
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.: 342-8291

SRP Section: 07.08 – Diverse Instrumentation and Control Systems

Application Section:

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Question No. 07.08-09

Clarify why the Diverse Manual ESF Actuation (DMA) input is missing to the CIM priority logic for Divisions B and D in APR1400 FSAR, Tier 2, Figure 7.3-5, "ESFAS Functional Logic Diagram, (CSAS)." 10 CFR Part 50, Appendix A, GDC 22, "Protection system independence," states, "The protection system shall be designed to assure that the effects of natural phenomena, and of normal operating, maintenance, testing, and postulated accident conditions on redundant channels do not result in loss of the protection function, or shall be demonstrated to be acceptable on some other defined basis. Design techniques, such as functional diversity or diversity in component design and principles of operation, shall be used to the extent practical to prevent loss of the protection function." Item II.Q of the SRM to SECY-93-087, Position 4, states, "A set of displays and controls located in the main control room shall be provided for manual, system-level actuation of critical safety functions and monitoring of parameters that support the safety functions." Clarify why the DMA input is missing to the CIM priority logic for Divisions B and D in APR1400 FSAR, Tier 2, Figure 7.3-5. Update the FSAR documents accordingly.

Response

The diverse manual engineered safety features (ESF) actuation (DMA) switches are diverse from the manual and automatic logic functions performed by digital equipment in the plant protection system (PPS) and engineered safety features-component control system (ESF-CCS). The DMA switches are classified as non-safety and are not required to meet single failure criterion. Therefore, there is no need to add the DMA inputs for Divisions B and D in DCD Tier 2, Figure 7.3-5.

Section 5.3 of the Diversity and Defense-in-Depth technical report, APR1400-Z-J-NR-14002-P, Rev. 0 provides the description of the DMA switches as the following:

The DMA switches provide system-level conventional switches as follows:

- DMA safety injection actuation signal (SIAS) switch - Divisions A and C
 - DMA containment spray actuation signal (CSAS) switch - Divisions A and C
 - DMA containment isolation actuation signal (CIAS) switch - Division A
 - DMA main steam isolation signal (MSIS) switch (1A, 1B, 2A, and 2B) - Division A
 - DMA auxiliary feedwater actuation signal-1 (AFAS-1) switch - Division A
 - DMA auxiliary feedwater actuation signal-2 (AFAS-2) switch - Division B
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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.

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