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UniStar
NUCLEAR ENERGY

10 CFR 50.4
10 CFR 52.79

June 4, 2014

UN#14-046

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: UniStar Nuclear Energy, NRC Docket No. 52-016
Supplemental Response to Request for Additional Information for the Calvert Cliffs Nuclear Power Plant, Unit 3,
RAI 391, Radiation Protection Design Features

References:

1) Surinder Arora (NRC) to Paul Infanger (UniStar Nuclear Energy), "CCNPP3 - FINAL RAI 391 RPAC 7115" email dated June 19, 2013

2) UniStar Nuclear Energy Letter UN#13-114, 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 391, Radiation Protection Design Features, dated August 16, 2013

3) UniStar Nuclear Energy Letter UN#14-003, from Paul Infanger to Document Control Desk, U.S. NRC, Response to Request for Additional Information for the Calvert Cliffs Nuclear Power Plant, Unit 3, RAI 409, Radiation Protection Design Features, dated January 16, 2014

The purpose of this letter is to provide a supplemental response to the request for additional information (RAI) identified in the NRC e-mail correspondence to UniStar Nuclear Energy (UNE), dated June 19, 2013 (Reference 1). This RAI addresses Radiation Protection Design Features, as discussed in Section 12.3 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.

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The RAI 391, Question 12.03-12.04-11, Part 3 response provided in Reference 2 indicated that a note was added to CCNPP Unit 3 FSAR Table 13.4-1, "Operational Programs Required by NRC Regulations and Program Implementation." The note added (Note 4) read as follows:

> Note 4 The CCNPP Unit 1 and 2 Radiation Protection Program is responsible for establishing and maintaining controls for the life of the CCNPP Unit 1 and 2 ISFSI. The CCNPP Unit 3 Radiation Protection Program will adopt the ALARA responsibility for Unit 3 personnel upon the receipt of the first load of new fuel.

The RAI 409, Question 12.03-13 response provided in Reference 3 indicated that FSAR Section 12.3.5.1 has been revised to specify that Calvert Cliffs Units 1 and 2 is responsible for total dose from all sources used on site and that this includes the sources used in the construction of CCNPP Unit 3 until CCNPP Unit 3 is provided its radioactive material license.

The purpose of this RAI 391, Question 12.03-12.04-11 supplemental response is to make the Note 4 of FSAR Table 13.4-1 consistent with the FSAR Section 12.3.5.1 text added in the RAI 409, Question 12.03-13 response (Reference 3).

Enclosure 1 provides our supplemental response to RAI 391, Question 12.03-12.04-11, 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 CCNPP Unit 3 COLA associated with this RAI 391, Question 12.03-12.04-11 supplemental response.

Our response does not include any new regulatory commitments. This letter, and its enclosures, do not contain any sensitive or proprietary information.

If there are any questions regarding this transmittal, please contact me at (410) 369-1987 or Mr. Mark Finley at (410) 369-1907.

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

Executed on June 4, 2014

Paul Infanger

Enclosures:
1) Supplemental Response to NRC Request for Additional Information, RAI 391, Question 12.03-12.04-11, Calvert Cliffs Nuclear Power Plant, Unit 3
2) Table of Changes to CCNPP Unit 3 COLA Associated with the Supplemental Response to RAI 391, Calvert Cliffs Nuclear Power Plant, Unit 3

cc: Surinder Arora, NRC Project Manager, U.S. EPR Projects Branch
Tomeka Terry, NRC Environmental Project Manager, U.S. EPR COL Application
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

Supplemental Response to NRC Request for Additional Information, RAI 391, Question 12.03-12.04-11, Calvert Cliffs Nuclear Power Plant, Unit 3

RAI No 391

Question 12.03-12.04-11

This RAI is a follow up to RAI 354, Question 12.03-12.04-10.

Calvert Cliffs Unit 3 construction workers are considered members of the public. Therefore, Calvert Cliffs Unit 3 construction workers cannot exceed the dose limits provided in 10 CFR 20.1301. 10 CFR 20.1301 requires that the total effective dose equivalent to individual members of the public does not exceed 100 mrem in a year or 2 mrem in any one hour. Consistent with the requirements in 10 CFR 20.1302, the licensee is required to make or cause to be made, as appropriate, surveys of radiation levels in unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas to demonstrate compliance with the dose limits for individual members of the public in § 20.1301. The licensee shall show compliance with the annual dose limits in 10 CFR 20.1301, as described in 10 CFR 20.1302(b).

In response to Question 12.03-12.04-10 and in subsequent calculation packages provided to the staff, UniStar provided information indicating that doses to construction workers would remain below 100 mrem/year during the construction period. However, this information is based on workers being located in expected working areas and assumes that stay times of workers in higher dose rate areas are limited. Staff notes that construction worker dose rates could potentially be greater than indicated if workers enter higher dose rate areas (such as adjacent to the ISFSI or resin storage area fence) or if an individual worker spends greater than the expected amount of time in higher dose rate areas. In addition, the applicant indicated that there are still some uncertainties related to the loading of the ISFSI and resin storage area and uncertainties related to the location of workers.

UniStar acknowledges in FSAR Section 12.3.5.1 and in subsequent calculation packages that they will be relying on Calvert Cliffs Units 1 & 2 radiation protection and ALARA programs to ensure that construction worker doses are maintained ALARA and that the limits provided in 10 CFR 20.1301 are not exceeded. However, upon reviewing the recent information provided by UniStar, it became apparent that the applicant cannot definitively ensure construction worker dose limits will not be exceeded without relying on operational program(s). Staff notes that for Calvert Cliffs Unit 3 to credit the Calvert Cliffs Units 1 & 2 radiation protection and ALARA programs, Calvert Cliffs Units 1 & 2 will have to update their programs and licensing basis to appropriately include Calvert Cliffs Unit 3. Finally, staff has concerns regarding specific construction areas near the ISFSI and resin storage area from reviewing the applicant's calculation packages and FSAR Revision 9.

Based on the above discussion, UniStar is requested to provide the following additional information:

1. Provide documentation of the agreement between Calvert Cliffs Units 1 & 2 and Calvert Cliffs Unit 3 showing that Calvert Cliffs Units 1 & 2 commit to expand their radiation protection and ALARA programs to cover Calvert Cliffs Unit 3 construction workers.

2. Revise Calvert Cliffs Unit 3 FSAR Section 12.3.5 to provide more information explaining how the Calvert Cliffs 1 & 2 radiation protection and ALARA programs will function for Calvert Cliffs Unit 3 construction workers.

3. Update Calvert Cliffs Unit 3 FSAR Table 13.4-1 to indicate when the Calvert Cliffs Units 1 & 2 radiation protection and ALARA programs will take effect and terminate for Calvert Cliffs Unit 3.

4. Update the construction worker dose rate calculation information in Calvert Cliffs Unit 3 FSAR Section 12.3.5 with current data and dose estimates, consistent with information provided to staff in the most recent calculation packages, ensuring that the data presented in the FSAR is accurate and consistent.

5. FSAR Revision 9, Figures 12.3-7 and 12.3-11 show a spoils, painters, and operators area adjacent to the resin storage area. FSAR Table 12.3-5 provides historical TLD readings along the resin storage area fence adjacent to the spoils, painters, and operators area reading as high as 166 milli-Roentgen/90 days. However, FSAR Table 12.3-9 indicates that the maximum dose rate to a construction worker over a 2,200 hour period in the Laydown/Spoils area is 22.36 mrem.

a. Please explain why the maximum dose rate in laydown/spoils areas is only 22.36 mrem/2,200 hours, when historical TLD readings very close to the laydown/spoils area adjacent to the resin storage area, have been as high as 166 mrem/90 days and 372 mrem/year in calendar year 2001.

b. In addition, since dose rates near the resin storage area fence could potentially exceed 100 mrem/2,200 hours, please update FSAR Section 12.3.5 to describe any specific procedures or controls that will be utilized to ensure that individual construction workers will not receive doses in excess of 100 mrem/year (particularly for workers in the spoils, painters, and operators area, adjacent to the resin storage area).

c. 10 CFR 20.1101(b) requires that the licensee use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve doses to members of the public that are as low as is reasonably achievable (ALARA). Please explain how having the spoils, painters, and operator's area in such close proximity to the resin storage area is ALARA.

6. FSAR Figures 12.3-7 and 12.3-11 show a parking lot to the southwestern side of the ISFSI. A small portion of this parking lot is inside the 100 mrem/8,760 hours contour in Figure 12.3-7.

a. Since there are uncertainties in the future loading of the ISFSI, please update the FSAR describing any specific procedures or controls that will be utilized to ensure that a construction worker does not receive significant dose from spending time in the parking lot or receive doses in excess of regulatory limits from spending time in the parking lot.

b. 10 CFR 20.1101(b) requires that the licensee use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve doses to members of the public that are as low as is reasonably achievable (ALARA). Please explain how locating this parking lot so close to the ISFSI is ALARA.

Supplemental Response

The request for additional information (RAI) 391, Question 12.03-12.04-11, Part 3 response[1] indicated that a note was added to Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 Final Safety Analysis Report (FSAR) Table 13.4-1, "Operational Programs Required by NRC Regulations and Program Implementation." The note added (Note 4) read as follows:

> Note 4 The CCNPP Unit 1 and 2 Radiation Protection Program is responsible for establishing and maintaining controls for the life of the CCNPP Unit 1 and 2 ISFSI. The CCNPP Unit 3 Radiation Protection Program will adopt the ALARA responsibility for Unit 3 personnel upon the receipt of the first load of new fuel.

The RAI 409, Question 12.03-13 response[2] indicated that FSAR Section 12.3.5.1 has been revised to specify that Calvert Cliffs Units 1 and 2 is responsible for total dose from all sources used on site and that this includes the sources used in the construction of CCNPP Unit 3 until CCNPP Unit 3 is provided its radioactive material license.

The purpose of this RAI 391, Question 12.03-12.04-11 supplemental response is to make the Note 4 of FSAR Table 13.4-1 consistent with the FSAR Section 12.3.5.1 text added in the RAI 409, Question 12.03-13 response[2]. Note 4 of FSAR Table 13.4-1 has been revised to indicate that the CCNPP Unit 3 Radiation Protection Program will adopt the ALARA responsibility for Unit 3 personnel when CCNPP Unit 3 is provided its radioactive material license.

COLA Impact

FSAR Table 13.4-1 has been revised as follows (the text shown in blue was added as part of the RAI 391, Question 12.03-12.04-11 response.[1] The red strikeout text and green underline text are added in this response):

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[1] UniStar Nuclear Energy Letter UN#13-114, 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 391, Radiation Protection Design Features, dated August 16, 2013

[2] UniStar Nuclear Energy Letter UN#14-003, from Paul Infanger to Document Control Desk, U.S. NRC, Response to Request for Additional Information for the Calvert Cliffs Nuclear Power Plant, Unit 3, RAI 409, Radiation Protection Design Features, dated January 16, 2014

Table 13.4-1—{Operational Programs Required by NRC Regulations and Program Implementation}
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Item	Program Title	Source (Required By)	FSAR Section	Implementation Milestones	Implementation Requirements
...					
10	Radiation Protection Program	10 CFR 20.1101 10 CFR 20.1406	12.1 12.5 Note 1 Note 4	Prior to receipt of by-product, source, or special nuclear material (excluding Exempt Quantities as described in 10 CFR 30.18) for those elements of the Radiation Protection Program (RPP) necessary to support such receipt Prior to receipt of fuel onsite for those elements of the RPP necessary to support such receipt Prior to initial fuel load for those elements of the RPP necessary to support fuel load and plant operation Prior to first shipment of radioactive waste for those elements of the RPP necessary to support such shipment	License Condition
11	Non-licensed Plant Staff Training Program	10 CFR 50.120; 10 CFR 52.79(a)(33)	13.2	18 months prior to scheduled date of initial fuel load	10 CFR 50.120(b)

Table 13.4-1—{Operational Programs Required by NRC Regulations and Program Implementation}
(Page 6 of 6)

Item	Program Title	Source (Required By)	FSAR Section	Implementation Milestones	Implementation Requirements
…					

Note 1 The corresponding U.S. EPR FSAR sections are incorporated by reference and include additional information regarding these programs.
Note 2 The Quality Assurance Program Description covers all phases of the facility's life, including design, construction, and operation. Implementation of the Quality Assurance Program Description has occurred. As such, a schedule for delayed implementation, after COL issuance, of the Quality Assurance Program Description for the operational phase and the corresponding license condition are not required.
"Construction includes those activities authorized by the issued COL or Limited Work Authorization. This does not include site preparation activities such as clearing, grubbing, excavation, demolition of existing structures, etc.
Note 3 The Inservice Testing Program will be fully implemented by generator online on nuclear heat. Appropriate portions of the program are implemented as necessary to support the system operability requirements of the technical specifications.
Note 4 The CCNPP Unit 1 and 2 Radiation Protection Program is responsible for establishing and maintaining controls for the life of the CCNPP Unit 1 and 2 ISFSI. The CCNPP Unit 3 Radiation Protection Program will adopt the ALARA responsibility for Unit 3 personnel ~~upon the receipt of the first load of new fuel~~ when CCNPP Unit 3 is provided its radioactive material license.

Enclosure 2

Table of Changes to CCNPP Unit 3 COLA Associated with the Supplemental Response to RAI 391, Calvert Cliffs Nuclear Power Plant, Unit 3

Table of Changes to CCNPP Unit 3 COLA

Associated with the Supplemental Response to RAI No. 391

Change ID #	Subsection	Type of Change	Description of Change
Part 2 – FSAR			
CC3-09-0356	12.3.5.1	Incorporate COLA markups associated with the response to RAI 157 Question 12.03-12.04-3.	The RAI 157 Question 12.03-12.04-3 response corrected a dose rate number under the "10 CFR 20.1301" paragraph located in COLA Section 12.3.5.1. The RAI 354, Question 12.03-12.04-10 response amends the dose rate number which was included in the RAI 157 Question 12.03-12.04-3 response.
CC3-10-0012	12.3.5.1, Table 12.3-9, Table 12.3-13	Incorporate COLA markups associated with the response to RAI 199 Question 12.03-12.04-6.	The RAI 199 Question 12.03-12.04-6 response corrected a dose rate number under the "10 CFR 20.1301" paragraph located in COLA Section 12.3.5.1. The RAI 354, Question 12.03-12.04-10 response amends the dose rate number which was included in the RAI 199 Question 12.03-12.04-6 response. The RAI 354, Question 12.03-12.04-10 response also amends the Zone W (Warehouse) dose rate provided in Table 12.3-9 and the collective dose data provided in Table 12.3-13, which was previously provided in the RAI 199 Question 12.03-12.04-6 response.

Change ID #	Subsection	Type of Change	Description of Change
CC3-12-0158	12.3.5.1, Table 12.3-9, Table 12.3-10, Table 12.3-12, Table 12.3-13, and Table 12.3-14	Incorporate COLA markups associated with the response to RAI 354 Question 12.03-12.04-10[3].	The text in FSAR section 12.3.5.1 under the headings, "Projected Dose Rates at CCNPP Unit 3," "ISFSI Dose Rates," "Example Dose Rate Calculation," "10 CFR 20.1301," and "Collective Doses to CCNPP Unit 3 Workers" was modified. The RAI 354 Question 12.03-12.04-10 response assumes that construction begins in the same year that the ISFSI is filled to license capacity (120 Horizontal Storage Modules), and assuming a 6-year construction period during which time the ISFSI remains filled to the same level, the conservatively bounding collective construction worker dose is approximately 6.8 person-rem. FSAR Section 12.3.5, including Tables 12.3-9, 12.3-10, 12.3-12, 12.3-13, and 12.3-14, are updated to reflect the response.
CC3-12-0158	Figure 12.3-7	Incorporate COLA markups associated with the response to RAI 354 Question 12.03-12.04-10[3].	Figure 12.3-7 was updated to improve legibility and more clearly display the worker zones and average dose rate contours.

[3]UniStar Nuclear Energy Letter UN#12-089, 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 354, Radiation Protection Design Features, dated September 20, 2012

Change ID #	Subsection	Type of Change	Description of Change
CC3-13-0126	12.3.5.1, Table 12.3-9, and FSAR Figures 12.3-7 and 12.3-11, and Table 13.4-1	Incorporate COLA markups associated with the response to RAI 391 Question 12.03-12.04-11[1].	The RAI 391 Question 12.03-12.04-11 response[1] corrected a dose rate number under the "10 CFR 20.1301" paragraph located in COLA Section 12.3.5.1. FSAR Table 12.3-9 dose rates have been revised including a revision to indicate that the maximum dose rate in the Laydown Area is 22.10 mrem/2200 hours. FSAR Figure 12.3-7 has been revised to indicate that construction workers (in the spoils, painters and operator's area) are not working adjacent to the areas in which the dose rates could potentially exceed 100 millirem/year (2,200 hours). FSAR Figure 12.3-11 has been revised to focus on the Resin Storage Detail. A note was added to Table 13.4-1 stating that the CCNPP Unit 1 and 2 Radiation Protection Program is responsible for establishing and maintaining controls for the life of the ISFSI.
CC3-14-0053	Table 13.4-1	Incorporate COLA markups associated with the supplemental response to RAI 391 Question 12.03-12.04-11 (this response).	Note 4 of FSAR Table 13.4-1 has been revised to indicate that the CCNPP Unit 3 Radiation Protection Program will adopt the ALARA responsibility for Unit 3 personnel when CCNPP Unit 3 is provided its radioactive material license.