

KHNPDCDRAIsPEm Resource

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Sent: Friday, August 07, 2015 5:05 PM
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Cc: Ciocco, Jeff; Lee, Samuel; Stubbs, Angelo; Dias, Antonio; Wunder, George; Umana, Jessica
Subject: APR1400 Design Certification Application RAI 135-8001 (9.2.6 Condensate Storage Facilities)
Attachments: image001.jpg; APR1400 DC RAI 135 SPSB 8001.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, 45 days to respond to the RAI question. We may adjust the schedule accordingly.

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

Thank you,

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Subject: APR1400 Design Certification Application RAI 135-8001 (9.2.6 Condensate Storage Facilities)
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REQUEST FOR ADDITIONAL INFORMATION 135-8001

Issue Date: 08/07/2015
Application Title: APR1400 Design Certification Review – 52-046
Operating Company: Korea Hydro & Nuclear Power Co. Ltd.
Docket No. 52-046
Review Section: 09.02.06 - Condensate Storage Facilities
Application Section: 9.2.6

QUESTIONS

09.02.06-1

GDC 2 establishes requirements with respect to the condensate storage facilities (CSF) design regarding protection against the effects of natural phenomena such as earthquakes, tornados, hurricanes and floods.

DCD Tier 2, Section 9.2.6.2, contains a description of the condensate storage and transfer system. The system includes three larges storage tanks (one 300,000 gallon demineralized water storage tank and two 255,000 gallon condensate storage tanks). These tanks are classified as seismic category III (non-seismic). As indicated in Section I of SRP 9.2.6, the staff's review of the condensate storage facilities includes the review of provisions for mitigating the environmental effects of system leakage or storage tank failure. Details on the provisions made to mitigate environmental effects from system leakage and storage tank failures are not included in the DCD.

The applicant is requested to provide a discussion of the provisions and CSF design features to ensure adequate protection against the effects of natural phenomena and adherence to Position C.2 of Regulatory Guide 1.29, "Seismic Design Classification." This information must be included in the DCD. The applicant is to provide a DCD markup of this response.

09.02.06-2

Section 9.2.6.1 of the APR1400 DCD states that *"the condensate storage facilities handle non-radioactive fluid. Therefore NRC RG 4.21 and GDC 60 are not applicable for the condensate storage facilities."*

The staff disagrees with the above statement. The condensate storage and transfer system is designed to maintain proper feedwater inventory in the secondary system during startup, shutdown, hot standby, and normal operation as indicated in DCD Section 9.2.6.1. During normal operation the hotwell level control maintains a normal level in the condenser hotwell by directing condensate flow to and from the condensate storage tank, as described in DCD Section 10.4.7.2. Since the steam and power conversion system may become contaminated through steam generator tube leakage, as indicated in DCD Section 10.1.1, the condensate exchanged between the condensate storage facilities and the condenser hotwell may result in the handling of radioactive fluids by the condensate storage facilities. It should be noted that DCD table 11.1-6 provides design basis radionuclide concentrations for the secondary system, which also suggest that the fluids handled by the condensate storage facility may be radioactive, which is opposite to what is claimed in DCD section 9.2.6.

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The technical rationale for GDC 60 being applicable to the condensate storage facilities is provided in Section 9.2.6, "Condensate Storage Facilities," of NUREG-0800, "Standard Review Plan" which states "GDC 60 requires that nuclear power unit designs include a means to control the release of radioactive materials in liquid effluents produced during normal operation, including anticipated operational occurrences. The criteria in GDC 60 apply to all tanks that are located outside the reactor containment and include radioactive materials in liquids. These tanks have the potential for uncontrolled releases of radioactive materials attributed to spillage. Through its connections with the reactor coolant system (in boiling-water reactors) or secondary coolant system (in pressurized water reactors), the CSF potentially contains radioactive material. Meeting GDC 60 requirement ensures that radiation exposures for operating personnel and the general public are as low as reasonably achievable. Regulatory Guide 1.143 provides guidance for implementing GDC 60. Following the regulatory guide provides assurance that the design of the CSF will include features to prevent uncontrolled releases of radioactive material. "

The current DCD does not indicate that the CSF meets the GDC 60 requirements, or that the design was developed using the guidance provided in Regulatory Guide 1.143.

The applicant is requested to describe how the APR1400 CSF meets the requirements of GDC 60 including design features for leakage detection, leakage prevention and leakage containment. This information must be included in the DCD. The applicant is to provide a DCD markup of this response including any table and/or diagram affected.

09.02.06-3

The DCD does not discuss how the condensate storage facilities (CSF) comply with 10 CFR 20.1406. In DCD section 9.2.6.1 the applicant states that NRC RG 4.21, which provides regulatory guidance on how to comply with 10 CFR 20.1406, is not applicable. The staff does not agree with the applicant position.

10 CFR 20.1406 requires, in part, that each design certification applicant describe how the facility design and procedures for operation will minimize, to the extent practicable, contamination of the facility and the environment, as well as the generation of radioactive waste. Since the condensate storage facilities interfaces with systems containing radioactive fluids, and can potentially contain radioactive fluids due to primary to secondary leakage (i.e., steam generator tube leakage), 10 CFR 20.1406 applies to the CSF for the APR1400. Regulatory Guide 4.21 provides guidance on meeting the requirements of 10 CFR 20.1406.

The applicant is requested to describe how the CSF comply with 10 CFR 20.1406, including information describing design features for leakage prevention and early leak detection. Also to be identified is whether the system uses any buried piping and how monitoring and inspection will be performed for those portions of the system. The applicant is requested to include the information in the DCD and provide a markup of the DCD text as well as any table and/or diagram affected.

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09.02.06-4

DCD Tier 2 Table 1.9-2 under the heading “Conformance or Summary Description of Deviation” states that SRP Section 9.2.6 is not applicable because “Condensate storage facilities have no safety-related functions and handle non-radioactive fluid, and that the APR1400 is not multi-unit.”

Although not all portions of SRP 9.2.6 are applicable to the APR1400, the staff finds that SRP 9.2.6 is still partially applicable since GDCs 2 and 60 apply to all CSFs.

The applicant is requested to revise and update the FSAR to correctly show the applicability of SRP 9.2.6 to the APR1400 CSF designs. The applicant is to provide a DCD markup of this response including any table and/or diagram affected.