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Your ref: Docket No. 52-006
Our ref: DCP/NRC2483

May 20, 2009

Subject: AP1000 Response to Request for Additional Information (SRP 6)

Westinghouse is submitting a response to the NRC request for additional information (RAI) on SRP Section 6. This RAI response is submitted in support of the AP1000 Design Certification Amendment Application (Docket No. 52-006). The information included in this response is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification and the AP1000 Design Certification Amendment Application.

Enclosure 1 provides the response for the following RAI(s):

RAI-SRP6.2.1.1-SPCV-06
RAI-SRP6.2.1.2-SPCV-01 R1
RAI-SRP6.2.2-SPCV-16
RAI-SRP6.2.4-SPCV-03

Questions or requests for additional information related to the content and preparation of this response should be directed to Westinghouse. Please send copies of such questions or requests to the prospective applicants for combined licenses referencing the AP1000 Design Certification. A representative for each applicant is included on the cc: list of this letter.

Very truly yours,

Robert Sisk, Manager
Licensing and Customer Interface
Regulatory Affairs and Standardization

/Enclosure

1. Response to Request for Additional Information on SRP Section 6

D063
NRO

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ENCLOSURE 1

Response to Request for Additional Information on SRP Section 6

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP6.2.1.1-SPCV-06
Revision: 0

Question:

The WGOTHIC models used to evaluate the containment response to LOCA and MSLB events were updated to reflect recent design changes to the pressurizer and pressurizer room, shield building air flow path, and external maximum wet bulb temperature. While the changes were found to be acceptable, the DCD text still references the outdated models described in Section 6.2.7 Ref. 20 as the design basis. Describe how these model revisions will be incorporated into the DCD.

Westinghouse Response:

The text provided below will be added to the DCD section 6.2.1 to indicate that changes for the pressurizer, shielding building air flow path and external maximum wet bulb temperature have been incorporated into an evaluation of the containment response analyses. The results of these evaluations show there is only a small impact on the analysis and the conclusions remain valid. Therefore there are no changes to the DCD output description because it is representative of the transient phenomenon.

Design Control Document (DCD) Revision:

6.2.1.1.1 Design Basis

The containment system is designed such that for all break sizes, up to and including the double-ended severance of a reactor coolant pipe or secondary side pipe, the containment peak pressure is below the design pressure. A summary of the results is presented in Table 6.2.1.1-1.

This capability is maintained by the containment system assuming the worst single failure affecting the operation of the passive containment cooling system (PCS). For primary system breaks, loss of offsite power (LOOP) is assumed. For secondary system breaks, offsite power is assumed to be available when it maximizes the mass and energy released from the break.

Additional discussion of the assumptions made for secondary side pipe breaks may be found in subsection 6.2.1.4.

The single failure postulated for the containment pressure/temperature calculations is the failure of one of the valves controlling the cooling water flow for the PCS. Failure of one of these valves would lead to cooling water flow being delivered to the containment vessel through two of three delivery headers. This results in reduced cooling flow for PCS operation. No other single failures are postulated in the containment analysis.

The containment integrity analyses for the AP1000 employ a multivolume lumped parameter model to study the long-term containment response to postulated Loss of Coolant Accidents (LOCA) and Main Steam Line Break (MSLB) accidents.

The analyses presented in this section are based on assumptions that are conservative with respect to the containment and its heat removal systems, such as minimum heat removal, and maximum initial containment pressure.

The containment response analyses have been evaluated for various changes. The results of this evaluation have shown that there is a small impact on the analyseis and the conclusions remain valid. The output provided in this section for the analysis is representative of the transient phenomenon and will continue to reference the model in Reference 20.

The containment design for the Safe Shutdown Earthquake (SSE) is discussed in subsection 3.8.2.

The minimum containment backpressure used in the Passive Core Cooling System (PXS) analysis is discussed in subsection 6.2.1.5.

PRA Revision:
None

Technical Report (TR) Revision:
None

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP6.2.1.2-SPCV-01
Revision: 1

Question:

In DCD 6.2.1.2, the TMD computer code and models described in WCAP-15965-P were used to calculate the differential pressure across subcompartment walls. However, as described in APP-GW-GLR-016 (TR-36) Rev. 0, changes were later made to the pressurizer diameter and height and to the wall height of the pressurizer compartment. Describe the impact of these dimensional changes on the subcompartment model input and analysis results for the pressurizer compartment.

Additional Question (Revision 1):

In response to RAI SRP6.2.1.2-SPCV-01, Westinghouse revised the TMD models used in the subcompartment analysis. The changes were shown to be acceptable but the DCD still cites the outdated models from Section 6.2.7 Ref. 26 as the design basis. Describe how the new models will be incorporated into the DCD.

Westinghouse Response:

The pressurizer diameter increased and the height was reduced for the revised pressurizer design. The increased pressurizer diameter reduced the cross-sectional area of the free volume between the pressurizer (PZR) and the cubical walls. The reduced cross-sectional area between the PZR and the cubicle walls would tend to cause transient differential pressure to increase across the sub-compartments walls. Reducing the cross-sectional area will result in an increased local pressure to handle the same flow through the cross-sectional area. The changes made to the pressurizer design also reduced the compressible volume between the PZR and the cubicle walls which would also tend to cause differential pressure to increase. In order to determine the impact of these changes Westinghouse performed a conservative calculation that resulted in a maximum differential pressure still below the 5.00 psid structural threshold for the PZR cubicle.

Additional Response (Revision 1):

The text provided below will be added to the DCD section 6.2.1 to indicate that the pressurizer changes have been evaluated in the subcompartment analysis. The results of the evaluation as provided above show there is only a small impact on the analysis and the conclusions remain valid. Therefore there is no change to the DCD output description because this is representative of the transient phenomenon.

Design Control Document (DCD) Revision:

6.2.1.2 Containment Subcompartments

6.2.1.2.1 Design Basis

Subcompartments within containment are designed to withstand the transient differential pressures of a postulated pipe break. These subcompartments are vented so that differential pressures remain within structural limits. The subcompartment walls are challenged by the differential pressures resulting from a break in a high energy line. Therefore, a high energy line is postulated, with a break size chosen consistent with the position presented in Section 3.6, for analyzing the maximum differential pressures across subcompartment walls.

Section 3.6 describes the application of the mechanistic pipe break criteria, commonly referred to as leak-before-break (LBB), to the evaluation of pipe ruptures. This eliminates the need to consider the dynamic effects of postulated pipe breaks for pipes which qualify for LBB. However, the analyses of containment pressure and temperature, emergency core cooling, and environmental qualification of equipment are based on double-ended guillotine (DEG) reactor coolant system breaks and through-wall cracks.

The pressurizer diameter and height were changed after the original subcompartment analysis was performed. The subcompartment analysis has been evaluated for the changes in the pressurizer. The results of this evaluation have shown that there is a small impact on the analysis and the conclusions remain valid. The output provided in this section for the analysis is representative of the transient phenomenon.

PRA Revision:

None

Technical Report (TR) Revision:

None

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP6.2.2-SPCV-16
Revision: 0

Question:

a. The response to RAI-SRP6.2.2-SPCV-07(a) states that for a DVI break, the water level will be "just above the top of the IRWST screen." From APP-PXS-GLR-001, the minimum flood up level is 107'9.6" while the top of the IRWST screen per APP-GW-GLN-147 (TR-147) is 107'8", which results in only 1.6" submergence. What is the impact on recirculation performance if the water level drops below the top of the IRWST screen due to uncertainties in calculations? The cited RAI response also indicates the minimum submergence was modeled in the head loss testing. What was the actual water level during the head loss testing?

b. The response to RAI-SRP6.2.2-SPCV-07(a) states vortexing is addressed in WCAP-16914-P, but the staff could not find it. Specifically, where in this report is vortexing addressed?

c. The response to RAI-SRP6.2.2-SPCV-07(d) states the head loss test flow rates bound the operation of the non safety systems, but no details were provided. What are predicted maximum flows through IRWST and recirculation screen with and without RNS operation? How are these flows bounded by the head loss testing? Explain why 1200 gpm max IRWST flow is identified in Table A.1-1 of WCAP-16914-P but 1260 gpm max IRWST flow is identified in response to RAI-SRP6.2.2-SRSB-02.

d. WCAP-16914-P Table 5-1 identifies 3.5 lbm Min-K insulation in AP1000 containment, but Min-K is not referenced in APP-GW-GLR-079 (TR-26) or the DC. What is the source of the Min-K used in WCAP-16914-P? Where is it located and what breaks generate its debris? Is it transported to recirculation or IRWST screen?

e. TR-26 states that 4.1 lbs coatings and 25.2 lb latent particulate, for a combined total of 29.3 lb, are transported to the screens. Table 5-1 in WCAP-16914-P identifies 29.3 lbs of latent particulate in AP1000 containment. Are failed coatings part of latent debris transported to screen? If no, document the latent debris composition actually used in the testing and explain why this differs from that reported in TR-26 (85% particulate, 5% coatings, 10% fiber by volume).

f. WCAP-16914-P states low-density fiberglass material was used to simulate the fibrous component of containment latent debris. How was this prepared? What was the resultant size? Were fiber fines easily suspended prior to introduction to flume?

g. In WCAP-16914-P, debris and velocities were scaled using "as designed" areas rather than the ITAAC areas, which are 10-40% more limiting for frontal area. Discuss the impact of using more limiting ITAAC values for frontal screen areas in flow and debris scaling. Discuss impact of using frontal areas rather than surface areas for flow and debris scaling.

h. The sequencing of debris reported in WCAP-16914-P did not appear to follow SE recommendations. Demonstrate that the actual test sequencing was conservative or prototypical of expected plant accumulation sequence.

i. WCAP-16914-P stated that most of the debris did not get transported to the suction piping. How much debris settled upstream and/or downstream of the screen? Explain why the test flume is prototypical for modeling this type of settling.

j. Provide the basis for the strainer design maximum head loss. Provide a value for predicted debris head loss and the associated evaluation.

Westinghouse Response:

a. The minimum water level of 107'-9.6" is a conservative number that includes uncertainties (minimum volume of water supplies, maximum containment flood volumes, etc.). As a result, the IRWST screen will be submerged even with minimum volume and uncertainties considered . During the testing the water level was set right at the top of the screen.

b. The screen testing was conducted with the water level set at the top of the screen and no vortexing was observed. This observation was not recorded in WCAP-164914 Rev. 0. Additional testing is being performed on the AP1000 screens with larger amounts of fiber. The WCAP will be revised to incorporate this additional test data. The question of potential vortexing will be clearly addressed in WCAP-16914 Rev. 1.

c. The maximum flow velocities experienced by the containment recirculation screens and IRWST screens are for the PXS room break.

   In order to explain the operation of the AP1000 during a LOCA two figures have been prepared. Both are based on a DVI line break in the PXS room. This break location was selected because it forces all the injection and recirculation flow through one IRWST screen which provides for the maximum IRWST screen flows. This break location also leads to the highest containment recirculation screen flows as discussed below.

   Scenario 1
   Figure 1 provides a graphical representation of post LOCA long term core cooling with RNS operation. A PXS room B break is selected because it results in the flooding of that room which is assumed to result in failure of the two recirculation squib valves associated with the recirculation flow path to this PXS subsystem. As a consequence, the flow

through one IRWST screen is equal to 100% of the RNS flow. It should be noted that it was conservatively assumed that with the injection of subcooled water from the RNS assuming its heat exchangers are being cooled, that the ADS 4 vent flow is 100% water. As a result, all the ADS 4 vent flow is returned to the RCS through the containment recirculation screens which maximizes flow.

The RNS pumps can inject a maximum of 2400 gpm into the RCS with worst case assumptions which include the RCS at atmospheric pressure, no throttling of the RNS, and maximum pump head. However, in this situation the RNS pumps will cavitate. To prevent this cavitation the pumps are required to be throttled to ≤1548 gpm which is consistent with the maximum PXS flow. Note that if the RNS can not be limited to this flow then the pumps will be stopped. Table 1 summarizes the flow rates for recirculation with and without RNS operation.

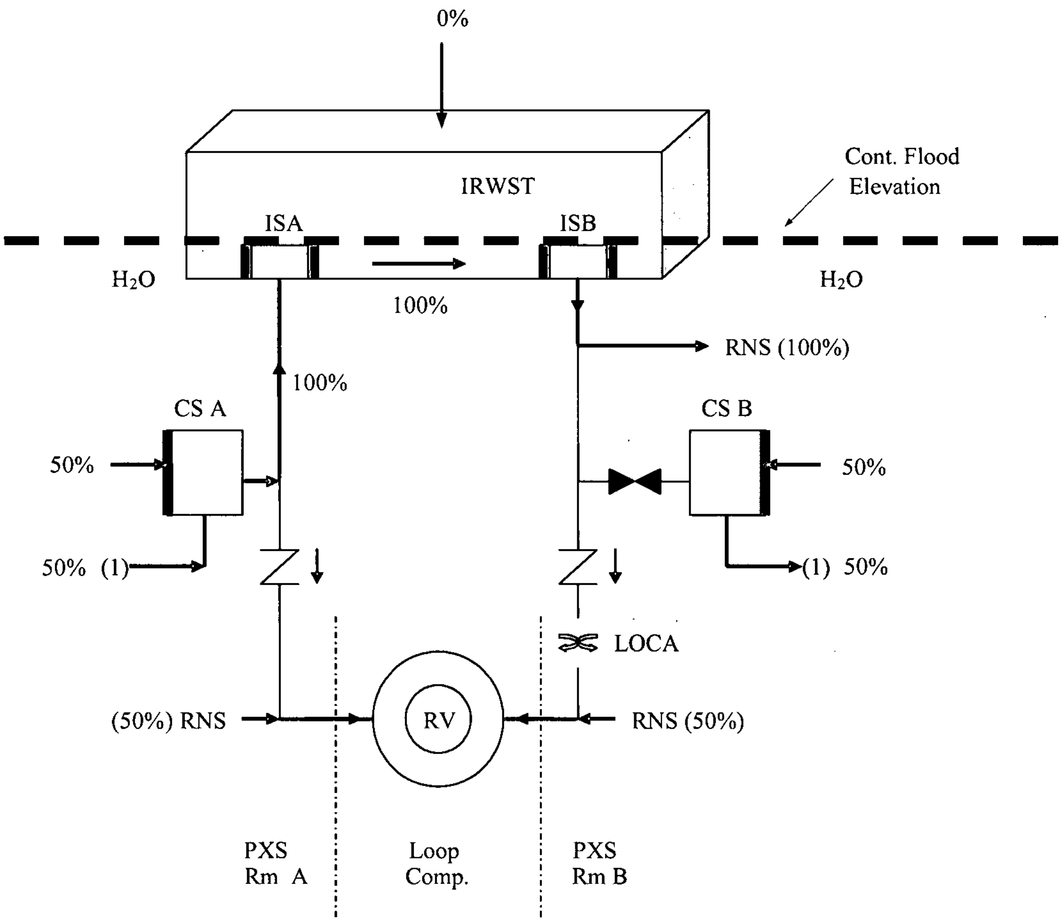


Figure 1: Recirculation Flow Paths with RNS in operation.

Scenario 2

Figure 2 represents the same scenario as Figure 1 except with PXS operation; RNS operation is assumed not available. This means the system is driven by natural circulation from decay heat and hydrostatic pressure heads. The main difference between these two scenario's is that without a heat exchanger (like the RNS has) the PXS injection will be hotter and there will be steaming in the core and in the ADS 4 vent. As a result, there will be condensate collected in the IRWST gutter and returned into the IRWST. This operation reduces the IRWST screen and the containment recirculation screen flows.

With PXS in operation (and RNS not operating), the initial gravity injection from the IRWST is approximately 1700 gpm through one IRWST screen. This injection flow rate decreases with time as the IRWST water level drops and equals the recirculation flow just before recirculation start (700 gpm, as discussed in the next paragraph). Since there is no debris initially in the IRWST, using a flow rate that occurs somewhat after the start of IRWST flow is reasonable.

The maximum DVI line flow rate during recirculation with PXS in operation is 1325 gpm. The long term core cooling analysis shows a 50/50 flow split between the two DEDVI lines for a LOCA in a PXS room. As shown in Figure 2, 50% of the total flows through one IRWST screen (ISB) into the faulted DVI line. 50% of 1325 gpm is 663 gpm which is rounded to 700 for conservatism.

With PXS in operation (and RNS not operating), the flow through the recirculation screens is based on the water flow out the ADS stage 4 flow path. The steam exiting the ADS 4 paths is condensed on the containment shell and drained back into the IRWST. The water flow out the ADS 4 lines is about 73% of the total. 73% of the total flow (1325 gpm) is 967 gpm. A flow rate of 1000 gpm is used for conservatism. Table 1 summarizes the flow rates for recirculation with and without RNS operation.

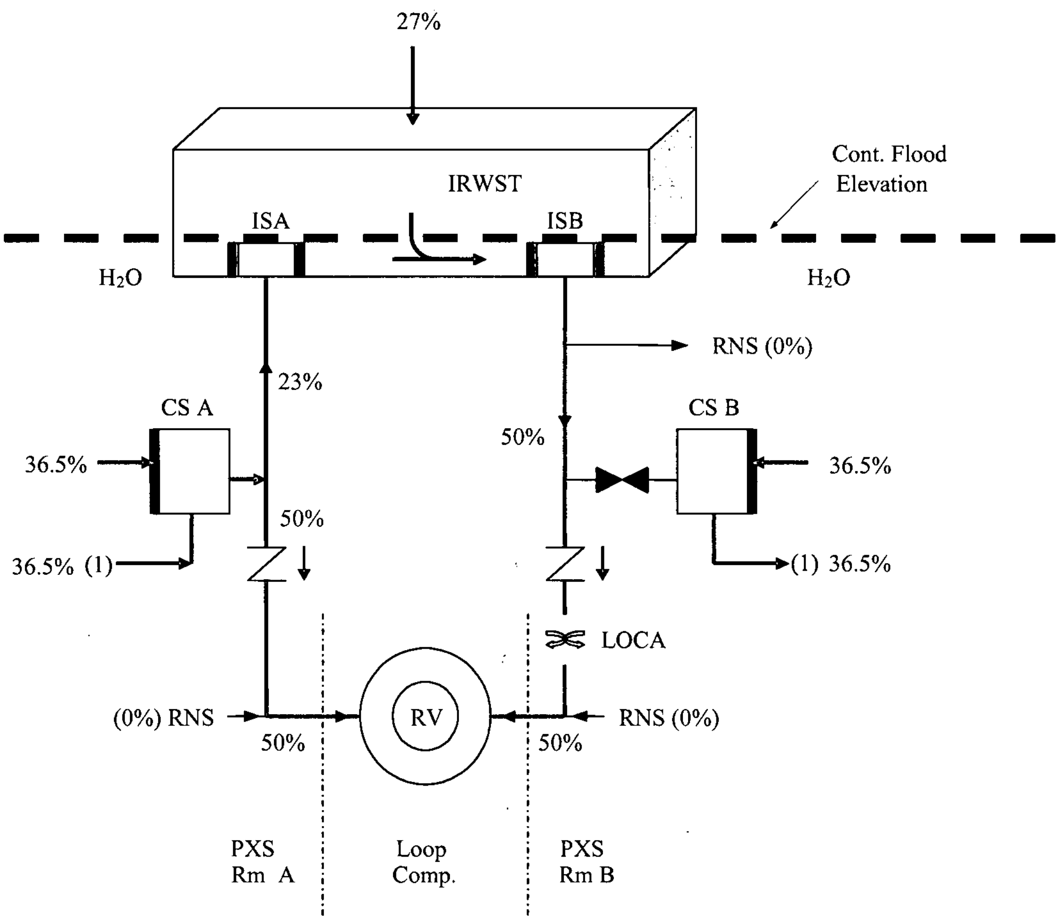


Figure 2: Recirculation Flow Paths without RNS in operation.

Table 1: IRWST and CR Screen Flow during PXS and RNS Operation

	IRWST Screen (gpm)	Containment Recirc. Screen (gpm)
Inject -RNS	≤1548[1]	N/A
PXS	1548[2]	N/A
Recirc.-RNS	≤1548[1]	≤1548[1]
PXS	700[3]	1000[3]

Notes:

1. The RNS pumps can inject a maximum of 2400 gpm into the RCS with worst case assumptions (RCS at atm pressure, no throttling of the RNS, maximum pump head). However, in this situation the RNS pumps will cavitate. To prevent this cavitation the pumps are required to be throttled to ≤1548 gpm which is consistent with the maximum PXS flow. Note that is the RNS can not be limited to this flow then the pumps will be stopped.

2. With PXS in operation (and RNS not operating), the initial gravity injection from the IRWST is approximately 1700 gpm through one IRWST screen. This injection flow rate decreases with time as the IRWST water level drops and equals the recirculation flow just before recirculation start (700 gpm, as discussed in note 3). Since there is no debris initially in the IRWST, using a flow rate that occurs somewhat after the start of IRWST flow is reasonable.

3. The maximum DVI line flow rate during recirculation with PXS in operation is 1325 gpm. The long term core cooling analysis shows a 50/50 flow split between the two DEDVI lines for a LOCA in a PXS room. As shown in Figure 2, 50% of the total flow is through one IRWST screen (ISB) into the faulted DVI line. 50% of 1325 gpm is 663 gpm which is rounded to 700 for conservatism.

4. With PXS in operation (and RNS not operating), the flow through the recirculation screens is based on the water flow out the ADS stage 4 flow path. The steam exiting the ADS 4 paths is condensed on the containment shell and drained back into the IRWST. The water flow out the ADS 4 lines is about 73% of the total. 73% of the total flow (1325 gpm) is 967 gpm. A flow rate of 1000 gpm is used for conservatism.

The current testing of the AP1000 screens has been preformed with flow rates that are consistent with these flow rates.

d. The potential source of the Min-K are vents located in the reactor vessel insulation just above the top of the active fuel. They are capsulated in stainless steel and seal welded. As discussed in the response to RAI-SRP6.2.2-SPCV-13, this enclosure will not be damaged which results in no debris generation.

e. As discussed in the response to RAI-SRP6.2.2-SRSB-05, the AP1000 is designed for 150 pounds of latent debris of which 8 pounds may be fibrous. Furthermore, as discussed in RAI-SRP6.2.2-SPCV-15, 100% of this latent debris is conservatively assumed to be transported to the containment recirculation screens; 50% of this debris is conservatively assumed to be transported to the IRWST screens. These assumptions are being used in the revised screen testing that is being performed at this time. In this testing, the latent debris that is not fiber is assumed to be particle. This assumption is conservative for two reasons. One is that in the AP1000, all of the coatings used inside the containment are required to be high density such that they would not transport to the screens. Two is that assuming that the non-fibrous material is small particles results in a conservatively high pressure loss.

f. WCAP-16914 Rev. 1 contains the results of the screen tests performed in April of 2009. Additionally, this report contains a section explicitly describing the debris preparation process, and will include pictures of the fibers in suspension.

g. The screen testing has been repeated. The new tests being performed have been scaled using the limiting ITAAC areas. Frontal areas are used for the screen tests to ensure that the tests are bounding. This approach is used because the test screens have a slightly smaller screen surface area relative to their frontal areas. This point is discussed in the screen test report (WCAP-16914 Rev. 0).

h. The final review guidance recommendations in Letter: ML080230112 came out on March 28, 2008, 25 days after the test report was released on March 3, 2008. New screen tests scheduled to occur over the next few weeks will use the NRC recommended sequencing guidance as provided in the 'REVISED GUIDANCE FOR REVIEW OF FINAL LICENSEE RESPONSES TO GENERIC LETTER 2004-02, "POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY RECIRCULATION DURING DESIGN BASIS ACCIDENTS AT PRESSURIZED-WATER REACTORS', March 31, 2008.

i. The debris was added to the flume just upstream of the screens. The debris tended to settle out before the screens so the water was stirred to prevent debris from settling out before the screen. A lot of the debris especially the particles passed through the screen and settled out downstream of the screen. The new screen tests that are underway at this time are being performed with particles that have been shown to remain suspended for a long time (hours) such that they do not settle out during the test. With the different particles the flume does not have issues with debris settling out and is therefore prototypical.

j. The screen design DP is 14 inches water head loss which is based on the safety analysis sensitivity analysis performed for AP1000 (refer to document APP-PXS-GLR-001). The predicted head loss is based on the screen testing performed for AP1000 (refer to WCAP-16914) which will be updated as soon as the current testing is completed.

Design Control Document (DCD) Revision:

None

PRA Revision:

None

Technical Report (TR) Revision:

WCAP-16914 Rev. 1.

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP6.2.4-SPCV-03
Revision: 0

Question:

AP1000 DCD, Rev. 14, Section 6.2.3.1.3, Containment Isolation Design, Additional Requirement M, states "Containment penetrations with leak-tight barriers, both inboard and outboard, are designed to limit pressure excursions between the barriers due to heating of fluid between the barriers. The penetration will either be fitted with relief or check valves to relieve internal pressure or one of the valves has been designed or oriented to limit pressures to an acceptable value."

NUREG 1793, Sect. 6.2.4.2 states "All overpressure relief valves used as containment isolation valves comply with the SRP acceptance criterion of having a setpoint greater than or equal to 150 percent of the containment design pressure."

AP1000 DCD, Rev. 17, provides four (4) additional overpressure relief valves, identified in Table 6.2.3-1, Containment Mechanical Penetrations and Isolation Valves. These valves have also been added to Tier 1, figure 2.2.1-1 and identified in Tier 1, Table 2.2.1-1, as CCS-PL-V220, SFS-PL-V067, VWS-PL-V080, and WLS-PL-V058.

1. Confirm that these four valves comply with the SRP 6.2.4 acceptance criterion of having a setpoint greater than or equal to 150 percent of the containment design pressure.

2. Also, address why the CVS letdown line at penetration P06 has not been similarly provided with an overpressure relief valve between the two normally closed containment isolation valves, CVS-PL-V045 and CVS-PL-V047. If overpressure protection is provided, identify the overpressure relief valve in Tier 1, figure 2.2.1-1, Tier 1, Table 2.2.1-1 and Tier 2, Table 6.2.3-1.

Westinghouse Response:

1. The containment design pressure is 59.0 psig. 150 percent of the containment design pressure is 88.5 psig. All of the subject relief valves have set pressures above this value. The following table identifies the set pressures as specified in their corresponding valve data sheets:

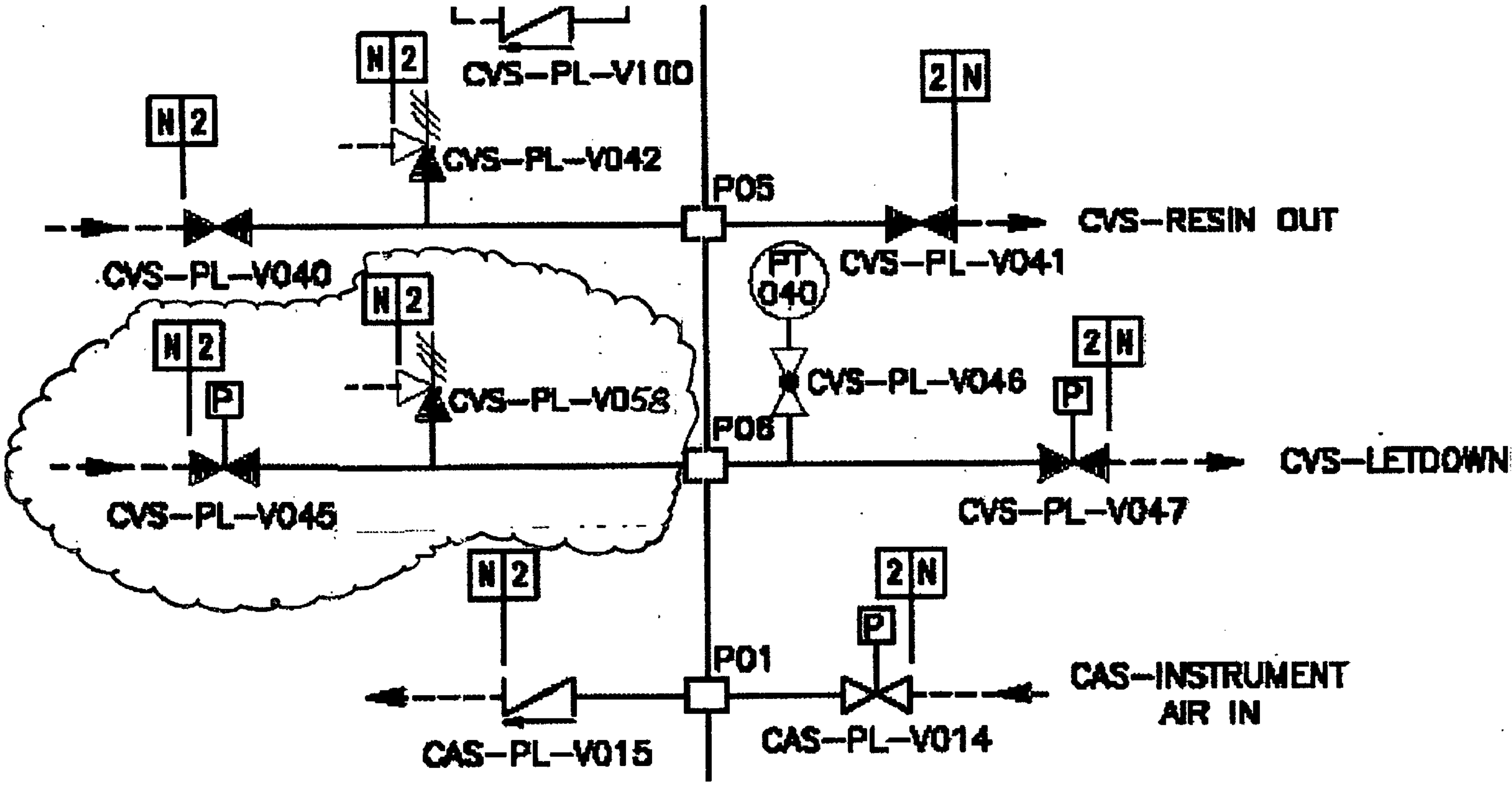
Valve Tag No.	Set Pressure PSIG	Valve Data Sheet Number
CCS-PL-V220	210	APP-PV16-Z0D-106
SFS-PL-V067	175	APP-PV16-Z0D-102
VWS-PL-V080	210	APP-PV16-Z0D-106
WLS-PL-V058	175	APP-PV16-Z0D-102

2. Relief valve CVS-PL-V058 has been approved to be incorporated into the design of the CVS Letdown Line. This relief valve functions to provide thermal over pressure relief due to over pressure caused by thermal expansion in the penetration. The valve is installed in containment downstream of valve CVS-PL-V045. DCD markups showing the required changes are provided.

Design Control Document (DCD) Revision:
The following DCD sections are affected by the addition of relief valve CVS-PL-V058:

- DCD Tier 1 Figure 2.2.1-1
- DCD Tier 1 Table 2.3.2-1
- DCD Table 3.2-3, "AP1000 Classification of Mechanical and Fluid Systems, Components and Equipment"
- DCD Table 3.9-12, "List of ASME Class 1, 2, and 3 Active Valves"
- DCD Table 3.9-16, "Valve Inservice Test Requirements"
- DCD Table 3.11-1, "Environmentally Qualified Electrical and Mechanical Equipment"
- DCD Table 6.2.3-1, "Containment Mechanical Penetrations and Isolation Valve"
- DCD Section 9.3.6.3.7, "Chemical and Volume Control System Valves"
- DCD Figure 9.3.6-1, "Chemical and Volume Control System"

Modify DCD Tier 1 Figure 2.2.1-1, "Containment System" as shown:



Modify DCD Tier 1 Table 2.3.2-1 as shown:

Table 2.3.2-1 (cont.)

Equipment Name	Tag No.	ASME Code Section III	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. for Harsh Envir.	Safety-Related Display	Control PMS	Active Function	Loss of Motive Power Position
CVS Letdown Line Containment Isolation Thermal Relief Valve	CVS-PL-V058	Yes	Yes	No	- / -	-	-	Transfer Open/ Transfer Closed	-
CVS Purification Return Line Pressure Boundary Check Valve	CVS-PL-V080	Yes	Yes	No	- / -	-	-	Transfer Closed	-
CVS Purification Return Line Pressure Boundary Isolation Check Valve	CVS-PL-V081	Yes	Yes	No	- / -	No	-	Transfer Closed	-
CVS Purification Return Line Pressure Boundary Check Valve	CVS-PL-V082	Yes	Yes	No	- / -	-	-	Transfer Closed	-
CVS Auxiliary Pressurizer Spray Line Pressure Boundary Valve	CVS-PL-V084	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	Closed
CVS Auxiliary Pressurizer Spray Line Pressure Boundary Check Valve	CVS-PL-V085	Yes	Yes	No	Yes/Yes	-	-	Transfer Closed	-

Modify DCD Table 3.2-3, "AP1000 Classification of Mechanical and Fluid Systems, Components and Equipment" as shown:

TABLE 3.2-3 (SHEET 3 OF 65)

AP1000 CLASSIFICATION OF MECHANICAL AND FLUID SYSTEMS, COMPONENTS, AND EQUIPMENT

Tag Number	Description	AP1000 Class	Seismic Category	Principal Construction Code	Comments
Chemical and Volume Control System (CVS) Location: Containment, Auxiliary Building, and Annex Building					
CVS-PL-V001	RCS Purification Stop	A	I	ASME III-1	
CVS-PL-V002	RCS Purification Stop	A	I	ASME III-1	
CVS-PL-V003	RCS Purification Stop	C	I	ASME III-3	
CVS-PL-V040	Resin Flush IRC Isolation	B	I	ASME III-2	
CVS-PL-V041	Resin Flush ORC Isolation	B	I	ASME III-2	
CVS-PL-V042	Flush Line Containment Isolation Relief	B	I	ASME III-2	
CVS-PL-V045	Letdown Containment Isolation IRC	B	I	ASME III-2	
CVS-PL-V046	Letdown Pressure Instrument Root	B	I	ASME III-2	
CVS-PL-V047	Letdown Containment Isolation ORC	B	I	ASME III-2	
CVS-PL-V058	Letdown Line Containment Isolation Relief	B	I	ASME III-2	
CVS-PL-V080	RCS Purification Return Line Check Valve	C	I	ASME III-3	
CVS-PL-V081	RCS Purification Return Line Stop Valve	A	I	ASME III-1	
CVS-PL-V082	RCS Purification Return Line Check Valve	A	I	ASME III-1	
CVS-PL-V084	Auxiliary Pressurizer Spray Line Isolation	A	I	ASME III-1	
CVS-PL-V085	Auxiliary Pressurizer Spray Line	A	I	ASME III-1	
CVS-PL-V090	Makeup Line Containment Isolation	B	I	ASME III-2	

Modify DCD Table 3.9-12, "List of ASME Class 1, 2, and 3 Active Valves" as shown:

Table 3.9-12 (Sheet 1 of 7)

LIST OF ASME CLASS 1, 2, AND 3 ACTIVE VALVES

Valve No.	Description	Function[(a)]
Chemical and Volume Control System		
CVS-PL-V001	Reactor Coolant System Purification Stop	1
CVS-PL-V002	Reactor Coolant System Purification Stop	1
CVS-PL-V003	Reactor Coolant System Purification Stop	1
CVS-PL-V042	Flush Line Containment Isolation Relief	2
CVS-PL-V045	Letdown Containment Isolation IRC	2
CVS-PL-V047	Letdown Containment Isolation ORC	2
CVS-PL-V058	Letdown Line Containment Isolation Relief	2
CVS-PL-V080	Reactor Coolant System Purification Return Line Check Valve	1
CVS-PL-V081	Reactor Coolant System Purification Return Line Stop Valve	1
CVS-PL-V082	Reactor Coolant System Purification Return Line Check Valve	1
CVS-PL-V084	Auxiliary Pressurizer Spray Line Isolation	1
CVS-PL-V085	Auxiliary Pressurizer Spray Line Check Valve	1
CVS-PL-V090	Makeup Line Containment Isolation	2
CVS-PL-V091	Makeup Line Containment Isolation	2
CVS-PL-V092	Hydrogen Add Containment Isolation	2
CVS-PL-V094	Hydrogen Add IRC Isolation Check Valve	2
CVS-PL-V100	Makeup Line Containment Isolation Thermal Relief Check Valve	2
CVS-PL-V136A	Demineralized Water System Isolation	3
CVS-PL-V136B	Demineralized Water System Isolation	3
Fuel Handing System		
FHS-PL-V001	Fuel Transfer Tube Isolation Valve	3
Passive Containment Cooling System		
PCS-PL-V001A	Passive Containment Cooling Water Storage Tank Isolation	3,4
PCS-PL-V001B	Passive Containment Cooling Water Storage Tank Isolation	3,4
PCS-PL-V001C	Passive Containment Cooling Water Storage Tank Isolation	3,4
PCS-PL-V002A	Passive Containment Cooling Water Storage Tank Series Isolation	3,4
PCS-PL-V002B	Passive Containment Cooling Water Storage Tank Series Isolation	3,4
PCS-PL-V002C	Passive Containment Cooling Water Storage Tank Series Isolation	3,4

Modify DCD Table 3.9-16, "Valve Inservice Test Requirements" as shown:

Table 3.9-16 (Sheet 2 of 21)

VALVE INSERVICE TEST REQUIREMENTS

Valve Tag Number	Description(1)	Valve Type	Safety-Related Missions	Safety Functions(2)	ASME IST Category	Inservice Testing Type and Frequency	IST Notes
CVS-PL-V047	Letdown Containment Isolation ORC	Remote	Maintain Close Transfer Close	Active-to-Failed RCS Pressure Boundary Containment Isolation Safety Seat Leakage Remote Position	A	Remote Position Indication, Exercise/2 Years Containment Isolation Leak Test Exercise Full Stroke/Quarterly Operability Test	27, 31
CVS-PL-V058	Letdown Line Containment Isolation Relief	Relief	Maintain Close Transfer Open Transfer Close	Active Containment Isolation Safety Seat Leakage	AC	Containment Isolation Leak Test Class 2/3 Relief Valve Tests/10 Years and 20% in 4 Years	27
CVS-PL-V080	RCS Purification Return Line Check Valve	Check	Maintain Close Transfer Close	Active Safety Seat Leakage	AC	Check Exercise/Cold Shutdown RCS Isolation Leak Test/Refueling	6, 32
CVS-PL-V081	RCS Purification Return Line Stop Valve	Check	Maintain Close Transfer Close	Active Safety Seat Leakage	AC	Check Exercise/Cold Shutdown RCS Isolation Leak Test/Refueling	6, 8, 32

Modify DCD Table 3.11-1, “Environmentally Qualified Electrical and Mechanical Equipment” as shown:

Table 3.11-1 (Sheet 18 of 50)

ENVIRONMENTALLY QUALIFIED ELECTRICAL AND MECHANICAL EQUIPMENT

Description	AP1000 Tag No.	Envir. Zone (Note 2)	Function (Note 1)	Operating Time Required (Note 5)	Qualification Program (Note 6)
RCS Letdown Stop Valve	CVS-PL-V003	1	ESF	5 min	M *
Limit Switch	CVS-PL-V003-L	1	PAMS	1 yr	E *
Motor Operator	CVS-PL-V003-M	1	ESF	5 min	E *
Demineralizer Flush Line Relief Valve	CVS-PL-V042	1	ESF	24 hr	M **
WLS Letdown IRC Isolation	CVS-PL-V045	1	ESF	5 min	M *
Limit Switch	CVS-PL-V045-L	1	PAMS	1 yr	E *
Solenoid Valve	CVS-PL-V045-S1	1	ESF	5 min	E *
Letdown Flow ORC Isolation	CVS-PL-V047	7	ESF	5 min	M S **
Limit Switch	CVS-PL-V047-L	7	PAMS	2 wks	E **
Solenoid Valve	CVS-PL-V047-S1	7	ESF	5 min	E **
Letdown Line Thermal Relief Valve	CVS-PL-V058	1	ESF	24 hr	M **
RCS Purification Check Valve	CVS-PL-V080	1	ESF	5 min	M *
RCS Purification Stop Valve	CVS-PL-V081	1	ESF	5 min	M *
RCS Purification Check Valve	CVS-PL-V082	1	ESF	5 min	M *
Auxiliary PZR Spray Isolation	CVS-PL-V084	1	ESF	5 min	M *
Limit Switch	CVS-PL-V084-L	1	PAMS	1 yr	E *
Solenoid Valve	CVS-PL-V084-S	1	ESF	5 min	E *
Auxiliary PZR Spray Isolation	CVS-PL-V085	1	ESF	5 min	M *
Makeup Line Containment Isolation	CVS-PL-V090	7	ESF	5 min	M S **
Limit Switch	CVS-PL-V090-L	7	PAMS	2 wks	E **
Motor Operator	CVS-PL-V090-M	7	ESF	5 min	E **
Makeup Line Containment Isolation	CVS-PL-V091	1	ESF	5 min	M *
Limit Switch	CVS-PL-V091-L	1	PAMS	1 yr	E *
Motor Operator	CVS-PL-V091-M	1	ESF	5 min	E *

Modify DCD Table 6.2.3-1, "Containment Mechanical Penetrations and Isolation Valves" as shown:

Table 6.2.3-1 (Sheet 1 of 4)

CONTAINMENT MECHANICAL PENETRATIONS AND ISOLATION VALVES

	Containment Penetration			Isolation Device					Test		
System	Line	Flow	Closed Sys IRC	Valve/Hatch Identification	DCD Subsection	Position N-S-A	Signal	Closure Times	Type[1] & Note	Medium	Direction
CCS	IRC loads in	In	No	CCS-PL-V200 CCS-PLV201	9.2.2	O-O-C O-O-C	S None	std. N/A	C,5	Air	Forward
	IRC loads out	Out	No	CCS-PLV208 CCS-PLV207	9.2.2	O-O-C O-O-C	SS	std. std.	C,5	Air	Forward
CVS	Spent resin flush out	Out	No	CVS-PL-V041 CVS-PL-V040 CVS-PL-V042	9.3.6	C-C-C C-C-C C-C-C	None None None	N/A N/A N/A	C	Air	Forward
	Letdown	Out	No	CVS-PL-V047 CVS-PL-V045 CVS-PL-V058	9.3.6	C-O-C C-O-C C-C-C	T T None	std. std. N/A	C	Air	Forward. Forward Reverse
	Charging	In	No	CVS-PL-V090 CVS-PL-V091 CVS-PL-V100	9.3.6	C-O-C C-O-C C-C-C	HR,PL2, S+PL1, SGL HR,PL2, S+PL1, SGL None	std. std. N/A	C	Air	Forward
	H2 injection to RCS	In	No	CVS-PL-V092 CVS-PL-V094	9.3.6	O-C-C C-C-C	T None	std. N/A	C	Air	Forward

Modify DCD Section 9.3.6.3.7, "Chemical and Volume Control System Valves" as shown:

9.3.6.3.7 Chemical and Volume Control System Valves

(11 paragraphs unchanged)

Letdown Line Relief Valve

A relief valve is provided to prevent overpressurization of the letdown line connected to the waste processing system. This relief valve prevents overpressurization that might be caused by opening the letdown line with a closed valve in the waste processing system. The set pressure of this relief valve is equal to the design pressure of the line connecting to the waste processing system. The relief capacity is sufficient to accommodate a conservatively high letdown rate assuming minimum flow resistances in the piping, valves, orifices, and equipment in the letdown line.

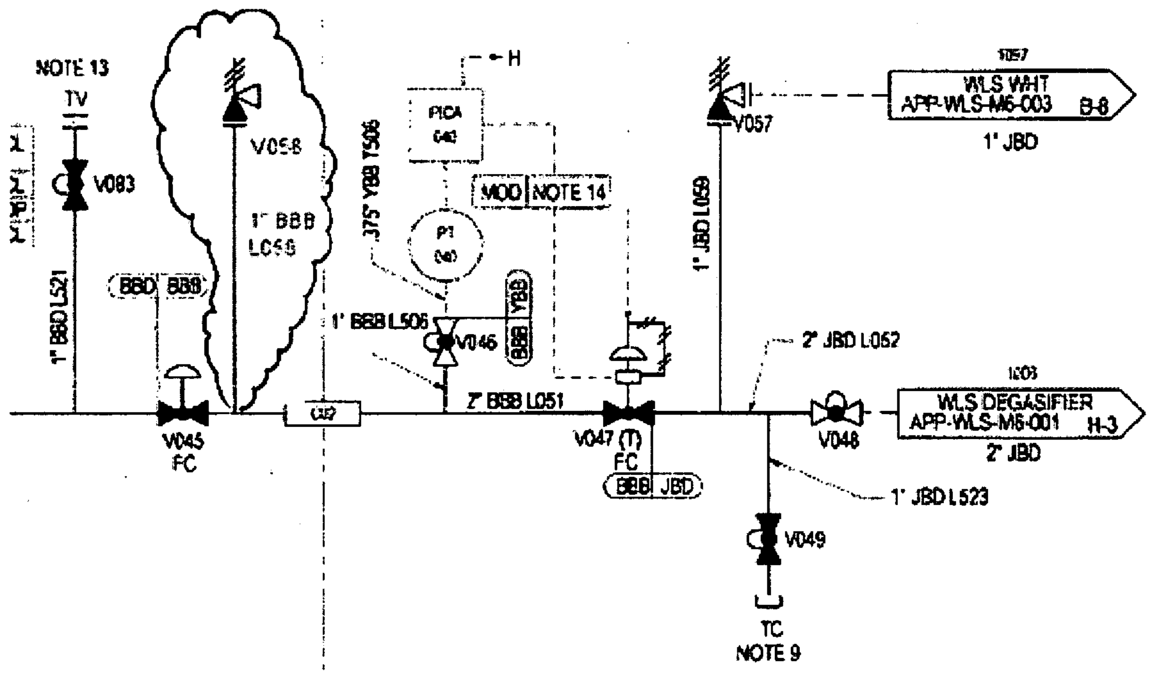
Letdown Line Containment Isolation Thermal Relief Valve

A relief valve is provided to prevent overpressurization of the letdown line containment penetration. This relief valve prevents overpressurization that might be caused by thermal expansion of the fluid between the containment isolation valves following an event causing containment isolation. This relief valve is located inside containment.

Resin Sluice Line Relief Valve

A relief valve is provided to prevent overpressurization of the line that is used to sluice resin from the mixed bed and cation bed demineralizers to the waste processing system. The set pressure of this relief valve is equal to the design pressure of the line it is connected to which is equal to the design pressure of the CVS purification equipment inside containment. The relief capacity is sufficient to accommodate thermal expansion of the water that is trapped between the two containment isolation valves that might occur following an accident that results in heatup of the containment.

Modify DCD Figure 9.3.6-1, Chemical and Volume Control System as shown:



PRA Revision:
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