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10 CFR 50.4  
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June 19, 2012

UN#12-051

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 351, Light Load Handling System (Related to Refueling)

References: 1) Surinder Arora (NRC) to Paul Infanger (UniStar Nuclear Energy), "FINAL  
RAI 351 SPFP 6498, dated May 22, 2012

2) Areva EPR DC - DRAFT Response to U.S. EPR Design Certification  
Application RAI No. 385, FSAR Ch. 9, Questions 09.01.04-15, -16 & -17 (Part 1  
of 4), dated June 30, 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 (UNE), dated May 22, 2012 (Reference 1). This RAI addresses Light Load Handling System (Related to Refueling), as discussed in Section 9.1.4 of the Final Safety Analysis Report (FSAR), as submitted in the Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 Combined License Application (COLA), Revision 8.

Enclosure 1 provides our response to RAI No. 351, Question 09.01.04-1, 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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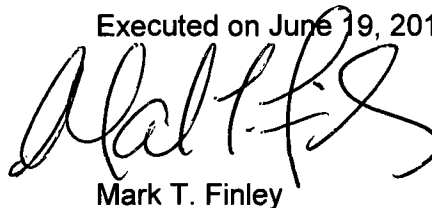
This response to RAI No. 351, Question 09.01.04-1 includes a change to the wording of Combined License (COL) Item 9.1-2 in FSAR Table 1.8-2, FSAR Subsection 9.1.4, and COLA Part 10: Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Appendix A. No previous UNE RAI responses have involved a change to these sections of the CCNPP Unit 3 COLA. The original wording of COL Item 9.1-2, reflected in Revision 8 of the CCNPP Unit 3 COLA, is consistent with the draft response to U.S. EPR Design Certification Application RAI No. 385, Question 09.01.04-15, dated June 30, 2011 (Reference 2). Enclosure 2 provides a table of changes to the CCNPP Unit 3 COLA associated with this RAI response.

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) 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 June 19, 2012



Mark T. Finley

- Enclosures:
- 1) Response to NRC Request for Additional Information RAI No. 351, Question 09.01.04-1, Light Load Handling System (Related to Refueling), Calvert Cliffs Nuclear Power Plant, Unit 3
  - 2) Table of Changes to CCNPP Unit 3 COLA Associated with Response to RAI No. 351, 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  
Getachew Tesfaye, 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)

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bcc: Sebastien Thomas, Sr. NI Engineer, Regulatory Affairs & Engineering  
Jon Kirkwood, Bell Bend Licensing

**Enclosure 1**

**Response to NRC Request for Additional Information RAI No. 351,  
Question 09.01.04-1, Light Load Handling System (Related to Refueling),  
Calvert Cliffs Nuclear Power Plant, Unit 3**

**RAI No. 351**

**NRC Question 09.01.04-1**

In accordance with 10CFR52.79(a)(28), the COL applicant is to provide preoperational testing and initial operations. RG 1.68 provides guidance that appropriate tests should be conducted to demonstrate that equipment and components used to handle or cool irradiated and non-irradiated fuel will operate in accordance with design.

Table 1.8-2 "U.S. EPR Combined License Information Items" of the DCD contains COL 9.1-2 requesting the COL applicant to provide a cask design acceptable for interfacing with the SFCTF prior to initial cask loading operations. The COL item specifies the design of the spent fuel cask must meet the following interface requirements:

- The mating surface of the cask maintains a leak-tight connection with the penetration assembly when the cask is connected to the penetration.
- The dose rates from a loaded cask during cask handling operations does not exceed those identified in Section 12.3.
- A structural and seismic analysis of the SFCTM and cask demonstrates that the fluid boundary between the penetration assembly and connected cask is maintained to preclude the loss of significant inventory in the spent fuel pool during cask loading operations, including safe shutdown earthquake (SSE), and the postulated drop of a fuel assembly from the maximum handling height in the cask loading pit onto a connected cask.

To address COL Item 9.1-2, Section 9.1.4 of the COL includes a commitment to provide, prior to initial cask loading operations, a cask design that satisfies the requirements in U. S. EPR FSAR Section 9.1.4 for interfacing with the spent fuel cask transfer facility (SFCTF). In the absence of the cask design, the staff is unable to locate any test program or other means to verify the proper operation of the SFCTF.

In order to assure the capability to remove fuel from the spent fuel pool, the applicant needs to demonstrate that an identified NRC-approved cask can be safely connected to SFCTF prior to fuel load. Additionally, the staff is unable to locate any test program to address COL 9.1-2 to verify that the design of the spent fuel cask meet the interface requirements. Therefore, the applicant is requested to provide a test program or other method to verify proper operation of the SFCTF prior to fuel load and prior to initial SFCTF use.

**Response**

The response to U.S. EPR RAI 525, Question 09.01.04-28<sup>1</sup> served to revise the wording of COL Item 9.1-2. Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 COLA FSAR Table 1.8-2, "FSAR Sections that Address COL Items" and FSAR Subsection 9.1.4, "Fuel Handling System" are being revised accordingly to reflect the new wording of COL Item 9.1-2. The text in CCNPP Unit 3 FSAR Subsection 9.1.4, and COLA Part 10: Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) which identifies how COL Item 9.1-2 is addressed, is being revised to include a two-step approach for addressing COL Item 9.1-2.

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<sup>1</sup> Areva Response to U.S. EPR Design Certification Application RAI No. 525 (6194, 6154), FSAR Ch. 9, Supplement 3, dated May 30, 2012.

## COLA Impact

CCNPP Unit 3 FSAR Chapter 1 and Chapter 9 will be updated as follows in a future COLA revision:

**Table 1.8-2 – FSAR Sections that Address COL Items**

Item No.	Description	Section
...		
9.1-2	<p><del>A COL applicant that references the U.S. EPR design certification will provide a cask design acceptable for interfacing with the SFCTF prior to initial cask loading operations. The design of the spent fuel cask must meet the following interface requirements:</del></p> <ul style="list-style-type: none"> <li><del>◆ The mating surface of the cask maintains a leak-tight connection with the penetration assembly when the cask is connected to the penetration.</del></li> <li><del>◆ The dose rates from a loaded cask during cask handling operations do not exceed those identified in Section 12.3.</del></li> <li><del>◆ A structural and seismic analysis of the SFCTM and cask demonstrates that the fluid boundary between the penetration assembly and connected cask is maintained to preclude the loss of significant inventory in the spent fuel pool during cask loading operations, including safe shutdown earthquake (SSE), and the postulated drop of a fuel assembly from the maximum handling height in the cask loading pit onto a connected cask.</del></li> </ul> <p><u>A COL applicant that references the U.S. EPR design certification will perform appropriate tests and analyses, which demonstrate that an identified NRC-approved cask can be safely connected to the spent fuel cask transfer facility (SFCTF), and the cask and its adapter meet the criteria specified in Table 9.1.4-1, prior to initial fuel loading into the reactor.</u></p> <p>9.1.4</p>	9.1.4
...		

#### 9.1.4 Fuel Handling System

The U.S. EPR FSAR included the following COL Item in Section 9.1.4:

~~A COL applicant that references the U.S. EPR design certification will provide a cask design acceptable for interfacing with the SFCTF prior to initial cask loading operations. The design of the spent fuel cask must meet the following interface requirements:~~

- ~~◆ The mating surface of the cask maintains a leak-tight connection with the penetration assembly when the cask is connected to the penetration.~~
- ~~◆ The dose rates from a loaded cask during cask handling operations do not exceed those identified in Section 12.3.~~
- ~~◆ A structural and seismic analysis of the SFCTM and cask demonstrates that the fluid boundary between the penetration assembly and connected cask is maintained to preclude the loss of significant inventory in the spent fuel pool during cask loading operations, including safe shutdown earthquake (SSE), and the postulated drop of a fuel assembly from the maximum handling height in the cask loading pit onto a connected cask.~~

A COL applicant that references the U.S. EPR design certification will perform appropriate tests and analyses, which demonstrate that an identified NRC-approved cask can be safely connected to the spent fuel cask transfer facility (SFCTF), and the cask and its adapter meet the criteria specified in Table 9.1.4-1, prior to initial fuel loading into the reactor.

The COL Item is addressed as follows with the following two-step approach:

~~Prior to initial cask loading operations, a cask design that satisfies the requirements in U.S. EPR FSAR Section 9.1.4 for interfacing with the SFCTF will be provided.~~

Before initial fuel loading into the reactor, the licensee shall perform an appropriate test and analysis that demonstrates that an identified NRC-approved cask can be safely connected to the SFCTF, and the cask and its adapter meet the criteria specified in U.S. EPR FSAR Table 9.1.4-1. Before initial fuel loading into the reactor, the licensee shall submit a report documenting the test and analysis required above and the results obtained, to the Director of the Office of New Reactors or the Director's designee.

The licensee shall not use the SFCTF for initial cask loading operations until the licensee performs the tests identified below, verifies that the results of the tests fall within the acceptance criteria and submits a report to the Director of the Office of New Reactors or the Director's designee.

The tests are:

- Verify the penetration leak tightness with loading pit filled with water.

- Verify the cask loading sequence and the sequential interlocking with the actual cask and a dummy assembly under water.

...

CCNPP Unit 3 COLA Part 10: ITAAC will be updated as follows in a future COLA revision:

## 2. COL ITEMS

...

### COL Item 9.1-2 in Section 9.1.4

Before initial fuel loading into the reactor, {Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC} will provide a cask design acceptable for interfacing with the SFCTF prior to initial cask loading operations. The design of the spent fuel cask must meet the following interface requirements:

- ◆ The mating surface of the cask maintains a leak-tight connection with the penetration assembly when the cask is connected to the penetration.
- ◆ The dose rates from a loaded cask during cask handling operations do not exceed those identified in Section 12.3.
- ◆ A structural and seismic analysis of the SFCTM and cask demonstrates that the fluid boundary between the penetration assembly and connected cask is maintained to preclude the loss of significant inventory in the spent fuel pool during cask loading operations, including safe shutdown earthquake (SSE), and the postulated drop of a fuel assembly from the maximum handling height in the cask loading pit onto a connected cask.

shall perform an appropriate test and analysis that demonstrates that an identified NRC-approved cask can be safely connected to the Spent Fuel Cask Transfer Facility SFCTF, and the cask and its adapter meet the criteria specified in U.S. EPR FSAR Table 9.1.4-1. Before initial fuel loading into the reactor, the licensee shall submit a report documenting the test and analysis required above and the results obtained, to the Director of the Office of New Reactors or the Director's designee.

The licensee shall not use the SFCTF for initial cask loading operations until the licensee performs the tests identified below, verifies that the results of the tests fall within the acceptance criteria and submits a report to the Director of the Office of New Reactors or the Director's designee.

The tests are:

- Verify the penetration leak tightness with loading pit filled with water.
- Verify the cask loading sequence and the sequential interlocking with the actual cask and a dummy assembly under water.



**Enclosure 2**

**Calvert Cliffs Nuclear Power Plant, Unit 3**

**Table of Changes to CCNPP Unit 3 COLA Associated with Response to RAI No. 351**

**Table of Changes to CCNPP Unit 3 COLA Associated with Response to RAI No. 351**

Change ID #	Subsection	Type of Change	Description of Change
<b>Part 2 – FSAR</b>			
GN-11-0163	Table 1.8-2	Design Control Document (DCD) Revision 3 change reflected in COLA Revision 8.	Original entry of U.S. EPR FSAR COL Item 9.1-2 as reflected in the CCNPP Unit 3 COLA Revision 8.
GN-11-0179	9.1.4	DCD Revision 3 change reflected in COLA Revision 8.	Original entry of U.S. EPR FSAR COL Item 9.1-2 and associated License Condition as reflected in the CCNPP Unit 3 COLA Revision 8.
GN-12-0123	Table 1.8-2, 9.1.4	Incorporate COLA markups associated with the RAI 351 Question 09.01.04-1 response.	<p>The UNE RAI 351 Question 09.01.04-1 response makes the CCNPP Unit 3 COLA consistent with the U.S. EPR Design Certification Application.</p> <p>U.S. EPR FSAR COL Item 9.1-2 was revised in the response to U.S. EPR Design Certification Application RAI No. 525, Question 09.01.04-28, dated May 30, 2012.</p> <p>CCNPP Unit 3 FSAR Table 1.8-2 and Subsection 9.1.4 are revised to make COL Item 9.1-2 consistent with the above response to U.S. EPR Design Certification Application RAI No. 525, Question 09.01.04-28. The text in CCNPP Unit 3 FSAR Subsection 9.1.4, which identifies how COL Item 9.1-2 is addressed, is also revised.</p>
<b>Part 10: ITAAC</b>			
GN-12-0060	Appendix A	DCD Revision 3 change reflected in COLA Revision 8.	Original entry of U.S. EPR FSAR COL Item 9.1-2 License Condition as reflected in the CCNPP Unit 3 COLA Revision 8.
GN-12-0123	Appendix A	Incorporate COLA markups associated with the RAI 351 Question 09.01.04-1 response.	<p>The UNE RAI 351 Question 09.01.04-1 response makes the CCNPP Unit 3 COLA consistent with the U.S. EPR Design Certification Application.</p> <p>U.S. EPR FSAR COL Item 9.1-2 was revised in the response to U.S. EPR Design Certification Application RAI No. 525, Question 09.01.04-28, dated May 30, 2012.</p> <p>The COL Item 9.1-2 text in CCNPP Unit 3 Part 10 ITAAC (Section 2 – COL ITEMS) is revised to identify how COL Item 9.1-2 is addressed.</p>