

REQUEST FOR ADDITIONAL INFORMATION 772-5734 REVISION 3

06/17/2011

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 07-14 Branch Technical Position - Guidance on Software Reviews for Digital Computer-Based Instrumentation and Controls Systems
Application Section: 07.01

QUESTIONS for Instrumentation, Controls and Electrical Engineering 2 (ESBWR/ABWR Projects)
(ICE2)

07-14 Branch Technical Position-43

10 CFR 50, Appendix A, General Design Criterion 1, "Quality Standards and Records," requires in part that systems and components important to safety be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed. Section B.3.1.1 of SRP, BTP 7-14, contains an acceptable approach to software project management.

US-APWR MUAP-07017-P (R4), Section 2.3.1, states, "MHI applies the PSMS application software life cycle process for US-APWR projects described in this SPM based on these experiences, ..." The staff requests applicant to clarify the statement "based on these experiences". The staff also requests MHI to expand on how these experiences relate to PSMS application software conforming to BTP 7-14 if that was the intent of the statement.

US-APWR MUAP-07017-P (R4), Section 3.1.1.2, states, "The PSMS application software is fully qualified by..." and "The PSMS is designed with four fully redundant and independent divisions..." The staff requests that the extraneous adjective "fully" be removed. The PSMS software is either qualified or not, and PSMS system either has redundant divisions or not.

US-APWR MUAP-07017-P (R4), Section 3.1.2, 2nd to last paragraph, states, "Section 2.2 of this SPM also describes the criteria and responsibilities for assuring independence of the QA and V&V organizations..." While Section 2.2 does describe the roles and responsibilities of the V&V organization, the staff requests MHI to address V&V independence with regards to the makeup of the V&V team. If the V&V team members consist of software developers, are the software developers allowed to write test scripts for and execute tests of the code that they prepared? Also, the staff requests MHI to address the reporting chain of those helpers for the duration of the V&V testing.

US-APWR MUAP-07017-P (R4), Section 3.1.2, last paragraph, states, "...Section 2.2 of this SPM satisfy the requirements in Section B.3.1.1 of BTP 7-14..." The staff requests that applicant substitute the word "requirements" with "guidance." BTP 7-14 is staff guidance and not regulation.

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US-APWR MUAP-07017-P (R4), Section 3.1.9, states "VVTM is responsible for assuring that the VVTE are trained and qualified for their assigned activities. Training and qualification of the DTE and VVTE shall include technical competencies,..." The staff requests MHI to clarify the qualification process and what training and qualification records, if any, will be kept.

Per BTP 7-14, Sections B.2.2 and B.2.3, the staff requests MHI provide a list of implementation and design outputs to support staff audit or inspection activities.

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10 CFR 50, Appendix A, General Design Criterion 1, "Quality Standards and Records," requires in part that systems and components important to safety be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed. SRP, BTP 7-14, Section B.3.1.2 provides an acceptable approach for Software Development Plan (SDP).

US-APWR MUAP-07017-P (R4), Section 3.2 did not specify a software life cycle model that is to be used for the US-APWR application software. Section B.3.1.2.1 of BTP 7-14 states that a life cycle model should be documented in the SDP. The staff requests MHI to specify the software lifecycle model used for the US-APWR application software.

US-APWR MUAP-07017-P (R4), Section 3.2.6.4.2 describes developing application software. Since PSMS application software code is generated as described in Section 3.2.6.4.2, how are suitable comments incorporated into the software code? The staff requests MHI to address suitable comments per Clause 5.3.4 of IEEE 1074-1995.

US-APWR MUAP-07017-P (R4), Section 3.2.8.2.3 describes two application software development tools. The staff requests MHI to address Clause 5.3.2 of IEEE 7-4.3.2-2003 on the subject. Also, this section states how the two application software development tools are developed and qualified in accordance with MELCO Quality Assurance Program. Generally, the staff associates the term 'qualified' with the commercial dedication of safety-related SSCs. Please clarify or change the wording as appropriate to avoid confusion with the standard use of the term 'qualified'.