

Draft

Request for Additional Information No. 115 (1054, 1353, 1434, 1048), Revision 0

10/21/2008

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: 14.03.05 - Instrumentation and Controls - Inspections, Tests, Analyses, and Acceptance Criteria

SRP Section: 14.03.09 - Human Factors Engineering - Inspections, Tests, Analyses, and Acceptance Criteria

Application Section: FSAR Ch 14

QUESTIONS for Construction Inspection and Allegations Branch (CCIB)

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

14.03.02-1

ITAAC Item 3.1 in Table 2.1.1-7

SRP 14.3 App. A IV.4.B states that Acceptance Criteria should be objective and unambiguous. The Commitment Wording and AC for Item 3.1 states, in part, that..."SBs 2 and 3 decoupling from RSB above elevation 0' 0" as described in Figures ...2.1.1-8 and 2.1.1-10". A review of these Figures indicate that the decoupling is shown to extend below 0' 0". Which is correct, the wording ..."above 0' 0'", or the Figures 2.1.1-8 and 2.1.1-10 which indicate decoupling below elevation 0' 0"?

In addition, should not the FB also be stated here as being decoupled from the RSB above elevation 0' 0" at its ceiling by the decoupling gap as shown on Figure 2.1.1-10?

14.03.02-2

ITAAC Item 4.2 in Table 2.1.1-7

SRP 14.3, App. A IV.4.B states that any differences between the design descriptions and the Commitment Wording of the ITAAC should be minimized unless intended to better conform the commitments in the design descriptions with the ITAAC format. The Commitment Wording of this ITAAC omits the wording "and safety related functions" after words "without loss of structural integrity" used in the design description in Section 2.1. The Commitment Wording, ITA, and AC should be revised to include the wording 'and safety related functions'.

Should the ITA and AC be split in two with an analysis and an inspection being performed? The analysis would verify that the NI structures will be Seismic Category I structures if they are constructed per the approved design, and the inspection would

verify that the NI structures conform to the analysis and the approved design and are able to withstand design basis loads per Section 2.1.1, without loss of structural integrity.

This comment is also applicable to the following ITAAC:

ITAAC Item 4.3 in Table 2.1.2-2

ITAAC Item 4.3 in Table 2.1.5-2

14.03.02-3

ITAAC Item 4.6 in Table 2.1.1-7

Why does the ITA not state that the inspection is of the as-built installation? It could state 'Inspection of RSB and RCB will be performed.'

14.03.02-4

ITAAC Item 4.8 in Table 2.1.1-7

SRP 14.3 App. A IV.4.B states that Acceptance Criteria should be objective and unambiguous. The AC for Item 4.8 lists room numbers UJA11 002, UJA11 005, UJA11 006, and UJA11-009 and refers to Figure 2.1.1-11. These room numbers are not listed on Figure 2.1.1-11. Similarly, room numbers UJA07 014 and UJA07 015 are referred on Figure 2.1.1-12, but these room numbers are not listed on Figure 2.2.2-12. The above two Figures should be revised to show the location of the room numbers identified in the AC, or justify otherwise.

14.03.02-5

ITAAC Item 3.1 in Table 2.1.3-1

SRP 14.3 App. A IV.4.B states that Acceptance Criteria should be objective and unambiguous. The Commitment Wording for Item 3.1 states, in part, that..."as shown on Figure 2.1.3-1, seismic separations are provided between the NAB and surrounding buildings". The AC for Item 3.1 states, in part, that..."The as-built NAB is separated from surrounding buildings as shown on Figure 2.1.3-1". Why doesn't the Item 3.1 ITAAC Commitment Wording state what minimum dimensions are required to permit seismic separation to exist between NAB and surrounding buildings, and the AC require that minimum dimensions be met to achieve desired seismic separation?

This is also applicable to following ITAAC:

ITAAC Item 3.2 in Table 2.1.4-1

14.03.02-6

ITAAC Item 3.3 in Table 2.1.1-7

The design commitment and AC refer to a flooding wall and water-tight door as described in Table 2.1.1-3. That table has four walls listed. Which wall does the ITAAC address?

14.03.02-7

ITAAC Item 4.1 in Table 2.2.2-2

This ITAAC states that EPGBs as-installed at site grade level....is at elevation 0' 0", as indicated on Figures 2.1.2-2 and 2.1.2-3. Grade elevation is shown on these figures but it is not correlated with an elevation of 0' 0". Please clarify what the reference elevation is on these figures.

14.03.02-8

ITAAC Item 4.9 in Table 2.1.1-7

The ITAAC requires an analysis to indicate that essential SSCs in RCB rooms in Table 2.1.1-4 are protected from the dynamic effects of pipe breaks. Should there not also be an inspection to determine whether the pipe whip restraints, that contain the pipes so as not to cause damage to the essential SSCs, are installed per the analysis? Revise ITAAC table accordingly.

14.03.02-9

Summarize the EPR standard design envelope site parameters, (such as, soil properties, seismology design basis, extreme wind, tornado, precipitation (for roof design) ambient design temperature, hazards in site vicinity, required stability of slope, and maximum settlement values for seismic Category I structures). Discuss necessary EPR standard design System Descriptions and ITAAC requirements for verification of site parameters, and provide needed ITAAC tables to ensure compliance with the EPR standard design envelope site parameters.

14.03.05-7

ITAAC 4.2 in FSAR Table 2.4.2-2

This ITAAC discusses a minimum inventory of controls, displays, and alarms in the MCR and RSS. How will an inspector know that the AC is met since it is not specific as to what is contained in that minimum inventory?

14.03.09-5

Table 3.4-1 General (1)

SRP 14.3.9, Acceptance Criteria 5 states that HFE-related ITAAC should primarily address verification of products (e.g., the control room, the human-system interfaces, etc.) or results reports from implementing the HFE program element implementation plan. The ITAAC in Table

3.4-1 for Human Factors Engineering (HFE) appear to be directed at the HFE program and its processes and not verification of products for the plant design or results reports from implementing the HFE program element implementation plan. Explain why the ITAAC for HFE do not address products for the plant design or results reports from implementing the HFE program element implementation plan, or revise .

14.03.09-6

Table 3.4-1 General (2)

Several ITAAC items in Table 3.4-1 refer to an "output summary" without identifying the document that is summarized. Please fully identify the documents subject to inspection in the ITAAC. The connection should be made between the words output summary and what is stated in the Design Commitment and ITA.

For instance - the output summary for item 2 in Table 3.4.-1 - The output summary is the Functional Requirements Analysis

For item 3 in Table 3.4.-1 - The output summary is the Functional Allocation report results

For item 5 in Table 3.4-1 - The output summary is the results of the staffing and qualification analysis.

For item 9 in Table 3.4-1 - In Tier 2 Section 18.8.3, The output summary referred to in AC b.1 for Item 9 is referred to as a results summary. Why is there a difference in the terminology?

For item 10 in Table 3.4-1 - In Tier 2 Section 18.9.3, The output summary referred to in AC b.1 for Item 9 is referred to as a results summary. Why is there a difference in the terminology.?

For item 11 in Table 3.4-1 - In Tier 2 Section 18.10.3.7, The output summary referred to in AC b.1 for Item 9 is referred to as a results summary. Why is there a difference in the terminology? In addition, the items that "results summary" contains for V&V is different between Tier 2 in this section and what is in the AC b.1 for item 11. Please clarify why there is a difference or revise appropriately.

The ITAs should be analysis or inspections or a combination of both. Evaluation is not a good word to use in the ITA since it is not defined in SRP Section 14.3. Analysis is defined as a "calculation, mathematical computation, or engineering or technical evaluation". Please consider revising the terminology used.

The ACs in this table are suggested to begin with either of the following: 1) A report exists and concludes that the **process.....**", or 2) "An output summary report exists and concludes that" .

14.03.09-7

ITAAC Item 4 in Table 3.4-1

SRP 14.3, App. A IV.4.B states that any differences between the design descriptions and the Commitment Wording of the ITAAC should be minimized unless intended to better conform the commitments in the design descriptions with the ITAAC format. The Commitment for Table 3.4-1, Item 4 does not agree with the wording in the description of HFE program features in Tier 1 Section 3.4.1. Section 3.4.1 item 4 states, in part, “A task analysis is documented by validation of operating procedures....” The Commitment states, in part, “A task analysis is documented by validation of operating procedure *guidelines*....” Why is this terminology different?

In Tier 2, Section 18.4.3 - It states 'The results summary also describes how successive iterations of the task analysis (TA) for procedure development, the procedures themselves, and training programs results in an HSI design that supports in-scope information, control, and support requirements.' The AC for item 4 states 'how iterations of the procedure development task analysis' Explain this difference in terminology. In addition, the output summary referred to in the AC is the report for the task analysis.

14.03.09-8

ITAAC Item 5 in Table 3.4-1

SRP 14.3, App. A IV.4.B describes the three column format for ITAAC including the provision that the acceptance criteria in Column 3 for the inspections, test, or analyses described in Column 2 which, if met, demonstrate that the Design Commitments in Column 1 have been met. The Commitment for Table 3.4-1, Item 5 is not aligned with the AC. The Commitment states that the evaluation of staffing will be based on “HSI design features.” The AC states that the output summary describes how minimum staffing “meets regulatory requirements while maintaining roles and responsibilities.” Please explain how the AC satisfies the Commitment.

Tier 2 on page 18.5-2 states 'The objective of the U.S. EPR staffing and qualifications analyses is to demonstrate that the HSI design and the number, roles, and responsibilities of the plant operating staff is able to adequately meet the demands of the processes of the plant.' This seems to be a more suitable AC.

14.03.09-9

ITAAC Item 8 in Table 3.4-1

SRP 14.3, App. A IV.4.B describes the three column format for ITAAC including the provision that the acceptance criteria in Column 3 for the inspections, test, or analyses described in Column 2 which, if met, demonstrate that the Design Commitments in Column 1 have been met. The three columns of Table 3.4-1, Item 8 are not aligned, as follows:

- The Commitment refers to the “methodology” for selecting and validating the final minimum inventory, while the ITA refers to the “process”.
- The Commitment and ITA refer to “validating the final minimum inventory”, while the AC refers to “verifying the completeness of the minimum inventory.”
- The AC refers to the “minimum inventory in the *MCR and RSS*”, while the Commitment and ITA refer only to the “*final* minimum inventory” without mentioning the MCR and RSS.

Why is the terminology used in the three ITAAC columns different?

In Tier 2 in Section 18.7.4.4 it is stated that 'The methodology for selecting the final minimum inventory is described in the HSI design implementation plan and includes a description'. After this sentence in Tier 2 is the listing of what the methodology for selecting the final minimum inventory includes, and that is what is stated for acceptance criterion a.1. Why is the implementation plan not used in this ITAAC?

Where is the acceptance criteria a.2 derived from? The methodology for verifying the completeness of the minimum inventory in the MCR and the RSS does not seem to be derived from Tier 2.

14.03.09-10

ITAAC Item 9 in Table 3.4-1

SRP 14.3, App. A IV.4.B describes the three column format for ITAAC including the provision that the acceptance criteria in Column 3 for the inspections, test, or analyses described in Column 2 which, if met, demonstrate that the Design Commitments in Column 1 have been met. The Commitment refers to several attributes for procedures that are not mentioned in the AC. Explain why the AC does not align with the Commitment.

14.03.09-11

ITAAC Item 10 in Table 3.4-1

SRP 14.3, App. A IV.4.B describes the three column format for ITAAC including the provision that the acceptance criteria in Column 3 for the inspections, test, or analyses described in Column 2 which, if met, demonstrate that the Design Commitments in Column 1 have been met. The Commitment for Table 3.4-1, Item 10 refers to several attributes for training program development that are not mentioned in the AC. Please explain why the AC does not align with the Commitment.

14.03.09-12

ITAAC Item 12 in Table 3.4-1

SRP 14.3, App. A IV.4.B describes the three column format for ITAAC including the provision that the acceptance criteria in Column 3 for the inspections, test, or analyses described in Column 2 which, if met, demonstrate that the Design Commitments in Column 1 have been met. The AC for Table 3.4-1, Item 12 does not appear to properly address the Commitment. The Commitment appears to require that the as-built design conforms to the standard design resulting from the HFE V&V process. The ITA and AC refer to a process for conducting design implementation without mentioning whether as-built design actually conforms with the standard design resulting from the HFE V&V process. Please clarify whether this item is intended to verify processes or features of the as-built design.

ITAAC item 1 in Table 3.4-1

The OER is conducted in accordance not only with a process but an implementation plan. Would the Commitment and AC for item 1 be more accurate if they referred to that implementation plan? For example:

Commitment - '.....performed in accordance with the implementation plan.....'

AC a.1 - 'A report exists and concludes that the implementation plan provided a method to:.....'

Item 6 in Table 3.4-1

An implementation plan is used to implement methodology for developing a HRA. In Tier 2, the following aspects of that implementation plan are listed: **(1)** considered to determine the risk-significant HAs and the importance measures, HRA sensitivity analyses, and threshold criteria used to compile the list of risk-significant HAs. **(2)** A description of how HAs influence operator tasks related to monitoring passive and automated systems. **(3)** A description of how the PRA and HRA results along with the risk-significant HAs are addressed in other aspects of the HFE program with a goal of minimizing the likelihood for operator error and the ability to detect and recover from errors. **(4)** A description of how HRA assumptions are validated during the design process. Four aspects of an implementation plan are listed here whereas the AC (a.1) only has three. Please explain or revise.

In Tier 2 in Section 18.6.3 for item 6, it states that 'An output report identifies the list of risk-important HAs and summarizes how those HAs and the associated tasks and scenarios were addressed during the various parts of the HFE design process. The output report addresses the results of the HRA assumption validation. This wording is different from what is in AC (b.1) for item 6 in Table 3.4-1. Please explain or revise.

Item 9 in Table 3.4-1

Again in Tier 2 an implementation plan is key to development of procedures. In Tier 2, it is stated ' An implementation plan describes:

- The basis or starting point for procedure development (i.e., how the TA (see Section 18.4) and procedure development interrelate).
- The content of procedures.
- How the HSI style guide (see Section 18.7.6.1) integrates with the procedure writer's guide.
- How procedures are verified and validated.
- The justification for using electronic operating procedures instead of paper-based procedures.'

In Item 9 for AC a.1 in Table 3.4-1, why does it state a process describes the items listed above?

Item 10 in Table 3.4-1

The AC for this item, in Tier 2 Section 18.9.1 states: 'An implementation plan describes training program scope including:

- Categories of personnel to be trained (similar to the scope of analysis conducted for staffing, see Section 18.5.1)
- Specific plant conditions, operational activities (e.g., operations, maintenance, testing and surveillance), and HSIs which effect training scenarios and methods.'

Why does the AC a.1 for item 10 state that a process describes the items listed above?

14.03.09-14

ITAAC Item 12 in Table 3.4-1

In Tier 2 Section 18.11.1, the following is stated; 'Design implementation verifies the following:

- Aspects of the design that were not verified during the V&V process.
- Modifications to the standard U.S. EPR design conform to the HFE principles and design guidance expressed in the HFE style guide and meets the HFE review criteria in NUREG-0711 (Reference NUREG-0711, "Human Factors Engineering Program Review Model," 1994.) and NUREG-0700 (Reference NUREG-0700, "Human-System Interface Design Review Guidelines," Revision 2, May 2002.).
- As-built HSIs, plant-specific procedures, and training conform to the design that resulted from the V&V process.
- Items in the HFE Issues Tracking Database have been adequately addressed.'

This appears to be different from what is stated in AC a.1 for Item 12.

In Tier 2 Section 18.11.4, the following is stated:

A summary report is generated detailing the status of HEDs tracked including any that remain unresolved. Also included are the methods and criteria used during the design implementation process and the results of the verification. This report becomes part of the final design documentation owned by the U.S. EPR operator.

This appears to be different from what is stated in AC b.1 for Item 12. Please explain.