent strainer wash systems are operating. Therefore, even during the screen wash process, makeup water provided post DBA is adequate to maintain the water level in the basin above the required minimum water level for the ESW pump Net Positive Suction Head (NPSH) and Vortex Suppression, considering the maximum evaporation and drift loss after 72 hours and up to 30 days post DBA. U.S. EPR FSAR Table 9.2.5-2, Ultimate Heat Sink Design Parameters, states the required cooling tower emergency makeup flow, post DBA (72 hours through 30 days) as ≥ 300 gpm. The U.S. EPR design 72-hour meteorological conditions resulting in maximum evaporation and drift from the UHS Cooling Tower, as depicted in U.S. EPR FSAR Table 9.2.5-3, are identical to the CCNPP Unit 3 values for the 72-hour meteorological conditions, resulting in maximum evaporation and drift loss, as shown in the comparison table in COLA FSAR Subsection 9.2.5.3.3. Therefore, the CCNPP Unit 3 UHS Makeup water capacity is bounded by U.S. EPR Makeup Water capacity, to meet the maximum evaporation and drift loss starting 72 hours post DBA through the remainder of the 30 day period.

Response to Address COL Item 9.2-9 in the COLA:

COL Item 9.2-9 states, "A COL applicant that references the U.S. EPR design certification will compare site-specific chemistry data for normal and emergency makeup water to the parameters in Table 9.2.5-5. If the specific data for the site fall within the assumed design parameters in Table 9.2.5-5, then the U.S. EPR standard design is bounding for the site. For site-specific normal and emergency makeup water data or characteristics that are outside the bounds of the assumptions presented in Table 9.2.5-5, the COL applicant will provide an analysis to confirm that the U.S. EPR UHS Cooling Towers are capable of removing the design basis heat load for a minimum of 30 days without exceeding the maximum specified temperature limit for ESWS and minimum required basin water level."

In a comparison of the CCNPP Unit 3 site-specific water chemistry with the parameters listed in U.S. EPR FSAR Table 9.2.5-5, it was determined that the site-specific data for both ESWS normal (desalinated) makeup water and UHS emergency (Chesapeake Bay) makeup water do not fall within the assumed design parameters of U.S. EPR FSAR Table 9.2.5-5 for both normal makeup water and UHS emergency makeup water. Therefore, the site-specific UHS Cooling Tower normal and emergency makeup water chemical constituents are not bounded by the values presented in U.S. EPR FSAR Table 9.2.5-5.

The CCNPP Unit 3 UHS Cooling Tower is designed for an initial Total Dissolved Solids (TDS) value of 5,000 ppm, cooling water flow rate of 19,200 gpm, and inlet wet bulb temperature of

81°F. An analysis of the UHS Cooling Tower Basin Chemistry indicated that, for the first 72 hours post DBA, considering no makeup water to the basin, the TDS of the cooling water in the basin will increase from 5,000 ppm to 8,134 ppm. An analysis of the U.S. EPR Ultimate Heat Sink, which is also applicable to Calvert Cliffs Unit 3, indicated that the UHS Cooling Tower basin maximum water temperature for the first 72 hours post DBA does not exceed the 95°F design cooling water temperature. This analysis considered basin cooling water initial TDS of 5,000 ppm of desalinated water and the worst environmental conditions from the 30-year hourly regional climatological data coincident with maximum heat load to the cooling tower. During this period, makeup water is not provided to the cooling tower. For the CCNPP Unit 3 UHS Cooling Tower, makeup water will be introduced to the cooling tower basin from the Chesapeake Bay after 72 hours post DBA. An analysis of the UHS Cooling Tower Basin Chemistry indicated that at the end of the thirty days, the TDS concentration of the cooling water in the basin may reach up to 72,460 ppm. This concentration in the cooling water could potentially reduce the thermal performance of the cooling tower. However, an analysis of the U.S. EPR UHS Sizing Criteria indicated that the cooling tower heat load decreases significantly, with no anticipation of increase after the first 6 hours of DBA, and is approximately 33.62% of the maximum heat load after 72 hours post DBA. Based on the analysis performed by the prospective cooling tower vendor, at the end of the thirty days, the cooling tower basin water temperature will remain below 95°F and any impact of the reduced cooling tower thermal performance due to the concentrated TDS levels will be off-set by the reduced heat load on the cooling tower.

An analysis of the UHS Basin Height indicated the minimum water level required for ESW pump NPSH and Vortex Suppression, or minimum pump submergence from the bottom of the cooling tower basin, is 119 inches plus 6 inches for instrumentation uncertainty for the total of 125 inches. Considering the foot print of the UHS Cooling Tower basin is 12,426 ft^2, the available mass of water at this level for ESW pump NPSH and Vortex Suppression is approximately 8,068,000 lbm. An analysis of the UHS Cooling Tower Basin Chemistry during Design Basis Accident (DBA) post 72 hour to 30 days, evaluated the amount of water available in the cooling tower basin every 24 hours after DBA. The mass of water available in the cooling tower at the end of the 72 hours after DBA, without any makeup water from the normal or emergency makeup water system, is 9,111,035 lbm. This mass results in a basin height that is 16 inches higher than the height of water required for ESW pump NPSH and Vortex Suppression. After 72 hours post DBA, makeup water will be provided to the cooling tower basin from the UHS (emergency) Makeup Water System at a flow rate of greater than or equal to 300 gpm. This will increase the cooling tower basin water level due to lower evaporation from the cooling tower. Therefore, the UHS Cooling Tower Basin water level will not decrease below the minimum required basin water level for the ESW pump NPSH and Vortex suppression. In conclusion, the U.S. EPR UHS Cooling Towers are capable of removing the design basis heat load for a minimum of 30 days without exceeding the maximum specified temperature limit for ESWS and minimum required basin water level.

COLA Impact

The Calvert Cliffs Nuclear Power Plant Unit 3 COLA is revised as follows:

1.8.2 Departures

The U.S. EPR FSAR includes the following COL Item in Section 1.8.2:

A COL applicant that references the U. S. EPR design certification will provide a list of any departures from the FSAR in the COL FSAR.

This COL Item is addressed as follows:

{The list of departures from the U.S. EPR FSAR is as follows:

Maximum Differential Settlement (across the basemat)	FSAR 2.5.4 and 3.8.5
Maximum Annual Average Atmospheric Dispersion Factor (limiting sector)	FSAR 2.3.5
Accident Atmospheric Dispersion Factor from (0 - 2 hour, Low Population Zone)	FSAR 2.3.4 and 15.0.3
In-Structure Response Spectra	FSAR 3.7.2.5.2
Shear Wave Velocity	FSAR 2.5.4.2.5.8, FSAR Table 2.0-1, and COLA Part 10, ITAAC Table 2.4-1
Generic Technical Specifications and Bases - Setpoint Control	FSAR 16 (COLA Part 4)
Post-DBA UHS Makeup Keep-Fill Line (piping, valve, and orifice) - UHS Makeup Water System	FSAR 9.2.5.5
UHS Makeup Water Pump Starting Logic	FSAR Section 9.2.5.7.3.1
Shifting of Twenty-Four (24) Hour Peak Ambient Temperature Profile	FSAR Section 9.2.5.3.3

Justification for these departures is presented in Part 7 of the COL application.}

Table 1.8-2— FSAR Sections that Address COL Items

Item No.	Description	Section
9.2-4	A COL applicant that references the U.S. EPR design certification will provide a description of materials that will be used for the essential service water system (ESWS) at their site location, including the basis for determining that the materials being used are appropriate for the site location and for fluid properties that apply	9.2.1.3.5
9.2-5	A COL applicant that references the U.S. EPR design certification will provide a description of materials that will be used for the UHS at their site location, including the basis for determining that the materials being used are appropriate for the site location and for the fluid properties that apply.	9.2.5.2, 9.2.5.3.2
9.2-6	A COL applicant that references the U.S. EPR design certification will confirm by analysis of the highest average site-specific wet bulb and dry bulb temperatures over a 72-hour period from a 30-year hourly regional climatological data set that the site-specific evaporative and drift losses for the UHS are bounded by the values presented in Table 9.2.5-3.	~~9.2.5.3,~~ 9.2.5.3.3
9.2-7	A COL applicant that references the U.S. EPR design certification will confirm that the site characteristic sum of 0% excedance maximum noncoincident wet bulb temperature and the site-specific wet bulb correction factor does not exceed the value provided in Table 9.2.5-2. If the value in Table 9.2.5-2 is exceeded, the maximum UHS cold-water return temperature of 95°F is to be confirmed by analysis (see Section 9.2.5.3.3).	9.2.5.3.1
9.2-8	A COL applicant that references the U.S. EPR design certification will confirm that the site-specific UHS makeup capacity is sufficient to meet the maximum evaporative and drift water loss after 72 hours through the remainder of the 30-day period consistent with RG 1.27.	~~9.2.5.3~~ 9.2.5.3.3
9.2-9	A COL applicant that references the U.S. EPR design certification will compare site-specific chemistry data for normal and emergency makeup water to the parameters in Table 9.2.5-5. If the specific data for the site fall within the assumed design parameters in Table 9.2.5-5, then the U.S. EPR standard design is bounding for the site. For site-specific normal and emergency makeup water data or characteristics that are outside the bounds of the assumptions presented in Table 9.2.5-5, the COL applicant will provide an analysis to confirm that the U.S. EPR UHS cooling towers are capable of removing the design basis heat load for a minimum of 30 days without exceeding the maximum specified temperature limit for ESWS and minimum required basin water level.	9.2.5.2, 9.2.5.2.4

9.2.5.2 System Description

The U. S. EPR FSAR includes the following COL Items in Section 9.2.5.2:

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A COL applicant that references the U.S. EPR design certification will provide a description of materials that will be used for the UHS at their site location, including the basis for determining that the materials being used are appropriate for the site location and for the fluid properties that apply.

The COL Items are addressed as follows:

{Sections 9.2.5.2.1 through 9.2.5.2.4 are added as a supplement to the U. S. EPR FSAR. <u>Section 9.2.5.3.2 provides a description of materials used for the UHS Makeup Water System, including the basis.</u>}

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9.2.5.2.3 {UHS Makeup Water System

{Emergency makeup water for the ESWS is provided by the site-specific, safety-related UHS Makeup Water System that draws water from the Chesapeake Bay. The Chesapeake Bay is channeled through the existing Units 1 and 2 intake channel, under the Units 1 and 2 baffle wall into the Unit 3 inlet area then piped to the CWS and UHS common forebay. The common forebay is shared between the CWS makeup water system and UHS makeup water system. During normal plant operation the maximum flow of water from the Unit 3 inlet area is approximately 49,000 gpm (185,485 lpm) for both the CWS demand and surveillance testing of the UHS Makeup Water. Two buried 60" safety-related <u>carbon steel</u> pipes <u>internally lined with cement and externally coated with a high solids epoxy</u> provide a flow path for Chesapeake Bay water to enter the common forebay. Both pipes are designed to account for head losses in the pipe and provide sufficient flow for the CWS makeup and UHS makeup. Both pipes are normally in operation, however, either pipe can be isolated for maintenance as the other pipe is capable of providing 100% flow for CWS makeup and UHS makeup. Due to the head loss through the pipes, the design low water level at the common forebay for the UHS makeup intake is at EL. -10.2 ft NGVD29, which is lower than the predicted minimum low water level in the Chesapeake Bay of -7.7 ft NGVD29. The common forebay invert elevation is at -22.5 ft NGVD29, which provides ample additional margin in pump submergence during UHS operation with one or two intake pipes. The Chesapeake Bay is the largest estuary in the U.S with a watershed area in excess of 64,000 square miles (165,700 square km). The existing Unit 1 & 2 inlet area draws over 2 million gpm (7,570,000 lpm) of Chesapeake Bay water through the inlet area. With the Unit 3 safety-related UHS Makeup Water system draw of 1,500 gpm (5,678 lpm) during a design basis accident and combined CWS makeup and UHS Makeup Water maintenance testing draw of approximately 49,000 gpm (185,485 lpm) during normal plant operation, the Unit 3 Chesapeake Bay draw will not impact the ability of the bay to provide water through the Unit 1 & 2 Intake Forebay to safely bring any unit to an orderly shutdown or cooldown following a design basis accident.

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9.2.5.2.4 ESWS Makeup Water Chemical Treatment

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Additions to the ESWS cooling towers are made as necessary on a periodic or continuing basis.

~~{TBD} - Site specific chemistry comparison for normal and emergency makeup water.}~~

In a comparison of the CCNPP Unit 3 site-specific water chemistry with the parameters listed in U.S. EPR FSAR Table 9.2.5-3, it was determined that the site-specific data for both ESWS normal (desalinated) makeup water and UHS emergency (Chesapeake Bay) makeup water do not fall within the assumed design parameters of U.S. EPR FSAR Table 9.2.5-5, for both normal makeup water and UHS emergency makeup water. Therefore, the site-specific UHS Cooling Tower normal and emergency makeup water chemical constituents are not bounded by the values presented in U.S. EPR FSAR Table 9.2.5-5.

The CCNPP Unit 3 UHS Cooling Tower is designed for an initial Total Dissolved Solids (TDS) value of 5,000 ppm, cooling water flow rate of 19,200 gpm, and inlet wet bulb temperature of 81°F. An analysis of the UHS Cooling Tower Basin Chemistry indicated that, for the first 72 hours post DBA, considering no makeup water to the basin, the TDS of the cooling water in the basin will increase from 5,000 ppm to 8,134 ppm. An analysis of the U.S. EPR Ultimate Heat Sink, which is also applicable to Calvert Cliffs Unit 3, indicated that the UHS Cooling Tower basin maximum water temperature for the first 72 hours post DBA does not exceed the 95°F design cooling water temperature. This analysis considered basin cooling water initial TDS of 5,000 ppm of desalinated water and the worst environmental conditions from the 30-year hourly regional climatological data coincident with maximum heat load to the cooling tower. During this period, makeup water is not provided to the cooling tower. For the CCNPP Unit 3 UHS Cooling Tower, makeup water will be introduced to the cooling tower basin from the Chesapeake Bay after 72 hours post DBA. An analysis of the UHS Cooling Tower Basin Chemistry indicated that at the end of the thirty days, the TDS concentration of the cooling water in the basin may reach up to 72,460 ppm. This concentration in the cooling water could potentially reduce the thermal performance of the cooling tower. However, an analysis of the U.S. EPR UHS Sizing Criteria indicated that the cooling tower heat load decreases significantly, with no anticipation of increase after the first 6 hours of DBA, and is approximately 33.62% of the maximum heat load after 72 hours post DBA. Based on the analysis performed by the prospective cooling tower vendor, at the end of the thirty days, the cooling tower basin water temperature will remain below 95°F and any impact of the reduced cooling tower thermal performance due to the concentrated TDS levels will be off-set by the reduced heat load on the cooling tower.

An analysis of the UHS Basin Height indicated the minimum water level required for ESW pump NPSH and Vortex Suppression, or minimum pump submergence from the bottom of the cooling tower basin, is 119 inches plus 6 inches for instrumentation uncertainty for the total of 125 inches. Considering the foot print of the UHS Cooling Tower basin is 12,426 ft^2, the available mass of water at this level for ESW pump NPSH and Vortex Suppression is approximately 8,068,000 lbm. An analysis of the UHS Cooling Tower Basin Chemistry during Design Basis Accident (DBA) post 72 hour to 30 days, evaluated the amount of water available in the cooling tower basin every 24 hours after DBA. The mass of water available in the cooling tower at the end of the 72 hours after DBA, without any makeup water from the normal or emergency makeup water system, is 9,111,035 lbm. This mass results in a basin height that is 16 inches higher than the height of water required for ESW pump NPSH and Vortex Suppression. After 72 hours post DBA, makeup water will be provided to the cooling tower basin from the UHS (emergency) Makeup Water System at a flow rate of greater than or equal to 300 gpm. This will increase the cooling tower basin water level due to lower evaporation from the cooling tower. Therefore, the UHS Cooling Tower Basin water level will not decrease below the minimum required basin water level for the ESW pump NPSH and Vortex suppression. In conclusion, the U.S. EPR UHS Cooling Towers are capable of removing the design basis heat load for a minimum of 30 days without exceeding the maximum specified temperature limit for ESWS and minimum required basin water level.}

9.2.5.3.3 Cooling Tower Basin

The U.S. EPR FSAR includes the following COL Items in Section 9.2.5.3.3:

A COL applicant that references the U.S. EPR design certification will confirm by analysis of the highest average site-specific wet bulb and dry bulb temperatures over a 72-hour period from a 30-year hourly regional climatological data set that the site-specific evaporative and drift losses for the UHS are bounded by the values presented in ~~EPR~~ Table 9.2.5-3.

A COL applicant that references the U.S. EPR design certification will confirm that the maximum UHS cold-water return temperature of 95°F is met by an analysis that confirms that the worst combination of site-specific wet bulb and dry bulb temperatures over a 24-hour period, from a 30-year hourly regional climatological data set is bounded by the values presented in ~~EPR~~ Table 9.2.5-4.

A COL applicant that references the U.S. EPR design certification will confirm that the site-specific UHS makeup capacity is sufficient to meet the maximum evaporative and drift water loss after 72 hours through the remainder of the 30-day period consistent with RG 1.27.

The COL Items are addressed as follows:

{Conditions for Maximum Evaporation in the Ultimate Heat Sink

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The table below provides a comparison of the Table 9.2.5-3 values in the U.S. EPR FSAR and the CCNPP site-specific values used for maximum evaporation from the UHS.

	US EPR FSAR Table 9.2.5-3		Calvert Cliffs Site-Specific Value	
Time (hr)	**Wet Bulb Temp (°F)**	**Dry Bulb Temp (°F)**	**Wet Bulb Temp (°F)**	**Dry Bulb Temp (°F)**
1	69.87	84	69.87	84
2	68.69	82	68.69	82
3	66.82	78	66.82	78
4	67.02	77	67.02	77
5	69.04	78	69.04	78
6	68.48	78	68.48	78
7	68.14	77	68.14	77
8	67.10	74	67.10	74
9	67.10	74	67.10	74
10	67.80	76	67.80	76
11	67.23	76	67.23	76
12	69.79	82	69.79	82
13	70.98	84	70.98	84
14	72.71	86	72.71	86
15	74.15	89	74.15	89
16	74.71	93	74.71	93
17	74.98	94	74.98	94
18	75.82 ~~75.92~~	93	75.82 ~~75.92~~	93
19	74.98	98	74.98	98
20	74.20	97	74.20	97
21	74.19	97	74.19	97
22	74.16	95	74.16	95
23	74.15	93	74.15	93
24	72.22	90	72.22	90
25	70.49	86	70.49	86
26	71.03	86	71.03	86
27	71.03	86	71.03	86
28	71.03	86	71.03	86
29	71.03	86	71.03	86
30	70.02	81	70.02	81
31	68.24	79	68.24	79
32	68.25	79	68.25	79
33	68.13	77	68.13	77

	US EPR FSAR Table 9.2.5-3		Calvert Cliffs Site-Specific Value	
Time (hr)	**Wet Bulb Temp (°F)**	**Dry Bulb Temp (°F)**	**Wet Bulb Temp (°F)**	**Dry Bulb Temp (°F)**
34	68.13	77	68.13	77
35	69.70	80	69.70	80
36	71.79	83	71.79	83
37	72.98	85	72.98	85
38	75.02	88	75.02	88
39	76.71	92	76.71	92
40	77.49	95	77.49	95
41	78.24	98	78.24	98
42	78.72	100	78.72	100
43	78.48	99	78.48	99
44	77.91	99	77.91	99
45	77.91	99	77.91	99
46	77.10	98	77.10	98
47	76.85	97	76.85	97
48	75.24	93	75.24	93
49	74.14	91	74.14	91
50	72.99	87	72.99	87
51	70.96	84	70.96	84
52	69.33	84	69.33	84
53	68.90	81	68.90	81
54	69.46	81	69.46	81
55	69.13	80	69.13	80
56	69.69	80	69.69	80
57	67.70	79	67.70	79
58	67.70	79 ~~78~~	67.70	79 ~~78~~
59	68.58	80	68.58	80
60	71.53	84	71.53	84
61	72.40	85	72.40	85
62	73	87	73	87
63	73.29	88	73.29	88
64	73.58	89	73.58	89
65	73.58	89	73.58	89
66	73.33	92	73.33	92
67	73.08	93	73.08	93
68	73.36	94	73.36	94
69	74.42	94	74.42	94
70	74.14	93	74.14	93

	US EPR FSAR Table 9.2.5-3		Calvert Cliffs Site-Specific Value	
Time (hr)	Wet Bulb Temp (°F)	Dry Bulb Temp (°F)	Wet Bulb Temp (°F)	Dry Bulb Temp (°F)
71	74.68	93	74.68	93
72	73.28	88	73.28	88

Makeup Capacity

The Ultimate Heat Sink analysis calculation uses 3-day meteorological data that maximizes inventory loss.

Review of the Ultimate Heat Sink sizing criteria calculation indicates the DBA heat load decreases, with no anticipated increases, during the period t=72 hours through t=720 hours. As heat load decreases, the cooling tower range decreases. Lower cooling tower range values yield lower evaporation rates for a given ambient wet bulb temperature. The 72nd hour of the DBA scenario represents the peak anticipated evaporation loss during the last 27 days of the DBA. The worst CCNPP Unit 3 meteorological conditions that result in the maximum evaporation loss of water from the UHS Cooling Tower over a 72 hours period is bounded by the value presented in the U.S. EPR FSAR Table 9.2.5-3.

Drift loss is a fixed percentage of the cooling water flowrate and is provided by the cooling tower vendor based on the drift eliminator configuration used. The drift loss value is independent of ambient environmental conditions. Seepage loss is an estimated value that is assumed to remain constant throughout the 30-day DBA scenario. Valve seat leakage is assumed to remain constant, based on a calculated value considering the number of closed boundary valves and valve sizes used in the system. Blowdown is secured during the DBA.

Makeup flow to the UHS towers under DBA conditions is the sum of the evaporation loss, valve seat leakage loss, drift loss, and seepage loss. The UHS makeup water system consists of four independent safety-related trains which provide makeup water from the Chesapeake Bay to the ESW System to meet the maximum evaporative and drift, seepage, and valve seat leakage water losses for the period from 72 hours post-accident up to 30 days post-accident. The CCNPP Unit 3 UHS Cooling Tower maximum drift loss (percent of water flow) for a single cooling tower will not exceed 0.005% as described in U.S. EPR FSAR Table 9.2.5-2. However, to be conservative 0.01% of cooling water flow has been considered as the design drift loss. This maximum drift loss is bound by the value presented in the U.S. EPR FSAR Table 9.2.5-3. The makeup flow to the cooling tower, when based on the inventory loss at the end of the initial 72-hour period, is sufficient to replenish losses through the end of the 30-day DBA scenario. The CCNPP Unit 3 UHS Makeup Water System provides ≥ 300 gpm of makeup water to the UHS Cooling Tower basin starting 72 hours post DBA. The CCNPP Unit 3 UHS Makeup Water pumps are sized to provide a maximum of approximately 750 gpm to the UHS Cooling Tower basin. This flow is sufficient to provide the minimum required flow even when the intermittent traveling screen wash and the intermittent strainer wash systems are operating.. Therefore, even during the screen wash process, makeup water provided post DBA is adequate to maintain the water level in the basin above the required minimum water level for the ESW pump Net Positive Suction Head (NPSH) and Vortex Suppression, considering the maximum evaporation and drift loss after 72 hours and up to 30 days post DBA. U.S. EPR FSAR Table 9.2.5-2, Ultimate Heat Sink Design Parameters, states the required cooling tower emergency makeup flow, post DBA (72 hours through 30 days) as ≥ 300 gpm. The U.S. EPR design 72 hours meteorological conditions resulting in maximum evaporation and drift from the UHS Cooling Tower, as depicted in U.S. EPR FSAR Table 9.2.5-3 are identical to the CCNPP Unit 3 values for the 72 hours meteorological conditions, resulting in maximum evaporation and drift loss, as shown in the comparison table in COLA FSAR Subsection 9.2.5.3.3. Therefore, the CCNPP Unit 3 UHS Makeup water capacity is bounded by U.S. EPR Makeup Water capacity, to meet the maximum evaporation and drift loss starting 72 hours post DBA through the remainder of the 30 day period.

Figure 9.2-3 provides the interface between the ESW and the UHS makeup water system. U.S. EPR FSAR Section 9.2 provides a detailed discussion of the ESW system, including a simplified flow arrangement for the ESW system.

Design Inlet Wet Bulb Temperature

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The wet bulb temperature is the controlling factor for establishing the tower basin water temperature because of the more limited ability of the ambient air to absorb heat energy in moving through the tower. Refer to U.S. EPR FSAR Table 9.2.5-4 for the worst case 24 hour meteorological period for ESWS cooling which envelopes the site-specific highest wet bulb temperature of 85° F. Alternatively, the higher difference between wet and coincident dry bulb temperatures indicates lower humidity and resultant higher evaporation rate, thus making this the controlling factor for determining both makeup water demand and required tower basin water volume. Refer to U.S. EPR FSAR Table 9.2.5-3 for the worst case 72 hour meteorological period for ESWS evaporation and refer to U.S. EPR FSAR Table 9.2.5-2 for the minimum basin water volume at the start of the DBA. In applying these factors to CCNPP Unit 3, the resulting maximum ESWS tower basin water temperature is less than the 95° F (35° C) worst-case design basis for the ESWS and the Component Cooling Water System (CCWS) heat exchangers. Based on the analysis of the Ultimate Heat Sink (UHS) System with ~~local~~ the worst combination of site-specific wet bulb temperature and dry bulb temperature over a 24 hours period from a 30 years hourly Regional meteorological dataset, it has been determined that the maximum ESWS supply temperature is less than 95° F (35° C) and the maximum evaporative loss from a UHS cooling tower during the post-72 hour design basis accident condition is 249 gpm (943 lpm)~~.~~, and the minimum UHS cooling tower basin water volume to be present in the basin at the start of Design Basis Accident (DBA) is 319,970 ft^3.

Minimum Cooling

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A software routine used in the Ultimate Heat Sink analysis calculation evaluated 30 years of meteorological data (PAXNAS) for Patuxent River Naval Air Station (11 miles from CCNPP Unit 3) and determined the worst 24 hour period from the perspective of minimum cooling. To maximize the basin cooling water temperature, the 24 hour metrological data set has been shifted so that the peak ambient wet bulb temperatures coincide with the peak cooling tower heat loads. These ambient temperature conditions are imposed on the cooling tower model with the highest average wet bulb temperature coincident with the peak cooling tower heat load for the first 24 hours of the DBA. The shifting of the site-specific peak ambient wet bulb temperature values constitute a departure from U.S. EPR FSAR Tier 2 Table 9.2.5-4, and is discussed in COLA Part 7.

The table below provides a comparison of the Table 9.2.5-4 values in the U.S. EPR FSAR and the CCNPP site-specific values used for minimum cooling from the UHS. ~~Because the same 24 hours of temperature values are used to determine the minimum water cooling in the UHS for both the U.S. EPR FSAR and CCNPP Unit 3, the minimum water cooling is the same and as such, the U.S. EPR design values envelop the CCNPP3 site characteristics.~~

	US EPR FSAR Table 9.2.5-4		Calvert Cliffs Site-Specific Value	
Time (hr)	Wet Bulb Temp (°F)	Dry Bulb Temp (°F)	Wet Bulb Temp (°F)	Dry Bulb Temp (°F)
1	75.8	82	82.0	93.0
2	76.1	83	84.6	99.0
3	76.1	83	85.3	99.0
4	77.3	85	85.3	99.0
5	79.7	89	84.2	100.0
6	80.8	91	84.2	100.0
7	82	93	84.6	99.0
8	84.6	99	83.9	99.0
9	85.3	99	83.9	99.0
10	85.3	99	82.6	96.0
11	84.2	100	82.6	93.0
12	84.2	100	82.1	91.0
13	84.6	99	82.1	91.0
14	83.9	99	81.9	90.0
15	83.9	99	80.7	88.0
16	82.6	96	80.7	88.0
17	82.6	93	79.5	86.0
18	82.1	91	79.5	86.0
19	82.1	91	75.8	82.0
20	81.9	90	76.1	83.0
21	80.7	88	76.1	83.0
22	80.7	88	77.3	85.0
23	79.5	86	79.7	89.0
24	79.5	86	80.8	91.0

1.1 DEPARTURES

This Departure Report includes deviations in the CCNPP Unit 3 COL application FSAR from the information in the U.S. EPR FSAR, pursuant to 10 CFR Part 52. The U.S. EPR Design Certification Application is currently under review with the NRC. However, for the purposes of evaluating these deviations from the information in the U.S. EPR FSAR, the guidance provided in Regulatory Guide 1.206, Section C.IV.3.3, has been utilized.

The following Departures are described and evaluated in detail in this report:

1. Maximum Tilt Settlement (across the basemat)
2. Maximum Annual Average Atmospheric Dispersion Factor (limiting sector),
3. Accident Atmospheric Dispersion Factor (0-2 hour, Low Population Zone)
4. Shear Wave Velocity
5. Not used
6. Soil Column Beneath the Nuclear Island, ESWB and EPGB
7. Generic Technical Specifications and Bases - Setpoint Control Program
8. Human Performance Monitoring
9. Post-DBA UHS Keep-Fill line - UHS Makeup Water System
10. UHS Makeup Water Pump Starting Logic
11. <u>Shifting of Twenty-Four (24) Hour Peak Ambient Temperature Profile</u>

1.1.11 Shifting of Twenty-Four (24) Hour Peak Ambient Temperature Profile

Affected U.S. EPR FSAR Sections: Tier 2, Table 9.2.5-4, Design Values for Minimum Water Cooling in the UHS.

Summary of Departure:

The U.S. EPR FSAR Tier 2, Table 9.2.5-4, Design Values for Minimum Water Cooling in the UHS, contains the worst 24 hours meteorological conditions considered for the design of the UHS Cooling Tower to maintain maximum ESWS tower basin water temperature less than the 95° F (35° C). To maximize the basin cooling water temperature, the site-specific 24 hour meteorological data set has been shifted so that the peak ambient wet bulb temperatures coincide with the peak cooling tower heat loads. These ambient temperature conditions are imposed on the cooling tower model with the highest average wet bulb temperature coincident with the peak cooling tower heat load for the first 24 hours of the DBA. Due to the shifting of the worst 24 hours meteorological conditions, Calvert Cliffs Unit 3 is not bounded by U.S. EPR FSAR Tier 2, Table 9.2.5-4.

Scope/Extent of Departure:

This Departure is identified in the CCNPP Unit 3 FSAR Section 9.2.5.7.3.1.

Departure Justification:

Shifting of the worst 24 hours meteorological conditions maximizes the basin cooling water temperature, so that the peak ambient wet bulb temperatures coincide with the peak cooling tower heat loads. This is a more conservative condition than the conditions assumed in the U.S. EPR FSAR. The site-specific analysis has determined that the U.S. EPR FSAR requirement that ESWS tower basin water temperature is less than the 95° F (35° C), is achieved.

Departure Evaluation:

This Departure associated with the shifting of the Twenty-Four (24) Hour Peak Ambient Temperature Profile has been evaluated and determined not to affect the ability of the UHS Cooling tower to maintain ESWS tower basin water temperature less than the 95° F (35° C).

Therefore, this Departure does not:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the plant-specific FSAR;

2. Result in more than a minimal increase in the likelihood of occurrence of malfunction of a structure, system, or component (SSC) important to safety and previously evaluated in the plant-specific FSAR;

3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the plant-specific FSAR;

4. Result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the plant-specific FSAR;

5. Create a possibility for an accident of a different type than any evaluated previously in the plant-specific FSAR;

6. Create a possibility for a malfunction of an SSC important to safety with a different result than any evaluated previously in the plant-specific FSAR;

This Departure does not affect resolution of a severe accident issue identified in the plant specific FSAR.

Based on the above, this Departure has no safety significance.

Enclosure 2

Table of Changes to CCNPP Unit 3 COLA Associated with Response to RAI No. 287

Table of Changes to CCNPP Unit 3 COLA Associated with Response to RAI No. 287

Change ID #	Subsection	Type of Change	Description of Change
Part 2 – FSAR			
10-0009	9.2.5	Incorporate COLA markups associated with the response to RAI 182, Q03.02.02-1[2]	The response to RAI 182, Q03.02.02-1 modifies and adds information associated with the UHS Makeup Water Intake Structure Traveling Screens.
11-0094	9.2.5.1	Incorporate COLA markups associated with the response to RAI 286, Q09.02.05-18[3]	The response to RAI 286, Q09.02.05-18 updates flow values.
11-0137	9.2.5.2.3	Incorporate COLA markups associated with the response to RAI 279, Q09.02.05-7[4]	The response to RAI 279, Q09.02.05-7 modifies a valve number.
11-0096	9.2.5.1	Incorporate COLA markups associated with the response to RAI 277, Q09.02.01-1[5]	The response to RAI 277, Q09.02.01-1 adds UHS makeup pump information.
12-0142	9.2.5.3.2	Incorporate COLA markups associated with the response to RAI 340, Q03.09.06-4[6]	The response to RAI 340, Q03.09.06-4 adds UHS makeup pump information.

[2] UniStar Nuclear Energy Letter UN#10-062, 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 182, System Quality Group Classification, dated March 12, 2010

[3] UniStar Nuclear Energy Letter UN#11-122, 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 286, Ultimate Heat Sink, dated April 6, 2011

[4] UniStar Nuclear Energy Letter UN#11-230, 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 279, Ultimate Heat Sink, dated August 19, 2011

[5] UniStar Nuclear Energy Letter UN#11-123, 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 277, Essential Service Water System, dated April 1, 2011

[6] UniStar Nuclear Energy Letter UN#12-077, from Mark T. Finley to Document Control Desk, U.S. NRC, Response to Request for Additional Information for the Calvert Cliffs Nuclear Power Plant, Unit 3, RAI 340, Functional Design Qualification and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints, dated July 26, 2012

Change ID #	Subsection	Type of Change	Description of Change
12-0242	1.8.2, 2.4.11.6, 9.2.5.1, 9.2.5.2.3, 9.2.5.2.4, 9.2.5.3.2, 9.2.5.4.1, 9.2.5.4.2, 9.2.5.5, 9.2.5.6, 9.2.5.7.3.1, 9.2.5.7.3.2, 14.2.14.2, Table 3.9-2, Table 3.10-1, and Figure 9.2-3 and 9.2-10	Incorporate COLA markups associated with the response to RAI 332, Q09.02.05-22[7]	The response to RAI 332, Q09.02.05-22 modifies and adds information associated with UHS piping.
13-0080	Table 1.8-2 9.2.5.2, 9.2.5.2.3 9.2.5.2.4 9.2.5.3.3	Incorporate COLA markups associated with the response to RAI 287, Q09.02.05-19	The response to RAI 287, Q09.02.05-19 modifies and adds information associated with COL Items 9.2-5, 9.2-6, 9.2-8, 9.2-9 and 9.2-11.
Part 7 – Departures			
11-0137	1.1.8	Incorporate COLA markups associated with the response to RAI 279, Q09.02.05-7[4]	The response to RAI 279, Q09.02.05-7 added a departure for Test Bypass Valve and piping for ESW Emergency Makeup piping design
12-0242	1.1.8, 1.1.9	Incorporate COLA markups associated with the response to RAI 332, Q09.02.05-22	The response to RAI 332, Q09.02.05-22 deletes departure 1.1.8 and adds new Departure 1.1.9 for Post-DBA UHS Makeup Keep-Fill piping, Valves and flow restricting orifice for the UHS Makeup Water System design, and deletes departure 1.1.8 for the test Bypass Valve and piping for ESW Emergency Makeup piping design.
Part 10 – Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) and ITAAC Closure			
12-0242	Appendix B, ITAAC Table 2.4-22, Table 2.4-29, and Figure 2.4-3	Incorporate COLA markups associated with the response to RAI 332, Q09.02.05-22	The response to RAI 332, Q09.02.05-22 adds new ITAAC Table 2.4-22 Items 23 and 24, adds new information to Table 2.4-29, and adds ITAAC Figure 2.4-3.

[7] UniStar Nuclear Energy Letter UN#12-154, from Mark T. Finley to Document Control Desk, U.S. NRC, Response to Request for Additional Information for the Calvert Cliffs Nuclear Power Plant, Unit 3, RAI 332, Ultimate Heat Sink, dated December 20, 2012