

KHNPDCRAIsPEm Resource

From: Ciocco, Jeff
Sent: Thursday, July 16, 2015 11:28 AM
To: apr1400rai@khnp.co.kr; KHNPDCRAIsPEm Resource; Harry (Hyun Seung) Chang; Yunho Kim; Christopher Tyree
Cc: Thomas, Matt; McKirgan, John; Olson, Bruce; Lee, Samuel
Subject: APR1400 Design Certification Application RAI 83-7962 (14.03.04 - Reactor Systems - Inspections, Tests, Analyses, and Acceptance Criteria)
Attachments: image001.jpg; APR1400 DC RAI 83 SRSB 7962.pdf

KHNP

The attachment contains the subject request for additional information (RAI). This RAI was sent to you in draft form. Your licensing review schedule assumes technically correct and complete responses within 30 days of receipt of RAIs. However, KHNP requests, and we grant, the following days to respond to the RAI's questions. We may adjust the schedule accordingly.

14.03.04-1: 60 days
14.03.04-2: 45 days
14.03.04-3: 45 days
14.03.04-4: 45 days
14.03.04-5: 45 days

Please submit your RAI response to the NRC Document Control Desk.

Thank you,

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REQUEST FOR ADDITIONAL INFORMATION 83-7962

Issue Date: 07/16/2015

Application Title: APR1400 Design Certification Review – 52-046

Operating Company: Korea Hydro & Nuclear Power Co. Ltd.

Docket No. 52-046

Review Section: 14.03.04 - Reactor Systems - Inspections, Tests, Analyses, and Acceptance Criteria

Application Section:

QUESTIONS

14.03.04-1

REQUIREMENT

NRC RG 1.206, SRP 14.3, SRP 14.3.4

ISSUE

In the FSAR Tier 2 Section 14.3.2.4, the applicant states "Section 2.4 of Tier 1 includes reactor systems, fuel, control rods, loose parts monitoring system, and core cooling systems in accordance with the guidance in NRC RG 1.206 (Reference 1), SRP 14.3 (Reference 2), SRP 14.3.4 (Reference 6) and the ITAAC for reactor systems that have been developed to verify the following..."

Contrary to the above, Tier 1 Section 2.4 of the DCD was reviewed by the staff and found to not have any information regarding fuel or loose parts monitoring systems, and very little information regarding control rods.

INFORMATION NEEDED

The staff needs the applicant to ensure the Tier 2 information is correct and update the Tier 1 sections of the DCD as necessary. The guidance referred to by the applicant in Tier 2 (e.g. RG 1.206, SRP 14.3, and SRP 14.3.4) is acceptable.

The staff also requests that the applicant, in general, verify consistency between Tier 1 and Tier 2 information and make any necessary corrections before submission of the next DCD revision.

14.03.04-2

REQUIREMENT

NRC SRP 14.3

ISSUE

In Tier 1 Section 2.4, "Reactor Systems," the applicant provided the location of each reactor system in its associated "Design Description" paragraph except for the Reactor Coolant Gas Vent System and the Leakage Detection System. Following the guidance in SRP 14.3, the staff determined that the location of each reactor system should be included in the design description.

INFORMATION NEEDED

The staff needs the applicant to provide the location of the Reactor Coolant Gas Vent System in Tier 1 Section 2.4.5.1, "Design Description," of the DCD, as well as provide the location of the Leakage Detection System in Tier 1 Section 2.4.7.1, "Design Description," of the DCD.

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14.03.04-3

REQUIREMENT

NRC SRP 14.3

ISSUE

In Tier 1 Section 2.4.5.1, "Design Description," of the DCD, the applicant states that "the RCGVS effluent from the pressurizer or the reactor vessel closure head is transported to the in-containment refueling water storage tank (IRWST) through the RCGVS sparger for the safety vent function." The guidance provided in SRP 14.3 states that all components discussed in the design description should be shown on the figure.

Contrary to the above, Tier 1 Figure 2.4.5-1, "Reactor Coolant Gas Vent System," shows the sparger emptying into an unnamed tank.

INFORMATION NEEDED

The staff needs the applicant to identify in Tier 1 Figure 2.4.5-1 which tank the "SPARGER" empties into.

14.03.04-4

REQUIREMENT

NRC SRP 14.3

ISSUE

In the FSAR Tier 2 Section 9.3.4, "Chemical and Volume Control System," the applicant states that the CVCS has safety related functions including, 1.) maintaining integrity of components (including piping and valves) in the reactor coolant pressure boundary, 2.) providing the means for isolating CVCS lines that pass through the containment penetrations to confine the release of any radioactivity from the containment following a postulated DBA, and 3.) limiting the magnitude of a boron dilution source to the RCS to prevent inadvertent RCS boron dilution.

Following the guidance provided in SRP 14.3, the staff determined that at a minimum, the "Design Description" sections in Tier 1 should provide a description of the system's safety functions.

INFORMATION NEEDED

The staff needs the applicant to revise the DCD to provide a description of the safety-related functions of the CVCS in Tier 1 Section 2.4.6.1, "Design Description."

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14.03.04-5

REQUIREMENT

NRC RG 1.75

ISSUE

Tier 1 Tables 2.4.1-4, "Reactor Coolant System ITAAC," 2.4.2-4, "In-containment Water Storage System ITAAC," 2.4.3-4, "Safety Injection System ITAAC," 2.4.4-4, "Shutdown Cooling System ITAAC," 2.4.5-4, "Reactor Coolant Gas Vent System ITAAC," and 2.4.6-4, "Chemical and Volume Control System ITAAC," each contain an ITAAC item labeled 6.c that commits to separation being provided "between Class 1E divisions, and between Class 1E division and non-Class 1E division." The Acceptance Criteria, 6.c., requires that "physical separation or electrical isolation exists in accordance with NRC RG 1.75 between these Class 1E divisions, and also between class 1E division and non-Class 1E division."

Contrary to the above, RG 1.75 states: "The underlying separation criteria are that (1) physical separation **AND** (2) electrical isolation must be provided to maintain the independence of safety-related circuits and equipment so that the safety functions required during and following any design-basis event can be accomplished."

INFORMATION NEEDED

The staff needs the applicant to justify use of the word "or" in the acceptance criteria, or re-word the acceptance criteria to accurately reflect what is required by RG 1.75. Please consider this justification or change for all ITAAC tables that include this ITAAC item, 6.c.

There are 4 instances where the word "division" is used in this ITAAC item (i.e. the last two uses of "division" in the Design Commitment and the Acceptance Criteria). The staff recommends clarifying if "division" should be plural in the Design Commitment and the Acceptance Criteria for each one of these ITAAC items. The staff also recommends the applicant to review all ITAAC items and ensure that editorial errors are fixed as appropriate.