

KHNPDCDRAIsPEm Resource

From: Ciocco, Jeff
Sent: Tuesday, March 08, 2016 11:07 AM
To: apr1400rai@khnp.co.kr; KHNPDCDRAIsPEm Resource; Andy Jiyong Oh; Steven Mannon
Cc: Otto, Ngola; Zimmerman, Jacob; Steckel, James; Wunder, George; Lee, Samuel; Williams, Donna
Subject: APR1400 Design Certification Application RAI 437-8540 (08.01 - Electric Power - Introduction)
Attachments: APR1400 DC RAI 437 EEB 8540.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 RAI question response times. We may adjust the schedule accordingly.

08.01-15: 45 days
08.01-16: 45 days
08.01-17: 45 days
08.01-18: 45 days
08.01-19: 30 days

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

Thank you,

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U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

REQUEST FOR ADDITIONAL INFORMATION 437-8540

Issue Date: 03/08/2016
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: 08.01 - Electric Power - Introduction
Application Section:

QUESTIONS

08.01-15

In **RAI 8166, Question 08.01-2**, dated August 31, 2015, the staff stated that DCD section 8.2.1 indicates that the APR1400 is designed to meet GDC 2, 4, 5, 17, and 18, however Table 8.1-2 indicated that GDC 5 is not applicable to the APR1400 design. Therefore, the staff asked the applicant to clarify the inconsistency between DCD section 8.2.1 and Table 8.1-2. In response to **RAI 8166, Question 08.01-2**, dated November 17, 2015, ADAMS Accession ML15321A290, the applicant stated in part that the requirements of GDC 5 pertain to the sharing of SSCs between units and since the APR1400 design is considered as a single unit with no shared SSCs, then the design is considered to meet the GDC 5 requirements. The applicant also revised Table 8.1-2 to indicated applicability of GDC 5 to sections 8.2, 8.3.1, and 8.3.2. The staff reviewed the applicant's response and noted that the addition of GDC 5 to Table 8.1-2 is not consistent with the response which indicates that the APR1400 design is a 1 unit plant and that GDC 5 applies to the sharing of SSCs between units. Therefore, the staff requests removal of the GDC 5 reference in sections 8.2.1, 8.1.3.3, and Table 8.1-2 for consistency with the response and the applicability of GDC 5 to the APR1400 design.

08.01-16

In **RAI 8166, Question 08.01-3**, dated August 31, 2015, the staff stated in part that APR1400 DCD Table 8.1-2, "Criteria and Guidelines for Electric Power Systems," and Table 1.9-2, "APR1400 Conformance with the Standard Review Plan," states that BTP 8-8, "Onsite (Emergency Diesel Generators) and Offsite Power Sources Allowed Outage Time Extensions," February 2012, is not applicable. Since BTP 8-8 is applicable to sections 8.2 and 8.3.1 according to the Standard Review Plan (SRP), NUREG-0800, the staff asked the applicant to clarify whether BTP 8-8 is applicable to the APR1400 design for the Class 1E emergency diesel generators (EDGs) discussed in section 8.3.1.1. In response to **RAI 8166, Question 08.01-3**, dated December 18, 2015, ADAMS Accession ML15352A274, the applicant stated in part that BTP 8-8 is not required for the APR1400 design, and that KHNP does not consider Allowed Outage Time (AOT) for diesel generators (DGs) at this time. In addition, KHNP indicated that the limiting conditions for operation (LCO) for emergency diesel generators (EDGs) is consistent with RG 1.93 and is in TS 3.8.1. The applicant is not committing to BTP 8-8, which is part of the guidance of SRP 8.2 and 8.3, and BTP 8-8 is based on RG 1.93, "Availability of Electric Power Sources." RG 1.93 pertains to the availability of both offsite and onsite power systems and provides an acceptable method for satisfying 10 CFR 50, Appendix A, GDC 17 and 10 CFR 50.36(c)(2). Therefore, the staff requests that the applicant include in the DCD a commitment to following the guidance in RG 1.93 or provide an alternate method to satisfy GDC 17.

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08.01-17

In **RAI 8166, Question 08.01-4**, dated August 31, 2015, the staff stated in part that APR1400 DCD Table 8.1-2, "Criteria and Guidelines for Electric Power Systems" regulations including 10 CFR 50.55a, 10 CFR 52.47 (b)(1), 10 CFR 52.80(a), 10 CFR 50.34(f)(2)(v), and 10 CFR 50.34(f)(2)(xiii) are applicable to the design, but the DCD did not discuss how the design meets these requirements. Therefore, the staff requested that the applicant discuss how the APR1400 design conforms to the above requirements. In response to **RAI 8166, Question 08.01-4**, dated December 11, 2015, ADAMS Accession ML15345A339, the applicant stated that the electric power system of the APR1400 design conforms to the requirements of 10 CFR 50.55a, 10 CFR 52.47 (b)(1), 10 CFR 52.80(a), 10 CFR 50.34(f)(2)(v), and 10 CFR 50.34(f)(2)(xiii). With regard to 10 CFR 50.55a, the applicant stated that in DCD Tier 2, Subsection 8.3.1.2.2 and 8.3.2.2.2, the Class 1E onsite ac and dc power systems of the APR1400 are designed to conform with the requirements of IEEE Std. 603-1991, including the correction sheet which is endorsed by NRC RG 1.153. However, the applicant did not provide a statement or discussion in the DCD to indicate applicability of 10 CFR 50.55a. With regard to 10 CFR 52.47 (b)(1) and 10 CFR 52.80(a), the applicant stated that the APR1400 facility will be constructed and will be operated in accordance with the design certification, the facility will be constructed and will be operated in conformity with the combined license, the ITAAC proposed for the electrical systems of APR1400 are described in DCD Tier 2, Subsection 14.3.2.6 and Tier 1, Section 2.6 and are sufficient to meet the requirements of 10 CFR. However, the applicant did not provide a statement or discussion in the DCD to indicate applicability of 10 CFR 52.47 (b)(1) and 10 CFR 52.80(a). With regard to 10 CFR 50.34(f)(2)(v) and 10 CFR 50.34(f)(2)(xiii), the applicant stated in part that a new subsection, 8.3.1.2.3, was proposed to Chapter 8 of the DCD, as a result of KHNP's response to RAI 134-8033, Question No. 08.03.01-12 (Reference KHNP submittal MKD/NW-15-0228L, dated October 28, 2015, ML15301A925). The staff reviewed the response to RAI 134-8033, Question No. 08.03.01-12 referenced in the response and found that this part of the response was acceptable with the changes made in subsection, 8.3.1.2.3. Therefore, the staff requests that the applicant provide a statement or discussion in the DCD to indicate applicability of 10 CFR 50.55a and its relationship with IEEE Std. 603-1991. Staff also requests that the applicant provide a statement or discussion in the DCD to indicate applicability of 10 CFR 52.47(b)(1) and 52.80(a).

08.01-18

In **RAI 8166, Question 08.01-6**, dated August 31, 2015, the staff stated that APR1400 DCD Table 8.1-2 listed the Commission Papers (SECY)-90-016 and SECY-91-078, but their applicability to the design was not discussed in DCD chapter 8 or other DCD sections. Therefore, the staff requested that the applicant provide a discussion on how the APR1400 design meets the guidance in SECY 90-016 and SECY 91-078. In response to **RAI 8166, Question 08.01-6**, dated December 18, 2015, ADAMS Accession ML15352A274, the applicant stated in part that station blackout rule (10 CFR 50.63) is the one that is applicable to the APR1400 electrical power system design and is applicable to SECY-90-016 and that the APR 1400 design meets the recommendation in SECY-90-016. The applicant also indicated that SECY-91-078 identifies the following two issues and provides recommendations on these

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issues, (1) Alternate Source of Power for Non-Safety Loads, (2) Connection of Safety Bus Offsite Power Sources through Non-safety Loads. The APR1400 design complies with the staff's position with regard to the second issue of SECY-91-078, and the response to RAI 16-7915 (Reference KHNP submittal MKD/NW-15- 0029L, dated June 22, 2015; ML15173A091) provides further discussion and clarification. However, the staff did not identify a statement or discussion in the DCD that provides specific mention to SECY-90-016 and SECY-91-078, and a review of referenced **RAI 7915** did not provide a change in the DCD with a statement for SECY-91-078. Therefore, the staff requests that the applicant provide an explanation or statement in the DCD as to how the APR1400 design meets SECY-90-016 and SECY-91-078.

08.01-19

In **RAI 8166, Question 08.01-7**, dated August 31, 2015, the staff stated that DCD Table 8.1-2 indicated that BTP 8-1, "Requirements on Motor-Operated Valves in the ECCS Accumulator Lines," was applicable to sections 8.3.1 and 8.1.3.3, and Table 1.9-2 also indicated that the APR1400 design conforms to BTP 8-1. The staff also indicated that Standard Review Plan (SRP) section 8.1 states in part that the safety analysis report should discuss the applicability of the criteria and guidelines listed and include a statement to the effect that they will be implemented or are implemented in the design of electrical power systems and the criteria and guidelines are listed in Table 8-1. Since the DCD did not include a discussion related to BTP 8-1, the staff asked the applicant to provide such discussion in the DCD. In response to **RAI 8166, Question 08.01-7**, dated January 26, 2016, ADAMS Accession ML16026A461, the applicant stated that the design of motor operated valves in the ECCS accumulator lines conforms to BTP 8-1 and is addressed in DCD Tier 2 sections 6.3.2.5.1, 7.3.1.4, 7.6.1.4 and Figure 7.6-2. The applicant added a reference in section 8.3.1.2.3 and Table 1.9-2 to indicate conformance to BTP 8-1. The staff reviewed the response and found that there was no specific mention in the referenced sections (6.3.2.5.1, 7.3.1.4, 7.6.1.4, and Figure 7.6-2) about BTP 8-1. Therefore, the staff requests that the applicant provide a clear reference to the applicability of BTP 8-1 in the referenced section(s).