

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.: 272-8313
SRP Section: 07.02 – Reactor Trip System
Application Section: 07.02
Date of RAI Issue: 10/27/2015

Question No. 07.02-13

Provide clarification on the Plant Protection System (PPS) watchdog timer and explain the purpose of the manual reset operation for the reactor trip switchgear system.

10 CFR 50.55a(h)(3) requires compliance with IEEE Std. 603-1991. IEEE Std. 603-1991, Clause 5.2, "Completion of Protective Action," states, in part, that the safety systems shall be designed so that, once initiated automatically or manually, the intended sequence of protective actions of the execute features shall continue until completion. When reviewing Technical Report APR1400-Z-J-NR-14001-P, Rev.0, "Safety I&C System," the staff noted two design aspects that require clarification.

1. In Figure 4-7, the staff is not clear about the application of note 2 to the design. Specifically identify what part of the logic in Figure 4-7, "Watchdog Timer for PPS," does Note 2 apply. Update the logic associated with note 2 in Figure 4-7 as part of the clarification.
2. Section 4.2.3.6, "Reactor Trip Siwtchgear System," does not explain the purpose or function of the manual reset operation. Explain the purpose and function of the manual reset operation and update the APR1400 application accordingly.

Response

1. Note 2 in Figure 4-7 applies to the initiation relay on the LCL DO Module within the figure. Note 2 indicates that the initiation relay of the LCL DO Module becomes de-energized upon a trip condition. Therefore, "Note 2" will be added on the right-hand side of the initiation relay on the LCL DO Module in Figure 4-7.
2. As stated in the "Analysis" section of Appendix A.5.2, "Completion of Protective Action," regarding compliance with Clause 5.2, return to normal operation after the protective action is completed requires a manual reset action by the operator. The manual reset operation is applied by the operator to the trip circuit breaker after the trip state is cleared.

The following description will be revised in Section 4.2.3.6 to provide the function and purpose of the trip circuit breaker reset:

[BEFORE]

Therefore, the manual reset operation for the RTSS trip circuit breaker is required by the operator... .

[AFTER]

Therefore, the manual reset operation for the RTSS trip circuit breaker is required by the operator **so that the latched trip state returns to the normal state**... .

Impact on DCD

There is no impact on 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 4.2.3.6 and Figure 4-7 of the Safety I&C System technical report will be revised, as indicated on the attached mark-up.



Figure 4-7 Watchdog Timer for PPS



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Question No. 07.02-14

Provide the operating bypass for the low pressurizer pressure actuation for safety injection actuation signal (SIAS) and containment isolation actuation signal (CIAS) in APR1400 FSAR Tier 1, Table 2.5.1-4, "Reactor Trip System and Engineered Safety Features Initiation Bypasses."

10 CFR 50.55a(h)(3) requires compliance with IEEE Std. 603-1991. IEEE Std. 603-1991, Clause 4.3, "states the design basis shall document the permissive conditions for each operating bypass capability that is to be provided. The NRC staff was not able to identify the operating bypass for the low pressurizer pressure actuation for the SIAS/CIAS in APR1400 FSAR Tier 1, Section 2.5.1.1, "Design Description," Item 7.b. Update to the operating bypass listing in FSAR Tier 1, Table 2.5.1-4, such that it is consistent with the operating bypass listing in FSAR Tier 2, Table 7.3-1, "ESFAS Operating Bypass Permissive."

Response

As indicated in Figure 7.2-14 of DCD Tier 2, the operating bypass for the low pressurizer pressure trip variable disables the CIAS and SIAS actuation.

In accordance with Tables 7.2-1 and 7.3-1 of DCD Tier 2, Table 2.5.1-4 of DCD Tier 1 will be revised to include the following information:

Low Pressurizer Pressure Trip Operating Bypass disables SIAS and CIAS actuation.

Impact on DCD

Table 2.5.1-4 of DCD Tier 1 will be revised as indicated on the attached mark-up.

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 1

Table 2.5.1-4

Bypass⁽¹⁾Reactor Trip System and Engineered Safety Features Initiation Bypasses

Bypass	Indication (MCR / RSR)
Low Pressurizer Pressure Trip Operating Bypass	Yes/Yes
High Logarithmic Power Trip Operating Bypass	Yes/Yes
DNBR Trip and LPD Trip Operating Bypass	Yes/Yes
Trip Channel Bypass	Yes/Yes

(1) CIAS/SIAS actuation is disabled by the operating bypass for the Low Pressurizer Pressure trip parameter