

REQUEST FOR ADDITIONAL INFORMATION 372-2787 REVISION 1

5/20/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

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

Application Section: 14.3.9

QUESTIONS for Operating Licensing and Human Performance Branch (AP1000/EPR Projects) (COLP)

14.03.09-1

HRA

The starting assumptions for the review of Section 2.9 and the ITAACs listed in Table 2.9-1 of Tier 1, were that the implementation plans contained sufficient detail to ensure the COL applicant can complete the respective HFE element, and that each ITAAC would explicitly address the completion of each HFE program element within Section 18.

Please provide clarification for the following:

1. After reviewing ITAAC #3, in Table 2.9-1, it is unclear to the staff how this ITAAC will fulfill the HRA HFE implementation plan given in Chapter 18. Please clarify for the staff whether the statement given for the design commitment column for ITAAC #3 means that, as the DC applicant, the HRA for the HFE process will be implemented in accordance with the HRA HFE implementation plan.
2. In NUREG-0800, Section 14.3, it states that the Inspections, Tests, and Analyses (ITA) column should contain the specific method used to demonstrate that the design commitment in Column 1 has been met. In the US-APWR DCD ITA column of Table 2.9-1 it states that "The HRA will be performed." In terms of the HRA/HFE in the ITA column, the staff believes that the NUREG-0800 guidance means that an inspection, test, analysis, or evaluation of what conducting the implementation plan had accomplished, will take place by the DC applicant or COL applicant. The staff understands that the HRA is a critical analytical step in the design of the plant controls. However, it should be done as part of the HRA/HFE implementation plan and not the ITAAC, as the HRA will give input on the risk-important human actions to the other elements of the HFE design process. Please clarify the meaning of "The HRA will be performed" statement for ITAAC #3 in the ITA column of Table 2.9-1.
3. In NUREG-0800 Section 14.3.9, it states that if an implementation plan, rather than a completed element, was accepted as part of the design process then the ITAAC should address the completion of the HFE program element. The Acceptance Criteria column gives no indication that there will be documentation showing the completion of the HRA/HFE implementation plan. Therefore, the staff is unclear how the acceptance criterion for ITAAC #3 addresses completion of the HRA/HFE implementation plan. Please clarify this issue. In addition, please clarify if a report

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will be available detailing the results of completion of the HRA/HFE implementation plan.

Note:

Using similar context to this RAI, the staff would like clarification for ITAAC 4 ([FRA/FA](#)) and ITAAC 6 ([Staffing and Qualifications](#)).

14.03.09-2

[OER](#)

After reviewing ITAAC 2, in Table 2.9-1, it is unclear how this ITAAC will fulfill the HRA HFE implementation plan given in Chapter 18. Please clarify for the staff whether the statement given for the design commitment column for ITAAC 2 means that, as the DC applicant, the OER for the HFE process will be implemented in accordance with the OER HFE implementation plan. Also in the design commitment column, please clarify what the term “relevant” means in the context of the second bullet.

14.03.09-3

[V&V](#)

After reviewing ITAAC 8, the staff is unclear how this ITAAC will fulfill the implementation plans for verification and validation activities. The design commitment is not clear, in that, it does not provide a statement that would lead back to the implementation procedures so that they could be implemented or verified. Please clarify for the staff whether the statement given for the design commitment column for ITAAC 8 means the V&V activities for the HFE process will be implemented in accordance with V&V implementation plan.

Also, in the Acceptance Criteria column, the wording appears to be the same as each of their respective design commitments. This approach to ITAAC does not seem to be consistent with the NUREG-0800 Section 14.3 description for acceptance criteria. Where it states that:

...In some cases, the acceptance criteria may be more general because the detailed supporting information in Tier 2 does not lend itself to concise verification...

NUREG-0800 Section 14.3 goes on to give an example of how, in these types of situations, the applicant will specify a method (usually a report of some sort) to verify that the commitments are met. It also states that Tier 2 is where the detailed supporting information would be provided to validate the report. The acceptance criteria wording does not provide information that a report will be available. Please clarify if a report that documents the results of conducting the V&V implementation plan, and the results of the analyses and inspections for ITAAC 8, will be provided.

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14.03.09-4

DESIGN IMPLEMENTATION

Please clarify how the design implementation ITAAC will be conducted in accordance with its associated implementation plan. The current wording in ITAAC #9 design commitment column does not clearly connect the two.

NUREG-0800, Section 14.3 guidance gives this example for acceptance criteria:

In general, the acceptance criteria should be objective and unambiguous. In some cases, the acceptance criteria may be more general because the detailed supporting information in Tier 2 does not lend itself to concise verification. For example, the acceptance criteria for the design integrity of piping and structures may be that a report "exists" that concludes the design commitments are met. In these cases, Tier 2 provides the detailed supporting information on multiple interdependent parameters that should be provided in order to demonstrate that a satisfactory report exists.

The ITAAC 9 acceptance criteria wording is unclear in 1) ensuring that the design implementation process is conducted by the implementation plan and 2) describing that the output of conducting the design implementation procedure will yield results that are consistent with the implementation plan.

In the acceptance criteria column of ITAAC 9, the staff notes that two of the three criteria from section 12.4.6 are included, but the third criteria (#2, in section 12.4.6) has not been included. Please clarify why this acceptance criterion has omitted the need to verify that the final HSIs, procedures and training match the design that is a result of the HFE process and V&V activities. Also, please clarify the reason for including the second bullet point in the design implementation ITAAC acceptance criteria column that deals with assigning a risk significance level to HAs.

14.03.09-5

HSI/PROCEDURES/TRAINING

The starting assumptions for the review of Section 2.9 and the ITAACs listed in Table 2.9-1 of Tier 1, were that the implementation plans contained sufficient detail to ensure the COL applicant can complete the respective HFE element, and that each ITAAC would explicitly address the completion of each HFE program element within Section 18.

Please provide clarification for the following:

1. The design commitment for ITAAC #7 in Table 2.9-1 states:

The scope of HSI design, procedures and training, which are developed and/or evaluated by the HFE program, includes operations, accident management, maintenance, tests, inspections and surveillances that are important to safety.

After reviewing ITAAC #7, in conjunction with section 2.9.1.3 of the US-APWR DCD, the staff is unclear how this ITAAC will fulfill the implementation plans for HSI design, procedure development and training development. The design commitment does not relate to how the HSI design (or procedures and training) has been developed in accordance with approved implementation plans; the commitment is merely limited to

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describing the "scope" of the HSI design, etc., which is only part of an overall HSI design methodology.

Please clarify for the staff whether the statement given for the design commitment column for ITAAC #7 means the HSI design, procedures development, and training development for the HFE process will be implemented in accordance with their respective implementation plans.

As well, it is suggested that, for clarity and conformity, the current single ITAAC commitment should be separated into three statements, HSI design, procedures, and training, as these are three distinct HFE elements.

2. The acceptance criteria for 7a states:

The design documentation exists to verify that panels and associated instrumentation, within the scope of the HFE program, comply with General Design Criteria 1 in Appendix A to 10 CFR 70 for quality standards and records.

Please clarify why 10 CFR 70 was referenced and not 10 CFR 50.

3. ITAAC #7 provides fourteen design commitments, or parts (a through n), that include HSI design, procedures, and training. In the Acceptance Criteria column, the wording appears to be the same as each of their respective design commitments. This approach to ITAAC does not seem to be consistent with the NUREG-0800 Section 14.3 description for acceptance criteria. Where it states that:

...In some cases, the acceptance criteria may be more general because the detailed supporting information in Tier 2 does not lend itself to concise verification...

NUREG-0800 Section 14.3 goes on to give an example of how, in these types of situations, the applicant will specify a method (usually a report of some sort) to verify that the commitments are met. It also states that Tier 2 is where the detailed supporting information would be provided to validate the report. The acceptance criteria wording does not indicate that a report will be available. Please clarify if a report will be provided that documents the results of conducting the HSI implementation plan (and for procedures and training), and the results of the analyses and inspections for ITAAC 7.