

REQUEST FOR ADDITIONAL INFORMATION 226-2018 REVISION 0

2/26/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 07.02 - Reactor Trip System

Application Section: Section 07.02 - Reactor Trip System

QUESTIONS for Instrumentation, Controls and Electrical Engineering 1 (AP1000/EPR Projects) (ICE1)

07.02-1

DCD Sect. 7.2.3.1 cites compliance with IEEE Std 379-2000 for its methodology for performing a failure modes and effects analysis (FMEA). Based on IEEE Std 603-1991 and Std 7-4.3.2-2003, IEEE Std 352 is the standard that provides the guidance for performing a FMEA. Conformance with the requirements of IEEE Std 379-2000, provides methods acceptable to the NRC staff for satisfying the NRC's regulations with respect to the application of the single-failure criterion. IEEE Std 352 states that a FMEA "is conducted to determine the effects of each component failure mode on the overall system performance. In this process, the component failure modes that could contribute to unsafe system failure are identified, and necessary action can be taken at this point in the procedure." Address the applicability of IEEE Std 352 in performing a FMEA analysis for the APWR I&C systems.

07.02-2

MHI is requested to provide additional information to be docketed with regards to the application of the MELTAC platform for the US-APWR. NUREG-0800, Standard Review Plan, Branch Technical Position 7-14.

"Guidance on Software Reviews for Digital Computer-based Instrumentation and Control Systems." (BTP-14) identifies guidelines for evaluating software life-cycle processes for digital computer-based instrumentation and control (I&C) systems. Table 1.9.2-7, of the DC-FSAR, "US-APWR Conformance with Standard Review Plan Chapter 7 Instrumentation and Controls" identifies conformance to BTP-14 with no exceptions. The staff requests MHI to address the guidelines of BTP-14, Section B.2.1, Software Life Cycle Process Planning and specific plans for the application software. Section 6.3 provides a high level summary of the plans for the application software. MUAP-07017, "US-APWR Technical Report; Software Program Manual" provides further detail of individual plans for the application software for the US-APWR. MHI is requested to docket the plant specific project plans, as part of the US-APWR design certification, so that a review can be done to ensure compliance with the SPM and 10 CFR. If the above information is not available, MHI should expand ITAAC beyond the single ITAAC on the life cycle process for the Class IE safety systems, Design Commitment No. 24 of Table 2.5.1-5. The additional ITAACs would be identified as Design Acceptance Criteria (DAC) and would typically specify the applicable portions of the High Quality Design Process delineated in Section C of Appendix A to RG 1.206, "Combined License Applications For Nuclear Power Plants (LWR Edition)."

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MHI is requested to identify at the document level as a minimum, or section of information, what is applicable to the basic software, application software or both.