2.2.1 Containment System

Design Description

The containment system (CNS) is the collection of boundaries that separates the containment atmosphere from the outside environment during design basis accidents.

The CNS is as shown in Figure 2.2.1-1 and the component locations of the CNS are as shown in Table 2.2.1-4.

1. The functional arrangement of the CNS and associated systems is as described in the Design Description of this Section 2.2.1.

2. a) The components identified in Table 2.2.1-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.

   b) The piping identified in Table 2.2.1-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements.

3. a) Pressure boundary welds in components identified in Table 2.2.1-1 as ASME Code Section III meet ASME Code Section III requirements.

   b) Pressure boundary welds in piping identified in Table 2.2.1-2 as ASME Code Section III meet ASME Code Section III requirements.

4. a) The components identified in Table 2.2.1-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure.

   b) The piping identified in Table 2.2.1-2 as ASME Code Section III retains its pressure boundary integrity at its design pressure.

5. The seismic Category I equipment identified in Table 2.2.1-1 can withstand seismic design basis loads without loss of safety function.

6. a) The Class 1E equipment identified in Table 2.2.1-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

   b) The Class 1E components identified in Table 2.2.1-1 are powered from their respective Class 1E division.

   c) Separation is provided between CNS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

7. The CNS provides the safety-related function of containment isolation for containment boundary integrity and provides a barrier against the release of fission products to the atmosphere.

8. Containment electrical penetration assemblies are protected against currents that are greater than the continuous ratings.

9. Safety-related displays identified in Table 2.2.1-1 can be retrieved in the main control room (MCR).

10. a) Controls exist in the MCR to cause those remotely operated valves identified in Table 2.2.1-1 to perform active functions.

    b) The valves identified in Table 2.2.1-1 as having protection and safety monitoring system (PMS) control perform an active function after receiving a signal from the PMS.

    c) The valves identified in Table 2.2.1-1 as having diverse actuation system (DAS) control perform an active function after receiving a signal from the DAS.

11. a) The motor-operated and check valves identified in Table 2.2.1-1 perform an active safety-related function to change position as indicated in the table.

    b) After loss of motive power, the remotely operated valves identified in Table 2.2.1-1 assume the indicated loss of motive power position.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.2.1-3 specifies the inspections, tests, analyses, and associated acceptance criteria for the CNS.

Table 2.2.1-1

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/DAS	Active Function	Loss of Motive Power Position
Service Air Supply Outside Containment Isolation Valve	CAS-PL-V204	Yes	Yes	No	-/-	No	-/-	None	-
Service Air Supply Inside Containment Isolation Check Valve	CAS-PL-V205	Yes	Yes	No	-/-	No	-/-	None	-
Instrument Air Supply Outside Containment Isolation Valve	CAS-PL-V014	Yes	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	Closed
Instrument Air Supply Inside Containment Isolation Check Valve	CAS-PL-V015	Yes	Yes	No	-/-	-	-/-	Transfer Closed	-
Component Cooling Water System (CCS) Containment Isolation Motor-operated Valve (MOV) - Inlet Line Outside Reactor Containment (ORC)	CCS-PL-V200	Yes	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	As Is
CCS Containment Isolation Check Valve - Inlet Line Inside Reactor Containment (IRC)	CCS-PL-V201	Yes	Yes	No	-/-	No	-/-	Transfer Closed	-

Note: Dash (-) indicates not applicable.

Table 2.2.1-1 (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/DAS	Active Function	Loss of Motive Power Position
CCS Containment Isolation MOV - Outlet Line IRC	CCS-PL-V207	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/No	Transfer Closed	As Is
CCS Containment Isolation MOV - Outlet Line ORC	CCS-PL-V208	Yes	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	As Is
Demineralized Water Supply Containment Isolation Valve ORC	DWS-PL-V244	Yes	Yes	No	-/-	No	-/-	None	-
Demineralized Water Supply Containment Isolation Check Valve IRC	DWS-PL-V245	Yes	Yes	No	-/-	No	-/-	None	-
Fuel Transfer Tube	FHS-FT-001	Yes	Yes	-	-/-	-	-/-	-	-
Fire Water Containment Supply Isolation Valve - Outside	FPS-PL-V050	Yes	Yes	No	-/-	No	-/-	None	-
Fire Water Containment Isolation Supply Check Valve - Inside	FPS-PL-V052	Yes	Yes	No	-/-	No	-/-	None	-
Spent Fuel Pool Cooling System (SFS) Discharge Line Containment Isolation Check Valve - IRC	SFS-PL-V037	Yes	Yes	No	-/-	No	-/-	Transfer Closed	-
SFS Discharge Line Containment Isolation MOV - ORC	SFS-PL-V038	Yes	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	As Is

Note: Dash (-) indicates not applicable.

Table 2.2.1-1 (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/DAS	Active Function	Loss of Motive Power Position
SFS Suction Line Containment Isolation MOV - IRC	SFS-PL-V034	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/No	Transfer Closed	As Is
SFS Suction Line Containment Isolation MOV - ORC	SFS-PL-V035	Yes	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	As I
Containment Purge Inlet Containment Isolation Valve - ORC	VFS-PL-V003	Yes	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/Yes	Transfer Closed	Closed
Containment Purge Inlet Containment Isolation Valve - IRC	VFS-PL-V004	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Closed	Closed
Integrated Leak Rate Testing Vent Discharge Containment Isolation Valve - ORC	VFS-PL-V008	Yes	Yes	No	-/-	No	-/-	None	-
Containment Purge Discharge Containment Isolation Valve - IRC	VFS-PL-V009	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Closed	Closed
Containment Purge Discharge Containment Isolation Valve - ORC	VFS-PL-V010	Yes	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/Yes	Transfer Closed	Closed
Fan Coolers Return Containment Isolation Valve - IRC	VWS-PL-V082	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/No	Transfer Closed	Closed
Fan Coolers Return Containment Isolation Valve - ORC	VWS-PL-V086	Yes	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	Closed

Note: Dash (-) indicates not applicable.

Table 2.2.1-1 (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/DAS	Active Function	Loss of Motive Power Position
Fan Coolers Supply Containment Isolation Valve - ORC	VWS-PL-V058	Yes	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	Closed
Fan Coolers Supply Containment Isolation Check Valve - IRC	VWS-PL-V062	Yes	Yes	No	-/-	No	-/-	Transfer Closed	-
Reactor Coolant Drain Tank (RCDT) Gas Outlet Containment Isolation Valve - IRC	WLS-PL-V067	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/No	Transfer Closed	Closed
RCDT Gas Outlet Containment Isolation Valve - ORC	WLS-PL-V068	Yes	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Closed	Closed
Sump Discharge Containment Isolation Valve - IRC	WLS-PL-V055	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes/Yes	Transfer Closed	Closed
Sump Discharge Containment Isolation Valve - ORC	WLS-PL-V057	Yes	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/Yes	Transfer Closed	Closed
Spare Penetration	CNS-PL-P40	Yes	Yes	-	-/-	-	-/-	-	-
Spare Penetration	CNS-PL-P41	Yes	Yes	-	-/-	-	-/-	-	-
Spare Penetration	CNS-PL-P42	Yes	Yes	-	-/-	-	-/-	-	-
Main Equipment Hatch	CNS-MY-Y01	Yes	Yes	-	-/-	-	-/-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.1-1 (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/ DAS	Active Function	Loss of Motive Power Position
Maintenance Hatch	CNS-MY-Y02	Yes	Yes	-	-/-	-	-/-	-	-
Personnel Hatch	CNS-MY-Y03	Yes	Yes	-	-/-	-	-/-	-	-
Personnel Hatch	CNS-MY-Y04	Yes	Yes	-	-/-	-	-/-	-	-
Containment Vessel	CNS-MV50	Yes	Yes	-	-/-	-	-/-	-	-
Electrical Penetration E01	VUS-JY-E01	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E02	VUS-JY-E02	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E06	VUS-JY-E06	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E09	VUS-JY-E09	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E10	VUS-JY-E10	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E11	VUS-JY-E11	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E12	VUS-JY-E12	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E13	VUS-JY-E13	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E14	VUS-JY-E14	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E15	VUS-JY-E15	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E16	VUS-JY-E16	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E18	VUS-JY-E18	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E21	VUS-JY-E21	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E22	VUS-JY-E22	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E23	VUS-JY-E23	Yes	Yes	-	Yes/Yes	-	-/-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.1-1 (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/ DAS	Active Function	Loss of Motive Power Position
Electrical Penetration E24	VUS-JY-E24	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E25	VUS-JY-E25	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E26	VUS-JY-E26	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E27	VUS-JY-E27	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E28	VUS-JY-E28	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E29	VUS-JY-E29	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E30	VUS-JY-E30	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E31	VUS-JY-E31	Yes	Yes	-	Yes/Yes	-	-/-	-	-
Electrical Penetration E32	VUS-JY-E32	Yes	Yes	-	Yes/Yes	-	-/-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.1-2		
Line Name	**Line Number**	**ASME Code Section III**
Instrument Air In	CAS-PL-L016	Yes
Service Air In	CAS-PL-L204	Yes
Component Cooling Water Supply to Containment	CCS-PL-L201	Yes
Component Cooling Water Outlet from Containment	CCS-PL-L207	Yes
Demineralized Water In	DWS-PL-L245	Yes
Fire Protection Supply to Containment	FPS-PL-L107	Yes
Spent Fuel Pool Cooling Discharge	SFS-PL-L017	Yes
Spent Fuel Pool Cooling Suction from Containment	SFS-PL-L038	Yes
Containment Purge Inlet to Containment	VFS-PL-L104, L105, L106	Yes
Containment Purge Discharge from Containment	VFS-PL-L203, L204, L205	Yes
Fan Cooler Supply Line to Containment	VWS-PL-L032	Yes
Fan Cooler Return Line from Containment	VWS-PL-L055	Yes
RCDT Gas Out	WLS-PL-L022	Yes
Waste Sump Out	WLS-PL-L073	Yes

Table 2.2.1-3 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The functional arrangement of the CNS and associated systems is as described in the Design Description of this Section 2.2.1.	Inspection of the as-built system will be performed.	The as-built CNS conforms with the functional arrangement as described in the Design Description of this Section 2.2.1.
2.a) The components identified in Table 2.2.1-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built components as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built components identified in Table 2.2.1-1 as ASME Code Section III.
2.b) The piping identified in Table 2.2.1-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built piping as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built piping identified in Table 2.2.1-2 as ASME Code Section III.
3.a) Pressure boundary welds in components identified in Table 2.2.1-1 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.
3.b) Pressure boundary welds in piping identified in Table 2.2.1-2 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.

Table 2.2.1-3 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4.a) The components identified in Table 2.2.1-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure.	i) A hydrostatic or pressure test will be performed on the components required by the ASME Code Section III to be tested.	iii) A report exists and concludes that the results of the pressure test of the components identified in Table 2.2.1-1 as ASME Code Section III conform with the requirements of the ASME Code Section III.
	ii) Impact testing will be performed on the containment and pressure-retaining penetration materials in accordance with the ASME Code Section III, Subsection NE, to confirm the fracture toughness of the materials.	ii) A report exists and concludes that the containment and pressure-retaining penetration materials conform with fracture toughness requirements of the ASME Code Section III.
4.b) The piping identified in Table 2.2.1-2 as ASME Code Section III retains its pressure boundary integrity at its design pressure.	A hydrostatic or pressure test will be performed on the piping required by the ASME Code Section III to be pressure tested.	A report exists and concludes that the results of the pressure test of the piping identified in Table 2.2.1-2 as ASME Code Section III conform with the requirements of the ASME Code Section III.
5. The seismic Category I equipment identified in Table 2.2.1-1 can withstand seismic design basis loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment and valves identified in Table 2.2.1-1 are located on the Nuclear Island.	i) The seismic Category I equipment identified in Table 2.2.1-1 is located on the Nuclear Island.
	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.
	iii) Inspection will be performed for the existence of a report verifying that the as-installed equipment including anchorage is seismically bounded by the tested or analyzed conditions.	iii) The as-installed equipment including anchorage is seismically bounded by the tested or analyzed conditions.

Table 2.2.1-3 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
6.a) The Class 1E equipment identified in Table 2.2.1-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Table 2.2.1-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
6.b) The Class 1E components identified in Table 2.2.1-1 are powered from their respective Class 1E division.	Testing will be performed by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.2.1-1 when the assigned Class 1E division is provided the test signal.
6.c) Separation is provided between CNS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Tier 1 Material, Section 3.3, Nuclear Island Buildings.	See Tier 1 Material, Section 3.3, Nuclear Island Buildings.
7. The CNS provides the safety-related function of containment isolation for containment boundary integrity and provides a barrier against the release of fission products to the atmosphere.	i) A containment integrated leak rate test will be performed. ii) Testing will be performed to demonstrate that remotely operated containment isolation valves close within the required response times.	i) The leakage rate from containment for the integrated leak rate test is less than L_a. ii) The containment purge isolation valves close within 20 seconds, SGS valves SGS-PL-V040A/B and SGS-PL-V057A/B are covered in Tier 1 Material, subsection 2.2.4, Table 2.2.4-4 (item 11.b.ii) and all other containment isolation valves close within 60 seconds upon receipt of an actuation signal.

Table 2.2.1-3 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
8. Containment electrical penetration assemblies are protected against currents that are greater than the continuous ratings.	An analysis for the as-built containment electrical penetration assemblies will be performed to demonstrate (1) that the maximum current of the circuits does not exceed the continuous rating of the containment electrical penetration assembly, or (2) that the circuits have redundant protection devices in series and that the redundant current protection devices are coordinated with the containment electrical penetration assembly's rated short circuit thermal capacity data and prevent current from exceeding the continuous current rating of the containment electrical penetration assembly.	Analysis exists for the as-built containment electrical penetration assemblies and concludes that the penetrations are protected against currents which are greater than their continuous ratings.
9. Safety-related displays identified in Table 2.2.1-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.2.1-1 can be retrieved in the MCR.
10.a) Controls exist in the MCR to cause those remotely operated valves identified in Table 2.2.1-1 to perform active functions.	Stroke testing will be performed on remotely operated valves identified in Table 2.2.1-1 using the controls in the MCR.	Controls in the MCR operate to cause remotely operated valves identified in Table 2.2.1-1 to perform active safety functions.
10.b) The valves identified in Table 2.2.1-1 as having PMS control perform an active safety function after receiving a signal from the PMS.	Testing will be performed on remotely operated valves listed in Table 2.2.1-1 using real or simulated signals into the PMS.	The remotely operated valves identified in Table 2.2.1-1 as having PMS control perform the active function identified in the table after receiving a signal from PMS.
10.c) The valves identified in Table 2.2.1-1 as having DAS control perform an active safety function after receiving a signal from DAS.	Testing will be performed on remotely operated valves listed in Table 2.2.1-1 using real or simulated signals into the DAS.	The remotely operated valves identified in Table 2.2.1-1 as having DAS control perform the active function identified in the table after receiving a signal from DAS.

Table 2.2.1-3 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
11.a) The motor-operated and check valves identified in Table 2.2.1-1 perform an active safety-related function to change position as indicated in the table.	i) Tests or type tests of motor-operated valves will be performed to demonstrate the capability of each valve to operate under design conditions.	i) A test report exists and concludes that each motor-operated valve changes position as indicated in Table 2.2.1-1 under design conditions.
	ii) Inspection will be performed for the existence of a report verifying that the as-installed motor-operated valves are bounded by the tests or type tests.	ii) A report exists and concludes that the as-installed motor-operated valves are bounded by the tests or type tests.
	iii) Tests of the as-installed motor-operated valves will be performed under preoperational flow, differential pressure, and temperature conditions.	iii) Each motor-operated valve changes position as indicated in Table 2.2.1-1 under pre-operational test conditions.
	iv) Exercise testing of the check valves with active safety functions identified in Table 2.2.1-1 will be performed under preoperational test pressure, temperature and fluid flow conditions.	iv) Each check valve changes position as inidcated in Table 2.2.1-1.
11.b) After loss of motive power, the remotely operated valves identified in Table 2.2.1-1 assume the indicated loss of motive power position.	Testing of the installed valves will be performed under the conditions of loss of motive power.	After loss of motive power, each remotely operated valve identified in Table 2.2.1-1 assumes the indicated loss of motive power position.

Table 2.2.1-4		
Component Name	**Tag. No.**	**Component Location**
Containment Vessel	CNS-MV-01	Shield Building

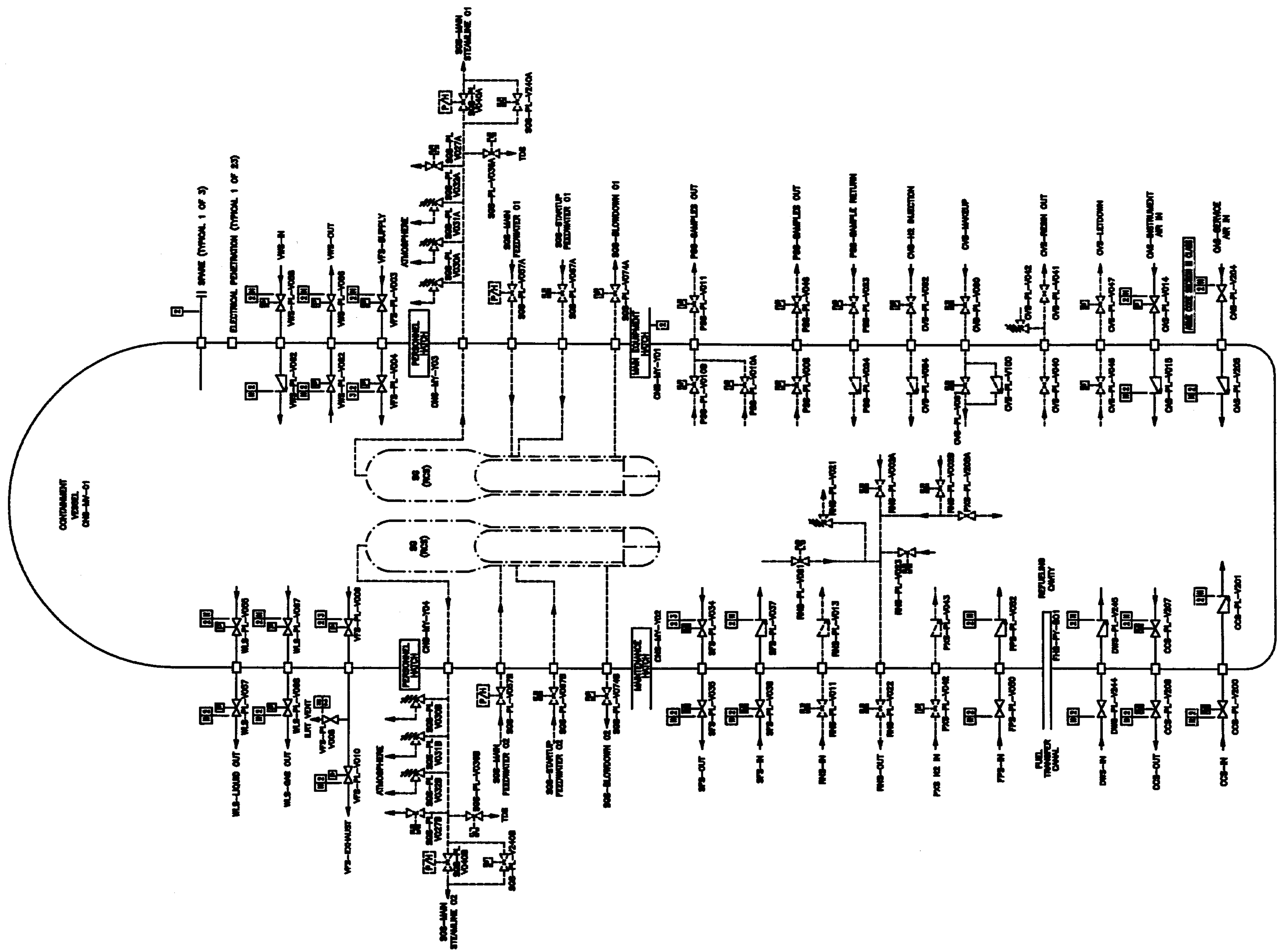

Figure 2.2.1-1
Containment System

2.2.2 Passive Containment Cooling System

Design Description

The passive containment cooling system (PCS) provides heat removal from the containment during design basis events.

The PCS is as shown in Figure 2.2.2-1 and the component locations of the PCS are as shown in Table 2.2.2-4.

1. The functional arrangement of the PCS is as described in the Design Description of this Section 2.2.2.

2. a) The components identified in Table 2.2.2-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.

   b) The piping identified in Table 2.2.2-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements.

3. a) Pressure boundary welds in components identified in Table 2.2.2-1 as ASME Code Section III meet ASME Code Section III requirements.

   b) Pressure boundary welds in piping identified in Table 2.2.2-2 as ASME Code Section III meet ASME Code Section III requirements.

4. a) The components identified in Table 2.2.2-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure.

   b) The piping identified in Table 2.2.2-2 as ASME Code Section III retains its pressure boundary integrity at its design pressure.

5. a) The seismic Category I equipment identified in Table 2.2.2-1 can withstand seismic design basis loads without loss of safety function.

   b) Each of the lines identified in Table 2.2.2-2 for which functional capability is required is designed to withstand combined normal and seismic design basis loads without a loss of its functional capability.

   c) The passive containment cooling ancillary water storage tank (PCCAWST) can withstand a seismic event.

6. a) The Class 1E equipment identified in Table 2.2.2-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

b) The Class 1E components identified in Table 2.2.2-1 are powered from their respective Class 1E division.

c) Separation is provided between PCS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

7. The PCS provides the following safety-related functions:

a) The PCS provides the delivery of water to the outside of the containment vessel.

b) The PCS provides wetting of the outside surface of the containment vessel and the inside and outside of the containment vessel above the operating deck is coated with an inorganic zinc material.

c) The PCS provides air flow over the outside of the containment vessel by a natural circulation air flow path from the air inlets to the discharge structure.

d) The PCS provides drainage of the excess water from the outside of the containment vessel through the two upper annulus drains.

e) The PCS provides a flow path for long-term makeup to the passive containment cooling water storage tank (PCCWST).

f) The PCS provides for long-term makeup from the PCCWST to the spent fuel pool.

8. The PCS provides the following nonsafety-related functions:

a) The PCS provides a PCCAWST initial inventory of cooling water for PCS delivery from hour 72 through day 7.

b) The PCS provides the delivery of water from the PCCAWST to the PCCWST.

c) The PCS provides water inventory for the fire protection system.

9. Safety-related displays identified in Table 2.2.2-1 can be retrieved in the main control room (MCR).

10. a) Controls exist in the MCR to cause the remotely operated valves identified in Table 2.2.2-1 to perform active functions.

b) The valves identified in Table 2.2.2-1 as having protection and safety monitoring system (PMS) control perform an active safety function after receiving a signal from the PMS.

c) The valves identified in Table 2.2.2-1 as having diverse actuation system (DAS) control perform an active safety function after receiving a signal from the DAS.

11. a) The motor-operated and check valves identified in Table 2.2.2-1 perform an active safety-related function to change position as indicated in the table.

    b) After loss of motive power, the remotely operated valves identified in Table 2.2.2-1 assume the indicated loss of motive power position.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.2.2-3 specifies the inspections, tests, analyses, and associated acceptance criteria for the PCS.

Table 2.2.2-1

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/DAS	Active Function	Loss of Motive Power Position
PCCWST	PCS-MT-01	No	Yes	-	-	-	-	-	-
Water Distribution Bucket	PCS-MT-03	No	Yes	-	-	-	-	-	-
Water Collection Troughs	PCS-MT-04	No	Yes	-	-	-	-	-	-
PCCWST Isolation Valve	PCS-PL-V001A	Yes	Yes	Yes	Yes/No	No	Yes/Yes	Transfer Open	Open
PCCWST Isolation Valve	PCS-PL-V001B	Yes	Yes	Yes	Yes/No	No	Yes/Yes	Transfer Open	Open
PCCWST Isolation Block MOV	PCS-PL-V002A	Yes	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Open	As Is
PCCWST Isolation Block MOV	PCS-PL-V002B	Yes	Yes	Yes	Yes/No	Yes (Valve Position)	Yes/No	Transfer Open	As Is
PCS Recirculation Loop Isolation Valve	PCS-PL-V023	Yes	Yes	-	No	No	-	Transfer Close	-
PCCWST Supply to Fire Protection System Isolation Valve	PCS-PL-V005	Yes	Yes	-	No	No	-	Transfer Close	-
PCS Makeup to SFS	PCS-PL-V009	Yes	Yes	-	No	No	-	Transfer Open/ Transfer Close	-
Water Makeup Isolation Stop Check Valve	PCS-PL-V014A	Yes	Yes	-	No	No	-	Transfer Open	-
PCS Water Delivery Flow Sensor	PCS-001	No	Yes	-	Yes/No	Yes	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.2-1 (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/DAS	Active Function	Loss of Motive Power Position
PCS Water Delivery Flow Sensor	PCS-002	No	Yes	-	Yes/No	Yes	-	-	-
PCS Water Delivery Flow Sensor	PCS-003	No	Yes	-	Yes/No	Yes	-	-	-
PCS Water Delivery Flow Sensor	PCS-004	No	Yes	-	Yes/No	Yes	-	-	-
Containment Pressure Sensor	PCS-005	No	Yes	-	Yes/Yes	Yes	-	-	-
Containment Pressure Sensor	PCS-006	No	Yes	-	Yes/Yes	Yes	-	-	-
Containment Pressure Sensor	PCS-007	No	Yes	-	Yes/Yes	Yes	-	-	-
Containment Pressure Sensor	PCS-008	No	Yes	-	Yes/Yes	Yes	-	-	-
PCCWST Water Level Sensor	PCS-010	No	Yes	-	Yes/No	Yes	-	-	-
PCCWST Water Level Sensor	PCS-011	No	Yes	-	Yes/No	Yes	-	-	-
High-range Containment Pressure Sensor	PCS-012	No	Yes	-	Yes/Yes	Yes	-	-	-
High-range Containment Pressure Sensor	PCS-013	No	Yes	-	Yes/Yes	Yes	-	-	-
High-range Containment Pressure Sensor	PCS-014	No	Yes	-	Yes/Yes	Yes	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.2-2			
Line Name	**Line Number**	**ASME Code Section III**	**Functional Capability Required**
PCCWST Discharge Lines	PCS-PL-L001A/B/C/D	Yes	Yes
PCCWST Discharge Crossconnect Line	PCS-PL-L002	Yes	Yes
PCCWST Discharge Header Lines	PCS-PL-L003A, L003B	Yes	Yes
Post-72-hour PCCWST Makeup Supply Line Connection	PCS-PL-L004 PCS-PL-L051	Yes	Yes
Post-72-hour PCCWST Makeup Supply Line	PCS-PL-L029 PCS-PL-L054	Yes	Yes
Post-72-hour SFS Makeup	PCS-PL-L017 PCS-PL-L049	Yes	Yes

Table 2.2.2-3 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The functional arrangement of the PCS is as described in the Design Description of this Section 2.2.2.	Inspection of the as-built system will be performed.	The as-built PCS conforms with the functional arrangement as described in the Design Description of this Section 2.2.2.
2.a) The components identified in Table 2.2.2-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built components as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built components identified in Table 2.2.2-1 as ASME Code Section III.
2.b) The piping identified in Table 2.2.2-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built piping as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built piping identified in Table 2.2.2-2 as ASME Code Section III.
3.a) Pressure boundary welds in components identified in Table 2.2.2-1 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.
3.b) Pressure boundary welds in piping identified in Table 2.2.2-2 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.
4.a) The components identified in Table 2.2.2-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure.	A hydrostatic test will be performed on the components required by the ASME Code Section III to be hydrostatically tested.	A report exists and concludes that the results of the hydrostatic test of the components identified in Table 2.2.2-1 as ASME Code Section III conform with the requirements of the ASME Code Section III.

Table 2.2.2-3 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
4.b) The piping identified in Table 2.2.2-2 as ASME Code Section III retains its pressure boundary integrity at its design pressure.	A hydrostatic test will be performed on the piping required by the ASME Code Section III to be hydrostatically tested.	A report exists and concludes that the results of the hydrostatic test of the piping identified in Table 2.2.2-2 as ASME Code Section III conform with the requirements of the ASME Code Section III.
5.a) The seismic Category I equipment identified in Table 2.2.2-1 can withstand seismic design basis loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment and valves identified in Table 2.2.2-1 are located on the Nuclear Island.	i) The seismic Category I equipment identified in Table 2.2.2-1 is located on the Nuclear Island.
	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function.
	iii) Inspection will be performed for the existence of a report verifying that the as-installed equipment including anchorage is seismically bounded by the tested or analyzed conditions.	iii) The report exists and concludes that the as-installed equipment including anchorage is seismically bounded by the tested or analyzed conditions.
5.b) Each of the lines identified in Table 2.2.2-2 for which functional capability is required is designed to withstand combined normal and seismic design basis loads without a loss of its functional capability.	Inspection will be performed for the existence of a report concluding that the as-built piping meets the requirements for functional capability.	A report exists and concludes that each of the as-built lines identified in Table 2.2.2-2 for which functional capability is required meets the requirements for functional capability.
5.c) The PCCAWST can withstand a seismic event.	Inspection will be performed for the existence of a report verifying that the as-installed PCCAWST and its anchorage are designed using seismic Category II methods and criteria.	A report exists and concludes that the as-installed PCCAWST and its anchorage are designed using seismic Category II methods and criteria.

Table 2.2.2-3 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
6.a) The Class 1E equipment identified in Table 2.2.2-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Tables 2.2.2-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
6.b) The Class 1E components identified in Table 2.2.2-1 are powered from their respective Class 1E division.	Testing will be performed by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.2.2-1 when the assigned Class 1E division is provided the test signal.
6.c) Separation is provided between PCS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Tier 1 Material, Section 3.3, Nuclear Island Buildings.	See Tier 1 Material, Section 3.3, Nuclear Island Buildings.

Table 2.2.2-3 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
7.a) The PCS provides the delivery of water to the outside of the containment vessel.	i) Testing will be performed to measure the PCCWST delivery rate from each of the two parallel flow paths.	i) When tested separately, each of the two flow paths delivers greater than or equal to: – 442 gpm at a PCCWST water level of 23.70 ft ± 0.25 ft above the lowest standpipe – 123.5 gpm at a PCCWST water level of 20.65 ft ± 0.25 ft above the lowest standpipe – 72.5 gpm at a PCCWST water level of 13.05 ft ± 0.25 ft above the lowest standpipe.
	ii) Testing and or analysis will be performed to demonstrate the PCWST inventory provides 72 hours of cooling.	ii) When tested and/or analyzed with both flow paths delivering and an initial water level at 24.25 + 0.25, - 0.00 ft, the water inventory provides greater than or equal to 72 hours of flow with a flow rate greater than or equal to 62.7 gpm.
	iii) Inspection will be performed to determine the PCCWST standpipes elevations.	iii) The elevations of the standpipes above the bottom standpipe are: – 6.1 ft ± 0.25 ft – 14.0 ft ± 0.25 ft – 21.6 ft ± 0.25 ft

Table 2.2.2-3 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
7.b) The PCS provides wetting of the outside surface of the containment vessel and the inside and the outside of the containment vessel above the operating deck is coated with an inorganic zinc material.	i) Testing will be performed to measure the wetted surface of the containment vessel from either of the two parallel flow paths to the containment vessel.	i) A report exists and concludes that with water in the PCCWST at the following levels, water delivery to the containment shell provides coverage measured at the spring line that is equal to or greater than the corresponding coverage used to calculate peak containment pressure in the safety analysis. - 23.70 ± 0.25 ft above the lowest standpipe - 20.65 ± 0.25 ft above the lowest standpipe - 13.05 ± 0.25 ft above the lowest standpipe
	ii) Inspection of the containment vessel exterior coating will be conducted.	ii) A report exists and concludes that the containment vessel exterior surface is coated with an inorganic zinc coating above elevation 135'-3".
	iii) Inspection of the containment vessel interior coating will be conducted.	iii) A report exists and concludes that the containment vessel interior surface is coated with an inorganic zinc coating above 7' above the operating deck.
7.c) The PCS provides air flow over the outside of the containment vessel by a natural circulation air flow path from the air inlets to the discharge structure.	Inspections of the air flow path segments will be performed.	Flow paths exist at each of the following locations: – Air inlets – Base of the outer annulus – Base of the inner annulus – Discharge structure
7.d) The PCS provides drainage of the excess water from the outside of the containment vessel through the two upper annulus drains.	Testing will be performed to verify the upper annulus drain flow performance.	With a water level within the upper annulus 10" ± 1" above the annulus drain inlet, the flow rate through each drain is greater than or equal to 450 gpm.

Table 2.2.2-3 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
7.e) The PCS provides a flow path for long-term makeup to the PCCWST.	i) See item 1 in this table. ii) Testing will be performed to measure the delivery rate from the long-term makeup connection to the PCCWST.	i) See item 1 in this table. ii) With a water supply connected to the PCS long-term makeup connection, each PCS recirculation pump delivers greater than or equal to 62.7 gpm when tested separately.
7.f) The PCS provides for long-term makeup from the PCCWST to the spent fuel pool.	i) Testing will be performed to measure the delivery rate from the PCCWST to the spent fuel pool. ii) Inspection of the PCCWST will be performed.	i) With the PCCWST water level at 23.75 ft ± 0.5 ft above the bottom of the tank, the flow path from the PCCWST to the spent fuel pool delivers greater than or equal to 50 gpm. ii) The volume of the PCCWST is greater than 400,000 gallons.
8.a) The PCS provides a PCCAWST initial inventory of cooling water for PCS delivery from hour 72 through day 7.	Inspection of the PCCAWST will be performed.	The volume of the PCCAWST is greater than 363,000 gallons.
8.b) The PCS provides the delivery of water from the PCCAWST to the PCCWST.	Testing will be performed to measure the delivery rate from the PCCAWST to the PCCWST.	With PCCASWST aligned to the suction of the recirculation pumps, each pump delivers greater than or equal to 62.7 gpm when tested separately.
8.c) The PCS provides water inventory for the fire protection system.	See Tier 1 Material, subsection 2.3.4, Fire Protection System.	See Tier 1 Material, subsection 2.3.4, Fire Protection System.
9. Safety-related displays identified in Table 2.2.2-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.2.2-1 can be retrieved in the MCR.
10.a) Controls exist in the MCR to cause the remotely operated valves identified in Table 2.2.2-1 to perform active functions.	Stroke testing will be performed on the remotely operated valves identified in Table 2.2.2-1 using the controls in the MCR.	Controls in the MCR operate to cause remotely operated valves identified in Table 2.2.2-1 to perform active functions.

Table 2.2.2-3 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
10.b) The valves identified in Table 2.2.2-1 as having PMS control perform an active safety function after receiving a signal from the PMS.	Testing will be performed on the remotely operated valves in Table 2.2.2-1 using real or simulated signals into the PMS.	The remotely operated valves identified in Table 2.2.2-1 as having PMS control perform the active function identified in the table after receiving a signal from the PMS.
10.c) The valves identified in Table 2.2.2-1 as having DAS control perform an active safety function after receiving a signal from the DAS.	Testing will be performed on the remotely operated valves listed in Table 2.2.2-1 using real or simulated signals into the DAS.	The remotely operated valves identified in Table 2.2.2-1 as having DAS control perform the active function identified in the table after receiving a signal from the DAS.
11.a) The motor-operated and check valves identified in Table 2.2.2-1 perform an active safety-related function to change position as indicated in the table.	i) Tests or type tests of motor-operated valves will be performed to demonstrate the capability of the valve to operate under its design conditions	i) A test report exists and concludes that each motor-operated valve changes position as indicated in Table 2.2.2-1 under design conditions.
	ii) Inspection will be performed for the existence of a report verifying that the as-installed motor-operated valves are bounded by the tested conditions.	ii) A report exists and concludes that the as-installed motor-operated valves are bounded by the tested conditions.
	iii) Tests of the as-installed motor-operated valves will be performed under preoperational flow, differential pressure, and temperature conditions.	iii) Each motor-operated valve changes position as indicated in Table 2.2.2-1 under preoperational test conditions.
	iv) Exercise testing of the check valves with active safety functions identified in Table 2.2.2-1 will be performed under preoperational test pressure, temperature and fluid flow conditions.	iv) Each check valve changes position as indicated in Table 2,2.2-1.
11.b) After loss of motive power, the remotely operated valves identified in Table 2.2.2-1 assume the indicated loss of motive power position.	Testing of the installed valves will be performed under the conditions of loss of motive power.	After loss of motive power, each remotely operated valve identified in Table 2.2.2-1 assumes the indicated loss of motive power position.

Table 2.2.2-4		
Component Name	**Tag No.**	**Component Location**
PCCWST	PCS-MT-01	Shield Building
PCCAWST	PCS-MT-05	Yard
Recirculation Pump A	PCS-MP-01A	Auxiliary Building
Recirculation Pump B	PCS-MP-01B	Auxiliary Building

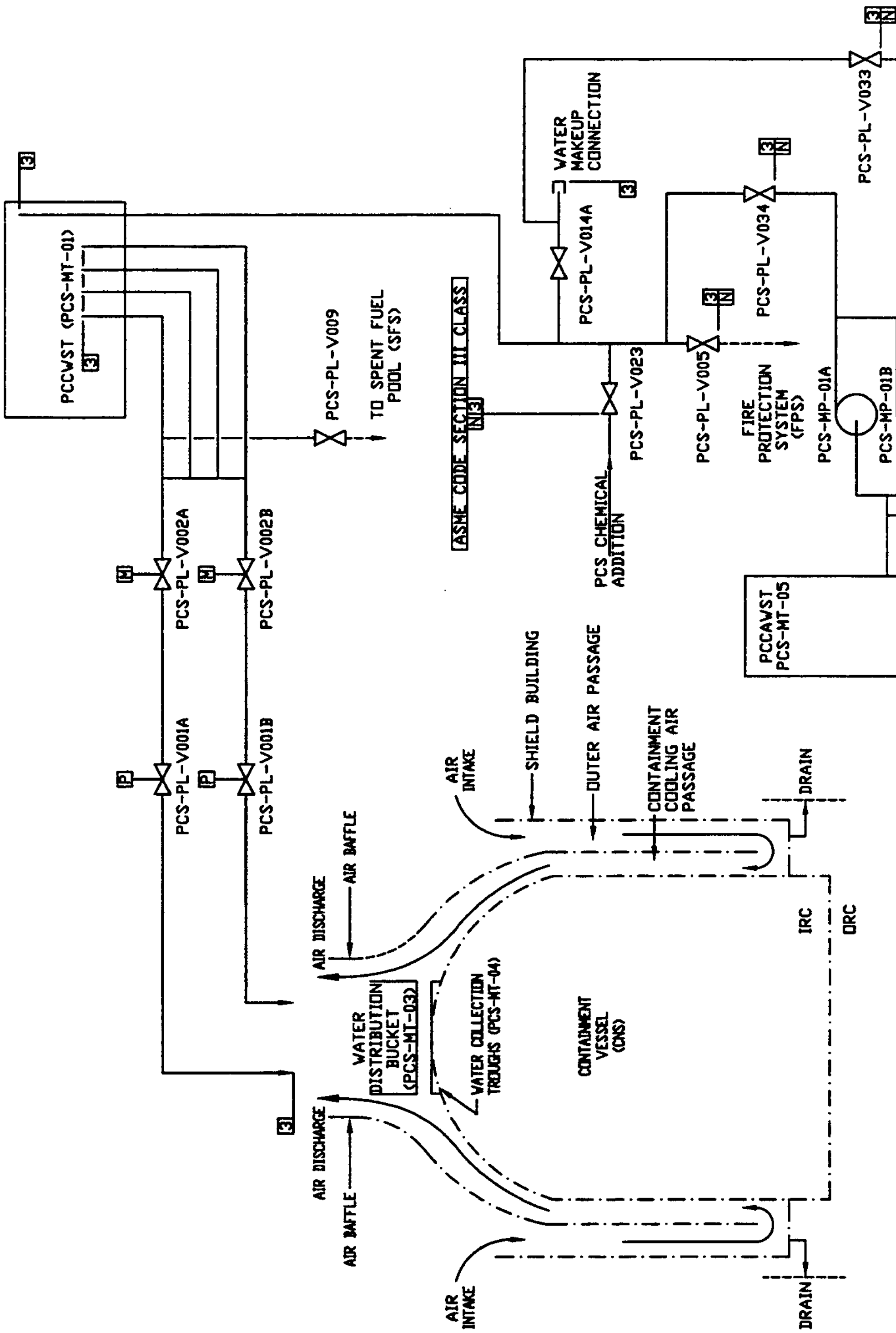

Figure 2.2.2-1
Passive Containment Cooling System

2.2.3 Passive Core Cooling System

Design Description

The passive core cooling system (PXS) provides emergency core cooling during design basis events.

The PXS is as shown in Figure 2.2.3-1 and the component locations of the PXS are as shown in Table 2.2.3-5.

1. The functional arrangement of the PXS is as described in the Design Description of this Section 2.2.3.

2. a) The components identified in Table 2.2.3-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.

   b) The piping identified in Table 2.2.3-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements.

3. a) Pressure boundary welds in components identified in Table 2.2.3-1 as ASME Code Section III meet ASME Code Section III requirements.

   b) Pressure boundary welds in piping identified in Table 2.2.3-2 as ASME Code Section III meet ASME Code Section III requirements.

4. a) The components identified in Table 2.2.3-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure.

   b) The piping identified in Table 2.2.3-2 as ASME Code Section III retains its pressure boundary integrity at its design pressure.

5. a) The seismic Category I equipment identified in Table 2.2.3-1 can withstand seismic design basis loads without loss of safety function.

   b) Each of the lines identified in Table 2.2.3-2 for which functional capability is required is designed to withstand combined normal and seismic design basis loads without a loss of its functional capability.

6. Each of the as-built lines identified in Table 2.2.3-2 as designed for leak before break (LBB) meets the LBB criteria, or an evaluation is performed of the protection from the dynamic effects of a rupture of the line.

7. a) The Class 1E equipment identified in Table 2.2.3-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

b) The Class 1E components identified in Table 2.2.3-1 are powered from their respective Class 1E division.

c) Separation is provided between PXS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

8. The PXS provides the following safety-related functions:

a) The PXS provides containment isolation of the PXS lines penetrating the containment.

b) The PRHR HX provides core decay heat removal during design basis events.

c) The CMTs, accumulators, in-containment refueling water storage tank (IRWST) and containment recirculation provide reactor coolant system (RCS) makeup, boration, and safety injection during design basis events.

d) The PXS provides pH adjustment of water flooding the containment following design basis accidents.

9. The PXS has the following features:

a) The PXS provides a function to cool the outside of the reactor vessel during a severe accident.

b) The accumulator discharge check valves (PXS-PL-V028A/B and V029A/B) are of a different check valve type than the CMT discharge check valves (PXS-PL-V016A/B and V017A/B).

c) The equipment listed in Table 2.2.3-6 has sufficient thermal lag to withstand the effects of identified hydrogen burns associated with severe accidents.

10. Safety-related displays of the parameters identified in Table 2.2.3-1 can be retrieved in the main control room (MCR).

11. a) Controls exist in the MCR to cause the remotely operated valves identified in Table 2.2.3-1 to perform their active function(s).

b) The valves identified in Table 2.2.3-1 as having protection and safety monitoring system (PMS) control perform their active function after receiving a signal from the PMS.

c) The valves identified in Table 2.2.3-1 as having diverse actuation system (DAS) control perform their active function after receiving a signal from the DAS.

12. a) The motor-operated and check valves identified in Table 2.2.3-1 perform an active safety-related function to change position as indicated in the table.

b) After loss of motive power, the remotely operated valves identified in Table 2.2.3-1 assume the indicated loss of motive power position.

13. Displays of the parameters identified in Table 2.2.3-3 can be retrieved in the MCR.

Inspection, Tests, Analyses, and Acceptance Criteria

Table 2.2.3-4 specifies the inspections, tests, analyses, and associated acceptance criteria for the PXS.

Table 2.2.3-1

Equipment Name	Tag No.	ASME Code Section III	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. Harsh Envir.	Safety-Related Display	Control PMS/ DAS	Active Function	Loss of Motive Power Position
Passive Residual Heat Removal Heat Exchanger (PRHR HX)	PXS-ME-01	Yes	Yes	-	- / -	-	- / -	-	-
Accumulator Tank A	PXS-MT-01A	Yes	Yes	-	- / -	-	- / -	-	-
Accumulator Tank B	PXS-MT-01B	Yes	Yes	-	- / -	-	- / -	-	-
Core Makeup Tank (CMT) A	PXS-MT-02A	Yes	Yes	-	- / -	-	- / -	-	-
CMT B	PXS-MT-02B	Yes	Yes	-	- / -	-	- / -	-	-
IRWST	PXS-MT-03	No	Yes	-	- / -	-	- / -	-	-
IRWST Screen A	PXS-MY-Y01A	No	Yes	-	- / -	-	- / -	-	-
IRWST Screen B	PXS-MY-Y01B	No	Yes	-	- / -	-	- / -	-	-
Containment Recirculation Screen A	PXS-MY-Y02A	No	Yes	-	- / -	-	- / -	-	-
Containment Recirculation Screen B	PXS-MY-Y02B	No	Yes	-	- / -	-	- / -	-	-
pH Adjustment Basket A	PXS-MY-Y03A	No	Yes	-	- / -	-	- / -	-	-
pH Adjustment Basket B	PXS-MY-Y03B	No	Yes	-	- / -	-	- / -	-	-
CMT A Inlet Isolation Motor-operated Valve	PXS-PL-V002A	Yes	Yes	Yes	Yes/Yes	Yes (Position)	Yes/No	None	As Is
CMT B Inlet Isolation Motor-operated Valve	PXS-PL-V002B	Yes	Yes	Yes	Yes/Yes	Yes (Position)	Yes/No	None	As Is

Note: Dash (-) indicates not applicable.

Table 2.2.3-1 (cont.)

Equipment Name	Tag No.	ASME Code Section III	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. Harsh Envir.	Safety-Related Display	Control PMS/ DAS	Active Function	Loss of Motive Power Position
CMT A Discharge Isolation Valve	PXS-PL-V014A	Yes	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	Open
CMT B Discharge Isolation Valve	PXS-PL-V014B	Yes	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	Open
CMT A Discharge Isolation Valve	PXS-PL-V015A	Yes	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	Open
CMT B Discharge Isolation Valve	PXS-PL-V015B	Yes	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	Open
CMT A Discharge Check Valve	PXS-PL-V016A	Yes	Yes	No	- / -	No	- / -	Transfer Open/ Transfer Closed	-
CMT B Discharge Check Valve	PXS-PL-V016B	Yes	Yes	No	- / -	No	- / -	Transfer Open/ Transfer Closed	-
CMT A Discharge Check Valve	PXS-PL-V017A	Yes	Yes	No	- / -	No	- / -	Transfer Open/ Transfer Closed	-
CMT B Discharge Check Valve	PXS-PL-V017B	Yes	Yes	No	- / -	No	- / -	Transfer Open/ Transfer Closed	-

Note: Dash (-) indicates not applicable.

Table 2.2.3-1 (cont.)

Equipment Name	Tag No.	ASME Code Section III	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. Harsh Envir.	Safety-Related Display	Control PMS/ DAS	Active Function	Loss of Motive Power Position
Accumulator A Pressure Relief Valve	PXS-PL-V022A	Yes	Yes	No	- / -	No	- / -	Transfer Open/ Transfer Closed	-
Accumulator B Pressure Relief Valve	PXS-PL-V022B	Yes	Yes	No	- / -	No	- / -	Transfer Open/ Transfer Closed	-
Accumulator A Discharge Check Valve	PXS-PL-V028A	Yes	Yes	No	- / -	No	- / -	Transfer Open	-
Accumulator B Discharge Check Valve	PXS-PL-V028B	Yes	Yes	No	- / -	No	- / -	Transfer Open	-
Accumulator A Discharge Check Valve	PXS-PL-V029A	Yes	Yes	No	- / -	No	- / -	Transfer Open	-
Accumulator B Discharge Check Valve	PXS-PL-V029B	Yes	Yes	No	- / -	No	- / -	Transfer Open	-
Nitrogen Supply Containment Isolation Valve	PXS-PL-V042	Yes	Yes	Yes	Yes/Yes	Yes (position)	Yes/No	Transfer Closed	Close
Nitrogen Supply Containment Isolation Check Valve	PXS-PL-V043	Yes	Yes	No	- / -	No	- / -	Transfer Closed	-
PRHR HX Inlet Isolation Motor-operated Valve	PXS-PL-V101	Yes	Yes	Yes	Yes/Yes	Yes (position)	Yes/No	None	As Is

Note: Dash (-) indicates not applicable.

Table 2.2.3-1 (cont.)

Equipment Name	Tag No.	ASME Code Section III	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. Harsh Envir.	Safety-Related Display	Control PMS/ DAS	Active Function	Loss of Motive Power Position
PRHR HX Control Valve	PXS-PL-V108A	Yes	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	Open
PRHR HX Control Valve	PXS-PL-V108B	Yes	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	Open
Containment Recirculation A Isolation Motor-operated Valve	PXS-PL-V117A	Yes	Yes	Yes	Yes/Yes	Yes (position)	Yes/Yes	Transfer Open	As Is
Containment Recirculation B Isolation Motor-operated Valve	PXS-PL-V117B	Yes	Yes	Yes	Yes/Yes	Yes (position)	Yes/Yes	Transfer Open	As Is
Containment Recirculation A Squib Valve	PXS-PL-V118A	Yes	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
Containment Recirculation B Squib Valve	PXS-PL-V118B	Yes	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
Containment Recirculation A Check Valve	PXS-PL-V119A	Yes	Yes	No	- / -	No	- / -	Transfer Open	-
Containment Recirculation B Check Valve	PXS-PL-V119B	Yes	Yes	No	- / -	No	- / -	Transfer Open	-
Containment Recirculation A Squib Valve	PXS-PL-V120A	Yes	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
Containment Recirculation B Squib Valve	PXS-PL-V120B	Yes	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is

Note: Dash (-) indicates not applicable.

Table 2.2.3-1 (cont.)

Equipment Name	Tag No.	ASME Code Section III	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. Harsh Envir.	Safety-Related Display	Control PMS/ DAS	Active Function	Loss of Motive Power Position
IRWST Injection A Check Valve	PXS-PL-V122A	Yes	Yes	No	- / -	No	- / -	Transfer Open	-
IRWST Injection B Check Valve	PXS-PL-V122B	Yes	Yes	No	- / -	No	- / -	Transfer Open	-
IRWST Injection A Squib Valve	PXS-PL-V123A	Yes	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
IRWST Injection B Squib Valve	PXS-PL-V123B	Yes	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
IRWST Injection A Check Valve	PXS-PL-V124A	Yes	Yes	No	- / -	No	- / -	Transfer Open	-
IRWST Injection B Check Valve	PXS-PL-V124B	Yes	Yes	No	- / -	No	- / -	Transfer Open	-
IRWST Injection A Squib Valve	PXS-PL-V125A	Yes	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
IRWST Injection B Squib Valve	PXS-PL-V125B	Yes	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Open	As Is
IRWST Gutter Isolation Valve	PXS-PL-V130A	Yes	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Closed	Closed
IRWST Gutter Isolation Valve	PXS-PL-V130B	Yes	Yes	Yes	Yes/Yes	No	Yes/Yes	Transfer Closed	Closed
CMT A Level Sensor	PXS-011A	-	Yes	-	Yes/Yes	Yes	- / -	-	-
CMT A Level Sensor	PXS-011B	-	Yes	-	Yes/Yes	Yes	- / -	-	-
CMT A Level Sensor	PXS-011C	-	Yes	-	Yes/Yes	Yes	- / -	-	-
CMT A Level Sensor	PXS-011D	-	Yes	-	Yes/Yes	Yes	- / -	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.3-1 (cont.)

Equipment Name	Tag No.	ASME Code Section III	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. Harsh Envir.	Safety-Related Display	Control PMS/ DAS	Active Function	Loss of Motive Power Position
CMT B Level Sensor	PXS-012A	-	Yes	-	Yes/Yes	Yes	-/-	-	-
CMT B Level Sensor	PXS-012B	-	Yes	-	Yes/Yes	Yes	-/-	-	-
CMT B Level Sensor	PXS-012C	-	Yes	-	Yes/Yes	Yes	-/-	-	-
CMT B Level Sensor	PXS-012D	-	Yes	-	Yes/Yes	Yes	-/-	-	-
CMT A Level Sensor	PXS-013A	-	Yes	-	Yes/Yes	Yes	-/-	-	-
CMT A Level Sensor	PXS-013B	-	Yes	-	Yes/Yes	Yes	-/-	-	-
CMT A Level Sensor	PXS-013C	-	Yes	-	Yes/Yes	Yes	-/-	-	-
CMT A Level Sensor	PXS-013D	-	Yes	-	Yes/Yes	Yes	-/-	-	-
CMT B Level Sensor	PXS-014A	-	Yes	-	Yes/Yes	Yes	- / -	-	-
CMT B Level Sensor	PXS-014B	-	Yes	-	Yes/Yes	Yes	- / -	-	-
CMT B Level Sensor	PXS-014C	-	Yes	-	Yes/Yes	Yes	- / -	-	-
CMT B Level Sensor	PXS-014D	-	Yes	-	Yes/Yes	Yes	- / -	-	-
IRWST Level Sensor	PXS-045	-	Yes	-	Yes/Yes	Yes	- / -	-	-
IRWST Level Sensor	PXS-046	-	Yes	-	Yes/Yes	Yes	- / -	-	-
IRWST Level Sensor	PXS-047	-	Yes	-	Yes/Yes	Yes	- / -	-	-
IRWST Level Sensor	PXS-048	-	Yes	-	Yes/Yes	Yes	- / -	-	-
PRHR HX Flow Sensor	PXS-049A	-	Yes	-	Yes/Yes	Yes	- / -	-	-
PRHR HX Flow Sensor	PXS-049B	-	Yes	-	Yes/Yes	Yes	- / -	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.3-1 (cont.)

Equipment Name	Tag No.	ASME Code Section III	Seismic Cat. I	Remotely Operated Valve	Class 1E/ Qual. Harsh Envir.	Safety-Related Display	Control PMS/ DAS	Active Function	Loss of Motive Power Position
Containment Flood-up Level Sensor	PXS-050	-	Yes	_	Yes/Yes	Yes	-/-	-	-
Containment Flood-up Level Sensor	PXS-051	-	Yes	_	Yes/Yes	Yes	-/-	-	-
Containment Flood-up Level Sensor	PXS-052	-	Yes	_	Yes/Yes	Yes	-/-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.3-2

Line Name	Line Number	ASME Code Section III	Leak Before Break	Functional Capability Required
PRHR HX inlet line from hot leg and outlet line to steam generator channel head	RCS-L134, PXS-L102, PXS-L103, PXS-L104A, PXS-L104B, PXS-L105, RCS-L114, RCS-L113	Yes	Yes	Yes
	PXS-L107	Yes	Yes	No
CMT A inlet line from cold leg C and outlet line to reactor vessel direct vessel injection (DVI) nozzle A	RCS-L118A, PXS-L007A, PXS-L015A, PXS-L016A, PXS-L017A, PXS-L018A, PXS-L020A, PXS-L021A	Yes	Yes	Yes
	PXS-L019A, PXS-L070A	Yes	Yes	No
CMT B inlet line from cold leg D and outlet line to reactor vessel DVI nozzle B	RCS-L118B, PXS-L007B, PXS-L015B, PXS-L016B, PXS-L017B, PXS-L018B, PXS-L020B, PXS-L021B	Yes	Yes	Yes
	PXS-L019B, PXS-L070B	Yes	Yes	No
Accumulator A discharge line to DVI line A	PXS-L025A	Yes	Yes	Yes
	PXS-L027A, PXS-L029A	Yes	No	Yes
Accumulator B discharge line to DVI line B	PXS-L025B	Yes	Yes	Yes
	PXS-L027B, PXS-L029B	Yes	No	Yes
IRWST injection line A to DVI line A	PXS-L125A, PXS-L127A	Yes	Yes	Yes
	PXS-L123A, PXS-L124A, PXS-L118A, PXS-L117A, PXS-L116A, PXS-L112A	Yes	No	Yes
IRWST injection line B to DVI line B	PXS-L125B, PXS-L127B	Yes	Yes	Yes
	PXS-L123B, PXS-L124B, PXS-L118B, PXS-L117B, PXS-L116B, PXS-L114B, PXS-L112B	Yes	No	Yes

Table 2.2.3-2

Line Name	Line Number	ASME Code Section III	Leak Before Break	Functional Capability Required
Containment recirculation line A	PXS-L113A, PXS-L131A, PXS-L132A	Yes	No	Yes
Containment recirculation line B	PXS-L113B, PXS-L131B, PXS-L132B	Yes	No	Yes
IRWST Gutter Drain Line	PXS-L142A, PXS-L142B	Yes	No	Yes
	PXS-L141A, PXS-L141B	Yes	No	No

Table 2.2.3-3			
Equipment	**Tag No.**	**Display**	**Control Function**
CMT A Discharge Isolation Valve (Position)	PXS-PL-V014A	Yes (Position)	-
CMT B Discharge Isolation Valve (Position)	PXS-PL-V014B	Yes (Position)	-
CMT A Discharge Isolation Valve (Position)	PXS-PL-V015A	Yes (Position)	-
CMT B Discharge Isolation Valve (Position)	PXS-PL-V015B	Yes (Position)	-
Accumulator A Nitrogen Vent Valve (Position)	PXS-PL-V021A	Yes (Position)	-
Accumulator B Nitrogen Vent Valve (Position)	PXS-PL-V021B	Yes (Position)	-
Accumulator A Discharge Isolation Valve (Position)	PXS-PL-V027A	Yes (Position)	-
Accumulator B Discharge Isolation Valve (Position)	PXS-PL-V027B	Yes (Position)	-
PRHR HX Control Valve (Position)	PXS-PL-V108A	Yes (Position)	-
PRHR HX Control Valve (Position)	PXS-PL-V108B	Yes (Position)	-
Containment Recirculation A Isolation Valve (Position)	PXS-PL-V118A	Yes (Position)	-
Containment Recirculation B Isolation Valve (Position)	PXS-PL-V118B	Yes (Position)	-
Containment Recirculation A Isolation Valve (Position)	PXS-PL-V120A	Yes (Position)	-
Containment Recirculation B Isolation Valve (Position)	PXS-PL-V120B	Yes (Position)	-
IRWST Line A Isolation Valve (Position)	PXS-PL-V121A	Yes (Position)	-
IRWST Line B Isolation Valve (Position)	PXS-PL-V121B	Yes (Position)	-
IRWST Injection A Isolation Squib (Position)	PXS-PL-V123A	Yes (Position)	-

Note: Dash (-) indicates not applicable.

Table 2.2.3-3 (cont.)			
Equipment	**Tag No.**	**Display**	**Control Function**
IRWST Injection B Isolation Squib (Position)	PXS-PL-V123B	Yes (Position)	-
IRWST Injection A Isolation Squib (Position)	PXS-PL-V125A	Yes (Position)	-
IRWST Injection B Isolation Squib (Position)	PXS-PL-V125B	Yes (Position)	-
IRWST Gutter Bypass Isolation Valve (Position)	PXS-PL-V130A	Yes (Position)	-
IRWST Gutter Bypass Isolation Valve (Position)	PXS-PL-V130B	Yes (Position)	-
Accumulator A Level Sensor	PXS-021	Yes	-
Accumulator B Level Sensor	PXS-022	Yes	-
Accumulator A Level Sensor	PXS-023	Yes	-
Accumulator B Level Sensor	PXS-024	Yes	-
PRHR HX Inlet Temperature Sensor	PXS-064	Yes	-
IRWST Surface Temperature Sensor	PXS-041	Yes	-
IRWST Surface Temperature Sensor	PXS-042	Yes	-
IRWST Bottom Temperature Sensor	PXS-043	Yes	-
IRWST Bottom Temperature Sensor	PXS-044	Yes	-

Note: Dash (-) indicates not applicable.

Table 2.2.3-4
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the PXS is as described in the Design Description of this Section 2.2.3.	Inspection of the as-built system will be performed.	The as-built PXS conforms with the functional arrangement as described in the Design Description of this Section 2.2.3.
2.a) The components identified in Table 2.2.3-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built components as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built components identified in Table 2.2.3-1 as ASME Code Section III.
2.b) The piping identified in Table 2.2.3-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built piping as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built piping identified in Table 2.2.3-2 as ASME Code Section III.
3.a) Pressure boundary welds in components identified in Table 2.2.3-1 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.
3.b) Pressure boundary welds in piping identified in Table 2.2.3-2 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.

Table 2.2.3-4 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
4.a) The components identified in Table 2.2.3-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure.	A hydrostatic test will be performed on the components required by the ASME Code Section III to be hydrostatically tested.	A report exists and concludes that the results of the hydrostatic test of the components identified in Table 2.2.3-1 as ASME Code Section III conform with the requirements of the ASME Code Section III.
4.b) The piping identified in Table 2.2.3-2 as ASME Code Section III retains its pressure boundary integrity at its design pressure.	A hydrostatic test will be performed on the piping required by the ASME Code Section III to be hydrostatically tested.	A report exists and concludes that the results of the hydrostatic test of the piping identified in Table 2.2.3-2 as ASME Code Section III conform with the requirements of the ASME Code Section III.
5.a) The seismic Category I equipment identified in Table 2.2.3-1 can withstand seismic design basis loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment and valves identified in Table 2.2.3-1 are located on the Nuclear Island.	i) The seismic Category I equipment identified in Table 2.2.3-1 is located on the Nuclear Island.
	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis dynamic loads without loss of safety function.
	iii) Inspection will be performed for the existence of a report verifying that the as-installed equipment including anchorage is seismically bounded by the tested or analyzed conditions.	iii) A report exists and concludes that the as-installed equipment including anchorage is seismically bounded by the tested or analyzed conditions.
5.b) Each of the lines identified in Table 2.2.3-2 for which functional capability is required is designed to withstand combined normal and seismic design basis loads without a loss of its functional capability.	Inspection will be performed verifying that the as-built piping meets the requirements for functional capability.	A report exists and concludes that each of the as-built lines identified in Table 2.2.3-2 for which functional capability is required meets the requirements for functional capability.

Table 2.2.3-4 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
6. Each of the as-built lines identified in Table 2.2.3-2 as designed for LBB meets the LBB criteria, or an evaluation is performed of the protection from the dynamic effects of a rupture of the line.	Inspection will be performed for the existence of an LBB evaluation report or an evaluation report on the protection from dynamic effects of a pipe break. Tier 1 Material, Section 3.3, Nuclear Island Buildings, contains the design descriptions and inspections, tests, analyses, and acceptance criteria for protection from the dynamic effects of pipe rupture.	An LBB evaluation report exists and concludes that the LBB acceptance criteria are met by the as-built RCS piping and piping materials, or a pipe break evaluation report exists and concludes that protection from the dynamic effects of a line break is provided.
7.a) The Class 1E equipment identified in Table 2.2.3-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Table 2.2.3-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
7.b) The Class 1E components identified in Table 2.2.3-1 are powered from their respective Class 1E division.	Testing will be performed by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.2.3-1 when the assigned Class 1E division is provided the test signal.
7.c) Separation is provided between PXS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Tier 1 Material, Section 3.3, Nuclear Island Buildings.	See Tier 1 Material, Section 3.3, Nuclear Island Buildings.
8.a) The PXS provides containment isolation of the PXS lines penetrating the containment.	See Tier 1 Material, subsection 2.2.1, Containment System.	See Tier 1 Material, subsection 2.2.1, Containment System.

Table 2.2.3-4 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
8.b) The PXS provides core decay heat removal during design basis events.	A heat removal performance test and analysis of the PRHR HX will be performed to determine the heat transfer from the HX. For the test, the reactor coolant hot leg temperature will be initially at ≥ 540°F with the reactor coolant pumps stopped. The IRWST water level for the test will be above the top of the HX. The IRWST water temperature is not specified for the test. The test will continue until the hot leg temperature decreases below 420°F.	A report exists and concludes that the PRHR HX heat transfer rate with the design basis number of PRHR HX tubes plugged is: $\geq 1.06 \times 10^{8}$ Btu/hr with 520°F HL and 120°F IRWST temperatures $\geq 4.34 \times 10^{7}$ Btu/hr with 420°F HL and 212°F IRWST temperatures
8.c) The PXS provides RCS makeup, boration, and safety injection during design basis events.	i) A low-pressure injection test and analysis for each CMT, each accumulator, each IRWST injection line, and each containment recirculation line will be conducted. Each test is initiated by opening isolation valve(s) in the line being tested. Test fixtures may be used to simulate squib valves. CMTs: Each CMT will be initially filled with water. All valves in these lines will be open during the test. Accumulators: Each accumulator will be partially filled with water and pressurized with nitrogen. All valves in these lines will be open during the test. Sufficient flow will be provided to fully open the check valves.	i) The injection line flow resistance from each source is as follows: CMTs: The calculated flow resistance between each CMT and the reactor vessel is $\geq 3.07 \times 10^{-5}$ ft/gpm^2 and $\leq 3.84 \times 10^{-5}$ ft/gpm^2. Accumulators: The calculated flow resistance between each accumulator and the reactor vessel is $\geq 1.49 \times 10^{-5}$ ft/gpm^2 and $\leq 1.86 \times 10^{-5}$ ft/gpm^2.

Table 2.2.3-4 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
	IRWST Injection: The IRWST will be partially filled with water. All valves in these lines will be open during the test. Sufficient flow will be provided to fully open the check valves.	IRWST Injection: The calculated flow resistance for each IRWST injection line between the IRWST and the reactor vessel is $\geq 1.33 \times 10^{-5}$ ft/gpm^2 and $\leq 2.66 \times 10^{-5}$ ft/gpm^2.
	Containment Recirculation: A temporary water supply will be connected to the recirculation lines. All valves in these lines will be open during the test. Sufficient flow will be provided to fully open the check valves.	Containment Recirculation: The calculated flow resistance for each containment recirculation line between the containment and the reactor vessel is $\leq 2.17 \times 10^{-5}$ ft/gpm^2.
	ii) A low-pressure test and analysis will be conducted for each CMT to determine piping flow resistance from the cold leg to the CMT. The test will be performed by filling the CMT via the cold leg balance line by operating the normal residual heat removal pumps.	ii) The flow resistance from the cold leg to the CMT is $\leq 7.69 \times 10^{-6}$ ft/gpm^2.

Table 2.2.3-4 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
	iii) Inspections of the routing of the following pipe lines will be conducted: - CMT inlet line, cold leg to high point - PRHR HX inlet line, hot leg to high point	iii) These lines have no downward sloping sections between the connection to the RCS and the high point of the line.
	iv) Inspections of the elevation of the following pipe lines will be conducted: - IRWST injection lines; IRWST connection to DVI nozzles - Containment recirculation lines; containment to IRWST lines - CMT discharge lines to DVI connection - PRHR HX outlet line to SG connection	iv) The maximum elevation of the top inside surface of these lines is less than the elevation of: - IRWST bottom inside surface - IRWST bottom inside surface - CMT bottom inside surface - PRHR HX lower channel head top inside surface
	v) Inspections of the elevation of the following tanks will be conducted: - CMTs - IRWST	v) The elevation of the bottom inside tank surface is higher than the direct vessel injection nozzle centerline by the following: - CMTs ≥ 7.5 ft - IRWST ≥ 3.4 ft
	vi) Inspections of each of the following tanks will be conducted: - CMTs - Accumulators - IRWST	vi) The calculated volume of each of the following tanks is as follows: - CMTs ≥ 2000 ft^3 - Accumulators ≥ 2000 ft^3 - IRWST ≥ 75,000 ft^3 between the tank outlet connection and the tank overflow

Table 2.2.3-4 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
	vii) Inspection of the as-built components will be conducted for plates located above the containment recirculation screens.	vii) Plates located above each containment recirculation screen are no more than 1 ft above the top of the screen and extend out at least 10 ft perpendicular to and at least 7 ft to the side of the trash rack portion of the screen.
	viii) Inspections of the IRWST and containment recirculation screens will be conducted.	viii) The screen surface area (width x height) of each screen is $\geq$ 70 ft^2. The bottom of the containment recirculation screens is $\geq$ 2 ft above the loop compartment floor.
	ix) Inspections will be conducted of the insulation used inside the containment on ASME Class 1 lines and on the reactor vessel, reactor coolant pumps, pressurizer and steam generators.	ix) The type of insulation used on these lines and equipment is a metal reflective type or a suitable equivalent.
	x) Inspections will be conducted of the as-built nonsafety-related coatings or of plant records of the nonsafety-related coatings used inside containment on walls, floors, ceilings, structural steel which is part of the building structure and on the polar crane.	x) A report exists and concludes that the coatings used on these surfaces has a dry film density of $\geq$ 100 lb/ft^3.
	xi) Inspection of the as-built CMT inlet diffuser will be conducted.	xi) The CMT inlet diffuser has a flow area $\geq$ 165 in^2.
	xii) Inspections will be conducted of the CMT level sensors (PSX-11A/B/D/C, -12A/B/C/D, - 13A/B/C/D, -14A/B/C/D) upper level tap lines.	xii) The centerline of each upper level tap line at the tee for each level sensor is located 1" $\pm$ 1" below the centerline of the upper level tap connection to the CMT.

Table 2.2.3-4 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
	xiii) Inspections will be conducted of the materials used in the vicinity of the containment recirculation screens or analysis, type tests, or a combination of analysis and type tests will be performed on coatings used on surfaces in the vicinity of the containment recirculation screens. In the vicinity of the containment recirculation screens includes surfaces located above the bottom of the recirculation screens up to and including the bottom surface of the plate discussed in Table 2.2.3-4, item 8.c.vii, out at least 10 feet perpendicular to and at least 7 feet to the side of the trash rack portion of the screen.	xiii) A report exists and concludes that these surfaces are stainless steel or that coatings used on these surfaces are qualified to remain attached to these surfaces during design basis events.
8.d) The PXS provides pH adjustment of water flooding the containment following design basis accidents.	Inspections of the pH adjustment baskets will be conducted.	Two pH adjustment baskets exist, each with a calculated volume ≥ 107 ft^3. The pH baskets are located below plant elevation 107 ft, 2 in.
9.a) The PXS provides a function to cool the outside of the reactor vessel during a severe accident.	i) A flow test and analysis for each IRWST drain line to the containment will be conducted. The test is initiated by opening isolation valves in each line. Test fixtures may be used to simulate squib valves. ii) Inspections of the as-built reactor vessel insulation will be performed.	i) The calculated flow resistance for each IRWST drain line between the IRWST and the containment is $\leq 1.38 \times 10^{-5}$ ft/gpm^2. ii) The combined total flow area of the water inlets is not less than 6 ft^2. The combined total flow area of the steam outlet(s) is not less than 7.5 ft^2.

Table 2.2.3-4 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
	vii) Inspection of the as-built components will be conducted for plates located above the containment recirculation screens.	vii) Plates located above each containment recirculation screen are no more than 10 ft above the top of the screen and extend out at least 10 ft from the trash rack portion of the screen.
	viii) Inspections of the IRWST and containment recirculation screens will be conducted.	viii) The screen surface area (width x height) of each screen is $\geq$ 70 ft^2. The bottom of the containment recirculation screens is $\geq$ 2 ft above the loop compartment floor.
	ix) Inspections will be conducted of the insulation used inside the containment on ASME Class 1 lines and on the reactor vessel, reactor coolant pumps, pressurizer and steam generators.	ix) The type of insulation used on these lines and equipment is a metal reflective type or a suitable equivalent.
	x) Inspections will be conducted of the as-built nonsafety-related coatings or of plant records of the nonsafety-related coatings used inside containment on walls, floors, ceilings, structural steel which is part of the building structure and on the polar crane.	x) A report exists and concludes that the coatings used on these surfaces has a dry film density of $\geq$ 100 lb/ft^3.
	xi) Inspection of the as-built CMT inlet diffuser will be conducted.	xi) The CMT inlet diffuser has a flow area $\geq$ 165 in^2.
	xii) Inspections will be conducted of the CMT level sensors (PSX-11A/B/D/C, -12A/B/C/D, - 13A/B/C/D, -14A/B/C/D) upper level tap lines.	xii) The centerline of each upper level tap line at the tee for each level sensor is located 1" $\pm$ 1" below the centerline of the upper level tap connection to the CMT.

Table 2.2.3-4 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
	xiii) Inspections will be conducted of the materials used in the vicinity of the containment recirculation screens or analysis, type tests, or a combination of analysis and type tests will be performed on coatings used on surfaces in the vicinity of the containment recirculation screens. In the vicinity of the containment recirculation screens includes surfaces located above the bottom of the recirculation screens up to and including the bottom surface of the plate discussed in Table 2.2.3-4, item 8.c.vii, out to 10 feet in front and 10 feet to the side of the screen face.	xiii) A report exists and concludes that these surfaces are stainless steel or that coatings used on these surfaces are qualified to remain attached to these surfaces during design basis events.
8.d) The PXS provides pH adjustment of water flooding the containment following design basis accidents.	Inspections of the pH adjustment baskets will be conducted.	Two pH adjustment baskets exist, each with a calculated volume $\geq 107\ ft^3$. The pH baskets are located below plant elevation 107 ft, 2 in.
9.a) The PXS provides a function to cool the outside of the reactor vessel during a severe accident.	i) A flow test and analysis for each IRWST drain line to the containment will be conducted. The test is initiated by opening isolation valves in each line. Test fixtures may be used to simulate squib valves.	i) The calculated flow resistance for each IRWST drain line between the IRWST and the containment is $\leq 1.38 \times 10^{-5}\ ft/gpm^2$.
	ii) Inspections of the as-built reactor vessel insulation will be performed.	ii) The combined total flow area of the water inlets is not less than $6\ ft^2$. The combined total flow area of the steam outlet(s) is not less than $7.5\ ft^2$.

Table 2.2.3-4 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
		A report exists and concludes that the minimum flow area between the vessel insulation and reactor vessel for the flow path that vents steam is not less than 7.5 ft^2 considering the maximum deflection of the vessel insulation with a static pressure of 12.95 ft of water.
	iii) Inspections will be conducted of the flow path(s) from the loop compartments to the reactor vessel cavity.	iii) A flow path with a flow area not less than 6 ft^2 exists from the loop compartment to the reactor vessel cavity.
9.b) The accumulator discharge check valves (PXS-PL-V028A/B and V029A/B) are of a different check valve type than the CMT discharge check valves (PXS-PL-V016A/B and V017A/B).	An inspection of the accumulator and CMT discharge check valves is performed.	The accumulator discharge check valves are of a different check valve type than the CMT discharge check valves.
9.c) The equipment listed in Table 2.2.3-6 has sufficient thermal lag to withstand the effects of identified hydrogen burns associated with severe accidents.	Tests, analyses, or a combination of tests and analyses will be performed to determine the thermal lag of this equipment.	A report exists and concludes that the thermal lag of this equipment is greater than the value required.
10. Safety-related displays of the parameters identified in Table 2.2.3-1 can be retrieved in the MCR.	Inspection will be performed for the retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.2.3-1 can be retrieved in the MCR.
11.a) Controls exist in the MCR to cause the remotely operated valves identified in Table 2.2.3-1 to perform their active function(s).	i) Testing will be performed on the squib valves identified in Table 2.2.3-1 using controls in the MCR, without stroking the valve.	i) Controls in the MCR operate to cause a signal at the squib valve electrical leads that is capable of actuating the squib valve.
	ii) Stroke testing will be performed on remotely operated valves other than squib valves identified in Table 2.2.3-1 using the controls in the MCR.	ii) Controls in the MCR operate to cause remotely operated valves other than squib valves to perform their active functions.

Table 2.2.3-4 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
11.b) The valves identified in Table 2.2.3-1 as having PMS control perform their active function after receiving a signal from the PMS.	i) Testing will be performed on the squib valves identified in Table 2.2.3-1 using real or simulated signals into the PMS without stroking the valve.	i) Squib valves receive an electrical signal at the valve electrical leads that is capable of actuating the valve after a signal is input to the PMS.
	ii) Testing will be performed on the remotely operated valves other than squib valves identified in Table 2.2.3-1 using real or simulated signals into the PMS.	ii) Remotely operated valves other than squib valves perform the active function identified in the table after a signal is input to the PMS.
	iii) Testing will be performed to demonstrate that remotely operated PXS isolation valves PXS-V014A/B, V015A/B, V108A/B open within the required response times.	iii) These valves open within 20 seconds after receipt of an actuation signal.
11.c) The valves identified in Table 2.2.3-1 as having DAS control perform their active function after receiving a signal from the DAS.	i) Testing will be performed on the squib valves identified in Table 2.2.3-1 using real or simulated signals into the DAS without stroking the valve.	i) Squib valves receive an electrical signal at the valve electrical leads that is capable of actuating the valve after a signal is input to the DAS.
	ii) Testing will be performed on the remotely operated valves other than squib valves identified in Table 2.2.3-1 using real or simulated signals into the DAS.	ii) Remotely operated valves other than squib valves perform the active function identified in Table 2.2.3-1 after a signal is input to the DAS.
12.a) The motor-operated and check valves identified in Table 2.2.3-1 perform an active safety-related function to change position as indicated in the table.	i) Tests or type tests of motor-operated valves will be performed that demonstrate the capability of the valve to operate under its design conditions.	i) A test report exists and concludes that each motor-operated valve changes position as indicated in Table 2.2.3-1 under design conditions.
	ii) Inspection will be performed for the existence of a report verifying that the as-installed motor-operated valves are bounded by the tests or type tests.	ii) A report exists and concludes that the as-installed motor-operated valves are bounded by the tests or type tests.

Table 2.2.3-4 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
	iii) Tests of the as-installed motor-operated valves will be performed under preoperational flow, differential pressure, and temperature conditions.	iii) Each motor-operated valve changes position as indicated in Table 2.2.3-1 under preoperational test conditions.
	iv) Exercise testing of the check valves with active safety functions identified in Table 2.2.3-1 will be performed under preoperational test pressure, temperature and fluid flow conditions.	iv) Each check valve changes position as indicated in Table 2.2.3-1.
12.b) After loss of motive power, the remotely operated valves identified in Table 2.2.3-1 assume the indicated loss of motive power position.	Testing of the installed valves will be performed under the conditions of loss of motive power.	After loss of motive power, each remotely operated valve identified in Table 2.2.3-1 assumes the indicated loss of motive power position.
13. Displays of the parameters identified in Table 2.2.3-3 can be retrieved in the MCR.	Inspection will be performed for retrievability of the displays identified in Table 2.2.3-3 in the MCR.	Displays identified in Table 2.2.3-3 can be retrieved in the MCR.

Table 2.2.3-5		
Component Name	**Tag No.**	**Component Location**
Passive Residual Heat Removal Heat Exchanger (PRHR HX)	PXS-ME-01	Containment Building
Accumulator Tank A	PXS-MT-01A	Containment Building
Accumulator Tank B	PXS-MT-01B	Containment Building
Core Makeup Tank (CMT) A	PXS-MT-02A	Containment Building
CMT B	PXS-MT-02B	Containment Building
IRWST	PXS-MT-03	Containment Building
IRWST Screen A	PXS-MY-Y01A	Containment Building
IRWST Screen B	PXS-MY-Y01B	Containment Building
Containment Recirculation Screen A	PXS-MY-Y02A	Containment Building
Containment Recirculation Screen B	PXS-MY-Y02B	Containment Building
pH Adjustment Basket A	PXS-MY-Y03A	Containment Building
pH Adjustment Basket B	PXS-MY-Y03B	Containment Building

Table 2.2.3-6		
Equipment	**Tag No.**	**Function**
Containment Air Sample Containment Isolation Valve IRC	PSS-PL-V008	Transfer open
Containment Pressure Sensors	PCS-005, 006, 007, 008	Sense pressure
RCS Wide Range Pressure Sensors	RCS-140A, B, C, D	Sense pressure
SG1 Wide Range Level Sensors	SGS-011, 012, 013, 014	Sense level
SG2 Wide Range Level Sensors	SGS-016, 017, 018, 019	Sense level
Hydrogen Ignitors	VLS-EH-01 through 64	Ignite hydrogen
Electrical Penetrations	VUS-JY-E01, 02, 06, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32	Maintain containment boundary

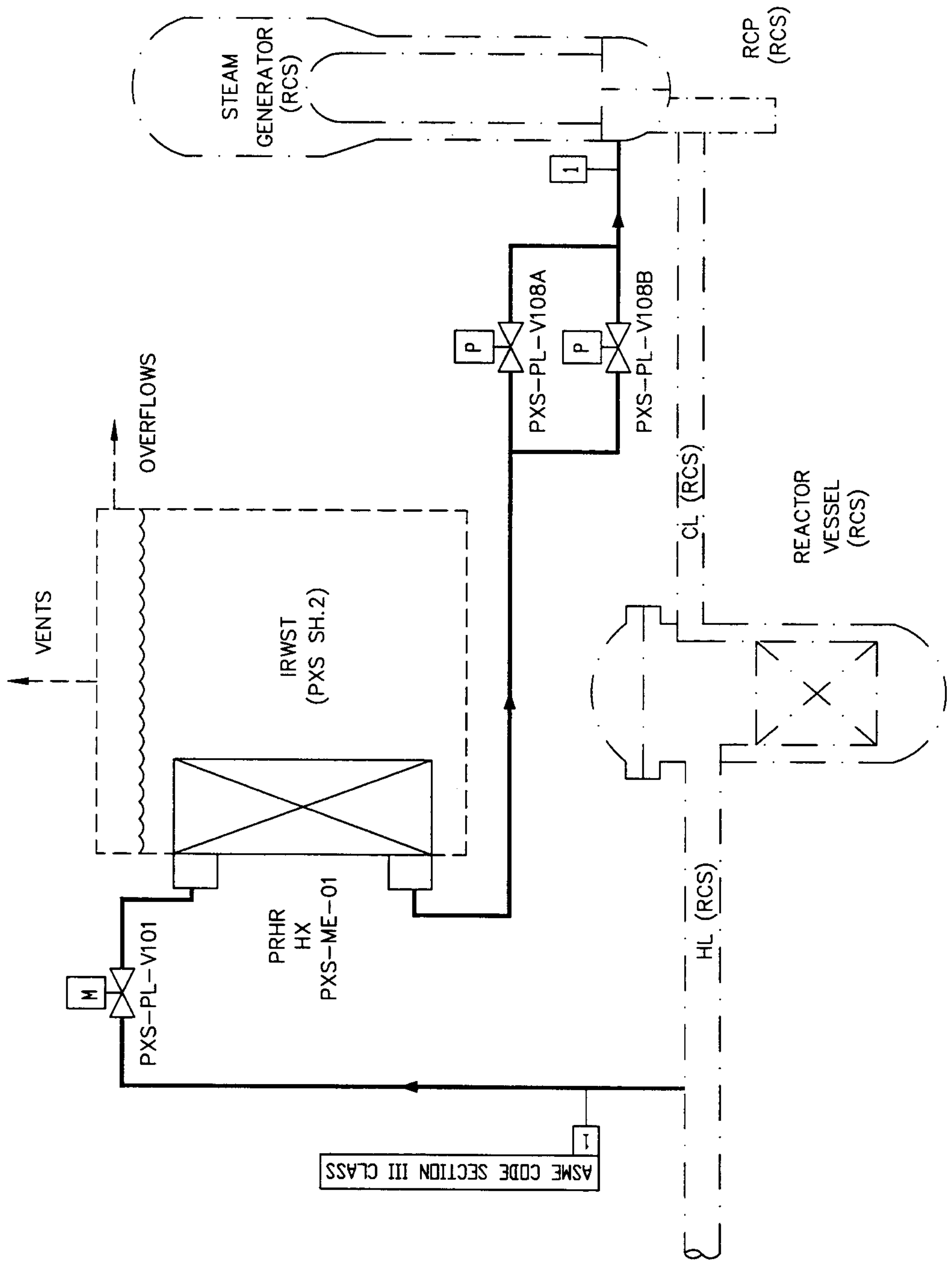

Figure 2.2.3-1 (Sheet 1 of 2)
Passive Core Cooling System

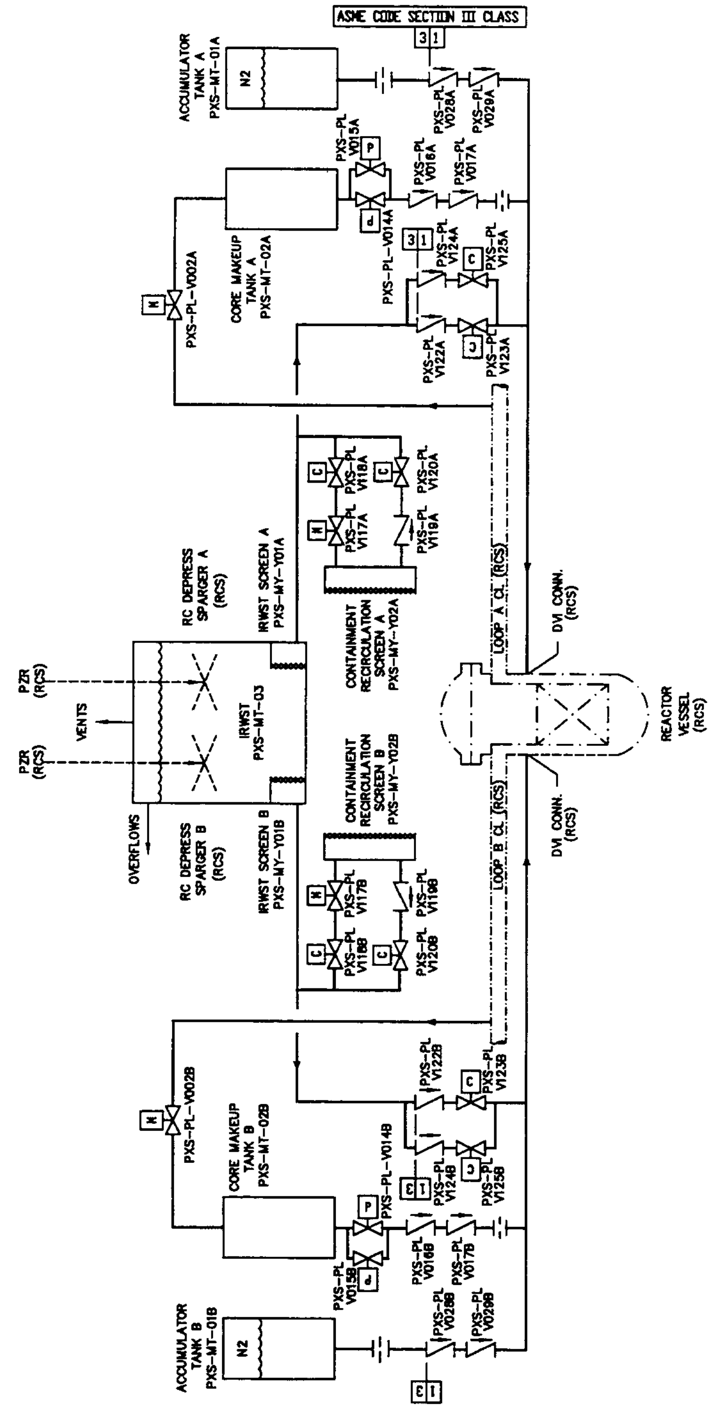

Figure 2.2.3-1 (Sheet 2 of 2)
Passive Core Cooling System

2.2.4 Steam Generator System

Design Description

The steam generator system (SGS) and portions of the main and startup feedwater system (FWS) transport and control feedwater from the condensate system to the steam generators during normal operation. The SGS and portions of the main steam system (MSS) and turbine system (MTS) transport and control steam from the steam generators to the turbine generator during normal operations. These systems also isolate the steam generators from the turbine generator and the condensate system during design basis accidents.

The SGS is as shown in Figure 2.2.4-1, sheets 1 and 2, and portions of the FWS, MSS, and MTS are as shown in Figure 2.2.4-1, sheet 3, and the locations of the components in these systems is as shown in Table 2.2.4-5.

1. The functional arrangement of the SGS and portions of the FWS, MSS, and MTS are as described in the Design Description of this Section 2.2.4.

2. a) The components identified in Table 2.2.4-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.

   b) The piping identified in Table 2.2.4-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements.

3. a) Pressure boundary welds in components identified in Table 2.2.4-1 as ASME Code Section III meet ASME Code Section III requirements.

   b) Pressure boundary welds in piping identified in Table 2.2.4-2 as ASME Code Section III meet ASME Code Section III requirements.

4. a) The components identified in Table 2.2.4-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure.

   b) The piping identified in Table 2.2.4-2 as ASME Code Section III retains its pressure boundary integrity at its design pressure.

5. a) The seismic Category I equipment identified in Table 2.2.4-1 can withstand seismic design basis loads without loss of safety function.

   b) Each of the lines identified in Table 2.2.4-2 for which functional capability is required is designed to withstand combined normal and seismic design basis loads without a loss of its functional capability.

6. Each of the as-built lines identified in Table 2.2.4-2 as designed for leak before break (LBB) meets the LBB criteria, or an evaluation is performed of the protection from the dynamic effects of a rupture of the line.

7. a) The Class 1E equipment identified in Table 2.2.4-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

   b) The Class 1E components identified in Table 2.2.4-1 are powered from their respective Class 1E division.

   c) Separation is provided between SGS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

8. The SGS provides the following safety-related functions:

   a) The SGS provides a heat sink for the reactor coolant system (RCS) and provides overpressure protection in accordance with Section III of the ASME Boiler and Pressure Vessel Code.

   b) During design basis events, the SGS limits steam generator blowdown and feedwater flow to the steam generator.

   c) The SGS preserves containment integrity by isolation of the SGS lines penetrating the containment. The inside containment isolation function (isolating the RCS and containment atmosphere from the environment) is provided by the steam generator, tubes, and SGS lines inside containment while isolation outside containment is provided by manual and automatic valves.

9. The SGS provides the following nonsafety-related functions:

   a) Components within the main steam system, main and startup feedwater system, and the main turbine system identified in Table 2.2.4-3 provide backup isolation of the SGS to limit steam generator blowdown and feedwater flow to the steam generator.

   b) During shutdown operations, the SGS removes decay heat by delivery of startup feedwater to the steam generator and venting of steam from the steam generators to the atmosphere.

10. Safety-related displays identified in Table 2.2.4-1 can be retrieved in the main control room (MCR).

11. a) Controls exist in the MCR to cause the remotely operated valves identified in Table 2.2.4-1 to perform active functions.

b) The valves identified in Table 2.2.4-1 as having PMS control perform an active safety function after receiving a signal from PMS.

12. a) The motor-operated valves identified in Table 2.2.4-1 perform an active safety-related function to change position as indicated in the table.

b) After loss of motive power, the remotely operated valves identified in Table 2.2.4-1 assume the indicated loss of motive power position.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.2.4-4 specifies the inspections, tests, analyses, and associated acceptance criteria for the SGS.

Table 2.2.4-1

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
Main Steam Safety Valve SG01	SGS-PL-V030A	Yes	Yes	-	-/-	No	-	Transfer Open/ Transfer Closed	-
Main Steam Safety Valve SG02	SGS-PL-V030B	Yes	Yes	-	-/-	No	-	Transfer Open/ Transfer Closed	-
Main Steam Safety Valve SG01	SGS-PL-V031A	Yes	Yes	-	-/-	No	-	Transfer Open/ Transfer Closed	-
Main Steam Safety Valve SG02	SGS-PL-V031B	Yes	Yes	-	-/-	No	-	Transfer Open/ Transfer Closed	-
Main Steam Safety Valve SG01	SGS-PL-V032A	Yes	Yes	-	-/-	No	-	Transfer Open/ Transfer Closed	-
Main Steam Safety Valve SG02	SGS-PL-V032B	Yes	Yes	-	-/-	No	-	Transfer Open/ Transfer Closed	-

Note: Dash (-) indicates not applicable.

Table 2.2.4-1 (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
Power-operated Relief Valve Block Motor-operated Valve Steam Generator 01	SGS-PL-V027A	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
Power-operated Relief Valve Block Motor-operated Valve Steam Generator 02	SGS-PL-V027B	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
Steam Line Condensate Drain Isolation Valve	SGS-PL-V036A	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	Closed
Steam Line Condensate Drain Isolation Valve	SGS-PL-V036B	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	Closed
Main Steam Line Isolation Valve	SGS-PL-V040A	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
Main Steam Line Isolation Valve	SGS-PL-V040B	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
Steam Line Condensate Drain Control Valve	SGS-PL-V086A	Yes	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed
Steam Line Condensate Drain Control Valve	SGS-PL-V086B	Yes	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed

Table 2.2.4-1 (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
Main Feedwater Isolation Valve	SGS-PL-V057A	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
Main Feedwater Isolation Valve	SGS-PL-V057B	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
Startup Feedwater Isolation Motor-operated Valve	SGS-PL-V067A	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
Startup Feedwater Isolation Motor-operated Valve	SGS-PL-V067B	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	As Is
Steam Generator Blowdown Isolation Valve	SGS-PL-V074A	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	Closed
Steam Generator Blowdown Isolation Valve	SGS-PL-V074B	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	Closed
Steam Generator Blowdown Isolation Valve	SGS-PL-V075A	Yes	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed
Steam Generator Blowdown Isolation Valve	SGS-PL-V075B	Yes	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed

Table 2.2.4-1 (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
Power-operated Relief Valve	SGS-PL-V233A	Yes	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed
Power-operated Relief Valve	SGS-PL-V233B	Yes	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed
Main Steam Isolation Valve Bypass Isolation	SGS-PL-V240A	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	Closed
Main Steam Isolation Valve Bypass Isolation	SGS-PL-V240B	Yes	Yes	Yes	Yes/Yes	Yes (Valve Position)	Yes	Transfer Closed	Closed
Main Feedwater Control Valve	SGS-PL-V250A	Yes	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed
Main Feedwater Control Valve	SGS-PL-V250B	Yes	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed
Startup Feedwater Control Valve	SGS-PL-V255A	Yes	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed
Startup Feedwater Control Valve	SGS-PL-V255B	Yes	Yes	Yes	Yes/Yes	No	Yes	Transfer Closed	Closed

Table 2.2.4-1 (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
Steam Generator 1 Narrow Range Level Sensor	SGS-001	No	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 1 Narrow Range Level Sensor	SGS-002	No	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 1 Narrow Range Level Sensor	SGS-003	No	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 1 Narrow Range Level Sensor	SGS-004	No	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 2 Narrow Range Level Sensor	SGS-005	No	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 2 Narrow Range Level Sensor	SGS-006	No	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 2 Narrow Range Level Sensor	SGS-007	No	Yes	-	Yes/Yes	Yes	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.4-1 (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
Steam Generator 2 Narrow Range Level Sensor	SGS-008	No	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 1 Wide Range Level Sensor	SGS-011	No	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 1 Wide Range Level Sensor	SGS-012	No	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 2 Wide Range Level Sensor	SGS-013	No	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 2 Wide Range Level Sensor	SGS-014	No	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 1 Wide Range Level Sensor	SGS-015	No	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 1 Wide Range Level Sensor	SGS-016	No	Yes	-	Yes/Yes	Yes	-	-	-
Steam Generator 2 Wide Range Level Sensor	SGS-017	No	Yes	-	Yes/Yes	Yes	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.4-1 (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
Steam Generator 2 Wide Range Level Sensor	SGS-018	No	Yes	-	Yes/Yes	Yes	-	-	-
Main Steam Line Steam Generator 1 Pressure Sensor	SGS-030	No	Yes	-	Yes/Yes	Yes	-	-	-
Main Steam Line Steam Generator 1 Pressure Sensor	SGS-031	No	Yes	-	Yes/No	Yes	-	-	-
Main Steam Line Steam Generator 1 Pressure Sensor	SGS-032	No	Yes	-	Yes/Yes	Yes	-	-	-
Main Steam Line Steam Generator 1 Pressure Sensor	SGS-033	No	Yes	-	Yes/No	Yes	-	-	-
Main Steam Line Steam Generator 2 Pressure Sensor	SGS-034	No	Yes	-	Yes/Yes	Yes	-	-	-
Main Steam Line Steam Generator 2 Pressure Sensor	SGS-035	No	Yes	-	Yes/No	Yes	-	-	-
Main Steam Line Steam Generator 2 Pressure Sensor	SGS-036	No	Yes	-	Yes/Yes	Yes	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.4-1 (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
Main Steam Line Steam Generator 2 Pressure Sensor	SGS-037	No	Yes	-	Yes/No	Yes	-	-	-
Steam Generator 1 Startup Feedwater Flow Sensor	SGS-55A	No	Yes	-	Yes/No	Yes	-	-	-
Steam Generator 1 Startup Feedwater Flow Sensor	SGS-55B	No	Yes	-	Yes/No	Yes	-	-	-
Steam Generator 2 Startup Feedwater Flow Sensor	SGS-56A	No	Yes	-	Yes/No	Yes	-	-	-
Steam Generator 2 Startup Feedwater Flow Sensor	SGS-56B	No	Yes	-	Yes/No	Yes	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.4-2

Line Name	Line Number	ASME Code Section III	Leak Before Break	Functional Capability Required
Main Feedwater Line	SGS-PL-L002A, L002B	Yes	No	No
Main Feedwater Line	SGS-PL-L003A, L003B	Yes	No	No
Startup Feedwater Line	SGS-PL-L004A, L004B, L005A, L005B	Yes	No	No
Startup Feedwater Line	SGS-PL-L005A, L005B	Yes	No	No
Main Steam Line (within containment)	SGS-PL-L006A, L006B	Yes	Yes	Yes
Main Steam Line (outside of containment)	SGS-PL-L006A, L006B	Yes	No	Yes
Main Steam Line	SGS-PL-L007A, L007B	Yes	No	No
Safety Valve Inlet Line	SGS-PL-L015A, L015B, L015C, L015D, L015E, L015F	Yes	No	Yes
Safety Valve Discharge Line	SGS-PL-L018A, L018B, L018C, L018D, L018E, L018F	Yes	No	Yes
Power-operated Relief Block Valve Inlet Line	SGS-PL-L024A, L024B	Yes	No	No
Power-operated Relief Valve Inlet Line	SGS-PL-L014A, L014B	Yes	No	No
Main Steam Isolation Valve Bypass Inlet Line	SGS-PL-L022A, L022B	Yes	No	No
Main Steam Isolation Valve Bypass Outlet Line	SGS-PL-L023A, L023B	Yes	No	No

Note: Dash (-) indicates not applicable.

Table 2.2.4-2 (cont.)

Line Name	Line Number	ASME Code Section III	Leak Before Break	Functional Capability Required
Main Steam Condensate Drain Line	SGS-PL-L021A, L021B	Yes	No	No
Steam Generator Blowdown Line	SGS-PL-L009A, L009B	Yes	No	No
Steam Generator Blowdown Line	SGS-PL-L027A, L027B	Yes	No	No
Steam Generator Blowdown Line	SGS-PL-L010A, L010B	Yes	No	No

Note: Dash (-) indicates not applicable.

Table 2.2.4-3		
Equipment Name	**Tag No.**	**Control Function**
Turbine Stop Valve	MTS-PL-V001A	Close
Turbine Stop Valve	MTS-PL-V001B	Close
Turbine Control Valve	MTS-PL-V002A	Close
Turbine Control Valve	MTS-PL-V002B	Close
Turbine Stop Valve	MTS-PL-V003A	Close
Turbine Stop Valve	MTS-PL-V003B	Close
Turbine Control Valve	MTS-PL-V004A	Close
Turbine Control Valve	MTS-PL-V004B	Close
Turbine Bypass Control Valve	MSS-PL-V001	Close
Turbine Bypass Control Valve	MSS-PL-V002	Close
Turbine Bypass Control Valve	MSS-PL-V003	Close
Turbine Bypass Control Valve	MSS-PL-V004	Close
Moisture Separator Reheat Supply Steam Control Valve	MSS-PL-V016	Close
Main to Startup Feedwater Crossover Valve	FWS-PL-097	Close
Main Feedwater Pump	FWS-MP-02A	Trip
Main Feedwater Pump	FWS-MP-02B	Trip
Startup Feedwater Pump	FWS-MP-03A	Trip
Startup Feedwater Pump	FWS-MP-03B	Trip

Table 2.2.4-4
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the SGS and portions of the FWS, MSS, and MTS are as described in the Design Description of this Section 2.2.4.	Inspection of the as-built system will be performed.	The as-built SGS and portions of the FWS, MSS, and MTS conform with the functional arrangement as defined in the Design Description of this Section 2.2.4.
2.a) The components identified in Table 2.2.4-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built components as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built components identified in Table 2.2.4-1 as ASME Code Section III.
2.b) The piping identified in Table 2.2.4-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built piping as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built piping identified in Table 2.2.4-2 as ASME Code Section III.
3.a) Pressure boundary welds in components identified in Table 2.2.4-1 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.
3.b) Pressure boundary welds in piping identified in Table 2.2.4-2 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.

Table 2.2.4-4 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4.a) The components identified in Table 2.2.4-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure.	A hydrostatic test will be performed on the components required by the ASME Code Section III to be hydrostatically tested.	A report exists and concludes that the results of the hydrostatic test of the components identified in Table 2.2.4-1 as ASME Code Section III conform with the requirements of the ASME Code Section III.
4.b) The piping identified in Table 2.2.4-2 as ASME Code Section III retains its pressure boundary integrity at its design pressure.	A hydrostatic test will be performed on the piping required by the ASME Code Section III to be hydrostatically tested.	A report exists and concludes that the results of the hydrostatic test of the piping identified in Table 2.2.4-2 as ASME Code Section III conform with the requirements of the ASME Code Section III.
5.a) The seismic Category I equipment identified in Table 2.2.4-1 can withstand seismic design basis loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment identified in Table 2.2.4-1 is located on the Nuclear Island. ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed. iii) Inspection will be performed for the existence of a report verifying that the as-installed equipment including anchorage is seismically bounded by the tested or analyzed conditions.	i) The seismic Category I equipment identified in Table 2.2.4-1 is located on the Nuclear Island. ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function. iii) A report exists and concludes that the as-installed equipment including anchorage is seismically bounded by the tested or analyzed conditions.
5.b) Each of the lines identified in Table 2.2.4-2 for which functional capability is required is designed to withstand combined normal and seismic design basis loads without a loss of its functional capability.	Inspection will be performed for the existence of a report concluding that the as-built piping meets the requirements for functional capability.	A report exists and concludes that each of the as-built lines identified in Table 2.2.4-2 for which functional capability is required meets the requirements for functional capability.

Table 2.2.4-4 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
6. Each of the as-built lines identified in Table 2.2.4-2 as designed for LBB meets the LBB criteria, or an evaluation is performed of the protection from the dynamic effects of a rupture of the line.	Inspection will be performed for the existence of an LBB evaluation report or an evaluation report on the protection from effects of a pipe break. Tier 1 Material, Section 3.3, Nuclear Island Buildings, contains the design descriptions and inspections, tests, analyses, and acceptance criteria for protection from the dynamic effects of pipe rupture.	An LBB evaluation report exists and concludes that the LBB acceptance criteria are met by the as-built RCS piping and piping materials, or a pipe break evaluation report exists and concludes that protection from the dynamic effects of a line break is provided.
7.a) The Class 1E equipment identified in Table 2.2.4-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.	Type tests, analyses, or a combination of type tests and analyses will be performed on Class 1E equipment located in a harsh environment.	A report exists and concludes that the Class 1E equipment identified in Table 2.2.4-1 as being qualified for a harsh environment can withstand the environmental conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
7.b) The Class 1E components identified in Table 2.2.4-1 are powered from their respective Class 1E division.	Testing will be performed by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.2.4-1 when the assigned Class 1E division is provided the test signal.
7.c) Separation is provided between SGS Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Tier 1 Material, Section 3.3, Nuclear Island Buildings.	See Tier 1 Material, Section 3.3, Nuclear Island Buildings.

Table 2.2.4-4 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
8.a) The SGS provides a heat sink for the RCS and provides overpressure protection in accordance with Section III of the ASME Boiler and Pressure Vessel Code.	i) Inspections will be conducted to confirm that the value of the vendor code plate rating of the steam generator safety valves is greater than or equal to system relief requirements. ii) Testing and analyses in accordance with ASME Code Section III will be performed to determine set pressure.	i) The sum of the rated capacities recorded on the valve vendor code plates of the steam generator safety valves exceeds 4,600,000 lb/hr per steam generator. ii) A report exists to indicate the set pressure of the valves is less than 1195 psig.
8.b) During design basis events, the SGS limits steam generator blowdown and feedwater flow to the steam generator.	i) Testing will be performed to confirm isolation of the main feedwater, startup feedwater, blowdown, and main steam lines. See item 11 in this table. ii) Inspection will be performed for the existence of a report confirming that the area of the flow limiting orifice within the SG main steam outlet nozzle will limit releases to the containment.	See item 11 in this table. ii) A report exists to indicate the installed flow limiting orifice within the SG main steam line discharge nozzle does not exceed 1.4 sq. ft.
8.c) The SGS preserves containment integrity by isolation of the SGS lines penetrating the containment.	See Tier 1 Material, subsection 2.2.1, Containment System.	See Tier 1 Material, subsection 2.2.1, Containment System.
9.a) Components within the main steam system, main and startup feedwater system, and the main turbine system identified in Table 2.2.4-3 provide backup isolation of the SGS to limit steam generator blowdown and feedwater flow to the steam generator.	i) Testing will be performed to confirm closure of the valves identified in Table 2.2.4-3. ii) Testing will be performed to confirm the trip of the pumps identified in Table 2.2.4-3.	i) The valves identified in Table 2.2.4-3 close after a signal is generated by the PMS. ii) The pumps identified in Table 2.2.4-3 trip after a signal is generated by the PMS.

Table 2.2.4-4 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
9.b) During shutdown operations, the SGS removes decay heat by delivery of startup feedwater to the steam generator and venting of steam from the steam generators to the atmosphere.	i) Tests will be performed to demonstrate the ability of the startup feedwater system to provide feedwater to the steam generators. ii) Tests and/or analyses will be performed to demonstrate the ability of the power-operated relief valves to discharge steam from the steam generators to the atmosphere.	i) See Tier 1 Material, subsection 2.4.1, Main and Startup Feedwater System. ii) A report exists and concludes that each power-operated relief valve will relieve greater than 200,000 lb/hr at 1003 psia ±10 psi.
10. Safety-related displays identified in Table 2.2.4-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.2.4-1 can be retrieved in the MCR.
11.a) Controls exist in the MCR to cause the remotely operated valves identified in Table 2.2.4-1 to perform active functions.	Stroke testing will be performed on the remotely operated valves listed in Table 2.2.4-1 using controls in the MCR.	Controls in the MCR operate to cause the remotely operated valves to perform active safety functions.
11.b) The valves identified in Table 2.2.4-1 as having PMS control perform an active safety function after receiving a signal from PMS.	i) Testing will be performed on the remotely operated valves listed in Table 2.2.4-1 using real or simulated signals into the PMS. ii) Testing will be performed to demonstrate that remotely operated SGS isolation valves SGS-V027A/B, V040A/B, V057A/B, V250A/B close within the required response times.	i) The remotely-operated valves identified in Table 2.2.4-1 as having PMS control perform the active function identified in the table after receiving a signal from the PMS. ii) These valves close within the following times after receipt of an actuation signal: V027A/B < 44 sec V040A/B, V057A/B < 5 sec V250A/B < 5 sec

Table 2.2.4-4 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
12.a) The motor-operated valves identified in Table 2.2.4-1 perform an active safety-related function to change position as indicated in the table.	i) Tests or type tests of motor-operated valves will be performed to demonstrate the capability of the valve to operate under its design conditions	i) A test report exists and concludes that each motor-operated valve changes position as indicated in Table 2.2.4-1 under design conditions.
	ii) Inspection will be performed for the existence of a report verifying that the as-installed motor-operated valves are bounded by the tests or type tests.	ii) A report exists and concludes that the as-installed motor-operated valves are bounded by the tests or type tests.
	iii) Tests of the as-installed motor-operated valves will be performed under pre-operational flow, differential pressure, and temperature conditions.	iii) Each motor-operated valve changes position as indicated in Table 2.2.4-1 under pre-operational test conditions.
12.b) After loss of motive power, the remotely operated valves identified in Table 2.2.4-1 assume the indicated loss of motive power position.	Testing of the installed valves will be performed under the conditions of loss of motive power.	After loss of motive power, each remotely operated valve identified in Table 2.2.4-1 assumes the indicated loss of motive power position.

Table 2.2.4-5		
Component Name	**Tag No.**	**Component Location**
Main Steam Line Isolation Valve	SGS-PL-V040A	Auxiliary Building
Main Steam Line Isolation Valve	SGS-PL-V040B	Auxiliary Building
Main Feedwater Isolation Valve	SGS-PL-V057A	Auxiliary Building
Main Feedwater Isolation Valve	SGS-PL-V057B	Auxiliary Building
Main Feedwater Control Valve	SGS-PL-V250A	Auxiliary Building
Main Feedwater Control Valve	SGS-PL-V250B	Auxiliary Building
Turbine Stop Valves	MTS-PL-V001A MTS-PL-V001B MTS-PL-V003A MTS-PL-V003B	Turbine Building
Turbine Control Valves	MTS-PL-V002A MTS-PL-V002B MTS-PL-V004A MTS-PL-V004B	Turbine Building
Main Feedwater Pumps	FWS-MP-01A FWS-MP-01B	Turbine Building
Feedwater Booster Pumps	FWS-MP-02A FWS-MP-02B	Turbine Building

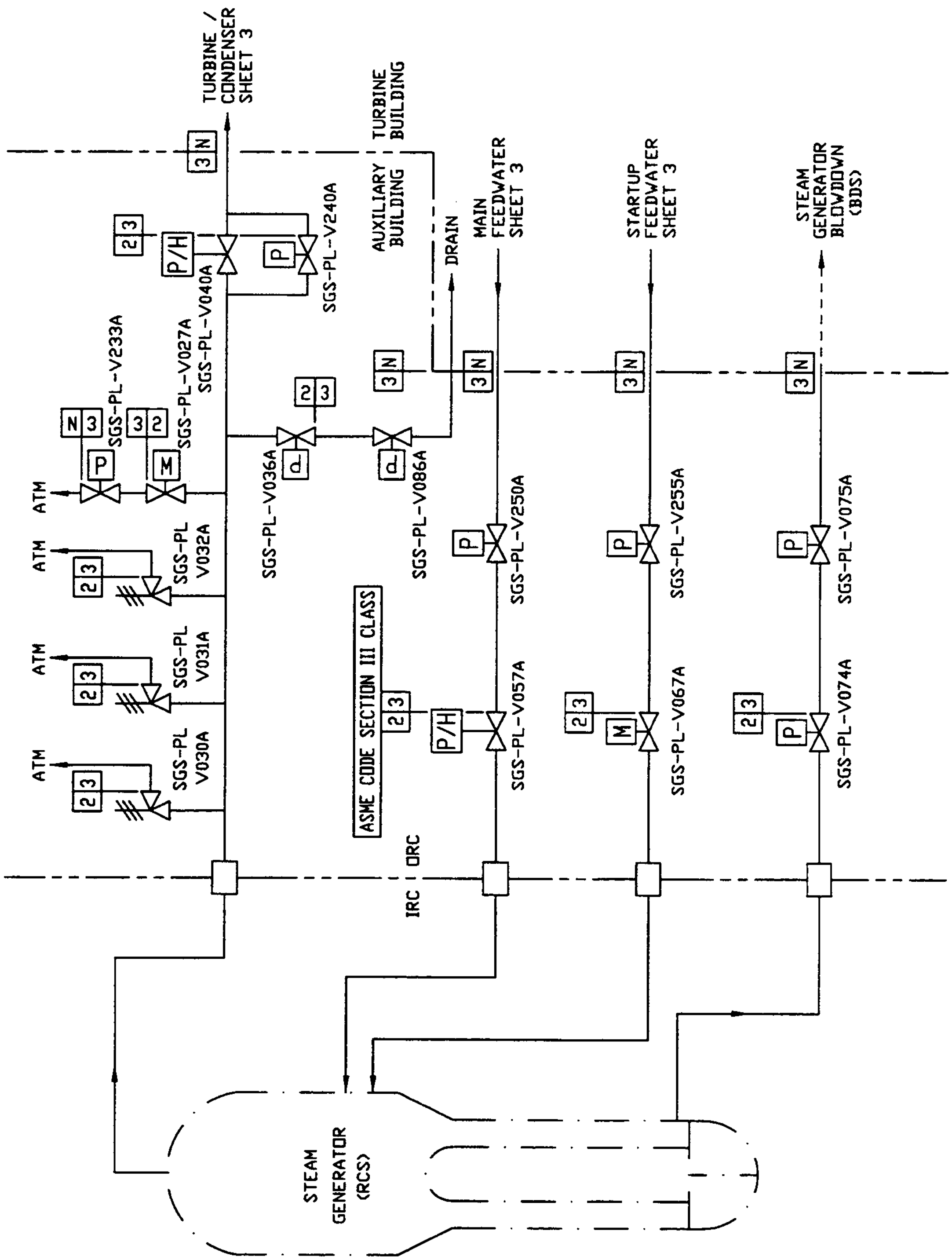

Figure 2.2.4-1 (Sheet 1 of 3)
Steam Generator System

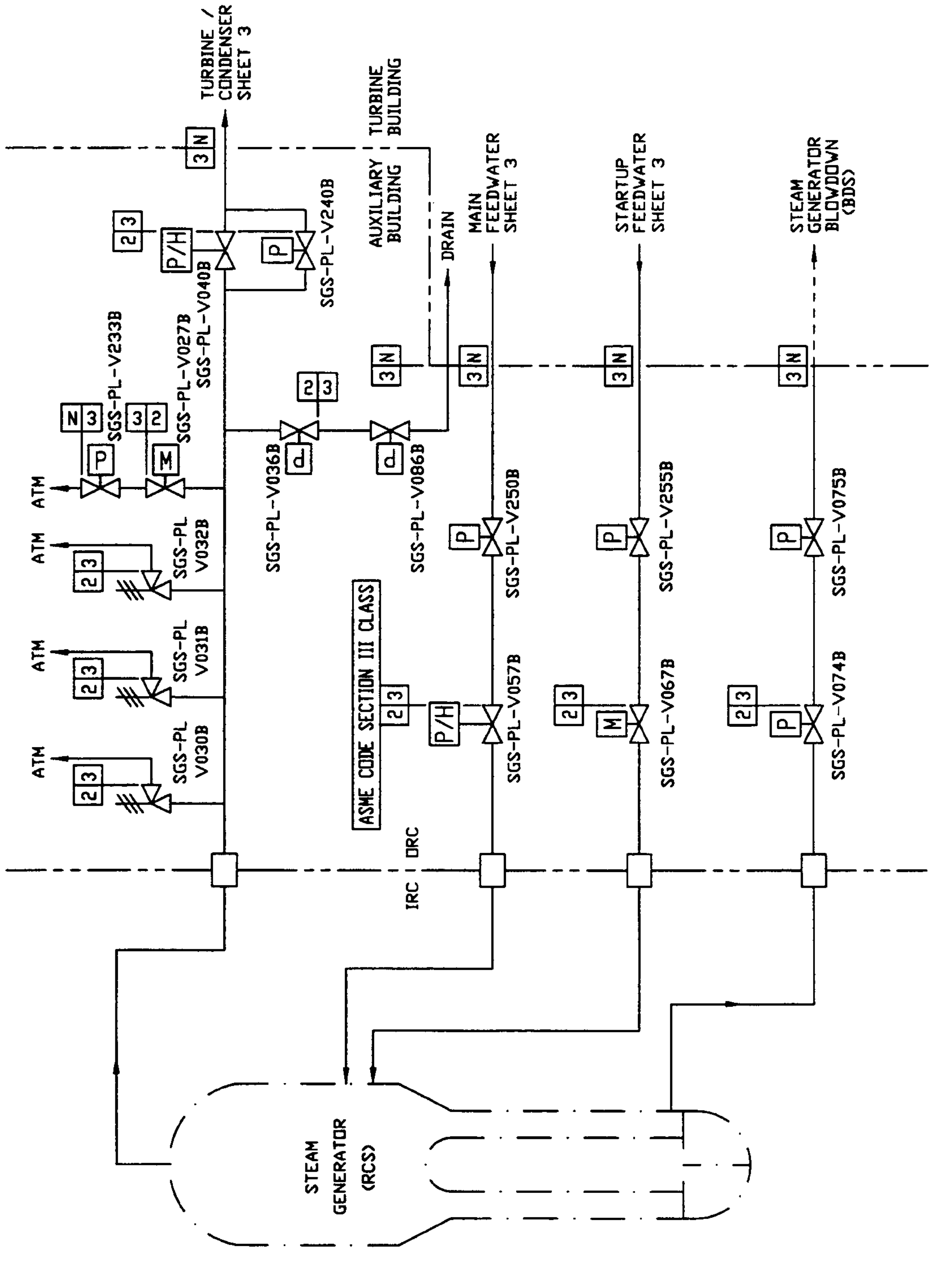

Figure 2.2.4-1 (Sheet 2 of 3)
Steam Generator System

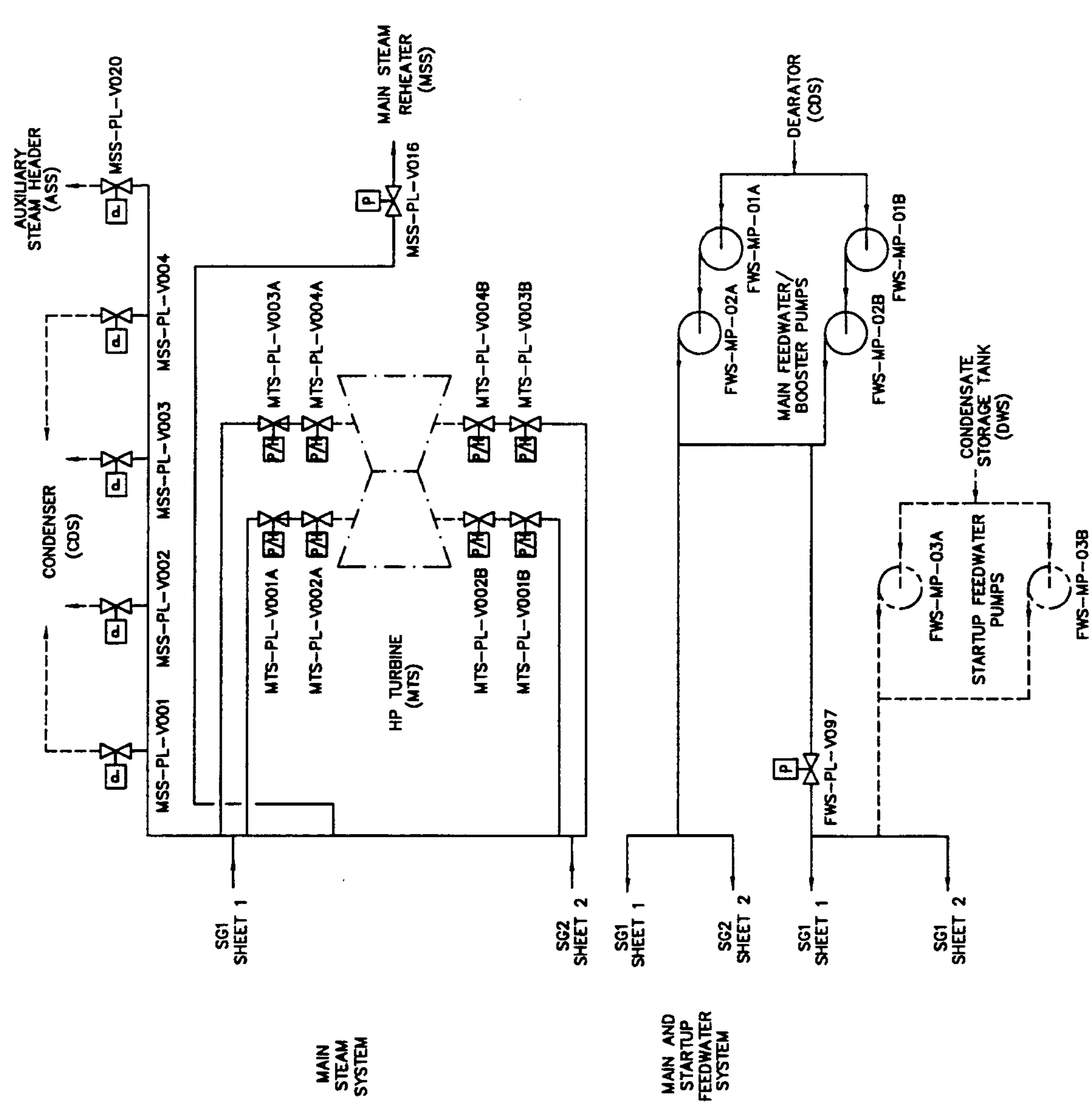

Figure 2.2.4-1 (Sheet 3 of 3)
Steam Generator System

2.2.5 Main Control Room Emergency Habitability System

Design Description

The main control room emergency habitability system (VES) provides a supply of breathable air for the main control room (MCR) occupants and maintains the MCR at a positive pressure with respect to the surrounding areas whenever ac power is not available to operate the nuclear island nonradioactive ventilation system (VBS) or high radioactivity is detected in the MCR air supply. (See CDM Section 3.5 for Radiation Monitoring). The VES also limits the heatup of the MCR, the instrumentation and control (I&C) equipment rooms, and the Class 1E dc equipment rooms by using the heat capacity of surrounding structures.

The VES is as shown in Figure 2.2.5-1 and the component locations of the VES are as shown in Table 2.2.5-6.

1. The functional arrangement of the VES is as described in the Design Description of this Section 2.2.5.

2. a) The components identified in Table 2.2.5-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.

   b) The piping identified in Table 2.2.5-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements.

3. a) Pressure boundary welds in components identified in Table 2.2.5-1 as ASME Code Section III meet ASME Code Section III requirements.

   b) Pressure boundary welds in piping identified in Table 2.2.5-2 as ASME Code Section III meet ASME Code Section III requirements.

4. a) The components identified in Table 2.2.5-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure.

   b) The piping identified in Table 2.2.5-2 as ASME Code Section III retains its pressure boundary integrity at its design pressure.

5. a) The seismic Category I equipment identified in Table 2.2.5-1 can withstand seismic design basis loads without loss of safety function.

   b) Each of the lines identified in Table 2.2.5-2 for which functional capability is required is designed to withstand combined normal and seismic design basis loads without a loss of its functional capability.

6. a) The Class 1E components identified in Table 2.2.5-1 are powered from their respective Class 1E division.

   b) Separation is provided between VES Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.

7. The VES provides the following safety-related functions:

   a) The VES provides a 72-hour supply of breathable quality air for the occupants of the MCR.

   b) The VES maintains the MCR pressure boundary at a positive pressure with respect to the surrounding areas.

   c) The heat loads within the MCR, the I&C equipment rooms, and the Class 1E dc equipment rooms are within design basis assumptions to limit the heatup of the rooms identified in Table 2.2.5-4.

8. Safety-related displays identified in Table 2.2.5-1 can be retrieved in the MCR.

9. a) Controls exist in the MCR to cause those remotely operated valves identified in Table 2.2.5-1 to perform their active functions.

   b) The valves identified in Table 2.2.5-1 as having protection and safety monitoring system (PMS) control perform their active safety function after receiving a signal from the PMS.

10. After loss of motive power, the remotely operated valves identified in Table 2.2.5-1 assume the indicated loss of motive power position.

11. Displays of the parameters identified in Table 2.2.5-3 can be retrieved in the MCR.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.2.5-4 specifies the inspections, tests, analyses, and associated acceptance criteria for the VES.

Table 2.2.5-1

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
Emergency Air Storage Tank 01	VES-MT-01	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 02	VES-MT-02	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 03	VES-MT-03	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 04	VES-MT-04	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 05	VES-MT-05	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 06	VES-MT-06	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 07	VES-MT-07	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 08	VES-MT-08	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 09	VES-MT-09	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 10	VES-MT-10	No	Yes	-	-/-	-	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.5-1 (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
Emergency Air Storage Tank 11	VES-MT-11	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 12	VES-MT-12	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 13	VES-MT-13	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 14	VES-MT-14	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 15	VES-MT-15	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 16	VES-MT-16	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 17	VES-MT-17	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 18	VES-MT-18	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 19	VES-MT-19	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 20	VES-MT-20	No	Yes	-	-/-	-	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.5-1 (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
Emergency Air Storage Tank 21	VES-MT-21	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 22	VES-MT-22	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 23	VES-MT-23	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 24	VES-MT-24	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 25	VES-MT-25	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 26	VES-MT-26	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 27	VES-MT-27	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 28	VES-MT-28	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 29	VES-MT-29	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 30	VES-MT-30	No	Yes	-	-/-	-	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.5-1 (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
Emergency Air Storage Tank 31	VES-MT-31	No	Yes	-	-/-	-	-	-	-
Emergency Air Storage Tank 32	VES-MT-32	No	Yes	-	-/-	-	-	-	-
Pressure Regulating Valve A	VES-PL-V002A	Yes	Yes	No	-/-	No	-	Throttle Flow	-
Pressure Regulating Valve B	VES-PL-V002B	Yes	Yes	No	-/-	No	-	Throttle Flow	-
MCR Air Delivery Isolation Valve A	VES-PL-V005A	Yes	Yes	Yes	Yes/No	No	Yes	Transfer Open	Open
MCR Air Delivery Isolation Valve B	VES-PL-V005B	Yes	Yes	Yes	Yes/No	No	Yes	Transfer Open	Open
MCR Pressure Relief Isolation Valve A	VES-PL-V022A	Yes	Yes	Yes	Yes/No	No	Yes	Transfer Open/ Transfer Closed	Open
MCR Pressure Relief Isolation Valve B	VES-PL-V022B	Yes	Yes	Yes	Yes/No	No	Yes	Transfer Open/ Transfer Closed	Open
MCR Air Delivery Line Flow Sensor	VES-003A	No	Yes	-	Yes/No	Yes	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.5-1 (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
MCR Air Delivery Line Flow Sensor	VES-003B	No	Yes	-	Yes/No	Yes	-	-	-
MCR Differential Pressure Sensor A	VES-004A	No	Yes	-	Yes/No	Yes	-	-	-
MCR Differential Pressure Sensor B	VES-004B	No	Yes	-	Yes/No	Yes	-	-	-

Note: Dash (-) indicates not applicable.

Table 2.2.5-2			
Line Name	Line Number	ASME Code Section III	Functional Capability Required
MCR Relief Line	VES-PL-022A	Yes	Yes
MCR Relief Line	VES-PL-022B	Yes	Yes

Table 2.2.5-3		
Equipment	Tag No.	Display
Air Storage Tank Pressure	VES-001A	Yes
Air Storage Tank Pressure	VES-001B	Yes

Table 2.2.5-4			
Room Name	Room Numbers	Heat Load 0 to 24 Hours (Btu/s)	Heat Load 24 to 72 Hours (Btu/s)
MCR Envelope	12401	12.8 (hour 0 through 3) 5.1 (hour 4 through 24)	3.9
I&C Rooms	12301, 12305	8.8	0
I&C Rooms	12302, 12304	13.0	4.2
dc Equipment Rooms	12201, 12205	3.7 (hour 0 through 1) 2.4 (hour 2 through 24)	0
dc Equipment Rooms	12203, 12207	5.8 (hour 0 through 1) 4.5 (hour 2 through 24)	2.0

Table 2.2.5-5 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The functional arrangement of the VES is as described in the Design Description of this Section 2.2.5.	Inspection of the as-built system will be performed.	The as-built VES conforms with the functional arrangement described in the Design Description of this Section 2.2.5.
2.a) The components identified in Table 2.2.5-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built components as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built components identified in Table 2.2.5-1 as ASME Code Section III.
2.b) The piping identified in Table 2.2.5-2 as ASME Code Section III is designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built piping as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built piping identified in Table 2.2.5-2 as ASME Code Section III.
3.a) Pressure boundary welds in components identified in Table 2.2.5-1 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.
3.b) Pressure boundary welds in piping identified in Table 2.2.5-2 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non-destructive examination of pressure boundary welds.
4.a) The components identified in Table 2.2.5-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure.	A hydrostatic test will be performed on the components required by the ASME Code Section III to be hydrostatically tested.	A report exists and concludes that the results of the hydrostatic test of the components identified in Table 2.2.5-1 as ASME Code Section III conform with the requirements of the ASME Code Section III.
4.b) The piping identified in Table 2.2.5-2 as ASME Code Section III retains its pressure boundary integrity at its design pressure.	A hydrostatic test will be performed on the piping required by the ASME Code Section III to be hydrostatically tested.	A report exists and concludes that the results of the hydrostatic test of the piping identified in Table 2.2.5-2 as ASME Code Section III conform with the requirements of the ASME Code Section III.

Table 2.2.5-5 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
5.a) The seismic Category I equipment identified in Table 2.2.5-1 can withstand seismic design basis loads without loss of safety function.	i) Inspection will be performed to verify that the seismic Category I equipment and valves identified in Table 2.2.5-1 are located on the Nuclear Island.	i) The seismic Category I equipment identified in Table 2.2.5-1 is located on the Nuclear Island.
	ii) Type tests, analyses, or a combination of type tests and analyses of seismic Category I equipment will be performed.	ii) A report exists and concludes that the seismic Category I equipment can withstand seismic design basis loads without loss of safety function.
	iii) Inspection will be performed for the existence of a report verifying that the as-installed equipment including anchorage is seismically bounded by the tested or analyzed conditions.	iii) A report exists and concludes that the as-installed equipment including anchorage is seismically bounded by the tested or analyzed conditions.
5.b) Each of the lines identified in Table 2.2.5-2 for which functional capability is required is designed to withstand combined normal and seismic design basis loads without a loss of its functional capability.	Inspection will be performed for the existence of a report verifying that the as-built piping meets the requirements for functional capability.	A report exists and concludes that each of the as-built lines identified in Table 2.2.5-2 for which functional capability is required meets the requirements for functional capability.
6.a) The Class 1E components identified in Table 2.2.5-1 are powered from their respective Class 1E division.	Testing will be performed by providing a simulated test signal in each Class 1E division.	A simulated test signal exists at the Class 1E equipment identified in Table 2.2.5-1 when the assigned Class 1E division is provided the test signal.
6.b) Separation is provided between VES Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.	See Tier 1 Material, Section 3.3, Nuclear Island Buildings.	See Tier 1 Material, Section 3.3, Nuclear Island Buildings.

Table 2.2.5-5 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
7.a) The VES provides a 72-hour supply of breathable quality air for the occupants of the MCR.	i) Testing will be performed to confirm that the required amount of air flow is delivered to the MCR. ii) Analysis of storage capacity will be performed based on as-built manufacturers data. iii) MCR air samples will be taken during VES testing and analyzed for quality.	i) The air flow rate from the VES is at least 60 scfm and not more than 70 scfm. ii) The calculated storage capacity is greater than or equal to 314,132 scf. iii) The MCR air is of breathable quality.
7.b) The VES maintains the MCR pressure boundary at a positive pressure with respect to the surrounding areas.	i) Testing will be performed with VES flowrate between 60 and 70 scfm to confirm that the MCR is capable of maintaining the required pressurization of the pressure boundary. ii) Air leakage into the MCR will be measured during VES testing using a tracer gas.	The MCR pressure boundary is pressurized to greater than or equal to 1/8-in. water gauge with respect to the surrounding area. ii) Analysis of air leakage measurements indicate that VES operation limits MCR air infiltration consistent with operator dose analysis.

Table 2.2.5-5 (cont.) Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
7.c) The heat loads within the MCR, the I&C equipment rooms, and the Class 1E dc equipment rooms are within design basis assumptions to limit the heatup of the rooms identified in Table 2.2.5-4.	An analysis will be performed to determine that the heat loads from as-built equipment within the rooms identified in Table 2.2.5-4 are less than or equal to the design basis assumptions	A report exists and concludes that: the heat loads within rooms identified in Table 2.2.5-4 are less than or equal to the specified values or that an analysis report exists that concludes: – The temperature and humidity in the MCR remain within limits for reliable human performance for the 72-hour period. – The maximum temperature for the 72-hour period for the I&C rooms is less than or equal to 125°F. – The maximum temperature for the 72-hour period for the Class 1E dc equipment rooms is less than or equal to 120°F.
8. Safety-related displays identified in Table 2.2.5-1 can be retrieved in the MCR.	Inspection will be performed for retrievability of the safety-related displays in the MCR.	Safety-related displays identified in Table 2.2.5-1 can be retrieved in the MCR.
9.a) Controls exist in the MCR to cause remotely operated valves identified in Table 2.2.5-1 to perform their active functions.	Stroke testing will be performed on remotely operated valves identified in Table 2.2.5-1 using the controls in the MCR.	Controls in the MCR operate to cause remotely operated valves identified in Table 2.2.5-1 to perform their active safety functions.
9.b) The valves identified in Table 2.2.5-1 as having PMS control perform their active safety function after receiving a signal from the PMS.	Testing will be performed on remotely operated valves listed in Table 2.2.5-1 using real or simulated signals into the PMS.	The remotely operated valves identified in Table 2.2.5-1 as having PMS control perform the active safety function identified in the table after receiving a signal from the PMS.
10. After loss of motive power, the remotely operated valves identified in Table 2.2.5-1 assume the indicated loss of motive power position.	Testing of the installed valves will be performed under the conditions of loss of motive power.	After loss of motive power, each remotely operated valve identified in Table 2.2.5-1 assumes the indicated loss of motive power position.

Table 2.2.5-5 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
11. Displays of the parameters identified in Table 2.2.5-3 can be retrieved in the MCR.	Inspection will be performed for retrievability of the parameters in the MCR.	The displays identified in Table 2.2.5-3 can be retrieved in the MCR.

Table 2.2.5-6		
Component Name	**Tag Number**	**Component Location**
Emergency Air Storage Tank 01	VES-MT-01	Auxiliary Building
Emergency Air Storage Tank 02	VES-MT-02	Auxiliary Building
Emergency Air Storage Tank 03	VES-MT-03	Auxiliary Building
Emergency Air Storage Tank 04	VES-MT-04	Auxiliary Building
Emergency Air Storage Tank 05	VES-MT-05	Auxiliary Building
Emergency Air Storage Tank 06	VES-MT-06	Auxiliary Building
Emergency Air Storage Tank 07	VES-MT-07	Auxiliary Building
Emergency Air Storage Tank 08	VES-MT-08	Auxiliary Building
Emergency Air Storage Tank 09	VES-MT-09	Auxiliary Building
Emergency Air Storage Tank 10	VES-MT-10	Auxiliary Building
Emergency Air Storage Tank 11	VES-MT-11	Auxiliary Building
Emergency Air Storage Tank 12	VES-MT-12	Auxiliary Building
Emergency Air Storage Tank 13	VES-MT-13	Auxiliary Building
Emergency Air Storage Tank 14	VES-MT-14	Auxiliary Building
Emergency Air Storage Tank 15	VES-MT-15	Auxiliary Building
Emergency Air Storage Tank 16	VES-MT-16	Auxiliary Building
Emergency Air Storage Tank 17	VES-MT-17	Auxiliary Building
Emergency Air Storage Tank 18	VES-MT-18	Auxiliary Building
Emergency Air Storage Tank 19	VES-MT-19	Auxiliary Building
Emergency Air Storage Tank 20	VES-MT-20	Auxiliary Building
Emergency Air Storage Tank 21	VES-MT-21	Auxiliary Building
Emergency Air Storage Tank 22	VES-MT-22	Auxiliary Building
Emergency Air Storage Tank 23	VES-MT-23	Auxiliary Building
Emergency Air Storage Tank 24	VES-MT-24	Auxiliary Building
Emergency Air Storage Tank 25	VES-MT-25	Auxiliary Building
Emergency Air Storage Tank 26	VES-MT-26	Auxiliary Building
Emergency Air Storage Tank 27	VES-MT-27	Auxiliary Building
Emergency Air Storage Tank 28	VES-MT-28	Auxiliary Building

Table 2.2.5-6 (cont.)		
Component Name	**Tag Number**	**Component Location**
Emergency Air Storage Tank 29	VES-MT-29	Auxiliary Building
Emergency Air Storage Tank 30	VES-MT-30	Auxiliary Building
Emergency Air Storage Tank 31	VES-MT-31	Auxiliary Building
Emergency Air Storage Tank 32	VES-MT-32	Auxiliary Building

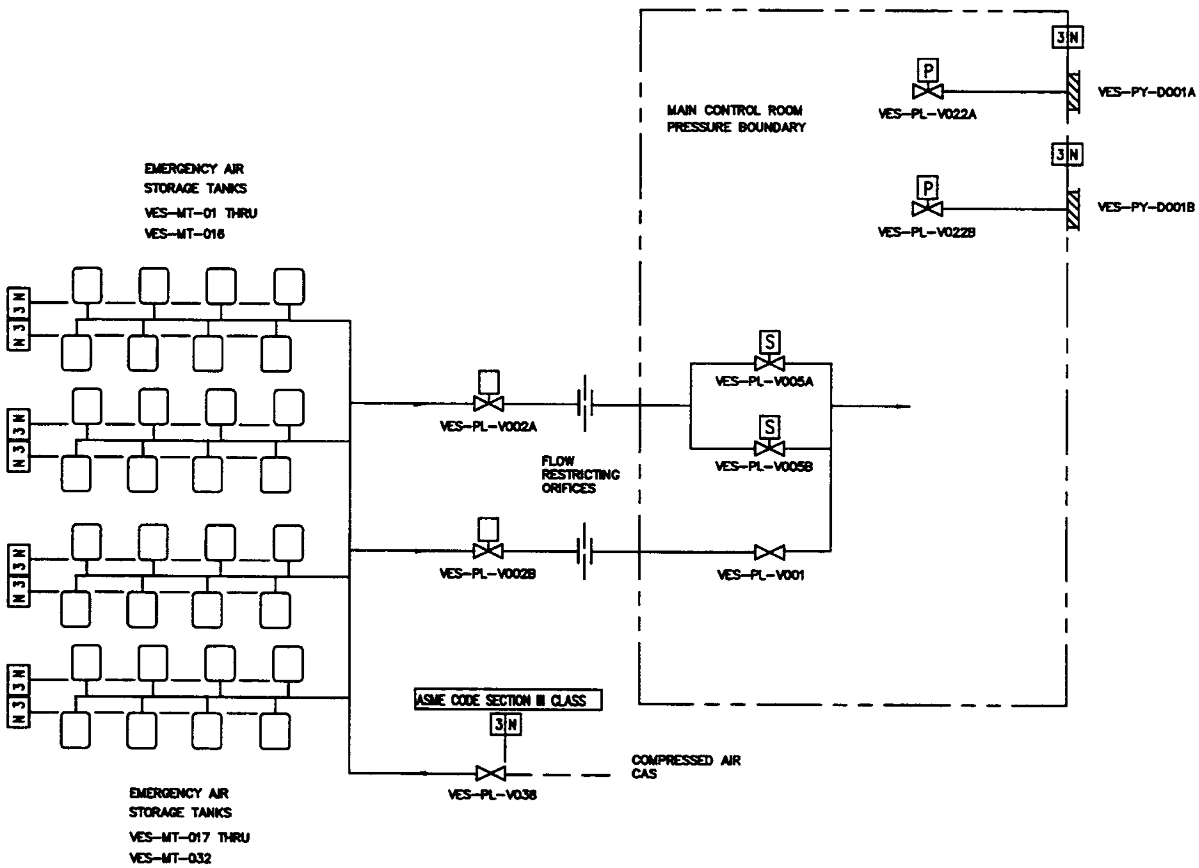

Figure 2.2.5-1
Main Control Room Emergency Habitability System