

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.: 317-8271

SRP Section: 14.03.05-Instrumentation and Controls - Inspections, Tests, Analyses, and Acceptance Criteria

Application Section:

Date of RAI Issue: 11/17/2015

Question No. 14.03.05-30

Provide design descriptions and a corresponding ITAAC to verify means are provided for manual initiation and control of the protective actions that have not been selected for automatic control.

10 CFR 50.55a(h)(3) states, in part, that an application filed on or after May 13, 1999, for design certifications must meet the requirements for safety systems in IEEE Std 603-1991 and the correction sheet dated January 30, 1995. IEEE Std 603-1991, Clause 6.2.2, states "Means shall be provided in the control room to implement manual initiation and control of the protective actions identified in [Clause] 4.5 that have not been selected for automatic control under 6.1. The displays provided for these actions shall meet the requirements of [Clause] 5.8.1." In RAI 38-7878, Question 07.05-2, the staff requested the applicant to justify why Type A variables are not required for this design when it appears that manually controlled actions were credited for cases where no automatic controls exist during several events analyzed in Chapter 15. As such, if the applicant determines that Type A variables are needed in response to this RAI, the staff requests the applicant to provide design descriptions and a corresponding ITAAC to verify means are provided for manual initiation and control of the protective actions that have not been selected for automatic control as required by IEEE Std 603-1991, Clause 6.2.2.

Response – (Rev. 1)

In response to RAI 294-8302 Question 07.05-6, KHNP has determined that Type A variables are to be included in the APR1400 design. The applicable Type A variables, (e.g., related operator actions), pertain to the component and are listed in a new Table 2.5.4-6 to be added to the APR1400 DCD, Tier 1. [Steam Generator Level is being clarified in Table 2.5.4-6 to specify that the wide range level is the credited variable.](#)

A description will be added to Section 2.5.4.1 of APR1400 DCD Tier 1 to state that means are provided for manual initiation and control of the protective actions that have not been selected

for automatic control. A corresponding ITAAC, Item 26, will be added to Table 2.5.4-4 to detail the associated testing that is to be performed for the as-built manual initiation and control switches. The addition of these items into Tier 1 of the DCD meets the requirements for safety systems as specified in IEEE Std 603-1991, Clause 6.2.2.

Impact on DCD

Table 2.5.4-6 of APR1400 DCD Tier 1 will be revised as indicated in the Attachment. Though the original response indicates future incorporation of DCD changes, the changes that were proposed in the original response to this RAI have been incorporated into Revision 1 of the DCD; therefore, only the pages containing proposed changes as a result of Revision 1 of this response are included in the Attachment.

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 Environment Report.

APR1400 DCD TIER 1

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Table 2.5.4-6

Control for Credited Manual Operator Action

Variables	Operator Action	Control/Component
<ul style="list-style-type: none"> - Pressurizer Pressure (Wide Range) - Pressurizer Level 	Close letdown line containment isolation valve (Diagnosis of letdown line break)	[CVCS] <ul style="list-style-type: none"> - Letdown Line CIV
<ul style="list-style-type: none"> - Pressurizer Pressure (Wide Range) - Pressurizer Level - SG Pressure - SG level 	Isolation of SG atmospheric dump valve of affected SG (Diagnosis of steam generator tube rupture (SGTR))	<ul style="list-style-type: none"> - SG 1 MSADV - SG 2 MSADV
<ul style="list-style-type: none"> - Pressurizer Pressure (Wide Range) - Pressurizer Level - SG Pressure (Wide Range) - SG Level (Wide Range) - Hot Leg Temperature (Wide Range) - Cold Leg Temperature (Wide Range) - Reactor Coolant System (RCS) Subcooling Margin - Core Exit Temperature (CET) Subcooling Margin 	Termination of safety injection for SGTR	[Stop SIP-1,2,3,4] <ul style="list-style-type: none"> - SI Pump 1 - SI Pump 2 - SI Pump 3 - SI Pump 4
<ul style="list-style-type: none"> - SG Pressure (Wide Range) - SG Level (Wide Range) 	Termination of auxiliary feedwater (AFW) for main steam line break and main feedwater line break	[Stop AFWPs] <ul style="list-style-type: none"> - AFW Pump A Motor Driven - AFW Pump B Motor Driven - AFW Turbine A Reset - AFW Turbine B Reset
<ul style="list-style-type: none"> - Logarithmic Reactor Power 	Stop charging pump (Terminate chemical and volume control system (CVCS) charging flow for boron dilution event)	[Stop Charging Pump 1,2] <ul style="list-style-type: none"> - Charging Pump A - Charging Pump B