ArevaEPRDCPEm Resource

From: Tesfaye, Getachew
Sent: Monday, August 08, 2011 6:22 AM
To: 'usepr@areva.com'
Cc: Chakravorty, Manas; Thomas, Brian; Bongarra, James; Junge, Michael; Jaffe, David; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 499 (5890, 5909), FSAR Ch. 14
Attachments: RAI_499_SEB2_5890_COLP_5909.doc

Attached please find the subject request for additional information (RAI). A draft of the RAI was provided to you on July 18, 2011, and on July 2, 2011, you informed us that the RAI is clear and no further clarification is needed. As a result, no change is made to the draft 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 date for receipt of this information will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the published schedule.

Thanks,
Getachew Tesfaye
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Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 3309

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Request for Additional Information No. 499(5890, 5909), Revision 0

8/08/2011

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 14.03.02 - Structural and Systems Engineering - Inspections, Tests, Analyses, and Acceptance Criteria
SRP Section: 14.03.09 - Human Factors Engineering - Inspections, Tests, Analyses, and Acceptance Criteria
Application Section: 14.03.02

QUESTIONS for Structural Engineering Branch 2 (ESBWR/ABWR Projects) (SEB2)
QUESTIONS for Operating Licensing and Human Performance Branch (AP1000/EPR Projects) (COLP)

14.03.02-52

FSAR Tier 1, Section 3.3 describes the initial test program. In Tier 1 Section 3.3.2, revision 0, it described the integrated tests for the preoperational test phase. Among the tests listed was the integrated leak rate test (ILRT) for the containment the purpose of which is to verify that the leak rate does not exceed the maximum rate allowed. Item 1.0 of Tier 1 Table 3.3-1, revision 0, provided the ITAAC for the ILRT. It appears that the test described was the Type A test required by Appendix J of 10 CFR 50. In addition to the Type A test, Type B and Type C tests are also required. In the current revision, revision 2 of Tier 1 Section 3.3.2, specific integrated tests are no longer identified and ITAAC Table 3.3-1 has been deleted. As containment leakage testing is performed to verify that one of the primary safety functions of the containment has been met and because the staff believes that containment leakage testing should be part of ITAAC in order to meet 10 CFR 52.47(b)(1), the applicant is requested to justify why ITAAC for this testing has not been included in Tier 1 of the U.S. EPR FSAR.

14.03.02-53

Follow-up to RAI 132, Question 14.03.02-11-30

In RAI 132, Question 14.03.02-11-30 the staff had requested information regarding ITAAC for the vent stack. In its response the applicant stated that it was not required to provide ITAAC covering the vent stack because it was not classified as a safety-related structure and served no safety-related function. In FSAR Tier 2 Table 3.2.2-1, revision 2, the vent stack is now classified as a Seismic Category I structure, safety class S. As such, the applicant is requested to include a design description of this structure in Tier 1, Section 2.1 and to provide appropriate ITAAC consistent with that of the other Seismic Category I structures.

14.03.02-54

Follow up to RAI 230, Question 14.03.02-32

In RAI 320, Question 14.03.02-32 the staff had identified issues with the wording of items 3.5a and 3.5b in Tier 1 Table 2.1.1-4, revision 1-interim, pertaining to pipe break hazards analyses. In its response the applicant stated that the response to RAI 222, Supplement 2, Question 03.06-01-31 deleted U.S. EPR FSAR Tier 1, Table 2.1.1-4, Item 3.5 and revised U.S. EPR FSAR Tier 1, Table 2.1.1-4, Item 3.4 to add an inspection of the features identified in the pipe break hazards analysis. In addition U.S. EPR FSAR Tier 1, Table 2.1.1-4, Item 3.4 was going to be revised to incorporate the wording “final as-built construction drawings” in its description. The changes described were shown in revision 2-interim of the FSAR. However, when revision 2 of the FSAR was issued item 3.4 of Tier 1 Table 2.1.1-4 was deleted in its entirety. The applicant is requested to explain why item 3.4 was deleted and why there is no specific item in the ITAAC tables that addresses pipe break hazards analysis. The applicant is also requested to explain why revision 2 of Tier 1 Table 2.1.1-4 is inconsistent with the revision 2-interim version which was provided as part of the response to RAI 320, Question 14.03.02-32.

14.03.02-55

Follow up to RAI 132, Question 14.03.02-11-24

In RAI 132, Question 14.03.02-11-24 the staff noted in Tier 1, FSAR Section 2.1.3, revision 0, related to the Nuclear Auxiliary Building, that the only ITAAC requirements in Table 2.1.3-1 for this structure were verification of a physical location and a requirement for a seismic separation. There was no commitment requiring that the NAB not fail on the adjacent FB or SB 4. In addition, the staff believed that the ITAAC table needed to be revised to require a reconciliation of the as-built conditions with the NAB structural design basis loads and that the results of such a reconciliation should be documented in a structural analysis report. Finally, the staff noted that it was not sufficient to merely verify there is a seismic separation between the NAB and adjacent structures. The required separation distance should be specified and through inspection verified that it had been met. (In RAI 115, Question 14.03.02-5 the staff had made a similar request regarding seismic separation.) In revision 2 of Tier 1 Table 2.1.3-1, the applicant has added a reconciliation of the design which includes tornado and SSE loads with the as installed configuration of the NAB, but the method of documenting this reconciliation has not been specified.

Regarding the separation of the NAB from the adjacent NI structures, the required separation distance has not been provided. In Tier 1 Table 2.1.3-1, revision 2, in item 3.2a under Inspections, Tests, Analyses, it states that an analysis will be performed but does not state what the analysis consists of or all of the factors to be considered in determining the net displacement between the NAB and the NI. In item 3.2b, under Inspections, Tests, Analyses, it states that an inspection of the site layout for the NAB prior to construction will be performed to verify that the minimum acceptable separation is provided. Basing the acceptability of the separation distance on an inspection of the site layout prior to construction is not acceptable as the actual separation distance could be reduced during construction of the plant and prove to be unacceptable when construction is completed.

The staff believes the ITAAC table should provide directly, or by reference, the required separation between the NI and NAB based on the soil profiles considered and the

analysis performed for the U.S EPR certified design. The required separation should include a margin of safety which should be identified in the ITAAC. Under the Acceptance Criteria in item 3.2a, it states that a report exists that defines the minimum acceptable separation prior to any settlement occurring. This is unacceptable as the settlement criteria needs to be included in the separation calculation. The staff therefore requests that Table 2.1.3-1 be modified to address the following information requests.

a. Consistent with the language provided in the ITAAC for the other structures, the reconciliation of the design loads with the as installed configuration of the NAB should state under the Acceptance Criteria that a report exists which reconciles deviations during construction and concludes that the as-built NAB structure conforms to the approved design and will withstand the design basis loads specified without loss of structural integrity.

b. The required separation between the NI and NAB including a safety margin should be calculated as part of the certified design. ITAAC should require that this separation be confirmed prior to fuel load. The analysis stated in the ITAAC should describe what type of analyses is to be performed and the types of building movements for both the NI and NAB that are to be included in determining the actual displacement between these two structures.

14.03.09-16

FSAR Tier 1, Revision 2 and Revision 3-Interim, contain “Table 3.4-1- Human Factors Engineering ITAAC.” The ITAAC are prepared using a format that is inconsistent with the staff’s current good practices for HFE ITAAC. The following is an example of an ITAAC format and content that represents the staff’s current good practice for HFE ITAAC:

Introduction to HFE ITAAC (Appears as an introduction to the ITAAC matrix):

In the ITAAC listed below, the “Results Summary Report” (RSR) is the report described in NUREG-0711. NUREG-711 states, “A results summary report gives the results of the applicant's efforts related to each element. The NRC staff will use the report as the main source of information for assessing the applicant's efforts using the review criteria contained in this document.”

The RSR should summarize the results of an HFE activity (e.g., task analysis) and provide a pointer to all documentation containing the detailed results. The NRC staff may inspect these detailed results. The RSR should provide a level of detail that allows verification that the methodology used to produce the results (e.g., a complete task analysis) follow the criteria contained in the NRC-approved implementation plan for that HFE activity.

For Design Certification, the NRC staff reviewed and approved implementation plans that describe how the NUREG-0711 criteria are to be implemented. Therefore, the Implementation Plans are the source documents for the ITAAC acceptance criteria.

For HFE-related ITAAC, when a COL applicant performs the inspection from column 2 of the ITAAC matrix, it is understood that the inspection activity is conducted by personnel other than those who conducted the Design Commitment (e.g., for task analysis, the inspection of the results summary report is performed by personnel who did not conduct the task analysis).

Sample HFE ITAAC Matrix Entry:

Design Commitment	Inspection, Test, Analysis	Acceptance Criteria
Task analysis is conducted in accordance with the Task Analysis Implementation Plan.	An inspection of the task analysis results summary report(s) will be performed to verify that the task analysis was conducted in accordance with the Task Analysis Implementation Plan.	An inspection report exists that: 1) concludes the Results Summary Report summarizes the results of the task analysis and references documents containing the detailed task analysis results. 2) concludes the task analysis was conducted in accordance with the Task Analysis Implementation Plan.

The staff recommends that the applicant use the example provided to re-structure the HFE-related ITAAC or provide justification for using an alternative approach. The staff also notes that the procedure and training elements are "Operational Programs." Commission direction provided in SECY-05-0197, identifies that ITAAC will not be used to inspect operational programs. Therefore, AREVA should delete these two ITAAC. Also, since V&V scenarios have not been completed, AREVA should add an ITAAC to reflect that work.