

REQUEST FOR ADDITIONAL INFORMATION 720-5539 REVISION 2

3/21/2011

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 07.01 - Instrumentation and Controls - Introduction

Application Section: 07.01

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

07.01-28

MHI is requested to address the issue of embedded digital systems in actuated equipment (pumps/valves/etc.) beyond PSMS/PCMS.

US-APWR Software Program Manual, MUAP-07017 (R3), section 3.6.6.4, states, "There are no commercial grade items used in the PSMS including application software. All systems, structures, and components [SSCs] in the PSMS use the qualified MELTAC Platform and Basic Software as described in Technical Report "Safety System Digital Platform –MELTAC– " (MUAP-07005), which are produced and maintained as Basic Components by MELCO under a 10 CFR 50 Appendix B QAP [quality assurance program]."

MHI is requested to address the issue of embedded digital systems in SSCs such as embedded digital devices in pumps, valves, motor control centers, electrical switchgear, and etc. These embedded digital devices/components can be subject to the issues identical to those digital devices/components used in reactor protection and engineered safety features systems. Notably, they can be subject to potential software common cause failures, and sensitive to electromagnetic interference (EMI). These issues can impact the reliability of the SSCs. If the devices/components are part of the safety-related SSCs, their software should conform to the required software quality assurance suitable to safety applications. From the staff's perspective, the embedded digital devices/components are part of plant's I&C systems. It is important that the design control document (DCD) identifies these issues to the COL holders and provides safeguards to address the issues.