

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.: 265-8327
SRP Section: 09.02.04 – Potable and Sanitary Water Systems
Application Section: 09.02.04
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Question No. 09.02.04-1

The staff has reviewed DCD Tier 2, Section 9.2.4, and found most of the information contained in the section to be enclosed in double brackets, indicating it to be conceptual design information (CDI) for which the applicant is not seeking certification. Paragraph (a)(24) of 10 CFR 52.47 requires “a representative conceptual design for those portions of the plant for which the application does not seek certification, to aid the NRC in its review of the FSAR and to permit assessment of the adequacy of the interface requirements.” Paragraph (a)(25) of 10 CFR 52.47 addresses interface requirements, and states that “the interface requirements to be met by those portions of the plant for which the applicant seeking certification” ... “must be sufficiently detailed to allow completion of the FSAR.”

In its review of DCD Tier 2, Section 9.2.4, the staff was unsure as to whether the necessary interface requirements had been established and whether the CDI was clearly differentiated from the standard plant certified design information. For example, DCD Tier 2, Section 9.2.4.2.1, provides, as CDI, the statement: “No cross connection exist between the domestic water system and any potentially radioactive system that domestic water is supplied to potentially radiologically contaminated areas, backflow prevention devices are installed.” But in DCD Tier 2, Figure 9.2.4-1, “Domestic Water and Sanitary Systems Flow Diagram,” it is indicated in Note 1 that domestic water supply isolation valves and backflow preventers are not CDI. So, since the domestic water supply isolation valves are not CDI, the staff would like to know which portions of the system contained within the buildings shown on DCD Tier 2, Figure 9.2.4-1, (auxiliary building, turbine generator building, etc.) are within the scope of the certified design or CDI.

In order for the staff to complete its review of this system the applicant is requested to:

- a. Clearly identify what portions of the Domestic Water and Sanitary Systems are within the scope of the DCD, and which portions are conceptual design.
- b. Clearly identify the interface requirements for the conceptual design.

Response

The design and configuration of the domestic water and sanitary systems are CDI. However, the following are design features to prevent the potential for contamination from radioactive sources, which are not CDI.

- DCD Tier 2, subsection 9.2.4.1, items a. and b.
- DCD Tier 2, subsection 9.2.4.2.1, following description(which will be revised for clarity):
“No cross connections exist between the domestic water system and any potentially radioactive system that domestic water is supplied to potentially radiologically contaminated areas, backflow prevention devices are installed.”
- DCD Tier 2, Subsection 9.2.4.3, “Safety Evaluation”

DCD Tier 2, subsection 9.2.4 will be revised to clearly identify what portions of the domestic water and sanitary systems are within the scope of the DCD, and which portions are part of conceptual design.

Impact on DCD

DCD Tier 2, subsections 9.2.4.1 and 9.2.4.2.1 will be revised as indicated in the attached markup.

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 29.2.4 Domestic Water and Sanitary Systems

[[The domestic water and sanitary systems consist of a domestic water system and a sanitary drainage system. The function of the domestic water system is to supply potable water for domestic use in the turbine generator building, compound building, auxiliary building, miscellaneous buildings, and future facilities. The function of sanitary drainage system is to collect and transfer non-radioactive sanitary water for treatment and to discharge during normal operation.]]

9.2.4.1 Design Bases

[[The domestic water and sanitary systems are non-safety-related.]]

The systems are designed to meet the following:

- a. ~~[[Per the requirements in GDC 60, there are no interconnections between the domestic water and sanitary systems and the systems with the potential to contain radioactive material.]]~~
- b. ~~[[The domestic water system is protected by an air gap, where necessary.]]~~
- c. [[The domestic water quality meets the more stringent requirements of either the U.S. Environmental Protection Agency’s “National Primary Drinking Water Regulations,” 40 CFR 141 (Reference 1), or all state and local environmental protection standards.]] The COL applicant is to determine all state and local department of health and environmental protection standards to be applied and followed for the domestic water system (COL 9.2 (13)). The COL applicant is to determine the source of domestic water to the site and the necessary required treatment plant (COL 9.2 (14)).
- d. [[The distribution of the domestic water by the domestic water system is in conformance with the Occupational Safety and Health Standard, 29 CFR 1910 (Reference 2).]]
- e. [[The domestic water and sanitary systems are designed to supply potable water at a rate of 200 L (53 gal) per person per day. The sanitary system is designed to receive and to treat the sewage for 750 people per day.]] The COL applicant is to confirm the sizing of domestic water tanks and associated pumps, if used (COL 9.2 (15)).

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- f. [[The sanitary drainage system located at each building collects sanitary water and transfers it to the sanitary water treatment facility.]] The COL applicant is to confirm whether the sanitary waste is sent to an onsite treatment facility or the city sewage system (COL 9.2 (16)).

9.2.4.2 System Description

The domestic water and sanitary systems are shown schematically in Figure 9.2.4-1.

9.2.4.2.1 Domestic Water System

[[Water for drinking and sanitary services is supplied by the domestic water system. Domestic water from the water treatment plant is pumped to the hydropneumatic tank by two domestic water pumps. The hydropneumatic tank and distribution headers are kept pressurized by compressed air from the service air system so that water can be provided throughout the plant as needed. The maximum required pressure of the tank is 5.6 kg/cm²G (80 psig) at the inlet of the compound building as the farthest point from the tank. The hydropneumatic tank is protected from overpressure by the safety relief valve. The domestic water pumps are protected by minimum recirculation piping on the discharge lines.]]

~~[[No cross connections exist between the domestic water system and any potentially radioactive system that domestic water is supplied to potentially radiologically contaminated areas, backflow prevention devices are installed.]]~~

[[The domestic water system provides flushing water for floor cleaning to various areas in the plant.]]

9.2.4.2.2 Sanitary Drainage System

[[The sanitary drain water treatment facility piping, and vacuum vents, and sensing valves and pits, pipes, fitting, and lifts. The vacuum station consists of vacuum pumps, a collection tank, sanitary water transfer pumps, instruments, and a local control panel.]]

No cross connections exist between the domestic water system and any potentially radioactive systems. All branches of the system supplying plumbing fixtures which are located in areas to which access is restricted due to a potential radiological hazard are provided with backflow prevention devices.