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.:	**496-8630**
SRP Section:	**6.3 – Emergency Core Cooling System**
Application Section:	**6.3**
Date of RAI Issue:	**06/17/2016**

Question No. 06.03-13

As required by 10 CFR 52.47(b)(1), the application must have the proposed inspections, tests, analyses, and acceptance criteria that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a facility that incorporates the design certification has been constructed and will be operated in conformity with the design certification, the provisions of the Act, and the Commission's rules and regulations.

The staff noted that in DCD Tier 2, Section 6.3.1.5, the applicant claims adequate physical separation is provided between the redundant piping paths and containment penetrations of the SIS so that the SIS meets its functional requirements even with a single failure. The staff determined that the applicant's current proposed Tier 1 ITAAC are not sufficient to ensure that adequate physical separation, to the extent practical, is provided for each division of the SIS to preclude the loss of the safety-related function by common-cause failure from postulated dynamic effects (i.e. missile and pipe break hazards), internal flooding, and fire.

The staff requests the applicant to provide an ITAAC item for the SIS that ensures each division is physically separated from the other divisions to preclude the loss of safety-related function by common-cause failure from postulated dynamic effects (i.e. missile and pipe break hazards), internal flooding, and fire. The acceptance criteria of this ITAAC item should ensure that the components of each division located outside containment are in separate enclosed areas, and the components of each division located inside containment are physically separated to the practical extent to preclude the loss of the safety-related function by common-cause failure from postulated dynamic effects (i.e. missile and pipe break hazards), internal flooding, and fire.

Response

Section 2.4.3.1 and Table 2.4.3-4 (page 1 of 8) of DCD Tier 1 will be revised to include Item 1.b, as indicated in the attachment to this response. Item 1.b is added to ensure the COL applicant will verify that the physical separation and isolation of the SIS meets the requirements stated in Section 6.3.1.5.

Impact on DCD

Section 2.4.3.1 and Table 2.4.3-4 (page 1 of 8) of DCD Tier 1 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.

2.4.3 Safety Injection System

2.4.3.1 Design Description

The safety injection system (SIS) is a safety-related system which injects borated water into the reactor vessel to provide core cooling and reactivity control in response to design basis accidents. The SIS also provides core cooling during feed and bleed operation, in conjunction with the pilot operated safety relief valves (POSRVs). The major components of the SIS are four safety injection pumps (SIPs), four identical safety injection tanks (SITs), and associated valves.

The SIS is located in the auxiliary building and containment building.

1.a

1. The functional arrangement of the SIS is as described in the Design Description of Subsection 2.4.3.1 and in Table 2.4.3-1 and as shown in Figure 2.4.3-1.

2.a The ASME Code components identified in Table 2.4.3-2 are designed and constructed in accordance with ASME Section III requirements.

1.b Physical separation exists between the four redundant trains of the SIS as described in Section 6.3.1.5 of DCD Tier 2.

cribed in the design basis to limit potential gas accumulation, identified in Table 2.4.3-1 is designed and constructed in accordance with ASME Section III requirements.

3.a Pressure boundary welds in ASME Code components identified in Table 2.4.3-2 meet ASME Section III requirements.

3.b Pressure boundary welds in ASME Code piping identified in Table 2.4.3-1 meet ASME Section III requirements.

4.a The ASME Code components identified in Table 2.4.3-2 retain their pressure boundary integrity at their design pressure.

4.b The ASME Code piping identified in Table 2.4.3-1 retains its pressure boundary integrity at its design pressure.

1.a

Table 2.4.3-4 (1 of 8)

Safety Injection System ITAAC

Design Commitment		Inspections, Tests, Analyses		Acceptance Criteria	
1.	The functional arrangement of the SIS is as described in the Design Description of Subsection 2.4.3.1 and in Table 2.4.3-1 and as shown in Figure 2.4.3-1.	1.	Inspection of the as-built system will be conducted.	1.	The as-built SIS conforms with the functional arrangement as described in the Design Description of Subsection 2.4.3.1 and in Table 2.4.3-1 and as shown in Figure 2.4.3-1.
2.a	The ASME Code components identified in Table 2.4.3-2 are designed and constructed in accordance with ASME Section III requirements.	2.a	Inspection of the as-built components will be performed as documented in the ASME design reports.	2.a	The ASME Section III design reports exist and conclude that the as-built components identified in Table 2.4.3-2 are designed and constructed in accordance with ASME Section III requirements.
2.b	The ASME Code piping including supports , and design features described in the design basis to limit potential gas accumulation, identified in Table 2.4.3-1 is designed and constructed in accordance with ASME Section III requirements.	2.b	Inspection of the as-built piping including supports will be performed as documented in the ASME design reports.	2.b	The ASME Section III design reports exist and conclude that the as-built piping including supports, and design features described in the design basis to limit potential gas accumulation, identified in Table 2.4.3-1 is designed and constructed in accordance with ASME Section III requirements.
3.a	Pressure boundary welds in ASME Code components identified in Table 2.4.3-2 meet ASME Section III requirements.	3.a	Inspections of the as-built pressure boundary welds will be performed in accordance with the ASME Section III.	3.a	A report exists and concludes that the ASME Section III requirements are met for non-destructive examination of the as-built
	identified in Table 2.4.3-1 meet ASME Section III requirements.		be performed in accordance with the ASME Section III.		

1.b Physical separation exists between the four redundant trains of the SIS.

1.b Inspections will be performed of the as-built SIS.

1.b Components of each train located outside containment are is separate enclosed areas, and the components of each train located inside containment are physically separated to the extent practical to preclude the loss of the safety-related function by common-cause failure from postulated dynamic effects, internal flooding, and fire.