
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.: 504-8628
SRP Section: 12.03 – Radiation Protection Design Features
Application Section: 9.1.3.2.3
Date of RAI Issue: 07/11/2016

Question No. 12.03-54

Regarding cross-contamination of systems, DCD Section 9.1.3.2.3 that, “the utility connections are designed with a minimum of two barriers to prevent the contamination of clean systems.” This statement is consistent with RG 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning," Section A-1, which provides design and operational procedures to minimize facility contamination which should be considered in meeting the requirement of 10 CFR 20.1406. Paragraph “a” of Section A-1 states, “The interface between structures, systems, and components (SSC) important to radiological safety and nonradioactive SSCs should be minimized. Necessary interfaces should have a minimum of two barriers, including one that can be a pressure differential, and should have instrumentation for prompt detection and control of cross-contamination.”

In addition, NRC Bulletin 80-10 discusses operational experience concerning the contamination of nonradioactive systems through leakage, valving errors, or other operating conditions in radioactive systems that have resulted in unmonitored, uncontrolled releases of radioactivity to the environment with significant environmental impact.

However, in reviewing the boric acid concentrator package and associated flow diagrams for the chemical and volume control system, in trying to resolve concerns associated with RAI 8353, Question 12.02-21, staff identified a piping connection between the reactor makeup water tank (RMWT) and the fire protection system (as shown in DCD Figure 9.3.4-1), with only one diaphragm valve separating the RMWT from the fire protection system. The applicant indicated in a conference call that this line was only used for the emergency containment spray backup system, during accident conditions, and there are not high pressures associated with the valve, therefore, the applicant indicated that the valve is not expected to be operated frequently and is not expected to leak. However, operating experience indicates that diaphragm valves have a tendency for through leakage, especially as the valves age.

In order to meet the criteria specified in DCD Section 9.1.3.2.3 and the above guidance, the applicant is requested to either 1) revise the design of the connection between the RMWT to the

fire protection system to either remove the permanent line or 2) if the applicant prefers to retain a permanent connection, please revise the design to provide a minimum of two barriers, including one that can be a pressure differential, and include instrumentation for prompt detection and control of cross-contamination.

Response

The water supply connection from the RMWT to the ECSBS will be modified according to RG 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning," Section A-1.

The modification will be incorporated in DCD Tier 2, Figure 9.3.4-1.

Impact on DCD

DCD Tier 2, Figure 9.3.4-1 will be revised as indicated in Attachment.

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 2

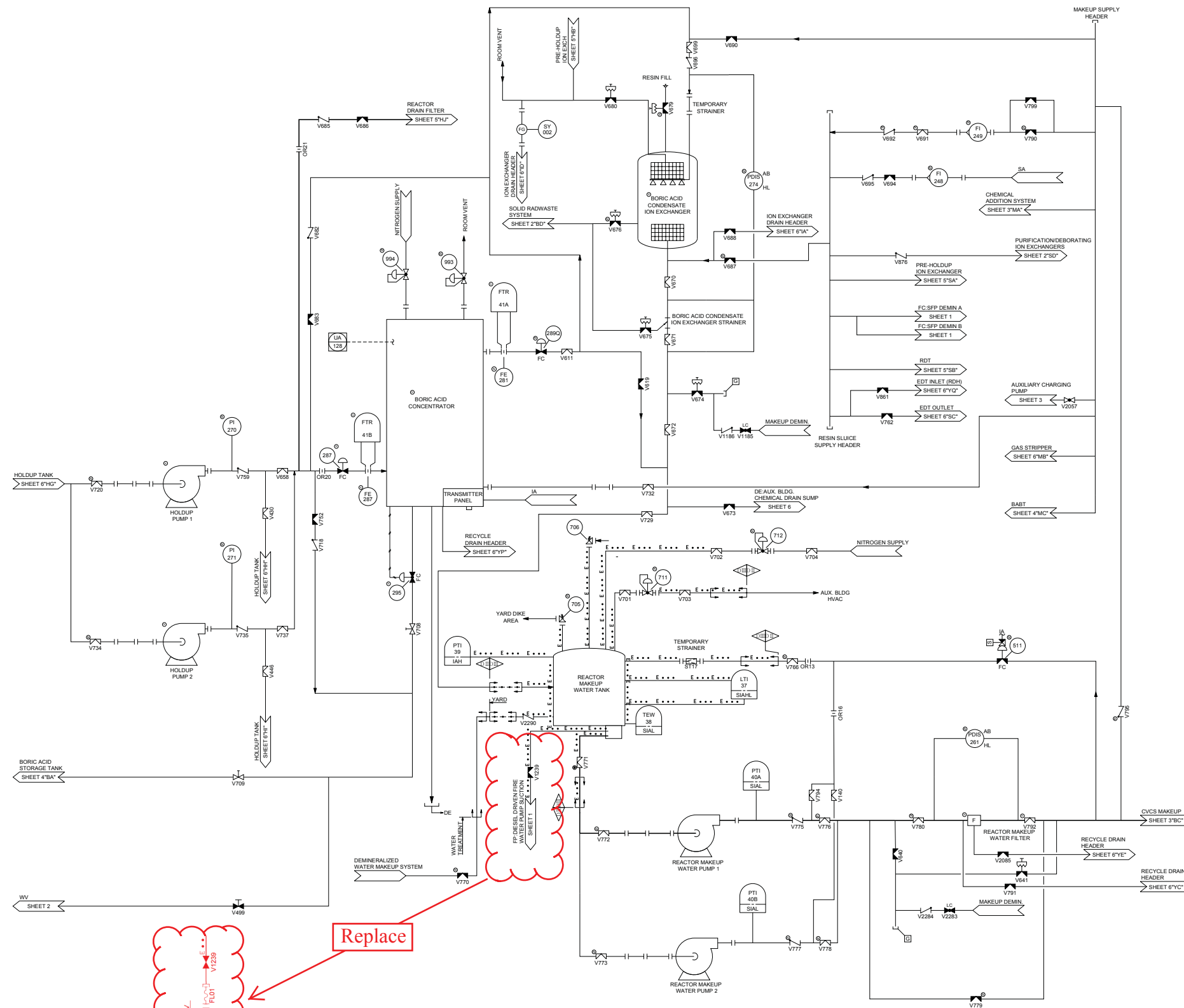


Figure 9.3.4-1 Chemical and Volume Control System Flow Diagram (7 of 7)