RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

9/23/2016

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-1041-1031, "MELTAC Platform Software Tools"

P. 4, List of Software Tools Category Used in Each Phase:

a. In order for the NRC staff to evaluate software tools for compliance with IEEE 7-4.3.2 Section 5.3.2, we will need to understand what the tools are used for as well as what functions they perform in relation to the MELCO safety software development processes. The software tools listed in Table 1 are not consistent with names of the software tools provided in Section 5.0, Detailed Description of Processes. Please clarify the specific function of the tools and identify what document describes the function of each tool. The response should include a description of what the rules are for using the tool correctly and what configurations or options are recommended or advised against.

    i. By further example of what the NRC staff needs to understand is the functions of the Engineering Tool. Section 4.1.4.1, Function Description of the TR, states the functional block diagrams are converted to graphical block diagrams by the MELTAC engineering tool. Section 5.7, MELTAC Engineering Tool, does not describe this function. Please explain.

b. Please provide an assessment of how each tool conforms to the software tools criteria of IEEE 7-4.3.2 Section 5.3.2for the tools listed below:

    i. **[ ]**
    ii. **[ ]**

c. Identify the lifecycle phases that the MIC will be used in as was done with the other software tools on Table 1.

d. Clause 5.3.2 of IEEE Std 7-4.3.2 specifies that software tools used to support software development are controlled under a configuration management plan. To evaluate compliance with this requirement, the NRC needs to review plans and procedures for establishment and maintenance of tool configuration control. Please provide documentation to show how tool configurations are controlled and Identify procedures used to maintain tool configuration control.

ANSWER:

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

Impact on Technical Report

Regarding a), Section 1.0, Table 1 in Section 4.0 and Section 5.0 of JEXU-1041-1031, “MELTAC Platform Software Tools” will be revised. Appendix B will be added to JEXU-1041-1031, “MELTAC Platform Software Tools” (see Attachment 1).
Regarding b), Section 5.10.2 of JEXU-1041-1031, “MELTAC Platform Software Tools” will be revised (see Attachment-2).
Regarding c), Table 1 in Section 4.0 of JEXU-1041-1031, “MELTAC Platform Software Tools” will be revised (see Attachment-3).
Regarding d), There is no impact on the Technical Report.

1.0 INTRODUCTION

This document describes the software tools, how their quality has been determined, how they are used and maintained, and verification and the validation (V&V) activities associated with the outputs generated by those software tools for the Mitsubishi Electric Total Advanced Controller (MELTAC) platform (i.e., Method (b) in Clause 5.3.2 of IEEE Std. 7-4.3.2-2003). This document encompasses the software tools used to develop the MELTAC platform basic software, which includes firmware and field programmable gate arrays (FPGAs) on all MELTAC platform modules.

This document supports “Safety System Digital Platform - MELTAC - Topical Report” (JEXU-1041-1008), which references “MELTAC Platform Software Program Manual” (JEXU-1041-1016) and satisfies the commitments made under Table 1 Section 2.17 “Software Tool Analysis Report” of “Mapping of MELTAC Platform Licensing Documents to the DI&C-ISG-06 Guidance” (JEXU-1041-1012).

BTP 7-14, B.3.1.11.2 requires evaluation process for software tools, if tools are purchased as commercial items. Appendix A describes the evaluation procedure for purchased software tools used to develop MELTAC platform basic software. Tools-2

“Safety System Digital Platform - MELTAC - Topical Report” (JEXU-1041-1008) also describes the MELTAC engineering tool functions associated with application software development. Appendix B of this document further describes these functions: how their quality has been determined, how they are expected to be used and maintained, and the verification and validation (V&V) activities associated with the outputs generated by the MELTAC engineering tool (i.e., Method (b) in Clause 5.3.2 of IEEE Std. 7-4.3.2-2003). Tools-1a

2.0 REFERENCES

Document Name	Document Number	Revision
Safety System Digital Platform - MELTAC - Topical Report	JEXU-1041-1008	Current
Mapping of MELTAC Platform Licensing Documents to the Digital I&C-ISG-06 Guidance”	JEXU-1041-1012	Current
Digital I&C-ISG-06 “Digital Instrumentation & Control Licensing Process”	ML110140103	1
MELTAC Platform Software Program Manual	JEXU-1041-1016	Current
Guidance on Software Reviews for Digital Computer-Based I&C Systems	NUREG 0800 BTP 7-14	2007
Criteria for use of Computer in Safety Systems for Nuclear Power Plants	RG 1.152	3
Criteria for Digital Computers in Safety Systems for Nuclear Power Generating Stations	IEEE Std. 7-4.3.2-2003	2003

4.0 OBJECTIVE AND METHODOLOGY

[**]** The software life cycle is described in Section 3 of “MELTAC Platform Software Program Manual” (JEXU-1041-1016).

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Table 1 - List of Software Tools Category Used in Each Phase

Tools-1a

Tools-1c

5.0 DETAILED DESCRIPTION OF PROCESSES

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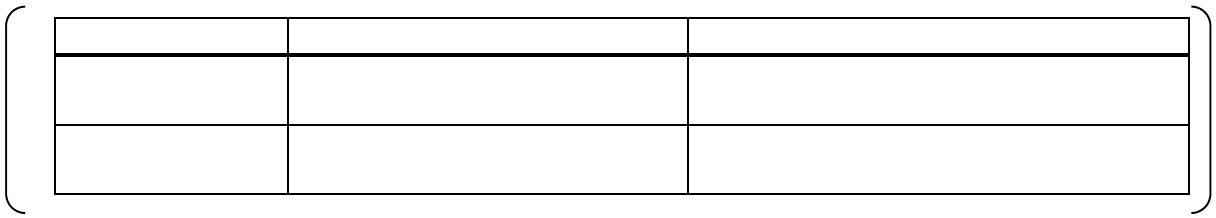

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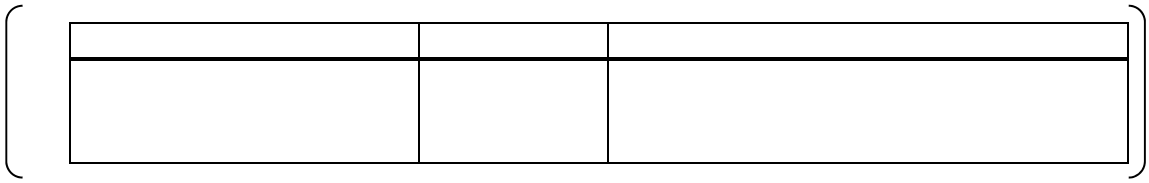

Tools-1a

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Tools-1a

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Tools-5

Tools-5

APPENDIX B MELTAC ENGINEERING TOOL FUNCTIONS FOR APPLICATION SOFTWARE DEVELOPMENT

The functional description of MELTAC engineering tool is described in Section 4.1.4 of “Safety System Digital Platform - MELTAC - Topical Report” (JEXU-1041-1008).
The table below lists the MELTAC engineering tool functions used to develop application software, which are expected to be used during implementation, test, and installation of application software.
This appendix also describes how the functions are used, including verification and validation (V&V) activities associated with the outputs generated by the MELTAC engineering tool.

Table B.1 MELTAC engineering tool functions used to develop application software

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Tools-1a

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Tools-1a

Tools-5

Tools-5

Tools-1b

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4.0 OBJECTIVE AND METHODOLOGY

[**]** The software life cycle is described in Section 3 of “MELTAC Platform Software Program Manual” (JEXU-1041-1016).

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Table 1 - List of Software Tools Category Used in Each Phase

Tools-1a

Tools-1c