CCNPP3eRAIPEm Resource

From: Arora, Surinder
Sent: Tuesday, August 03, 2010 7:39 AM
To: 'Poche, Robert'; 'cc3project@constellation.com'
Cc: CCNPP3eRAIPEm Resource; Roach, Edward; Dehmel, Jean-Claude; Colaccino, Joseph; Biggins, James; Vrahoretis, Susan; Patel, Jay; Chazell, Russell
Subject: FINAL RAI 254 CHPB 4782
Attachments: FINAL RAI 254 CHPB 4782.doc

Rob,

Attached please find the subject request for additional information (RAI). The draft of this RAI was sent to you on July 22, 2010. No clarification phone call was requested during the draft review period on this RAI.

The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a schedule date for submitting your technically correct and complete response will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the review schedule.

Your response letter should also include a statement confirming that the response does or does not contain any sensitive or proprietary information.

Thanks.

SURINDER ARORA, PE
PROJECT MANAGER,
Office of New Reactors
US Nuclear Regulatory Commission

Phone: 301 415-1421
FAX: 301 415-6406
Email: Surinder.Arora@nrc.gov

Hearing Identifier: CalvertCliffs_Unit3Col_RAI
Email Number: 7

Mail Envelope Properties (B46615B367D1144982B324704E3BCEED2774EFAC60)

Subject: FINAL RAI 254 CHPB 4782
Sent Date: 8/3/2010 7:38:37 AM
Received Date: 8/3/2010 7:38:40 AM
From: Arora, Surinder

Created By: Surinder.Arora@nrc.gov

Recipients:
"CCNPP3eRAIPEm Resource" <CCNPP3eRAIPEm.Resource@nrc.gov>
Tracking Status: None
"Roach, Edward" <Edward.Roach@nrc.gov>
Tracking Status: None
"Dehmel, Jean-Claude" <Jean-Claude.Dehmel@nrc.gov>
Tracking Status: None
"Colaccino, Joseph" <Joseph.Colaccino@nrc.gov>
Tracking Status: None
"Biggins, James" <James.Biggins@nrc.gov>
Tracking Status: None
"Vrahoretis, Susan" <Susan.Vrahoretis@nrc.gov>
Tracking Status: None
"Patel, Jay" <Jay.Patel@nrc.gov>
Tracking Status: None
"Chazell, Russell" <Russell.Chazell@nrc.gov>
Tracking Status: None
"'Poche, Robert'" <Robert.Poche@constellation.com>
Tracking Status: None
"'cc3project@constellation.com'" <cc3project@constellation.com>
Tracking Status: None

Post Office: HQCLSTR01.nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	1036	8/3/2010 7:38:40 AM
FINAL RAI 254 CHPB 4782.doc	43514	

Options
Priority: Standard
Return Notification: No
Reply Requested: Yes
Sensitivity: Normal
Expiration Date:
Recipients Received:

Request for Additional Information No. 254 (eRAI 4782)

8/3/2010

Calvert Cliffs Unit 3
UniStar
Docket No. 52-016
SRP Section: 11.02 - Liquid Waste Management System
Application Section: 11.2

QUESTIONS for Health Physics Branch (CHPB)

11.02-3

Supplemental question to the response of RAI 209, Question 11.02-1

In the response dated April 24, 2010, the applicant provides information addressing the staff's concerns on the approach used in determining doses to the members of the public due to liquid effluents and confirming compliance with NRC regulations and guidance. The response presents a complete revision of FSAR Section 11.2 and includes information supporting a site-specific dose assessment for liquid effluent releases to the Chesapeake Bay, a cost-benefit analysis, and a revision to the departures and exemption reports (Part 7 of the application).

The additional information appears generally acceptable, but the staff was unable to independently confirm some of the dose results, approach and results used in the cost-benefit analysis, and noted a number of inconsistencies in the presentation of the new information and proposed revisions to the FSAR, given the concerns identified in RAI 209, Questions 11.02-1(1) and 11.02-1(2). The response to RAI 209, Question 11.02-1(3) addressing a revision of FSAR Section 2.1.1.3, as it relates to FSAR Section 11.2 and compliance with 10 CFR 20.1301 and 20.1302 and Part 50 Appendix I, appears acceptable.

Based on the staff's review of responses to RAI 209, Questions 11.02-1(1) and 11.02-1(2), the applicant is requested to address the following items in the proposed revision of FSAR Section 11.2 and Part 7:

A. FSAR Sections 11.2.3.3

Provide the appropriate FSAR references (sections or tables) supporting the basis for the:

1. blowdown discharge rate of 21,008 gallons per minute (gpm) (79,500 liters per minute) and liquid waste management system discharge flow rate of 11 gpm (41.6 L/min).

2. dilution factors of 13.3 for fish and invertebrates, 58 for swimming and shoreline exposures, and 296 for desalinization of brackish water to create drinking water.

3. distance of 550 ft (168 m) as the offshore location of the diffuser discharge point.

B. FSAR Section 11.2.3.4.1

In the discussion justifying the exclusion of irrigation as an exposure pathway because of the brackish nature of the Chesapeake Bay, confirm whether this is the case for drinking water within the flow and tidal flux of the Chesapeake Bay that might be drawn and impacted by discharges from the proposed plant.

The information presented in FSAR 11.2.3.4.1 and supporting text do not discuss, nor reference the results of a land-use census and how its results were justified for the analysis presented in FSAR Section 11.2.3.4. The applicant is requested to provide information supporting the selection of the applied offsite dose receptors and exposure pathways and provide a reference for a land-use census.

C. FSAR Section 11.2.3.5

The text states that liquid effluent releases comply with 10 CFR Part 20, Appendix B, Table 2 limits, but does not provide results demonstrating that conclusion. The discussion relies on the results presented in U.S. EPR FSAR Table 11.2-7 as supporting documentation. It should be noted that the results presented in U.S. EPR FSAR Table 11.2-7 are based on a different set of assumptions applied to a hypothetical site. Consequently, these results and underlying assumptions do not apply to the CCNPP-3 plant and site-specific conditions. The applicant is requested to provide site-specific information demonstrating compliance with 10 CFR Part 20, Appendix B, Table 2, Column 2 limits for liquid effluents and unity-rule for the sum-of-the-ratios for discharges associated with normal operation and maximum fuel defects.

D. FSAR Table 11.2-1

Include a footnote providing the basis of the stated shoreline, swimming, and boating usage times of 200, 100, and 200 hrs per year, respectively.

E. FSAR Table 11.2-2

Based on an independent analysis of dose results presented in FSAR Table 11.2-2, the staff confirmed the results for all but the potable exposure pathway. For potable water, the staff's results for the thyroid are about a factor of 1.8 times higher for all four age groups, while in agreement for all other organs.

F. FSAR Table 11.2-3

In FSAR Table 11.2-3, a third line entry should be added to include the thyroid dose and identify the corresponding limiting age group.

G. FSAR Table 11.2-4

In FSAR Table 11.2-4, provide references for the stated historical whole body, thyroid, and maximum organ doses for CCNPP Units 1 and 2 in confirming compliance with 40 CFR Part 190 for the entire site with all three CCNPP units.

H. FSAR Table 11.2-5

Confirm and correct accordingly the following observations for the footnotes cited in FSAR Table 11.2-5:

1. For footnote 1, confirm that table citations should be FSAR Tables 11.2-2 and 11.2-3 and not Tables 11.2-6 and 11.2-7.

2. For footnotes 3 and 4, provide FSAR table citations for the stated sector and boundary distances from the site.

3. Staff comments on results characterizing doses from gaseous effluents presented in this table will be addressed as part of the review of the applicant's response to RAI 210, Question 11.03-1.

I. FSAR Tables 11.2-6, 11.2-7, 11.2-8, and 11.2-9

For the information supporting the results of the cost-benefit analysis (CBA), confirm and correct accordingly the following observations on results and footnotes presented in FSAR Tables 11.2-6, 11.2-7, 11.2-8, and 11.2-9 and supporting FSAR text:

1. Based on a review of U.S. EPR FSAR Section 11.2-3, the derivation of the liquid effluent source term considers the use of an evaporator, centrifuge, and demineralizer in treating liquid wastes before being released to the environment. A review of CCNPP-3 FSAR Section 11.2.4 and Table 11.2-6 (footnotes 1 and 2) indicates that the descriptions of the reference and alternate configurations used in the CBA seem to be reversed in their applications. As described, the alternate configuration appears to use the current design features of the liquid waste management system.

2. For population dose results that reflect shoreline, boating, and swimming activities, provide in FSAR Table 11.2-7 the values assumed in the LADTAP II code for transient times for each mode of exposure.

3. In CCNPP-3 FSAR Table 11.2-7, confirm that the citation of Table 11.2-4 (column headed "Value") should be corrected to reflect that the corresponding information instead is in U.S. EPR FSAR Section 11.2. As presented, the entry implies that the GALE normal operation source term can be found in CCNPP-3 FSAR Table 11.2-4, which is not correct.

4. A review of the population dose results presented in CCNPP-3 FSAR Table 11.2-8 indicates that the estimated doses assigned to the case where an additional demineralizer is used is the base case and not the alternate case. The staff's evaluation confirmed that the projected population doses of 0.105 total body person–rem and 0.199 thyroid person-rem reflect the base case configuration of the liquid waste management system as described in U.S. EPR FSAR Section 11.2.3 and Table 11.2-7 using the normal operation source term. In FSAR Table 11.2-8, the results for the case without a demineralizer, the population doses are 0.159 total body person–rem and 0.625 thyroid person-rem. If the CBA analysis were to assume a system augmentation with another demineralizer added to the basic system design features, the resulting population doses would be expected to be lower than the base case of 0.105 total body person–rem and 0.199 thyroid person-rem. The applicant is requested to address this inconsistency in formulating the conditions and parameters applied to the base and alternate cases.

5. Based on a review of the CBA assumptions listed in FSAR Table 11.2-9, the staff was unable to confirm the assumed total cost of $296,000 for the system augmentation using 30 years for operation and maintenance. Based on the information presented in Regulatory Guide 1.110 and applied to the least costly

demineralizer option (rated at 50 gpm), the staff used a direct cost of $72,000 (RG 1.110,Table A-1), an operating cost of $5,000 per year (RG 1.110, Table A-2), and a maintenance cost of $5,000 per year (RG 1.110, Table A-3). The total cost is estimated to be $372,000, derived as: $72,000 + [($5,000 + $5,000) x 30].

6. In determining whether the system augmentation complies with Section II.D of Appendix I to 10 CFR Part 50, the methodology applied a process other than described in RG 1.110, Regulatory Position C.5 and Appendix A, while stating in FSAR Section 11.2.4.2 that the method applies RG 1.110. The applicant is requested to describe the equivalency of the method applied in the CCNPP-3 FSAR.

J. Departures and Exemption Report (FSAR Part 7)

For the proposed revisions to Section 1.1.X (Liquid Effluent Discharge Design) and Section 1.1.Y (Estimated Doses for Liquid and Gaseous pathways) of the departures and exemption report, the applicant is requested to address and resolve the following observations:

1. In light of the above, the applicant is requested to update the proposed revisions to the Departure Report Section 1.1.X (Liquid Effluent Discharge Design) and Section 1.1.Y (Estimated Doses for Liquid and Gaseous pathways) of the departures and exemption report to reflect the disposition and closure of the above observations.

2. In Departure Report Sections 1.1.X and 1.1.Y, the applicant should refer the regulatory methodology and process applied in screening out the proposed departures in concluding that the changes do not adversely affect any safety-related system or safety-related portion of a system and does not conflict with applicable regulatory guidance.

In Departure Report Section 1.1.Y, the applicant states that doses to maximally exposed individuals from liquid and gaseous effluents are conservative and “bounding for all sites” based on the information presented in U.S. EPR FSAR Sections 11.2.3.4 and 11.3.3.4. This conclusion is incorrect since the assumptions and parameters used in U.S. EPR FSAR Sections 11.2 and 11.3 in assessing doses to maximally exposed individuals and populations rely on characteristics assigned to a hypothetical site and the U.S. EPR FSAR does not present a comparative evaluation of its hypothetical site parameters against the characteristics of potential candidate sites.