

CCNPP3COLA PEmails

From: John Rycyna
Sent: Friday, May 01, 2009 1:13 PM
To: Poche, Robert; McQueeney, Jennifer; katie.thurstin@unistarnuclear.com
Cc: CCNPP3COL Resource; David Jeng; Jim Xu; Michael Miernicki; Joseph Colaccino; James Biggins; Adam Gendelman
Subject: Draft RAI No 118 SEB 2198.doc (PUBLIC)
Attachments: Draft RAI No 118 SEB 2198.doc

Rob,

Attached is DRAFT RAI No. 118. You have until May 15, 2009 to review it and to decide whether you need a conference call to discuss it. After the call or after May 15, 2009 the RAI will be finalized and sent to you. You then have 30 days to respond.

John Rycyna, PE
Sr. Project Manager
Division of New Reactor Licensing
Office of New Reactors
U.S. Nuclear Regulatory Commission
301-415-4122

Hearing Identifier: CalvertCliffs_Unit3Cola_Public_EX
Email Number: 719

Mail Envelope Properties (499C2FC6BB962446994CA8682D8ADF331830D86F73)

Subject: Draft RAI No 118 SEB 2198.doc (PUBLIC)
Sent Date: 5/1/2009 1:12:55 PM
Received Date: 5/1/2009 1:12:57 PM
From: John Rycyna

Created By: John.Rycyna@nrc.gov

Recipients:

"CCNPP3COL Resource" <CCNPP3COL.Resource@nrc.gov>
Tracking Status: None
"David Jeng" <David.Jeng@nrc.gov>
Tracking Status: None
"Jim Xu" <Jim.Xu@nrc.gov>
Tracking Status: None
"Michael Miernicki" <Michael.Miernicki@nrc.gov>
Tracking Status: None
"Joseph Colaccino" <Joseph.Colaccino@nrc.gov>
Tracking Status: None
"James Biggins" <James.Biggins@nrc.gov>
Tracking Status: None
"Adam Gendelman" <Adam.Gendelman@nrc.gov>
Tracking Status: None
"Poche, Robert" <Robert.Poche@constellation.com>
Tracking Status: None
"McQueeney, Jennifer" <Jennifer.McQueeney@unistarnuclear.com>
Tracking Status: None
"katie.thurstin@unistarnuclear.com" <katie.thurstin@unistarnuclear.com>
Tracking Status: None

Post Office: HQCLSTR02.nrc.gov

| Files | Size | Date & Time |
|-------------------------------|-------------|------------------------|
| MESSAGE | 432 | 5/1/2009 1:12:57 PM |
| Draft RAI No 118 SEB 2198.doc | | 53358 |

Options

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

Request for Additional Information No. 118
DRAFT
5/1/2009

Calvert Cliffs Unit 3
UniStar
Docket No. 52-016
SRP Section: 14.03.02 - Structural and Systems Engineering - Inspections, Tests, Analyses, and
Acceptance Criteria
Application Section: FSAR 14.03.02

QUESTIONS for Structural Engineering Branch 2 (ESBWR/ABWR Projects) (SEB2)

14.03.02-2

A.

The staff has conducted its preliminary assessment of Calvert Cliffs Unit 3 FSAR Section 14.3.2, using the acceptance criteria and guidance provided in SRP 14.3.2 and RG 1.206 C.II.1.2.2. As needed, the staff also reviewed Section 14.3.2 of the EPR FSAR. Based on its preliminary assessment, the staff determined that additional information and clarification will be needed before it can determine whether FSAR Section 14.3.2 sufficiently meets the expectations of SRP 14.3.2 and RG 1.206 C.II.1.2.2. Therefore, the staff requests the applicant to address the following:

1. SRP 14.3.2 is entitled "Structural and Systems Engineering – Inspections, Tests, Analyses, and Acceptance Criteria". CCNPP3 FSAR 14.3.2 and EPR FSAR 14.3.2 are entitled "Tier 1, Chapter 2, System Based Design Descriptions and ITAAC. Please confirm that the scope of CCNPP3 FSAR/ EPR FSAR 14.3.2 is consistent with and addresses the scope of SRP 14.3.2. If this is not the case, please explain the differences and, as applicable, identify where in the CCNPP3 FSAR/ EPR FSAR other information pertinent to SRP 14.3.2 can be found.
2. Please explain the process used to identify the eight (8) specific items listed in FSAR Table 14.3-1. If there is information in EPR FSAR 14.3.2 that is used as input to this process, please identify it.
3. Please explain the process used to identify the Site-Specific Structures, Systems and Components listed in FSAR Table 14.3-2. If there is information in EPR FSAR 14.3.2 that is used as input to this process, please identify it.
4. In FSAR Table 14.3-2, there are a number of "No" entries in the "U.S. EPR Interface" column. Please explain the significance of these entries.
5. In FSAR Table 14.3-2, there are a number of "No" entries in the "Selected for ITAAC" column. These always align with a "No" entry in the "U.S. EPR Interface" column. Please explain the significance of these entries.
6. In FSAR Table 14.3-2, there are a number of "Yes" entries in the "Selected for ITAAC" column that align with a "No" entry in the "U.S. EPR Interface" column. Please explain the significance of these entries.

7. The staff compared the entries in FSAR Table 14.3-3 to EPR FSAR Tier 1 Section 4 - "Interface Requirements", and concluded that the EPR interface requirements have been properly identified in FSAR Table 14.3-3. The staff notes that for eight (8) of the interface requirements, no ITAAC is selected for CCNPP3, apparently on the basis that the design information provided in the CCNPP3 FSAR satisfies the interface requirement. Please confirm this, and provide a justification why the information in the FSAR is sufficient. Otherwise, please explain the basis for not selecting an ITAAC.

8. The staff notes that there are ITAAC identified in FSAR Part 10 Appendix B related to all eight (8) of the FSAR Table 14.3-3 entries discussed in (7) above. Please explain the significance of these ITAAC, if any, in satisfying the corresponding interface requirements identified in FSAR Table 14.3-3.

B

For three (3) interface requirements in Calvert Cliffs Unit 3 FSAR Table 14.3-3, related to new and spent fuel storage racks, the applicant indicates that no ITAAC is needed and states: "The design of the new and spent fuel storage racks is discussed in Section 9.1." FSAR Section 9.1 states that the design and analyses for the new and spent fuel storage racks will be incorporated in Revision 1 of the U.S. EPR FSAR. It further states that this revision will include the analyses in UniStar Topical Report UN-TR-08-001, "Spent and New Fuel Storage Analyses for U.S. EPR Topical Report", dated March 2008 (UniStar, 2008) and incorporate additional analyses to bind the site specific conditions at {CCNPP Unit 3}. Since EPR FSAR Rev 1 has not been submitted, the staff considers the applicant's determination that an ITAAC is not needed to be premature. Therefore, the staff requests the applicant to include the pertinent information in the Calvert Cliffs Unit 3 FSAR, or reconsider its determination that an ITAAC is not needed.

C

Calvert Cliffs Unit 3 COL Application, Part 10 - ITAAC, Appendix A, Section 3 - "Operational Programs Implementation" references FSAR Table 13.4-1. In FSAR Table 13.4-1, entitled "Operational Programs Required by NRC Regulations and Program Implementation", Item 12 addresses the Maintenance Rule (10 CFR 50.65), and references FSAR Section 17.6. FSAR Section 17.6 incorporates by reference NEI 07-02 Rev. 3 (September 2007), entitled "Generic FSAR Template for Maintenance Rule Program Description for Plants Licensed under 10 CFR Part 52". The applicant is requested to discuss key elements of CCNPP3's approach for addressing the Maintenance Rule (10 CFR 50.65) compliance issue and the appropriateness of incorporating NEI 07-02 Rev. 3 by reference. Also indicate any precedent for "incorporating by reference" the NEI 07-02 Rev 3 report in a COL application.

D

Calvert Cliffs Unit 3 COL Application, Part 10 - ITAAC, Appendix A, Section 3 - "Operational Programs Implementation" references FSAR Table 13.4-1. In FSAR Table 13.4-1, entitled "Operational Programs Required by NRC Regulations and Program Implementation", Item 1 addresses In-service Inspection Program (10 CFR 50.55a(g)),

and references FSAR Sections 5.2.4 (ASME Class 1) and 6.6 (ASME Class 2 and 3). The staff notes that 10 CFR 50.55a also requires ISI of the containment structure, in accordance with ASME Section XI, Subsections IWE and IWL, and the special provisions for inaccessible areas defined in 10 CFR 50.55a.

The staff requests the applicant to explain why ISI of the containment structure is not included in FSAR Table 13.4-1. If this is an oversight, please revise FSAR Table 13.4-1 accordingly.

E

Calvert Cliffs Unit 3 COL Application, Part 10 – ITAAC, Appendix B, Tables 2.4-1 through 2.4-31 provide three columns titled “Commitment Wording,” “Inspection, Test, or Analysis,” and “Acceptance Criteria.” For each item in each table, provide a reference to the specific FSAR Section that contains the commitment wording. Also describe the process used to ensure that all commitments have been included in the ITAAC tables. For the second and third columns, provide a reference to the specific FSAR section that describes the details of each Inspection, Test or Analysis (ITA) item and Acceptance Criteria (AC) item that is discussed in the ITAAC tables.

F

Calvert Cliffs Unit 3 COL Application, Part 10 – ITAAC, Appendix B Table 2.4-1 specifies Structural Fill and Backfill Under Seismic Category I and Seismic Category II-SSE Structures ITAAC. For this table, provide the following information:

1. Clarify if there are any Category II structures that utilize structural fill or backfill. If so, explain why these structures are not included in this table.
2. The table should reference figures that show the depth and plan area for all structural fill and backfill for all Seismic Category I, II, and II-SSE structures.
3. The specific tests to be performed under the second column (ITA) should be discussed or a reference should be provided to an FSAR section that describes the tests to be performed.
4. For Items 1, 2 and 3 under Acceptance Criteria, reference should be made to a report that describes the tests that have been performed and documents that the acceptance criteria have been met.
5. For item 4, explain why this item refers only to “backfill,” while the other items refer to “structural fill and backfill.” As applied to the Calvert Cliffs plant, explain the difference between the terms “backfill” and “structural backfill.”

G

Calvert Cliffs Unit 3 COL Application, Part 10 – ITAAC, Appendix B Tables 2.4-2 through 2.4-6 provide ITAAC for the Nuclear Island Structures, Emergency Power Generating

Building, Nuclear Auxiliary Building, Radioactive Waste Building and Essential Service Water Building.

1. As discussed in Appendix B Section 2.1, the design certification ITAAC for these structures are contained in the U.S. EPR FSAR Tier 1, which is incorporated by reference. The staff notes that there are a number of RAIs related to the ITAAC included in the U.S. EPR FSAR application that may result in the revision of the EPR ITAAC tables. Therefore, it is the staff's understanding that the applicant will also incorporate by reference any future changes to the design certification ITAAC. Also, it is the staff's understanding that the ITAAC in Tables 2.4-2 through 2.4-6 are considered supplemental site-specific ITAAC for these structures. Please confirm that the staff's understanding is correct.

2. For the site-specific ITAAC in Tables 2.4-2 through 2.4-6, provide the following information:

a. For Items 1 and 2, provide a reference to a report that will document that the acceptance criteria have been met.

b. For Item 1, describe or reference a section in the FSAR that describes the inspection procedure that will be used to provide assurance that the waterproofing membrane will cover the entire bottom surface and sides of the foundation mat and the below grade structural walls, including locations of intersecting vertical and horizontal seams. For all walls, specify the elevation of the top of the waterproofing membrane and the technical basis for this elevation. Also describe the inspection procedure that will be used to assure that no damage to the membrane has occurred during construction.

c. For item 2, describe or reference a section in the FSAR that describes the tests that will be conducted to ensure that the concrete meets specific parameters. Also describe the specific parameters that must be met.

3. Questions 2.a, 2.b, and 2.c above also apply to plant-specific ITAAC in Table 2.4-7 (Items 4 and 5), Table 2.4-8 (Items 2 and 3), Table 2.4-9 (Items 6 and 7), and Table 2.4-10 (Items 3 and 4).

4. Explain why Items 1 and 2 in ITAAC Table 2.4-2 are not also included in ITAAC Tables 2.4-11 through 2.4-20.

H

The staff has asked a number of RAIs related to scope and content of the design certification ITAAC included in the U.S. EPR FSAR application, which may result in the revision of the EPR design certification ITAAC tables. The scope and content of the plant-specific ITAAC in Calvert Cliffs Unit 3 COL Application, Part 10 – ITAAC, Appendix B Tables 2.4-7 through 2.4-10 and Tables 2.4-21 through 2.4-31 should be compared to the design certification ITAAC after they are satisfactorily revised to address the staff's RAIs. The scope, clarity and level of detail of these plant-specific ITAAC should be revised to be consistent with the final, staff-accepted design certification ITAAC. Please confirm that the Appendix B tables will be revised, as necessary to be consistent in scope and content with the EPR design certification ITAAC.

I

The staff has reviewed Calvert Cliffs Unit 3 COL Application, Part 10 – ITAAC, Appendix B Table 2.4-7 for the UHS Makeup Water Intake Structure and has identified the need for the following information. The ITAAC should be revised accordingly to address each issue or a technical explanation should be provided for not including this information in the ITAAC.

1. For safety-related structures, ITAAC should require an analysis for reconciling the as-built plant with all the structural design-basis loads and acceptance criteria. The analysis results are to be documented in a structural analysis report. Items 1, 2, 3, 6 and 9 should be revised to specifically address this requirement and each item should provide a reference to a report that will document that the acceptance criteria have been met. The ITAAC should also identify the location in the FSAR where the acceptance criteria can be found.

2. Item 1 refers to the “existing bulkhead” wall, but does not provide any reference to the structural design-basis loads and acceptance criteria. This information should be included in the ITAAC.

3. Items 1, 2, 6, and 9 refer to flood and wave forces. The ITAAC should address all loads (e.g., earthquake, flood, wind, tornado, rain, and snow) on the structures referenced in these items.

4. Item 3 refers to the consideration of seismic loads on the retaining wall surrounding the CCNPP Unit 3 Intake Channel (i.e., Fore bay). The ITAAC should address all loads (e.g., earthquake, flood, wind, tornado, rain, and snow) on the structure referenced in this item.

J

The staff has reviewed Calvert Cliffs Unit 3 COL Application, Part 10 – ITAAC, Appendix B Table 2.4-8 for the UHS Electrical Building and has identified the need for the following information. The ITAAC should be revised accordingly to address each issue or a technical explanation should be provided for not including this information in the ITAAC.

1. For safety-related structures, ITAAC should require an analysis for reconciling the as-built plant with all the structural design-basis loads and acceptance criteria. The analysis results are to be documented in a structural analysis report. Items 1, 4 and 7 should be revised to specifically address this requirement and should provide a reference to a report that will document that the acceptance criteria have been met. The ITAAC should also identify the location in the FSAR where the acceptance criteria can be found.

2. Items 1, 4, and 7 refer to flood and wave forces. The ITAAC should address all loads (e.g., earthquake, flood, wind, tornado, rain, and snow) on the structures referenced in these items.

K

The staff has reviewed Calvert Cliffs Unit 3 COL Application, Part 10 – ITAAC, Appendix B Table 2.4-9 for Buried Duct Banks and Pipes and has identified the need for the following information. The ITAAC should be revised accordingly to address each issue or a technical explanation should be provided for not including this information in the ITAAC.

1. Items 1 and 2 should reference engineering drawings that show the location of all the Seismic Category I buried piping and electrical duct banks.
2. Items 2 and 3 only reference ACI 349 and ANSI/AISC 690. These items should reference all the analysis and design criteria for the concrete and steel components.
3. For safety-related structures, ITAAC should require an analysis for reconciling the as-built plant with all the structural design-basis loads and acceptance criteria. The analysis results are to be documented in a structural analysis report. Items 3, 4 and 5 should be revised to specifically address this requirement and should provide a reference to a report that will document that the acceptance criteria have been met. The ITAAC should also identify the location in the FSAR where the acceptance criteria can be found.
4. The sentence describing the acceptance criteria for item 5 is not a complete sentence since it refers to “the following design basis loads” and none are provided. Reference should be made to all design basis loads and a reference to the specific FSAR sections that define these loads should be provided.
5. For Item 8, provide a reference to the section in the FSAR that describes the criteria for the use of waterproof wrapping or coating for buried pipes. Also describe or reference a section in the FSAR that describes the inspection procedure that will be used to provide assurance that the waterproof wrapping or coating for buried pipes will cover the entire surface of the piping. Also describe the inspection procedure that will be used to assure that no damage to the membrane or coating has occurred during construction.

L

The staff has reviewed Calvert Cliffs Unit 3 COL Application, Part 10 – ITAAC, Appendix B Table 2.4-10 for the Fire Protection Building and noted that Item 2 does not require an analysis for reconciling the as-built plant with all the structural design-basis loads and acceptance criteria, as well as the documentation of the analysis results in a structural analysis report. This item should be revised to specifically address this requirement and should provide a reference to a report that will document that the acceptance criteria have been met. The ITAAC should also identify the location in the FSAR where the acceptance criteria can be found. The ITAAC should be revised accordingly to address this issue or a technical explanation should be provided for not including this information in the ITAAC.

M

Calvert Cliffs Unit 3 COL Application, Part 10 – ITAAC, Appendix B Tables 2.4-11 through 2.4-20 are for non-Category I structures. The acceptance criteria state that a report exists and concludes that under seismic loads the as-built structure will not impact the ability of any safety-related structure, system or component to perform its safety function.

SRP 3.7.2 states that all non-Category I structures should be assessed to determine whether their failure under SSE conditions could impair the integrity of seismic Category I SSCs, or result in incapacitating injury to control room occupants. Each non-Category I structure should meet at least one of the following criteria:

- A. The collapse of the non-Category I structure will not cause the non-Category I structure to strike a Category I SSC.
- B. The collapse of the non-Category I structure will not impair the integrity of seismic Category I SSCs, nor result in incapacitating injury to control room occupants.
- C. The non-Category I structure will be analyzed and designed to prevent its failure under SSE conditions, such that the margin of safety is equivalent to that of Category I structures.

For each of the structures included in ITAAC Tables 2.4-11 through 2.4-20, explain which of the above three criteria are being utilized to satisfy the requirements for design of non-Category I structures. Each ITAAC should provide the following information:

1. If criterion A is utilized, the ITAAC should provide the minimum separation distance of the structure from all Category I SSCs. The ITAAC should also include a reference to the technical basis for this separation distance.
2. If criterion B is utilized, the ITAAC should provide the technical basis for the determination that collapse of the non-Category I structure is acceptable. This should include a description of any additional loads imposed on any Category I SSCs that could be impacted and the method used to conclude that these loads are not damaging. Also, any protective shields installed to prevent direct impact on Category I SSCs should be described.
3. If criterion C is utilized the ITAAC should provide or reference the analysis and design procedures used to demonstrate that, under SSE conditions, the margin of safety for the structure is equivalent to that of Category I structures.

N

The staff has reviewed Calvert Cliffs Unit 3 COL Application, Part 10 – ITAAC, Appendix B Table 2.4-26 for the Fire Water Distribution System and noted that Items 2, 3, and 5 do not require an analysis for reconciling the as-built plant with all the design-basis loads and acceptance criteria, as well as the documentation of the analysis results in an analysis report. This item should be revised to specifically address this requirement and should provide a reference to a report that will document that the acceptance criteria

have been met. The ITAAC for each item should also identify the location in the FSAR where the acceptance criteria can be found. The ITAAC should be revised accordingly to address this issue or a technical explanation should be provided for not including this information in the ITAAC.

O

The staff has reviewed Calvert Cliffs Unit 3 COL Application, Part 10 – ITAAC, Appendix B Table 2.4-28 for New and Spent Fuel Storage Racks and has identified the need for the following information. The ITAAC should be revised accordingly to address each issue or a technical explanation should be provided for not including this information in the ITAAC.

1. For safety-related structures, ITAAC should require a reconciliation analysis of the as-built plant for all the structural design-basis loads and acceptance criteria. The analysis results are to be documented in a structural analysis report. Item 2 should be revised to specifically address this requirement for the new and spent fuel storage racks and should provide a reference to a report that will document that the acceptance criteria have been met. The ITAAC should also identify the location in the FSAR where the acceptance criteria can be found.
2. Item 3 only references as acceptance criteria the stress limits of ASME Section III, Subsection NF. This item should reference all the analysis and design criteria for the new and spent fuel storage racks.
3. Item 4 should reference the FSAR section that defines the acceptance criteria for the structural welds for the new and spent fuel storage racks.
4. Item 7 should reference the FSAR section that defines the structural materials for the new and spent fuel storage racks, as well as the technical bases for concluding that the materials for the spent fuel racks are corrosion-resistant and compatible with the expected water chemistry of the spent fuel pool.