RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

11/11/2013

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**No.995-7024 Revision 0**
SRP SECTION:	**07.01 – Instrumentation and Controls - Introduction**
APPLICATION SECTION:	**07.01 – Instrumentation and Controls - Introduction**
DATE OF RAI ISSUE:	**2/21/2013**

QUESTION NO. : 07.01-45

10 CFR 50.55a(a)(1) requires that structures, systems, and components (SSCs) must be designed, fabricated, erected, constructed, tested, and inspected to quality standards commensurate with the importance of the safety function to be performed.

IEEE Std. 603-1991, incorporated by reference via 10 CFR 50.55a(h), Section 5.3 requires that components and modules be of a quality that is consistent with minimum maintenance requirements and low failure rates.

GDC 1 requires quality standards and maintenance of appropriate records for SSCs important to safety.

US-APWR design control document (DCD) Tier 2 Section 7.1.3.13 states that the quality of PSMS components and modules (including the MELTAC platform) and the quality of the PSMS design process are controlled by a program that meets the requirements of ASME NQA-1- 1994. Conformance to ASME NQA-1-1994 is described further in Section 17.5. Subsequently, in response to RAI 720-5539, Question 07.01-28, the applicant stated that only MELTAC platform or analog equipment is planned to be used for safety-related applications.

Since the applicant is not proposing to commercially dedicate any of the MELTAC platform hardware/software components, the staff requests the applicant to provide the following:

1. In accordance with the regulatory requirements and guidance for safety-related I&C systems, ensure that the technical and quality requirements (and any exceptions to regulations and guidance) for the safety-related I&C systems (including the MELTAC platform) design and development are identified in the US-APWR DCD and related technical and topical reports.

2. Ensure that the safety-related I&C systems' technical and quality requirements provided in the US-APWR design certification material are self-standing; and do not rely upon or reference any sub-vendor documents. In addition, ensure that the US-

APWR DCD contains provisions to flow down these I&C technical and quality requirements to the applicable sub-vendors.

3. Ensure sufficiently clear ITAAC are specified in the US-APWR DCD to verify and validate the implementation process steps that confirm the quality of the as-built safety-related I&C systems in conformance with the applicable quality requirements, and that the implemented design meets the technical requirements.

4. Since the quality of the PSMS design and development process is controlled by a program that meets the requirements of ASME NQA-1-1994, the applicant is asked to remove any reference to commercial grade dedication (CGD) of the MELTAC platform components that may contradict the ASME NQA-1-1994 based program from the USAPWR DCD and related technical and topical reports.

ANSWER:

MHI Answer to NRC Request 1

As described in DCD Section 7.1, the safety-related I&C for the US-APWR consists of a fully safety-related digital I&C platform, named MELTAC Platform. The technical and quality requirements for the safety-related I&C platform design and development are identified in the following documents.

- DCD Chapter 7
- "Safety I&C System Description and Design Process" (MUAP-07004)
- "Safety System Digital Platform – MELTAC –" (MUAP-07005)
- "US-APWR Software Program Manual" (MUAP-07017)
- "MELTAC Platform ISG-04 Conformance Analysis" (JEXU-1015-1009 will be resubmitted as MHI document MUAP-13018)
- "US-APWR Response Time of Safety I&C System" (MUAP-09021)
- "US-APWR Instrument Setpoint Methodology" (MUAP-09022)

A roadmap table (i.e., applicability matrix) will be added in MUAP-07005 that will point to the technical and quality requirements for the safety-related I&C platform that are pertinent to each respective safety requirement. (See Table 0-1 "Regulatory Requirements and Guidance Applicability Matrix for the Safety-related Platform Design and Development" in Attachment 2)

This roadmap table, similar to Table 7.1-2 of the DCD Chapter 7, contains the criteria from SRP Table 7-1, IEEE Std. 603-1991 and IEEE Std. 7-4.3.2-2003 and provides links to the applicable ITAAC.

MHI Answer to NRC Request 2

The safety-related I&C systems' technical and quality requirements are described in the US-APWR DCD and related technical and topical reports.

The technical and quality requirements for the safety-related I&C platform are also described in the MHI documentation in the DCD and related technical and topical reports. The safety-related I&C platform design information (i.e., MELTAC platform design information) is attached in the MUAP-07005 and MUAP-13018 to show that the safety-related I&C platform (i.e., MELTAC Platform) design conforms to NRC regulations and guidance and meets the

technical and quality requirements contained in the US-APWR DCD and related technical and topical reports.

In order to ensure that the technical and quality requirements for MELTAC platform are self-standing and do not rely upon or reference any sub-vendor documents, the following changes will be provided in the DCD and related technical reports.

- The applicability matrix table for the technical and quality requirements, as mentioned above, which identifies the technical and quality requirements of the safety-related I&C platform will be added into the MELTAC Technical Report (MUAP-07005). The applicability matrix table shows the technical and quality requirements for the safety-related I&C platform are described into the MHI documentation, but do not rely upon or reference any sub-vendor documents. The applicability matrix table points to the DCD and related reports sections which describe the technical and quality requirements of the safety-related platform. The applicability matrix table also points to the MUAP-07005 sections which describe the design information of the safety-related platform. The design information demonstrates that the safety-related digital platform design conforms to NRC regulations and guidance, and meets the technical and quality requirements.
- MELTAC Technical Report (MUAP-07005) will also be revised to clearly identify:
  - Design information, which demonstrates that the safety-related I&C platform (i.e., MELTAC Platform) design conforms to NRC regulations and guidance and meets the technical and quality requirements of the US-APWR DCD and related technical and topical reports.
  - Reference information, which is not considered design information (e.g., purpose, scope, and definition sections)
- "MELTAC Platform ISG-04 Conformance Analysis" (JEXU-1015-1009) will be re-submitted as MHI's document (i.e., MUAP document).
- The name "MELTAC" will maintained to indicate the safety-related I&C platform for the US-APWR.

For the MELTAC Technical Report, the following sections will be changed to clearly identify design information.

The scope of design information will be identified. The scope of design information is as below.

Section 4: Safety I&C platform MELTAC specifications
Section 5: Safety I&C platform MELTAC qualification test specifications
Section 6: Safety I&C platform MELTAC lifecycle and security measures
Section 7: Safety I&C platform MELTAC reliability information
Appendix A, B, D, E, G and H: Safety I&C platform MELTAC detailed information

5.0 ENVIRONMENTAL, SEISMIC, ELECTROMAGNETIC AND ISOLATION QUALIFICATION
A table to show regulatory requirements and acceptance criteria for each test will be added. The existing qualification test results will be maintained, because they establish qualification confirmation of the MELTAC platform.

6.0 LIFE CYCLE
The information about lifecycle and security measures under 10CFR50 Appendix B QAP will be maintained as design information. The MELTAC CGD process performed in the past, which is not DCD design information, will be removed from this Technical Report

Appendix C
This appendix refers to internal MELCO information and will be deleted.

In DCD Section 7.1.2, MHI will add a description ensuring that the technical and quality requirements identified in the applicability matrix table are imposed on the applicable sub-vendors.

In addition to the above changes, the following revision will also be made for DCD Chapter 7 and MHI I&C technical reports.

References to the Basic SPM are deleted in the DCD Chapter 7 and MHI Technical Reports. The MELTAC platform technical and quality requirements that are executed by the basic software are specified in the DCD/Technical Reports and verified and validated by ITAAC and in accordance with the US-APWR SPM. See also “MHI Answer to NRC Request 1” above for the links of ITAAC to the technical and quality requirements.

Also references of the MELCO documents such as the Basic SPM (including JEXU, JSX, N-, Q- documents) documents which are used or referred as the basis of digital I&C technical and quality requirements are removed from the DCD Chapter 7 and MHI Technical Reports.

MHI Answer to NRC Request 3
DCD Tier 1 Table 2.5.1-6 ITAAC 1 through 31 have already been tailored to verify that as-built I&C system meets the technical requirements specified in the DCD and related technical reports, including regulatory requirements for Class 1E safety systems.

As currently written, DCD Tier 1 Table 2.5.1-6 ITAAC 24.i through 24.v will verify and validate that each SPM implementation process is implemented to manage the PSMS software life cycle. The V&V specified in the SPM is achieved at the system level through application level testing, which encompasses the safety-related I&C platform hardware and software.

Therefore, a new ITAAC is not needed and the current ITAAC do not need to be revised.

Links that connect specific ITAAC to the technical and quality requirements of the safety-related I&C platform are provided in the applicability matrix table as described in “MHI Answer to NRC Request 1” above.

MHI Answer to NRC Request 4
Based on the discussion at the public meeting held on February 26, 2013, the following change will be made.

- Any reference to CGD of the MELTAC platform components will be removed from DCD Subsection 7.1.3.13.
- The MELTAC CGD process in the MELTAC Technical Report (MUAP-07005) will be removed.

The past MELTAC CGD process information is deleted from the DCD and Technical Reports also.
The references of NRC’s MELCO inspection are removed from the DCD and Technical Reports.

Impact on DCD
Attachment 1 shows the mark up of the DCD.

Impact on R-COLA
There is no impact on the R-COLA.

Impact on PRA
There is no impact on the PRA.

Impact on Technical / Topical Report
MUAP-07005 will be revised.
Attachment 2 shows the mark up of MUAP-07005.

“MELTAC Platform ISG-04 Conformance Analysis” (JEXU-1015-1009, which will be resubmitted as MHI document MUAP-13018) will be revised.
Attachment 2 also shows the mark up of MUAP-13018.