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.:	**233-8244**
SRP Section:	**05.02.02 - Overpressure Protection**
Application Section:	**5.2.2, 5.4.10 and 6.4.14**
Date of RAI Issue:	**10/02/2015**

Question No. 05.02.02-2

General Design Criterion (GDC) 15, as it relates to designing the RCS and associated auxiliary, control, and protection systems with sufficient margin to assure that the design conditions of the RCPB are not exceeded during any condition of normal operation, including AOOs. The staff reviews Tier 1 content, including ITAAC, to ensure that all Tier 1 information is consistent with Tier 2 information since all Tier 1 information is derived from Tier 2.

In accordance with Section 5.2.2 of NUREG-0800, for pressurized water reactors (PWRs), the area of review for operation at power includes pressurizer, safety and relief valves (SRVs), and the piping from these valves to a quench tank or to containment atmosphere on the primary side, as well as steam generator SRVs on the secondary side.

a. DCD Tier 1, Table 2.4.1-1, “Reactor Coolant System Equipment and Piping Location/Characteristics,” indicates that the pressurizer piping downstream of and excluding pressurizer pilot operated safety relief valves is classified as nonseismic. However, DCD Tier 2, Table 3.2-1, “Classification of Structures, Systems, and Components,” Item 79.g., indicates that “POSRV piping” is classified as “I/II”. The staff is unable to determine what seismic classification is applied to the POSRV discharge piping or locate any classification breaks on figures in DCD. In addition, an inconsistency may exist between Tier 1 and 2 regarding this piping classification. The applicant should verify the proper classification is applied to the POSRV discharge piping and update the DCD for consistency

b. DCD Section 5.2.2.3, “Flow Diagrams,” provides the reference to flow diagrams for the overpressure components and states, “The flow diagram showing the in-containment refueling water storage tank (IRWST) is given in Figure 6.8-3.” DCD Tier 1, Figure 2.4.2-1 shows the discharge of the POSRV into the IRWST. Figure 6.8-3, “Incontainment Water Storage System Flow Diagram,” shows the piping connections for the SCS relief valve discharge, but the staff is unable to locate the POSRV discharge connections to the IWRST. The applicant is requested to verify the location of

the POSRV discharge connection to IRWST in Figure 6.8-3. In addition, an inconsistency may exist between Tier 1 and 2 regarding this piping configuration. The applicant should verify the proper configuration and update DCD for consistency

Response

a. Seismic classification of the POSRV discharging piping is as follows.

- POSRV discharging piping upstream of 3-way valves: Seismic Category II
- POSRV discharging piping downstream of 3-way valves: Seismic Category I

DCD Tier 1 Table 2.4.1-1, Table 2.4.1-2, and Figure 2.4.2-1 will be revised to clarify the classification of the POSRV discharge piping and to be consistent between the DCDs.

DCD Tier 2 Table 3.2-1 was revised with the response to RAI 72-8020 Question 03.02.02-5.

b. The location of the POSRV discharge connection to the IRWST is shown on Figure 2.4.1-2 in Tier 1 and Figure 5.1.2-3 in Tier 2, but not Figure 6.8-3, each of which is the schematic and flow diagram for Pressurizer and POSRV including the portion of the POSRV discharge, respectively. Therefore consistency exists between Tier 1 and Tier 2. On the other hand, Figure 6.8-3 shows the flow diagram of the in-containment water storage system (IW) and the IW system does not include the portion of the POSRV discharge.

Figure 5.1.2-3 in Tier 2 was revised with the response to RAI 25-7844 Question 06.02.02-3 to indicate the spargers and associated piping as the POSRV discharge.

Impact on DCD

DCD Tier 1 Table 2.4.1-1, Table 2.4.1-2, and Figure 2.4.2-1 will be revised, as shown in the attachment associated with this response.

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 the Technical, Topical, or Environmental Report.

Table 2.4.1-1

Reactor Coolant System Equipment and Piping Location/Characteristics

Equipment and Piping Name	Location	ASME Section III Class	Seismic Category	LBB
Reactor vessel	Containment	1	I	No
Pressurizer	Containment	1	I	No
Steam generators (primary/secondary)	Containment	1/2	I	No
~~Pressurizer piping downstream of and excluding pressurizer pilot operated safety relief valves~~	~~Containment~~	- (1)	~~No~~	~~No~~
Reactor coolant piping drain piping upstream of and including the second drain stop valve	Containment	1	I	No
Reactor coolant piping	Containment	1	I	Yes
Pressurizer surge line piping	Containment	1	I	Yes
Pressurizer spray line piping	Containment	1	I	No
Control element drive mechanisms	Containment	1	I	No

(1) Dash (-) indicates not applicable.

Pilot operated safety relief valves (POSRVs)	Containment	1	I	No
POSRV discharging piping upstream of 3-way valves	Containment	- (1)	II	No
POSRV discharging piping downstream of 3-way valves	Containment	3	I	No
3-way valves of POSRV discharge piping	Containment	3	I	No

Table 2.4.1-2 (2 of 2)

Component Name	Item No. (1)	ASME Section III Class	Seismic Category	Class 1E/ Harsh Envir. Qual.	Control/ Display at MCR	Control/ Display at RSR	Control Signal	Active Safety Function	Loss of Motive Power Position
PZR Spray Control Valve (AOV)	RC-100E, 100F	1	I	No/No	Yes/Yes	-/-	PPCS	-	Closed
PZR Spray Bypass Valve (Manual)	RC-236, 237	1	I	-/No	-/-	-/-	-	-	-
PZR Spray Isolation Valve (MOV)	RC-442, 443	1	I	No/No	Yes/ Yes	-/-	-	-	As Is
PZR Spray Check Valve	RC-244	1	I	-/No	-/-	-/-	-	-	-
Controlled Bleedoff Isolation Valve (MOV)	RC-430, 431, 432, 433	2	I	No/No	Yes/Yes	-/-	-	-	As Is
Control Element Drive Mechanism	CEDM # 1 ~ 93	1	I	Yes (4)/Yes	Yes/Yes	-	PPS, RPS, DPS, RPCS	-	-

(1) The column "Item No." is information only (not part of certified design).

(2) Dash(-) indicates not applicable.

(3) For motor operated pilot valves.

(4) For Reed Switch Position Transmitter (RSPT)

3-way Valves of POSRV Discharge Piping (MOV)	RC-385,386	3	I	Yes/Yes	Yes/Yes	Yes/Yes	-	-	As Is
Vacuum Relief Valve	RC-1401,1402, 1403,1404	3	I	No/No	-	-	-	-	-

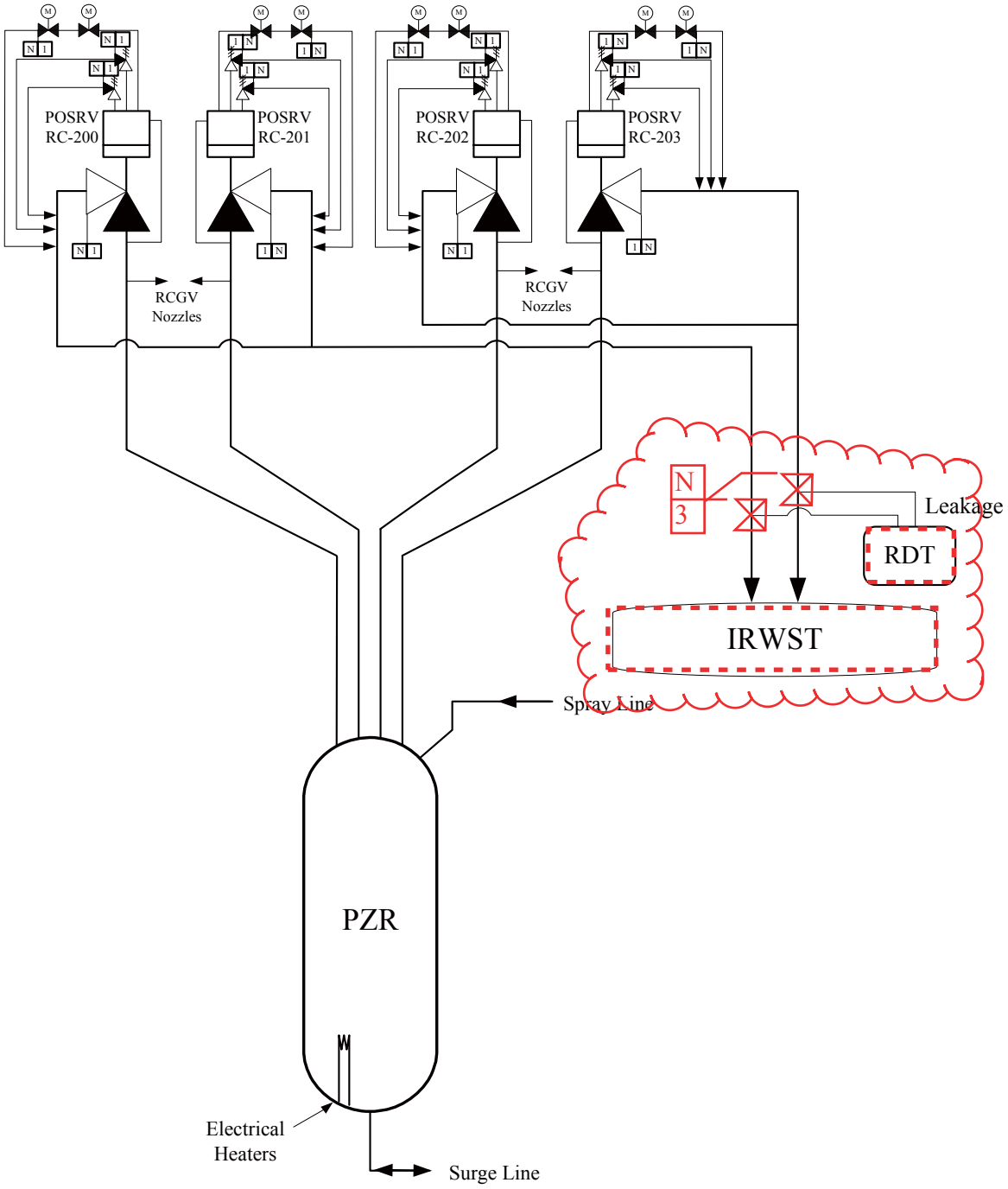

Figure 2.4.1-2 Reactor Coolant System (Pressurizer)