KHNPDCDRAIsPEm Resource

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Sent: Wednesday, October 14, 2015 7:53 AM
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Cc: Thomas, Vaughn; Vera, Marieliz; Olson, Bruce; Lee, Samuel
Subject: APR1400 Design Certification Application RAI 247-8314 (14.03.02 - Structural and Systems Engineering - Inspections, Tests, Analyses, and Acceptance Criteria)
Attachments: APR1400 DC RAI 247 SEB1 8314.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.

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

Thank you,

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REQUEST FOR ADDITIONAL INFORMATION 247-8314

Issue Date: 10/14/2015
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: 14.03.02 - Structural and Systems Engineering - Inspections, Tests, Analyses, and Acceptance Criteria
Application Section:

QUESTIONS

14.03.02-1

Tier 1 Section 2.2.1, Nuclear Island Structures

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. SRP Section 14.3, and in particular, Sections 14.3.2 and Appendix C provide guidance in developing design descriptions, figures, and ITAAC for structural related items. The staff reviewed DCD Tier 1, Section 2.2.1, Nuclear Island Structures, and noted that Section 2.2.1.1, Design Description, does not include some of the key attributes applicable to the NI structures.

Therefore, the applicant is requested to include the following items or justify why they are not described:

(a) Site grade elevation
(b) For the design basis loads - external events: tornado loading

In addition, the staff reviewed DCD Tier 1, Tables 2.2.1-1 and 2.2.1-2 for the NI structures and identified some items that need to be addressed to ensure the adequacy of the ITAAC. These are described below.

1. The title for DCD Tier 1 Table 2.2.1-1 should be corrected because it only identifies walls, while the table entries include wall and floor thicknesses.

2. For DCD Tier 1, Table 2.2.1-2, Nuclear Island Structures ITAAC, the following items should be addressed:

ITAAC 1 identifies the ITAAC for the configuration of the NI structures. For the Design Commitment and Acceptance Criteria columns, the statements identify the basic configuration of the NI structures as shown in Figures 2.2.1-1 through 2.2.1-13. It is not clear why the statements in the two columns do not also refer to the Design Description in Section 2.2.1.1 in addition to Figures 2.2.1-1 through 2.2.1-13. Including the reference to Section 2.2.1.1 would ensure that the configuration information in the design description is also part of the ITAAC.

ITAAC 2.a identifies the ITAAC for the containment to be designed and constructed to meet the requirements of ASME, Section III, Division 2. If this statement is to apply to the entire containment, then Division 1 should also be identified since it is applicable to steel portions of the containment not backed by concrete. If this statement was intended to only apply to the containment excluding the steel portions of the containment not backed by concrete, then that should be clarified in the ITAAC statement. Also, designation of this information should be consistent in the three ITAAC columns - Design Commitment; Inspections, Tests, and Analyses and Acceptance Criteria.

ITAAC 2.b identifies the ITAAC for the containment penetrations to be designed and constructed to meet ASME Section III. For completeness, the applicable Division 1 and/or 2 of ASME Section III should be identified in the three ITAAC columns. Furthermore, since the penetration assembly contains portions which are backed by concrete and portions that are not backed by concrete, the ITAAC statement and applicable Division 1 and/or 2 should be identified and consistent with each other.

ITAAC 2.c identifies the ITAAC for the containment and its penetrations to ensure they retain their pressure boundary integrity associated with the design pressure. The designation of the ASME Section III, Divisions 1 and 2, is not identified in the second and third columns of the ITAAC.

ITAAC 4 identifies the key dimensions of the NI structures and the need for a report that concludes that the NI structure as-built wall and slab thickness conform with the structural configuration as described in Table 2.2.1-1. Explain why the as-built criteria don't also include the information in Figures 2.2.1-1 through 2.2.1-13.

It should be noted that wherever ITAAC, in terms of numerical data (e.g., dimensions), are identified a tolerance or range should be included to avoid having difficulties by the COL applicant in meeting these ITAAC.

3. For Table 2.2.1-3, Seismic Classification of the Building, it identifies the Essential Service Water Supplier Structure. In DCD Tier 2, Table 3.2-1, Classification of Structures, Systems, and Components, this nomenclature does not appear; however, the structure entitled, Essential Service Water Building does appear. This should be clarified and a single consistent nomenclature for the structures should be made in both DCD Tier 1 and Tier 2.

14.03.02-2

Tier 1 Section 2.2.2, Emergency Diesel Generator Building

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. SRP Section 14.3, and in particular, Sections 14.3.2 and Appendix C provide guidance in developing design descriptions, figures, and ITAAC for structural related items.

The staff reviewed DCD Tier 1, Section 2.2.2, Tables 2.2.1-1 and 2.2.2-2 for the EDG Building and identified some items that need to be addressed to ensure the adequacy of the ITAAC. These are described below.

1. The title for DCD Tier 1 Table 2.2.2-1 should be corrected because it only identifies walls, while the table entries include wall and floor thicknesses.

2. For DCD Tier 1, Table 2.2.2-2, Emergency Diesel Generator Building ITAAC, the following item should be addressed: ITAAC 3 identifies the key dimensions of the EDG structures and the need for a report that concludes that the EDG structure as-built wall and slab thickness conform with the structural configuration as described in Table 2.2.2-1. Explain why the as-built criteria don't also include the information in Figures 2.2.2-1 through 2.2.2-2 or include this information where appropriate.

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14.03.02-3

Tier 1 Section 2.2.5 Protection against hazards

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. SRP Section 14.3, and in particular, Sections 14.3.2 and Appendix C provide guidance in developing design descriptions, figures, and ITAAC for structural related items. SRP Acceptance criteria 14.3.2.II.8 indicates that the division walls are at least 2.5 m above the floor, and safety-related electrical, instrumentation, and control equipment are located at least 20cm above the floor surface.

FSAR Tier 1 Section 2.2.5.1.2 “Internal Flooding” state that key characteristics of the protective provisions against internal flooding hazards are: divisional flood barriers provided in the nuclear island against the internal flooding and safety-related electrical, instrumentation and control equipment are located above the internal design flood level, between others.

The staff is requesting the applicant to address the measure from the floor of the division walls and the distance between the floor and the safety-related electrical, instrumentation, and control equipment.


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