
REVISED RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

APR1400 Design Certification

Korea Electric Power Corporation / Korea Hydro & Nuclear Power Co., LTD

Docket No. 52-046

RAI No.: 45-7883
SRP Section: 07.09 - Data Communication Systems
Application Section:
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Question No. 07.09-3

Address multidivisional control and display stations staff guidance for the data communication interface between the Information Flat Panel Display (IFPD) and Engineered Safety Features-Component Control System Soft Control Module (ESCM).

10 CFR 50.55a(h) requires compliance to IEEE Std 603-1991. IEEE Std 603-1991, Clause 5.6.1, states, in part, "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," and Clause 5.6.3, states, in part, "The safety system design shall be such that credible failures in and consequential actions by other systems, as documented in 4.8 of the design basis, shall not prevent the safety systems from meeting the requirements of this standard." RG 1.75 provides guidance on the physical separation requirements of IEEE Std. 603-1991, Clause 5.6. BTP 7-11 provides guidance on application and qualification of isolation devices to meet the electrical isolation requirements of IEEE Std. 603-1991 Clause 5.6. DI&C-ISG-04 provides guidance for meeting the communications independence requirements of IEEE Std. 603-1991, Clause 5.6.

Technical Report, APR1400-Z-J-NR-14001-P, Rev. 0, "Safety I&C System," describes the design features of the APR1400 digital I&C system and how the design complies with NRC regulation. Technical Report, Appendix C, Section C.3, "Data Communication Systems" states, in part, "DI&C-ISG-04 Section 3 is not applicable as described in Section C.5.3." Section C.5.1.5 discusses communication between IFPD and ESCM, and that data sent from IFPD to ESCM are used to support operator's manual action.

Although the ESCM may not be used to perform a credited safety function, it appears to the staff that the component data from IFPD (non-safety control) to ESCM (safety-related) may be used to control safety-related equipment. Section 3.1.1 of DI&C-ISG-04 provides guidance on the control of safety-related equipment from a non-safety workstation. Based on the staff's understanding of the interface between ESCM and the IFPD, the staff finds that the non-safety

IFPD is used to indirectly control safety-related equipment. Thus, the guidance of DI&C-ISG-04 applies. The staff requests the applicant to address the staff positions in ISG-04, Section 3, for this interface. Also, it is not clear if it is possible to bypass or lockout any safety functions from the non-safety IFPD via the ESCM. Identify and describe the various types of commands that ESCM could send to the Engineered Safety Features - Component Control System (ESF-CCS) Loop Controller (LC). The staff requests applicant to clarify, and update the FSAR with this information.

Response – (Rev. 4)

Section C.5.3 of technical report, APR1400-Z-J-NR-14001-NP, Rev. 0, “Safety I&C System,” has been wholly revised to address compliance of the interface between the engineered safety features-component control system (ESF-CCS) soft control module (ESCM) and the information flat panel display (IFPD) to the guidance in DI&C ISG-04, Section 3, as shown in the attachment to the Rev.2 response.

The ESCM does not provide any manual bypass function or lockout function for safety components or safety systems.

The signal types sent from the ESCM to the ESF-CCS loop controller (LC) are as follows:

- Discrete control signal(e.g., on/off, start/stop)
- Modulation control signal(e.g., level control, flow control)

The attachment to the Rev.2 response has been revised to include a list of components controlled by the ESCM and placed into the technical report APR1400-Z-J-NR-14001-NP, Rev.1, “Safety I&C System”, Appendix E and to reflect the latest design changes of the ESCM, (e.g., acknowledgement action on the soft control template), in Section C.5.3.

In addition to above changes, the deletion to the statement “There are no manual control signals for component control to be sent from IFPD via the process-component control system (P-CCS) to safety-related control logics in the ESF-CCS loop controllers. So, the IFPDs are not applicable to DI&C-ISG-04, Section 3, “Multidivisional Control and Display Stations.”” has been made for design consistency. The multidivisional interface of IFPDs is that the IFPDs send component identification information to the ESCM and the IFPDs are applicable to DI&C-ISG-04, Section 3.

In order to maintain consistency between DCD Tier 2, Chapter 7 and Chapter 18, APR1400-E-I-NR-14011-NP, Rev.1, “Basic Human-System Interface” will be revised to ensure that the control action confirm message is specified on the ESCM when the component is selected on the IFPD, as shown in the attachment associated with this response.

Impact on DCD

There is no impact on the DCD.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

Section 4.7.3 and 4.10.1 of technical report APR1400-E-I-NR-14011-NP, Rev.1, “Basic Humans-System Interface” will be revised as indicated in the attachment associated with this response.



Figure 4-34 Format Chaining Display Page Access

4.7.3 Soft Control Format Chaining



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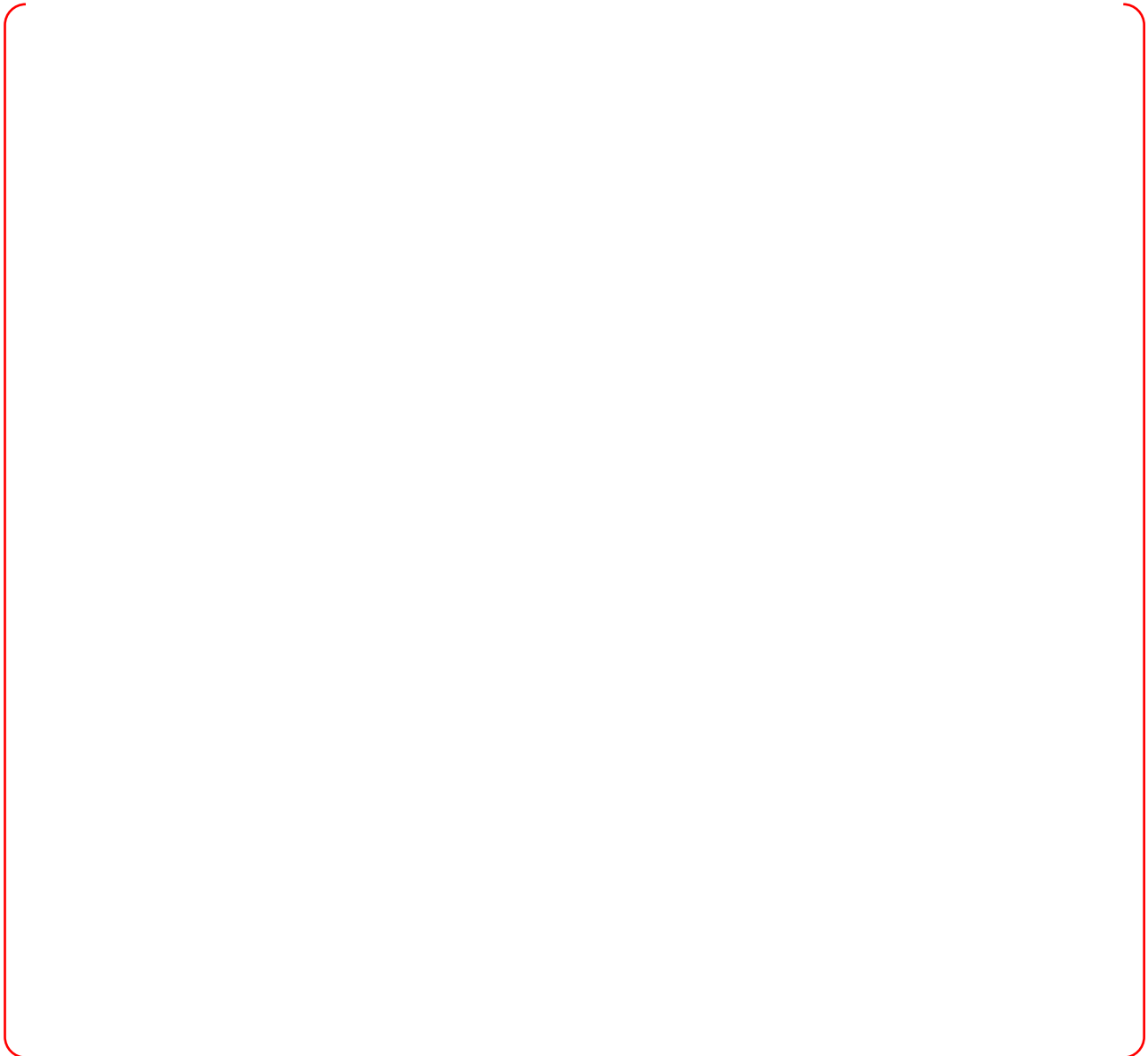


Figure 4-36 Format Chaining for Safety Soft Control

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4.10 ESF-CCS Soft Control Module

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4.10.1 Use with IFPDs

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4.10.2 Stand-alone Use

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