
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

8/22/2024

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

Mitsubishi Electric Corporation

EPID: L-2023-TOP-0036
RAI NO.: RAI 7
DATE OF RAI ISSUE: 1/19/2024

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.

ANSWER:

There is an inconsistency about the inter-divisional vital communication. To clarify restrictions about applications of the Data Link and the Control Network to vital communication, section 2.0 and 3.1.3 of MELTAC Platform ISG-04 Conformance Analysis Report (JEXU-1041-1015) will be revised.

| Q9

ISG-04 states that “*Vital communications as used herein are communications that are needed to support a safety function. Failure of vital communications could inhibit the performance of the safety function. The most common implementation of vital communications is the distribution of channel trip information to other divisions for the purpose of voting.*”

The actual signals included in vital communications, and the safety functions they support, are defined at application level.

[

]

Impact on Topical Report and/or Support Documents.

There are no impacts on MELTAC Topical Report (JEXU-1041-1008).
 Section 2.0, 3.1.3 and 3.1.14 of MELTAC Platform ISG-04 Conformance Analysis Report (JEXU-1041-1015) will be revised (see Attachment-1).

Q9

Revision History

Revision	Date	Page (section)	Description
0	March 2024	All	Initial issue
1	August 2024	1,2 Attachment 1	Revised to reflect the result of NRC Observation meeting (ADAMS Accession No. ML24206A078 and ML24212A321). Q9 notation corresponds to the NRC question number for RAI responses. Added section 2.0 of ISG-04 Conformance Analysis (JEXU-1041-1015) as the impacts on support documents. Added the markup of section 2.0 of ISG-04 Conformance Analysis (JEXU-1041-1015).

3.1.3 Staff Position 3

Requirement
<p>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. Receipt of information that does not support or enhance the safety function would involve the performance of functions that are not directly related to the safety function. Safety systems should be as simple as possible. Functions that are not necessary for safety, even if they enhance reliability, should be executed outside the safety system. A safety system designed to perform functions not directly related to the safety function would be more complex than a system that performs the same safety function, but is not designed to perform other functions. The more complex system would increase the likelihood of failures and software errors. Such a complex design, therefore, should be avoided within the safety system. For example, comparison of readings from sensors in different divisions may provide useful information concerning the behavior of the sensors (for example, On-Line Monitoring). Such a function executed within a safety system, however, could also result in unacceptable influence of one division over another, or could involve functions not directly related to the safety functions, and should not be executed within the safety system. Receipt of information from outside the division, and the performance of functions not directly related to the safety function, if used, should be justified. It should be demonstrated that the added system/software complexity associated with the performance of functions not directly related to the safety function and with the receipt of information in support of those functions does not significantly increase the likelihood of software specification or coding errors, including errors that would affect more than one division. The applicant should justify the definition of “significantly” used in the demonstration.</p>
Analysis
<div style="border: 1px solid black; height: 250px; width: 100%;"></div>

RAI 7

3.1.14 Staff Position 14

Requirement
Vital communications should be point-to-point by means of a dedicated medium (copper or optical cable). In this context, "point-to-point" means that the message is passed directly from the sending node to the receiving node without the involvement of equipment outside the division of the sending or receiving node. Implementation of other communication strategies should provide the same reliability and should be justified.
Analysis
<div style="border: 1px solid black; height: 150px; width: 100%;"></div>

RAI 7

iii "Vital" communications as used herein are communications that are needed to support a safety function. Failure of vital communications could inhibit the performance of the safety function. The most common implementation of vital communications is the distribution of channel trip information to other divisions for the purpose of voting.

3.1.15 Staff Position 15

Requirement
Communication for safety functions should communicate a fixed set of data (called the "state") at regular intervals, whether data in the set has changed or not.
Analysis
<div style="border: 1px solid black; height: 100px; width: 100%;"></div>

2.0 SCOPE

[

RAI 7
Rev.1
Q9