RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

10/7/2016

SAFETY SYSTEM DIGITAL PLATFORM
- MELTAC (MITSUBISHI ELECTRIC TOTAL ADVANCED CONTROLLER) -
TOPICAL REPORT

Mitsubishi Electric Corporation

TAC NO.:	**MF4228**
RAI NO.:	**#1**
DATE OF RAI ISSUE:	**6/29/2016**

QUESTION NO.: 1 for JEXU-1041-1022, "Summary of MELTAC Platform Design"

Software Requirements Specification (SRS) & Software Design Specifications (SDS):

a. The summary document, JEXU-1041-1022, states the MELCO document which contains the information for a software requirements specification is "MELTAC-Nplus S System Specification." Section 4.1, "System Specification (Platform Specification)." The summary document provides the table of contents of the System Specification but not the specification itself. The NRC requires System Specifications to support its safety evaluation. The NRC staff has endorsed Institute of Electrical and Electronics Engineers (IEEE) Standard 830-1998, "IEEE Recommended Practice for Software Requirements Specifications," by regulatory guide (RG) 1.172. Also, the NRC Standard Review Plan (SRP) Section 7-14, "Guidance on Software Reviews for Digital Computer-Based Instrumentation and Control Systems," Section B.3.3.1 provides acceptance criteria for a SRS. Additional guidance can be found in NUREG/CR-6101 Sections 3.2.1 and 4.2.1. The acceptance criteria using these references is delineated in ISG-06 Section D.4.4.3.1. The summary document points to JEXU-1024-1010, "MELTAC-Nplus S System Specification." Therefore the staff requests this document be submitted on the docket with an analysis of conformance to the acceptance criteria, or any alternatives, to RG 1.172 and the applicable sections of the SRP, Section 7.14, specifically identified.

b. ISG-06. Section D.4.4.3.3, references the acceptance criteria for the software design specification including the SRP Section BTP 7-14, "Guidance on Software Reviews for Digital Computer-Based Instrumentation and Control Systems," Section B.3.3.3, "Design Activities – Software Design Specification

(SDS)." This guidance provides functional and process characteristics as well as review guidance of SDSs.

Provide an explanation how the following documents, identified in Table 1 and Appendix A, provide the information for the controller CPU module to conform to the Software Design Specification guidance stated above. Also the NRC staff requests these documents be submitted on the docket:

Hardware Requirement Specification, JEXU-1024-1021,
Hardware Specification, JEXU-1024-1051,
Software Specification, JSX4L400,
FPGA Specification, JEXU-1024-1071.

ANSWER:

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Impact on Topical Report
There is no impact on the Topical Report.

Impact on Technical Report

Regarding a.), Section 2.0 of “Summary of MELTAC Platform Design” (JEXU-1041-1022) will be revised. Appendix B will be added to “Summary of MELTAC Platform Design” (JEXU-1041-1022) (see Attachment-1).
Regarding b.), Section 2.0 of “Summary of MELTAC Platform Design” (JEXU-1041-1022) will be revised. Appendix C will be added to “Summary of MELTAC Platform Design” (JEXU-1041-1022) (see Attachment-1).

1.0 INTRODUCTION

This summary describes the design documents associated with the Mitsubishi Electric Corporation (MELCO) Energy Systems Center (ESC) Mitsubishi Electric Total Advanced Controller (MELTAC) Platform. The MELCO ESC design documents encompass the MELTAC Platform hardware and the basic software, which includes the firmware and Field Programmable Gate Arrays (FPGAs) on all MELTAC Platform modules.

This document supports the “Safety System Digital Platform - MELTAC - Topical Report” (JEXU-1041-1008) and satisfies the commitments made under Table 1 sections 1.12, 1.13, 2.3, 2.9, 3.1, 3.3, 3.7, 3.8, 3.9 and 3.10 of “Mapping of MELTAC Platform Licensing Documents to the DI&C-ISG-06 Guidance” (JEXU-1041-1012).

2.0 DOCUMENTATION TREE AND CATEGORIZATION

Figure 1 shows the MELTAC Platform Documentation Tree. These documents are internal documents, which are categorized into three groups according to the following phases: Design Phase, Qualification Phase, and V&V Phase. The scope of this summary is the design documents prepared in the Design Phase.

The Qualification Phase documents are described in “Summary of MELTAC Platform Equipment Qualification” (JEXU-1041-1023), and the V&V Phase documents are described in “Summary of MELTAC Platform V&V” (JEXU-1041-1026).

The MELTAC Platform Design documents corresponding to the information required by DI&C-ISG-06 “Licensing Process” (ISG-06) Enclosure B (Tier 3) are listed in Section 3. Specific document numbers are identified in Appendix A.

The types and summaries of the design documents related to the MELTAC Platform are listed in Section 4.

The conformance of Software Requirements Specification (SRS), regarding NRC Standard Review Plan (SRP) Section 7-14, “Guidance on Software Reviews for Digital Computer-Based Instrumentation and Control Systems,” Section B.3.3.1 acceptance criteria for SRS, is evaluated in Appendix B. Design-1a

The conformance of Software Design Specification (SDS), regarding NRC Standard Review Plan (SRP) Section 7-14, “Guidance on Software Reviews for Digital Computer-Based Instrumentation and Control Systems,” Section B.3.3.3 acceptance criteria for SDS, is evaluated in Appendix C. Design-1b

APPENDIX B CONFORMANCE EVALUATION OF SOFTWARE REQUIREMENT SPECIFICATION

Table B-1 Conformance of SRP Section BTP 7-14
Section B.3.3.1.1 Functional Characteristics of SRS

Design-1a

Design-1a

Design-1a

Table B-2 Conformance of SRP Section BTP 7-14
Section B.3.3.1.2 Process Characteristics of SRS

Design-1a

Design-1a

Design-1a

Design-1a

APPENDIX C CONFORMANCE EVALUATION OF SOFTWARE DESIGN SPECIFICATIONS

Table C-1 Conformance of SRP Section BTP 7-14
Section B.3.3.3.1 Functional Characteristics of SDS

Design-1b

Design-1b

Design-1b

Table C-2 Conformance of SRP Section BTP 7-14
Section B.3.3.3.2 Process Characteristics of SDS

Design-1b

Design-1b

Design-1b

Design-1b