

US-APWRRRAIsPEm Resource

From: Buckberg, Perry
Sent: Thursday, January 30, 2014 12:52 PM
To: 'us-apwr-rai@mhi.co.jp'; US-APWRRRAIsPEm Resource
Cc: Junge, Michael; Lee, Samuel; Ward, William; Green, Brian
Subject: US-APWR Design Certification Application RAI 1072-7311 (18 - HFE)
Attachments: US-APWR DC RAI 1072 COLP 7311.pdf

MHI,

The attachment contains the subject HFE related request for additional information (RAI). This RAI was sent to you in draft form on January 13, 2014 resulting in no need for clarification. Your licensing review schedule assumes technically correct and complete responses when the response is issued.

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

Thanks,

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U.S. Nuclear Regulatory Commission

Office of New Reactors

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REQUEST FOR ADDITIONAL INFORMATION 1072-7311

Issue Date: 1/30/2014

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

Operating Company: Mitsubishi Heavy Industries

Docket No. 52-021

18 – Human Factors Engineering

QUESTIONS:

18-258

NUREG-0711, Revision 2, review criterion 5.4(1) states, in part, “Internal and external initiating events and actions affecting the PRA Level I and II analysis should be considered when identifying risk-important actions.”

Although MUAP-13009-P (R0) explains how risk will be used in the Task Analysis (TA) process, it is not explicitly stated how it accounts for the “Internal and external initiating events” as described in the criterion. Staff notes that Table 7-1 of MUAP-13009-P (R0) refers the reader to section 4.2.1 for this information.

Please clarify how both internal and external initiating events are addressed by the TA process.

18-259

NUREG-0711, Rev. 2, Review Criterion 5.4 (2) describes the use of detailed task narratives as part of the Task Analysis process.

MUAP-13009-P (R0) Section 4.2.2 “Basic Task Analysis – HSI Inventory” (page 17) states, “This page illustrates the format for a task narrative, which includes the items specified in (1) through (17) in Subsection 4.2.1.” However, the page is blank with the exception the statement above and two titles.

Please clarify how this page will be used or submit a complete example.

18-260

NUREG-0711, Rev. 2, Criterion 5.4(2) includes consideration of biomechanics under Response Requirements (see Table 5.1).

It is unclear how MUAP-13009-P (R0) addresses biomechanics and “forces needed” as described in the criterion.

Please provide clarification regarding how these Response Requirements will be addressed in the Task Analysis process.

18-261

NUREG-0711, Rev. 2, criterion 5.4(4) indicates that the task analysis should address certain issues including the “...allocation of monitoring and control tasks to the (a) formation of a meaningful job...”

It is unclear how the implementation plan addresses this part of the criterion.

Table 7-1 of MUAP-13009-P (R0) indicates that information regarding the “formation of a meaningful job,” as indicated in the criteria, should be found in Section 4.2.1 paragraph 3. However, this description does not sufficiently describe how the criterion will be met.

Please explain how task analysis is used to form meaningful jobs for operators.

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18-262

NUREG-0711, Rev. 2, Review Criterion 5.4(4) indicates that the task analysis should address crew member skills.

Table 7-1 of MUAP-13009-P(R0) indicates that this criterion is addressed in Section 4.2.1, item (6). Item (6) addresses qualification level and the number of personnel, but does not specifically call out skills. It is unclear how skills are addressed by this description.

Please clarify how skills are addressed by this item, or elsewhere in the document.

18-263

NUREG-0711 Criterion 5.4(2) indicates that workload should be considered during the task analysis.

Section 4.3.3 "Workload Assessment" of MUAP-13009 (R0) provides a method for assessing workload using a well known standard. However, Section 4.3.2.2 introduces the use of weighting factors that have been developed by the applicant to modify these figures. These weighting factors can be found on Table 4-5 and Table 4-6.

Section 4.3.2.2, paragraph 1) indicates that the figures on Table 4-5 were derived using subject matter expert judgment and confirmed in a task analysis pilot project.

Section 4.3.2.2, paragraph 2) indicates that the figures on Table 4-6 were derived from the FRA/FA and confirmed through a task analysis pilot project.

It is unclear based upon the information provided that the weighting factors shown in these tables provide a reasonable and conservative modification to the workload assessment method described in Section 4.3.3. Please provide additional information which establishes the technical bases for using these weighting factors as part of the workload assessment methodology.