

JEXU-1041-1008, SAFETY SYSTEM DIGITAL PLATFORM - MELTAC

[MITSUBISHI ELECTRIC TOTAL ADVANCED CONTROLLER] TOPICAL REPORT ‘

REQUESTS FOR ADDITIONAL INFORMATION (RAIS)

RAI 1

Regulatory Basis: Title 10 of the *Code of Federal Regulations* (10 CFR) Paragraph 50.55a(h), “Protection and Safety Systems,” requires that protection systems must be consistent with their licensing basis or may meet the requirements of the Institute of Electrical and Electronics Engineers (IEEE) Standard (Std) 603-1991, “IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations,” and the correction sheet dated January 30, 1995. Clause 5.4, “Equipment Qualification” of IEEE Std 603-1991 states, in part, that safety system equipment shall be qualified by type test, previous operating experience, or analysis, or any combination of these three methods, to substantiate that it will be capable of meeting, on a continuing basis, the performance requirements as specified in the design basis. MELTAC is a safety system digital platform which shall meet the requirements in the above Clause 5.4.

Background and Issue: Section 5.0 of the MELTAC Topical Report (TR) states, in part, that “If any module is updated, and it is determined that qualification re-testing is required by the evaluations conducted in accordance with Section 6.1.7, the module will be tested with the same method and acceptance criteria. The same method and acceptance criteria will also be used for any new MELTAC modules.” However, some testing standards and their criteria, especially for electromagnetic compatibility have been changed in the revised MELTAC TR.

Request: Please clarify if and how the same method and acceptance criteria will be used to qualify the updated and new MELTAC modules. Also provide a list of updated and new MELTAC modules with qualification methods and acceptance criteria to be used for their qualification.

RAI 2

Regulatory Basis: 10 CFR 50.55a(h), “Protection and Safety Systems,” requires that protection systems must be consistent with their licensing basis or may meet the requirements of the IEEE Std 603-1991, “IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations,” and the correction sheet dated January 30, 1995. Clause 5.4, “Equipment Qualification” of IEEE Std 603-1991 states, in part, that safety system equipment shall be qualified by type test, previous operating experience, or analysis, or any combination of these three methods, to substantiate that it will be capable of meeting, on a continuing basis, the performance requirements as specified in the design basis. MELTAC is a safety system digital platform which shall meet the requirements in the above Clause 5.4.

Background and Issue: Plant Specific Action Item (PSAI) 5.2.4 of the safety evaluation (SE) for the original MELTAC TR requires the licensees to demonstrate that the generically qualified MELTAC platform equipment envelops the site conditions. However, Page 5 of the MELTAC TR states, in part, that “there is no additional site-specific EMI [electromagnetic interference] qualification.”

Enclosure 2

~~Enclosure 1~~

Request: Please provide a statement justifying, clarifying, or explaining this statement in the revised MELTAC TR, since the EMI qualification testing for the MELTAC updated and new modules will not be performed until 2025 or later.

RAI 3

Regulatory Basis: 10 CFR 50.55a(h), "Protection and Safety Systems," requires that protection systems must be consistent with their licensing basis or may meet the requirements of the IEEE Std 603-1991, "IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations," and the correction sheet dated January 30, 1995. Clause 5.4, "Equipment Qualification" of IEEE Std 603-1991 states, in part, that safety system equipment shall be qualified by type test, previous operating experience, or analysis, or any combination of these three methods, to substantiate that it will be capable of meeting, on a continuing basis, the performance requirements as specified in the design basis. MELTAC is a safety system digital platform which shall meet the requirements in the above Clause 5.4.

Background and Issue: The PSND termination unit modules are included in Appendix A, "Hardware Specification," of the revised MELTAC TR, which describes modules that are used for safety systems. However, Generic Open Item 5.1.2 of the original SE states that the PSND termination unit module has not been qualified.

Request: Please provide information to support the qualification of the PSND termination unit modules.

RAI 4

Regulatory Basis: 10 CFR 50.55a(h), "Protection and Safety Systems," requires that protection systems must be consistent with their licensing basis or may meet the requirements of the IEEE Std 6031991, "IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations," and the correction sheet dated January 30, 1995. Clause 5.4, "Equipment Qualification" of IEEE Std 603-1991 states, in part, that safety system equipment shall be qualified by type test, previous operating experience, or analysis, or any combination of these three methods, to substantiate that it will be capable of meeting, on a continuing basis, the performance requirements as specified in the design basis. MELTAC is a safety system digital platform which shall meet the requirements in the above Clause 5.4.

Background and Issue: The equipment qualification testing for the revised and new modules will not be performed until the next phase of this project, in 2025 or later.

Request: Please provide clarification to support the confirmative statements included in the revised MELTAC TR under the following regulatory guidance:

- a. Regulatory Guide (RG) 1.100, "Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants," on Page 6.
- b. RG 1.180, "Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems," on Page 9.
- c. RG 1.209, "Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants," on Page 10.
- d. IEEE Standard 323, "Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations" on Page 12.

- e. IEEE Standard 344, “Standard for Seismic Qualification of Equipment for Nuclear Power Generating Stations” Page 12.
- f. MIL-STD-461G in Section 3.0 of the MELTAC TR on Page 15.

RAI 5

Regulatory Basis: 10 CFR 50.55a(h), “Protection and Safety Systems,” requires that protection systems must be consistent with their licensing basis or may meet the requirements of the IEEE Std 603-1991, “IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations,” and the correction sheet dated January 30, 1995. Clause 5.4, “Equipment Qualification” of IEEE Std 603-1991 states, in part, that safety system equipment shall be qualified by type test, previous operating experience, or analysis, or any combination of these three methods, to substantiate that it will be capable of meeting, on a continuing basis, the performance requirements as specified in the design basis. MELTAC is a safety system digital platform which shall meet the requirements in the above Clause 5.4.

Background and Issue: Section 3.1.17 of the MELTAC Platform ISG-04 Conformance Analysis Report states that [[[REDACTED]]] But the equipment qualification testing for new and modified modules are not conducted yet.

Request: Please clarify or provide additional information to support the quoted statement in the MELTAC TR.

RAI 6

Regulatory Basis: 10 CFR 50.55a(h), “Protection and Safety Systems,” requires that protection systems must be consistent with their licensing basis or may meet the requirements of the IEEE Std 603-1991, “IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations,” and the correction sheet dated January 30, 1995. Clause 5.6.1, “Between Redundant Portions of a Safety System” states, in part, that redundant portions of a safety system provided for a safety function shall be independent of and physically separated from each other to the degree necessary to retain the capability to accomplish the safety function during and following any design basis event requiring that safety function. Clause 5.6.3, “Between Safety Systems and Other Systems”, states, in part, that the safety system design shall be such that credible failures in and consequential actions by other systems, as documented in Section 4.8 of the design basis, shall not prevent the safety systems from meeting the requirements of this standard. MELTAC is a safety system digital platform which shall meet the requirements in the above Clauses 5.6.1 and 5.6.3.

Background and Issue: Section 4.3.2 of the MELTAC TR states that the Control Network can also be used to communicate non-safety data between different divisions. Staff Position 3 of Digital Instrumentation & Controls (DI&C)-Interim Staff Guidance (ISG)-04 says that “A safety channel should not receive any communication from outside its own safety division unless that communication supports or enhances the performance of the safety function”.

Request: Please clarify what non-safety data are communicated between safety divisions and provide justifications on how the revised Melco platform meets the above criterion of DI&C-ISG-04.

RAI 7

Regulatory Basis: 10 CFR 50.55a(h), “Protection and Safety Systems,” requires that protection systems must be consistent with their licensing basis or may meet the requirements of the IEEE Std 603-1991, “IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations,” and the correction sheet dated January 30, 1995. Clause 5.6.1, “Between Redundant Portions of a Safety System” states, in part, that redundant portions of a safety system provided for a safety function shall be independent of and physically separated from each other to the degree necessary to retain the capability to accomplish the safety function during and following any design basis event requiring that safety function. Clause 5.6.3, “Between Safety Systems and Other Systems”, states, in part, that the safety system design shall be such that credible failures in and consequential actions by other systems, as documented in Section 4.8 of the design basis, shall not prevent the safety systems from meeting the requirements of this standard. MELTAC is a safety system digital platform which shall meet the requirements in the above Clauses 5.6.1 and 5.6.3.

Background and Issue: Section 3.1.3 of MELTAC Platform ISG-04 Conformance Analysis Report states that [[

]] However, in Section 3.1.16 it states that [[
]]. But inter-division vital communications include safety functions.

Request: Please clarify and explain inconsistency between Sections 3.1.3 and 3.1.16.

RAI 8

Regulatory Basis: 10 CFR 50.55a(h), “Protection and Safety Systems,” requires that protection systems must be consistent with their licensing basis or may meet the requirements of the IEEE Std 603-1991, “IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations,” and the correction sheet dated January 30, 1995. Clause 5.6.1, “Between Redundant Portions of a Safety System” states, in part, that redundant portions of a safety system provided for a safety function shall be independent of and physically separated from each other to the degree necessary to retain the capability to accomplish the safety function during and following any design basis event requiring that safety function. Clause 5.6.3, “Between Safety Systems and Other Systems”, states, in part, that the safety system design shall be such that credible failures in and consequential actions by other systems, as documented in Section 4.8 of the design basis, shall not prevent the safety systems from meeting the requirements of this standard. MELTAC is a safety system digital platform which shall meet the requirements in the above Clauses 5.6.1 and 5.6.3.

Background and Issue: At the top of Page 26 of the ISG-04 Conformance Analysis Report states that “...Control Network fault may affect the safety function...” However, at the bottom of Page 106 of the MELTAC TR it states that “inter-divisional communication for safety-related functions is not implemented in the Control Network”.

Request: Please clarify and explain the inconsistency in use of the control network.

RAI 9

Regulatory Basis: 10 CFR 50.55a(h), “Protection and Safety Systems,” requires that protection systems must be consistent with their licensing basis or may meet the requirements of the IEEE Std 603-1991, “IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations,” and the correction sheet dated January 30, 1995. Clause 5.6.1, “Between Redundant Portions of a Safety System” states, in part, that redundant portions of a safety system provided for a safety function shall be independent of and physically separated from each other to the degree necessary to retain the capability to accomplish the safety function during and following any design basis event requiring that safety function. Clause 5.6.3, “Between Safety Systems and Other Systems”, states, in part, that the safety system design shall be such that credible failures in and consequential actions by other systems, as documented in Section 4.8 of the design basis, shall not prevent the safety systems from meeting the requirements of this standard. MELTAC is a safety system digital platform which shall meet the requirements in the above Clauses 5.6.1 and 5.6.3.

Background and Issue: The approved MELTAC TR states that “Inter-divisional communication for safety-related functions is not implemented in the Control Network” on Page 106. However, the new changes shown on the same page include inter-divisional communication among safety divisions and also communication with non-safety controllers.

Request: Please clarify and explain the inconsistency between the approved MELTAC platform and the new changes in the revised MELTAC platform.