US-APWRRAIsPEm Resource

From: Ciocco, Jeff
Sent: Monday, March 04, 2013 9:21 AM
To: us-apwr-rai@mhi.co.jp; US-APWRRAIsPEm Resource
Cc: Pieringer, Paul; Walker, Jacqwan; Junge, Michael; Ward, William; Hamzehee, Hossein
Subject: US-APWR Design Certification Application RAI 1000-6964 (18)
Attachments: US-APWR DC RAI 1000 COLP 6964.pdf

MHI,

The attachment contains the subject request for additional information (RAI). This RAI was sent to you in draft form. Your licensing review schedule assumes technically correct and complete responses within 30 days of receipt of RAIs. However, MHI is currently working to provide the NRC with a schedule of ongoing HFE work. The schedule will include dates for the submission of this RAI response. We will adjust the schedule accordingly.

Please submit your RAI response to the NRC Document Control Desk.

Thank you,

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U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Hearing Identifier: Mitsubishi_USAPWR_DCD_eRAI_Public
Email Number: 65

Mail Envelope Properties (320204600EA7B9408FE833FF15E4FF7DCE76BAE2D2)

Subject: US-APWR Design Certification Application RAI 1000-6964 (18)
Sent Date: 3/4/2013 9:20:52 AM
Received Date: 3/4/2013 9:21:08 AM
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Post Office: HQCLSTR01.nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	696	3/4/2013 9:21:08 AM
US-APWR DC RAI 1000 COLP 6964.pdf	77856	
image001.jpg	3989	

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

REQUEST FOR ADDITIONAL INFORMATION 1000-6964

Issue Date: 3/4/2013

Application Title: US-APWR Design Certification - Docket Number 52-021

Operating Company: Mitsubishi Heavy Industries

Docket No. 52-021

Review Section: 18 - Human Factors Engineering
Application Section: 18

QUESTIONS

18-193

10CFR 52.47, "Contents of applications; technical information"

"The application must contain a level of design information sufficient to enable the Commission to judge the applicant's proposed means of assuring that construction conforms to the design and to reach a final conclusion on all safety questions associated with the design before the certification is granted. The information submitted for a design certification must include performance requirements and design information sufficiently detailed to permit the preparation of acceptance and inspection requirements by the NRC, and procurement specifications and construction and installation specifications by an applicant."

SECY-92-053, "Use of Design Acceptance Criteria during 10 CFR PART 52 Design Certification Reviews"

"The DAC are a set of prescribed limits, parameters, procedures, and attributes upon which the NRC relies, in a limited number of technical areas, in making a final safety determination to support a design certification. The DAC are to be objective (measurable, testable, or subject to analysis using pre-approved methods), and must be verified as a part of the ITAAC performed to demonstrate that the as built facility conforms to the certified design…"
"Design acceptance criteria would have to be sufficiently detailed to provide an adequate basis for the staff to make a final safety determination regarding the design. The use of DAC would result in less design detail, and more detail regarding how the DAC acceptance criteria will be demonstrated by the COL licensee during construction. Analysis methods, performance tests, and inspections, would be specified in lieu of design detail…"

Background and Request for Information.
On June 11, 2012, a public meeting was held with MHI to review generic quality issues the staff identified in the submittals related to Functional Requirements Analysis/Function Allocation (FRA/FA), Task Analysis (TA), and Verification and Validation (V&V). Specific examples were provided to explain and illustrate the staff's concerns. MHI agreed to address these concerns by revising the associated Implementation Plans. Revised plans for all of the HFE elements were submitted on September 21, 2012. The staff is reviewing these plans. This work has been significantly slowed and complicated by the continued existence of the same quality challenges discussed at the public meeting.

This Request for Additional Information requests that MHI revise the Implementation Plans to address the following quality issues:

1) The correlation between NUREG-0711 acceptance criteria and the Implementation Plan descriptions remain weak. Some acceptance criteria have still not been addressed. Some are only partially addressed. In general, acceptance criteria associated with processes do not have sufficient detail for the staff to draw a safety conclusion and the description that is provided is not sufficiently quantitative to serve as an acceptance criterion for the DAC ITAAC.

2) In general, the V&V IP, Sections 4.3.4 and 4.3.5 do not provide distinct explanations of the following concepts: Performance Measurement Characteristics, Performance Measures, and Performance Criteria. These concepts need to be separated and clearly explained within the implementation plan.

3) Within the V&V IP, expert judgment is acceptable when minimum qualifications are provided (as has been done). However, some cases exist where the expert is determining how the process will be implemented. In these cases additional information is needed describing the minimum standards or principles the expert will apply so there is an objective process description that the staff can use to support safety determinations.

4) Document changes identified in previous RAIs have not been included.

Example: The RAI response to RAI 796-5728, Question 18-161 is acceptable but has not been accurately reflected in the V&V IP revision 2. Specifically, the last sentence in the second paragraph of Section 4.4, “Test Design” does not make sense and is not consistent with the RAI response. ("Only when areas outside of the control room are considered special environmental stressors such as temperature and radiation will also be included in the tests.")

5) Reviewer’s notes which look to be written to the S&Q IP creator have been left within the text.

6) There are inconsistencies within and between paragraphs.

Example: Section 4.4.3, “Test personnel Training," first paragraph contains inconsistent information. The first sentence states, "a minimum of three experts in the areas of HFE, plant operations, and operator training shall serve as test observers/administrators." Later in the same paragraph it states, “The observer/administrator team will include two HFE experts....The third member will have either a plant operations or training background." There are also what appear to be extraneous words in the paragraph (inter, same, specific).

Example: The last paragraph in Section 4.3.4 states that the sample scenarios will contain “Failure modes and detailed acceptance criterion, including Pass/Fail criterion. Measures and measurement tools to be used.” This seems to be contrary to the preceding paragraph which states, “In the case of plant performance measures, the evaluation criteria are shown, include a clear definition of the process parameter of interest as part of the test plan and included in the analysis of the test." Also the subsequent paragraph (starting section 4.3.5) states that performance measures in general are identified in the test procedures. The inconsistency needs to be addressed and if inclusion of performance measures within test procedures is the intended path then the test procedures associated with the sample scenarios need to be submitted to demonstrate how performance measures are being selected.

7) Errors in grammar, spelling, and sentence structure make some parts incomprehensible and in other parts leave the staff confused as to what is really meant.

Examples:

Pg 17: “In addition the “Time” to identify, decide and take action, data will be collected for both primary and secondary tasks.”

PG 16: “In the case of plant performance measures, the evaluation criteria are shown, include a clear definition of the process parameter of interest as part of the test plan and included in the analysis of the test."

Pg 22: “Monitoring/detection problems **Converging the Perspectives”**


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