
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

APR1400 Design Certification

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

Docket No. 52-046

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Application Section:
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Question No. 07.09-10

Beside the MTP, clarify whether there are any other safety systems that send data to the DCS gateway.

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." Digital I&C Interim Staff Guidance (DI&C-ISG)-04 provides guidance for meeting the communications independence requirements of IEEE Std. 603-1991, Clause 5.6. Section 7.9.1.4 of the FSAR Tier 2 states "the MTP sends data to the IPS through the DCS gateway server using fiber-optic cable uni-directionally... The DCS gateway server receives data from safety systems with fiber-optic isolation." Besides the MTP, it is not clear to the staff if there are any other safety systems that send data to the DCS gateway. Clarify whether there are additional safety systems that send data to the DCS gateway and update the FSAR as appropriate.

Response

As shown in DCD Tier 2, Figure 7.9-1, besides the maintenance and test panel (MTP), there are no other safety systems that directly send data to the DCS gateway server.

The information processing system (IPS) requires safety component data to provide the operator with safety related variables during normal operation. The safety systems send the safety component data to the IPS, but they do not directly send the data to the IPS. The interface between the safety systems and the IPS is achieved by unidirectional Ethernet communication from the MTP to the DCS gateway.

DCD Tier 2, Subsection 7.9.1.4 will be revised as indicated in the attachment associated with this response.

Impact on DCD

DCD Tier 2, Subsection 7.9.1.4 will be revised as indicated in the attachment associated with this response.

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

There is no impact on any Technical, Topical, or Environmental Report.

APR1400 DCD TIER 2

The ITP sends the status and alarm information to the QIAS-N through the SDL unidirectionally. Therefore the failure of the QIAS-N does not prevent the ITP from performing the intended functions.

c. DCS gateway server

~~The DCS gateway server receives data from safety systems with fiber optic isolation.~~

Data Communication from Non-Safety System to Safety System

Ethernet communication is used to communicate from the IFPD to the ESCM. The connection does not transfer any safety or control information to perform any safety or control functions. The signal from the IFPD provides component identification information to the ESCM. This signal is used for bringing up the control template on the ESCM display and is not used for performing any control functions. Therefore, the ESF-CCS division does not rely on information from the IFPD to accomplish its function.

Compliance with DI&C-ISG-04 regarding communication from the IFPD to the ESCM is described in Appendix C of the Safety I&C System Technical Report (Reference 3).

Data Communication between the QIAS-N and Other Systems

The QIAS-N network is implemented by the SDN.

a. QIAS-N network

The QIAS-N network is used for signal connections as follows:

- 1) QIAS-N processor
- 2) QIAS-N display
- 3) QIAS-N MTP

The QIAS-N network and the DCN-I network are independent of each other. The QIAS-N network uses different data communication hardware and protocols from the DCN-I network.

The DCS gateway server receives data from the MTP with fiber optic isolation.