
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.: 269-8319
SRP Section: 09.02.02 – Reactor Auxiliary Cooling Water System
Application Section: 09.02.07
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Question No. 09.02.02-16

10 CFR 52.47(b)(1) requires that a DC application contain the proposed inspections, tests, analyses, and acceptance criteria (ITAAC) that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a plant that incorporates the design certification is built and will operate in accordance with the design certification, the provisions of the Atomic Energy Act, and the NRC's regulations.

The staff found that the proposed ITAAC in DCD Tier 1, Section 2.7.2.3, Table 2.7.2.3-4, are incomplete, or that clarification is needed. Consequently, the Tier 1 information should be revised to address the following:

- a) Item 10 provides the ITAAC for the essential chilled water (ECW) pump head. The acceptance criteria require that available net positive suction head (NPSH) exceed the NPSH required. This conflicts with DCD Tier 2, Section 9.2.7.2.1.2, which specifies that the available NPSH is a minimum of 25 percent greater than the required NPSH. In addition, the ITAAC does not specify the analysis to be performed assuming worst case parameters such as low compression tank water level and high water temperature.
- b) DCD Tier 1, Table 2.7.2.3-4, does not include an ITAAC for the ECW pump flow testing.

The applicant is requested to revise DCD Tier 1, Table 2.7.2.3-4, to address the above items in order to ensure that the APR 1400 will be built and operated in accordance with the design certification.

Response

- a) The sentence in DCD Tier 2, Subsection 9.2.7.2.1.2 that states "The available net positive suction head (NPSH) is a minimum of 25 percent greater than the required NPSH specified by the pump vendor" is to require the pump vendor to design and

manufacture the essential chilled water (ECW) pump, with a sufficient amount of margin for NPSH. KHNP believes that the current acceptance criteria for Item 10 that requires the NPSH available to exceed the NPSH required is appropriate and a specific exceedance value is not necessary in the acceptance criteria. The NPSH available for the ECW pump is determined by analyses considering the vendor's pump NPSH required test results, pressure losses of pump inlet piping and components, and the suction head from the ECW compression tank with its operating pressure and minimum level. The inspections, tests, analyses for Item 10 will be revised to specify the analysis to be performed.

- b) DCD Tier 1, Table 2.7.2.3-4, Item 12.b provides an ITAAC for the ECW pump flow testing.

Impact on DCD

DCD Tier 1, Table 2.7.2.3-4 will be revised as shown 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 Environmental Report.

APR1400 DCD TIER 1

Table 2.7.2.3-4 (4 of 5)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
7.a (cont.)	7.a.iii Tests of the as-built check valves will be performed under pre-operational test pressure, and fluid flow conditions.	7.a.iii Each check valve changes position as indicated in Table 2.7.2.3-2 under pre-operational test conditions.
7.b After loss of motive power, AOVs identified in Table 2.7.2.3-2 assume the indicated loss of motive power position.	7.b Test of the as-built AOVs will be performed under the conditions of loss of motive power.	7.b Upon loss of motive power, each as-built AOV identified in Table 2.7.2.3-2 assumes the indicated loss of motive position.
8.a All controls required by the design exist in the MCR to start and stop the essential chillers and pumps identified in Table 2.7.2.3-2.	8.a Tests will be performed using the controls in the MCR.	8.a All controls in the as-built MCR start and stop the essential chillers and pumps identified in Table 2.7.2.3-2.
8.b All controls required by the design exist in the RSR to start and stop the essential chillers and pumps identified in Table 2.7.2.3-2.	8.b Tests will be performed using the controls in the RSR.	8.b All controls in the as-built RSR start and stop the essential chillers and pumps identified in Table 2.7.2.3-2.
8.c All displays and alarms required by the design exist in the MCR as defined in Tables 2.7.2.3-2 and 2.7.2.3-3.	8.c Inspections will be performed on the displays and alarms in the MCR.	8.c All displays and alarms exist and are retrieved in the as-built MCR as defined in Tables 2.7.2.3-2 and 2.7.2.3-3.
8.d All displays and alarms required by the design exist in the RSR as defined in Tables 2.7.2.3-2 and 2.7.2.3-3.	8.d Inspections will be performed on the displays and alarms in the RSR.	8.d All displays and alarms exist and are retrieved in the as-built RSR as defined in Tables 2.7.2.3-2 and 2.7.2.3-3.
9. The two mechanical divisions of the ECWS are physically separated.	9. Inspections of the as-built mechanical divisions will be performed.	9. The two mechanical divisions of the ECWS are physically separated by a divisional wall or a fire barrier.
10. The ECW pumps and ECW makeup pumps have sufficient net positive suction head (NPSH).	10. Test to measure the as-built ECW pump and ECW makeup pump suction pressure will be performed. Inspection and analyses to determine NPSH available to each pump will be performed based on test data and as-built data.	10. A report exists and concludes that the as-built calculated NPSH available exceeds each ECW pump's and ECW makeup pump's NPSH required.

The analyses will be performed using the vendor's pump NPSH required test results and the following information:

- pressure losses of pump inlet piping and components,
- suction head from the ECW compression tank with its operating pressure and minimum level.