3MA System Evaluation For ISLOCA

3MA.1 General Comments About the Appendix

This Attachment discusses each of the systems evaluated in detail, presented in the order listed in the Appendix, and following a repetitive outline format.

The first section, "Upgrade Description," describes the changes made to the system and the reasons for placement of the URS boundary.

The second section, "Downstream Interfaces," discusses the systems that interface with the subject system, that could potentially be pressurized by reactor pressure passed through (downstream) the subject system. Each downstream system is dispositioned as being either not applicable for URS upgrading or applicable and the topic of another Attachment 3MA section.

The third section, "Upgraded Components," provides a detailed listing of the components upgraded to the URS design pressure. Also, to indicate some components were not inadvertently overlooked, some components are shown as "No change." The listings are grouped in sections that describe a particular pressure travel path. This grouping may include more than the system of the subject section to detail the path to the tank or sink in which the pressure is dissipated after crossing the last closed valve at the URS boundary.

3MA.2 Residual Heat Removal System

3MA.2.1 Upgrade Description

The RHR System pump suction piping was low pressure and has been upgraded to the URS design pressure. The RHR has two suction sources, one from the suppression pool and the other from the RPV as used for shutdown cooling. The suction piping also includes the keep-fill pump and its piping.

The URS boundary was terminated at the last valve before the suppression pool, which is valve E11-F001. The suppression pool is a large structure, designed to 0.310 MPaG and impractical to upgrade to the URS design pressure.

The other suction branch to the RPV is not a URS boundary because it interfaces to the high pressure RPV. The only portions of the RHR System that are not upgraded to the URS design pressure is unobstructed piping to the suppression pool.

3MA.2.2 Downstream Interfaces

Other systems are listed below that interface with RHR and could possibly be exposed to reactor pressure. A description of the interface location and a statement of its applicability to ISLOCA is given.

- Makeup Water (Condensate) System upstream of the injection valve for the purpose of providing a filling and flushing water source. Another interface with MUWC is between the pair of valves to the FPC System. The MUWC System is discussed in Section 3MA.11, where it is explained how certain MUWC upgrades were made that provide an open path to the CST. The MUWC line cannot be pressurized because of the open communication to the CST, and the CST is vented to atmosphere. There is no source to pressurize the MUWC line because of closed valves in the RHR System's URS region.

- High Conductivity Waste (Radwaste) for drainage located up stream of the pump suction. HCW upgrades are discussed in the Radwaste System, Section 3MA.13.

- Low Conductivity Waste, (Radwaste) at the end of a branch off of the loop B mainline down stream of the RHR heat exchanger. The LCW upgrades are discussed in the Radwaste System, Section 3MA.13.

- Sampling System at the outlet of the RHR heat exchanger. The Sampling System's design pressure exceeds the URS design pressure without upgrade.

- Fuel Pool Cooling and Cleanup System on an RHR System discharge branch. FPC System upgrades are discussed in Section 3MA.8.

- The Fire Protection System and the fire truck connection provide water for the Alternating Current (AC) Independent Water Addition piping of RHR loop C upstream of the RPV injection, wetwell spray line, and drywell spray line. The Fire Protection System piping is designed for 1.37 MPaG and is protected from over pressure by two locked closed block and bleed valves, RHR-F101 and RHR-F102, and a drain pipe between these valves vented to the HCW sump in the Reactor Building. This design very effectively prevents reactor pressure from reaching the Fire Protection System. No upgrade to URS is practical or appropriate for the extensive piping of the Fire Protection System since the system function is not related to ISLOCA nor is its interconnection a normal plant operational pathway.

3MA.2.3 Upgraded Components — RHR System

A detailed listing of the components upgraded for the RHR System follows, including identification of those interfacing system components not requiring upgrade.

RESIDUAL HEAT REMOVAL SYSTEM, Tier 2 Figure 5.4-10, Sheets 1 through 7.

RHR Subsystem A suction piping from the suppression pool.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 3	RHR Pump C001A	3.43 MPaG, 182°C, 3B, As	No change
	450A-RHR-002 Pipe	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	20A-RHR-701 Pipe	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	20A-RHR-F701A Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-PX002A Press.Pt.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	450A-RHR-D002A Temp.Str.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-700 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-F700A Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-PI001A Press.I	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	50A-RHR-018 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	50A-RHR-F026A Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	450A-RHR-F001A MO Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-042 Pipe	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	20A-RHR-F061A Valve	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
Sheet 2	450A-RHR-001 Pipe	0.310 MPaG, 104°C,3B,As	No change
	450A-RHR-D001A Suct.Str.	0.310 MPaG, 104°C,3B,As	No change

RHR Subsystem A suction piping from the reactor pressure vessel.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 3	350A-RHR-011 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	350A-RHR-F012A MO Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-032 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-F042A Rel.Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-707 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-F712A Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-PT009A Press.T	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
Sheet 2	350A-RHR-011 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	* 20A-RHR-504 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	* 20A-RHR-F508A Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-030 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	** 100A-RHR-031 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	** 100A-RHR-F041A Check V	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	** 100A-RHR-F040A Valve.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	***300A-RHR-F016A Valve LC	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	***300A-RHR-098 Pipe	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG

* To LCW funnel drain to LCW Sump.
** To MUW (Condensate) Stem interface.
*** To FPC System interface

RHR Subsystem A discharge fill pump suction piping from the suppression pool.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 3	40A-RHR-C002A Pump	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	40A-RHR-015 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	40A-RHR-F022A Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	40A-RHR-D008A Temp.Str.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-708 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-F713A Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-PX010APress.Pt.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG

	25A-RHR-017 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-709 Pipe	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	25A-RHR-F718A Valve	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	25A-RHR-F719A Valve	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	25A-RHR-PX013A Press.Pt.	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	25A-RHR-F025A Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-D009A RO	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG

RHR Subsystem A discharge from relief valves and test line valve directly to the suppression pool without restriction.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 3	250A-RHR-008 Pipe	0.310 MPaG, 104°C,3B,As	No change
	100A-RHR-025 Pipe	0.310 MPaG, 104°C,3B,As	No change
	100A-RHR-014 Pipe	0.310 MPaG, 104°C,3B,As	No change
	50A-RHR-037 Pipe	0.310 MPaG, 104°C,3B,As	No change
	50A-RHR-033 Pipe	0.310 MPaG, 104°C,3B,As	No change
	50A-RHR-021 Pipe	0.310 MPaG, 104°C,3B,As	No change
	20A-RHR-041 Pipe	0.310 MPaG, 104°C, 3B, As	No Change
	20A-RHR-060A Valve	0.310 MPaG, 104°C, 3B, As	No Change
Sheet 2	250A-RHR-008 Pipe	0.310 MPaG, 104°C,3B,As	No change
	250A-RHR-055A Valve	0.310 MPaG, 104°C, 3B, As	No Change
	Suppression Pool		

RHR Subsystem A flushing line interface at branch discharging to feedwater.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	100A-MUWC-134 Pipe	1.37 MPaG, 66°C,6D,C	No change
Sheet 2	100A-RHR -F032A Valve	3.43 MPaG, 182°C,3B,As	No change
	100A-RHR -026 Pipe	3.43 MPaG, 182°C,3B,As	No change
	100A-RHR -F033A Check V.	3.43 MPaG, 182°C,3B,As	No change

RHR Subsystem A flushing line interface at suction shutdown branch from RPV.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	100A-MUWC-133 Pipe	1.37 MPaG, 66°C,6D,C	No change
Sheet 3	100A-RHR -F040A Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	100A-RHR -031 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	100A-RHR -F041A Check V.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG

RHR Subsystem B suction piping from the suppression pool.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 4	RHR Pump C001B	3.43 MPaG, 182°C,3B,As	No Change
	450A-RHR-102 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-731 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-F701B Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-PX002B Press.Pt.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	450A-RHR-D002B Temp.Str.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-730 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-F700B Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-PI001B Press.I	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG

	50A-RHR-124 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	50A-RHR-F026B Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	450A-RHR-F001B MO Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-152 Pipe	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	20A-RHR-061B Valve	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
Sheet 2	450A-RHR-101 Pipe	0.310 MPaG, 104°C,3B,As	No change
	450A-RHR-D001B Suct.Str.	0.310 MPaG, 104°C,3B,As	No change

RHR Subsystem B suction piping from the reactor pressure vessel.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 4	350A-RHR-111 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	350A-RHR-F012B MO Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-139 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-F042B Rel.Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-737 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-F712B Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-PT009B Press.T	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
Sheet 2	350A-RHR-111 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	* 20A-RHR-534 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	* 20A-RHR-F508B Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-137 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	** 300A-RHR-114 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	** 300A-RHR-F016B Valve LC	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	*** 100A-RHR-138 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	*** 100A-RHR-F041B Check Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	*** 100A-RHR-F040B Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG

* To LCW funnel drain to LCW Sump. ** To FPC System interface.
*** To MUW (Condensate) System interface.

RHR Subsystem B discharge fill pump suction piping from the suppression pool.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 4	40A-RHR-C002B Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	40A-RHR-121 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	40A-RHR-F022B Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	40A-RHR-D008B Temp.Str.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-738 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-F713B Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-PX010BPress.Pt.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-123 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-F025B Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-D009B RO	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-741 Pipe	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	25A-RHR-F718B Valve	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	25A-RHR-F719B Valve	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	25A-RHR-PX013B Press.Pt.	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG

RHR Subsystem B flushing line interface at branch discharging to RPV.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	100A-MUWC-137 Pipe	1.37 MPaG, 66°C,6D,C	No change
Sheet 5	100A-RHR -F032B Valve	3.43 MPaG, 182°C,3B,As	No change
	100A-RHR -132 Pipe	3.43 MPaG, 182°C,3B,As	No change
	100A-RHR -F033B Check V.	3.43 MPaG, 182°C,3B,As	No change

RHR Subsystem B flushing line interface at suction of shutdown branch from RPV.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	100A-MUWC-136 Pipe	1.37 MPaG, 66°C,6D,C	No change
Sheet 2	100A-RHR -F040B Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
Sheet 2	100A-RHR -138 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	100A-RHR -F041B Check V.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG

RHR Subsystem C suction piping from the suppression pool.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 6	RHR Pump C001C	3.43 MPaG, 182°C,3B,As	No change
	450A-RHR-202 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-761 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-F701C Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-PX002C Press.Pt.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	450A-RHR-D002C Temp.Str.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-760 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-F700C Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-PI001C Press.I	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	50A-RHR-225 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	50A-RHR-F026C Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	450A-RHR-F001C MO Vlv	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-255 Pipe	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	20A-RHR-F061C Valve	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
Sheet 2	450A-RHR-201 Pipe	0.310 MPaG, 104°C,3B,As	No change
	450A-RHR-D001C Suct. Str.	0.310 MPaG, 104°C,3B,As	No change

RHR Subsystem B discharge from relief valves and test line valve directly to the suppression pool without restriction.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 4	250A-RHR-109 Pipe	0.310 MPaG, 104°C,3B,As	No change
	100A-RHR-131 Pipe	0.310 MPaG, 104°C,3B,As	No change
	100A-RHR-120 Pipe	0.310 MPaG, 104°C,3B,As	No change
	50A-RHR-145 Pipe	0.310 MPaG, 104°C,3B,As	No change
	50A-RHR-140 Pipe	0.310 MPaG, 104°C,3B,As	No change
	50A-RHR-127 Pipe	0.310 MPaG, 104°C,3B,As	No change
	20A-RHR-151 Pipe	0.310 MPaG, 104°C, 3B, As	No Change
	20A-RHR-060B Valve	0.310 MPaG, 104°C, 3B, As	No Change
Sheet 2	250A-RHR-109 Pipe	0.310 MPaG, 104°C,3B,As	No change
	250A-RHR-055B Valve	0.310 MPaG, 104°C, 3B, As	No Change
	Suppression Pool		

RHR Subsystem B interface with Radwaste System.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 4	150A-RHR-023 Pipe	3.43 MPaG, 66°C, 3B, As	No Change
	150A-RHR-230 Pipe	3.43 MPaG, 66°C, 3B, As	No Change
	150A-RHR-129 Pipe	3.43 MPaG, 66°C,3B,As	No change
	150A-LCW-F006 Valve	2.82 MPaG, 66°C,4D,B	Was 0.981 MPaG
	150A-RHR-FE012B Flow El.	3.43 MPaG, 66°C, 3B, As	No Change
	20A-RHR-739 Pipe	3.43 MPaG, 66°C, 3B, As	No Change
	20A-RHR-740 Pipe	3.43 MPaG, 66°C, 3B, As	No Change
	20A-RHR-714B Valve	3.43 MPaG, 66°C, 3B, As	No Change
	20A-RHR-715B Valve	3.43 MPaG, 66°C, 3B, As	No Change
	20A-RHR-716B Valve	3.43 MPaG, 66°C, 3B, As	No Change
	20A-RHR-717B Valve	3.43 MPaG, 66°C, 3B, As	No Change
	20A-RHR-FT012B Press.Trans.	3.43 MPaG, 66°C, 3B, As	No Change
	100A-RHR-146 Pipe	3.43 MPaG, 66°C, 3B, As	No Change
	100A-RHR-F052B Valve	3.43 MPaG, 66°C, 3B, As	No Change
	150A-LCW-CS Pipe	0.981 MPaG, 66°C,4D,B	No change
	200A-LCW-SS Pipe	0.981 MPaG, 66°C,4D,B	No change
	200A-LCW-SS Valve LO	0.981 MPaG, 66°C,4D,B	No change
	200A-LCW-SS AO Valve	0.981 MPaG, 66°C,4D,B	No change
	* LCW Collector Tank A	0 MPaG, 66°C,4D,B	No change
	200A-LCW-SS Valve LO	0.981 MPaG, 66°C,4D,B	No change
	200A-LCW-SS AO Valve	0.981 MPaG, 66°C,4D,B	No change
	*LCW Collector Tank B	0 MPaG, 66°C,4D,B	No change
	200A-LCW-SS Valve LO	0.981 MPaG, 66°C, 4D, B	No Change
	200A-LCW-SS AO Valve	0.981 MPaG, 66°C, 4D, B	No Change
	* LCW Collector Tank C	0 MPaG, 66°C, 4D, B	No Change
	200A-LCW-SS Valve LO	0.981 MPaG, 66°C, 4D, B	No Change
	200A-LCW-SS AO Valve	0.981 MPaG, 66°C, 4D, B	No Change
	* LCW Collector Tank D	0 MPaG, 66°C, 4D, B	No Change

* Each LCW collector tank is served by the HVAC tank vent system exhausting tank air through filter to RW Stack.

RHR Subsystem C suction piping from the reactor pressure vessel.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 6	350A-RHR-212 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	350A-RHR-F012C MO Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-240 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-F042C Rel.Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-767 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	50A-RHR-F712C Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-PT009C Press.T	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
Sheet 2	350A-RHR-212 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	* 20A-RHR-564 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	* 20A-RHR-F508C Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-238 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	** 300A-RHR-215 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	** 300A-RHR-F016C Valve LC	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	*** 100A-RHR-239 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	*** 100A-RHR-F041C Check Vlv.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG

	*** 100A-RHR-F040C Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG

* To LCW funnel drain to LCW Sump. ** To FPC System interface.
*** To MUW (Condensate) System interface.

RHR Subsystem C discharge fill pump suction piping from the suppression pool.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 6	40A-RHR-C002C Pump	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	40A-RHR-222 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	40A-RHR-F022C Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	40A-RHR-D008C Temp.Str.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-768 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-F713C Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	20A-RHR-PX010C Press.Pt.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-224 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-F025C Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-D009C RO	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	25A-RHR-770 Pipe	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	25A-RHR-F718C Valve	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	25A-RHR-F719C Valve	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	25A-RHR-PX013C Press.Pt.	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG

RHR Subsystem C discharge from relief valves and test line valve direct to the suppression pool without restriction.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 6	20A-RHR-254 Pipe	0.310 MPaG, 104°C, 3B, As	No change
	20A-RHR-060C Valve	0.310 MPaG, 104°C, 3B, As	No change
Sheet 3	250A-RHR-209 Pipe	0.310 MPaG, 104°C,3B,As	No change
	100A-RHR-232 Pipe	0.310 MPaG, 104°C,3B,As	No change
	100A-RHR-221 Pipe	0.310 MPaG, 104°C,3B,As	No change
	50A-RHR-246 Pipe	0.310 MPaG, 104°C,3B,As	No change
	50A-RHR-241 Pipe	0.310 MPaG, 104°C,3B,As	No change
	50A-RHR-228 Pipe	0.310 MPaG, 104°C,3B,As	No change
Sheet 2	250A-RHR-209 Pipe	0.310 MPaG, 104°C,3B,As	No change
	250A-RHR-F055C Valve	0.310 MPaG, 104°C, 3B, As	No change
	Suppression Pool		

RHR Subsystem C flushing line interface at branch discharge to RPV.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 7	100A-RHR-F032C Valve	3.43 MPaG, 182°C, 3B, As	No change
Sheet 1	100A-MUWC-140 Pipe	1.37 MPaG, 66°C,6D,C	No change
	100A-RHR -233 Pipe	3.43 MPaG, 182°C,3B,As	No change
	100A-RHR -F033C Check V.	3.43 MPaG, 182°C,3B,As	No change

RHR Subsystem C flushing line interface at suction of shutdown branch from RPV.

Reference	Components	Press./Temp./Design Seismic Class	Remarks
Sheet 1	100A-MUWC-139 Pipe	1.37 MPaG, 66°C,6D,C	No change
	100A-RHR -239 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	100A-RHR -F041C Check V.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG

Sheet 2	100A-RHR-F040C Valve	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG

RHR Subsystem C outdoor fire truck connection in RHR pump discharge pipe to RPV.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 7	100A-RHR -F103 Valve	2.82 MPaG, 66°C,6D,C	Was 1.57 MPaG
	100A-RHR -F104 Check V.	2.82 MPaG, 66°C,6D,C	Was 1.57 MPaG
	100A-RHR -249 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.57 MPaG
	100A-RHR -247 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.57 MPaG
	100A-RHR -F100 Check V.	2.82 MPaG, 66°C,6D,C	Was 1.57 MPaG
	100A-RHR -F101 Key Lock V.	3.43 MPaG, 182°C,3B,As	No change
	100A-RHR -248 Pipe	3.43 MPaG, 182°C,3B,As	No change
	20A-RHR -769 Pipe	3.43 MPaG, 182°C,3B,As	No change
	20A-RHR -F790 Globe V.	3.43 MPaG, 182°C,3B,As	No change
	20A-RHR -PI-099 Press I	3.43 MPaG, 182°C,3B,As	No change
	20A-RHR -570 Pipe	3.43 MPaG, 182°C,3B,As	No change
	* 20A-RHR -F592 Globe V.LO	3.43 MPaG, 182°C,3B,As	No change
	20A-RHR -571 Pipe	3.43 MPaG, 182°C,3B,As	No change
	** 20A-RHR -F591 Globe V.NC	3.43 MPaG, 182°C,3B,As	No change
	100A-RHR -F102 Key Lock V.	3.43 MPaG, 182°C,3B,As	No change
	100A-RHR -FE-100 Flow El.	3.43 MPaG, 182°C,3B,As	No change
	*** 300A-RHR -205 Pipe	3.43 MPaG, 182°C,3B,As	No change

* Funnel drain to LCW sump in Reactor Building.
** Test valve.
*** Injection pipe to RPV at outboard isolation valve MO F-005C.

No other low Press. components of the RHR System were identified for upgrading to the higher design Press. as shown on the marked P & ID's. Interface with the LCW Reactor Building sump which is vented to atmosphere, is through open funnel drains with low Press. piping to the sump.

3MA.3 High Pressure Core Flooder System

3MA.3.1 Upgrade Description

The HPCF System pump suction piping was low pressure and has been upgraded to the URS design pressure. The HPCF has two suction sources, the primary source being the condensate storage tank (CST) and the suppression pool as an alternate.

The URS boundary was terminated at the last HPCF valve in the pipeline to the CST, E22-F001. Beyond this valve, the pipeline is open to the CST except for three locked open maintenance valves in parallel adjacent to the CST. The pipeline to the CST is a large pipe (50.8 cm) providing a common supply to the HPCF, RCIC, and SPCU System, Because of the open communication to the CST, and the CST is vented to atmosphere, this line cannot be pressurized. The CST is a large structure, impractical to upgrade to the URS design pressure.

The URS boundary was terminated at the last valve before the suppression pool, which is valve E22-F006 and is normally closed. The suppression pool is a large structure, impractical to

upgrade to the URS design pressure. The only portions of the HPCF System that are not upgraded to the URS design pressure is unobstructed piping to the suppression pool.

3MA.3.2 Downstream Interfaces

Other systems are listed below that interface with HPCF and could possibly be exposed to reactor pressure. A description of the interface location and a statement of its applicability is ISLOCA is given.

- Makeup Water (Condensate) System upstream of the injection valve for the purpose of providing the piping keep-fill water source and a filling and flushing water source. The MUWC System is discussed in Section 3MA.11, where it is explained how certain MUWC changes were made that provide an open path to the CST. The MUWC line cannot be pressurized because of the open communication to the CST, and the CST is vented to atmosphere.

There is no source to pressurize the MUWC line because of closed valves in the HPCF System's URS region.

- High Conductivity Waste System for drainage is located downstream of CST suction valve. HCW is discussed in Section 3MA.13.

3MA.3.3 Upgraded Components — HPCF System

A detailed listing of the components upgraded for the HPCF System follows, with identification of interfacing system components not requiring upgrade.

HIGH PRESSURE CORE FLOODER SYSTEM, Tier 2 Figure 6.3-7, Sheets 1 and 2.:

HPCF Subsystem B suction piping from the suppression pool.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 2	400A-HPCF-006 Pipe	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-701 Pipe	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-F701B Valve	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-PX004B Press. Pt.	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-D001B Temp. Str.	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	400A-HPCF-010 Pipe	2.82 MPaG, 104°C,3B,As	Was 1.37 MPaG
	20A-HPCF-700 Pipe	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-F700B Valve	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-PI001B Press.Ind.	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-PT002B Press.Trn.	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-PT003B Press.Trn.	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	25A-HPCF-023 Pipe	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	25A-HPCF-F020B Relief V.	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	400A-HPCF-F007B Check V.	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-025 Pipe	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-F022B T.Valve&cap	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	400A-HPCF-F006B MO.Valve	2.82 MPaG, 104°C,3B,As	Was 1.37 MPaG

	xxA-HPCF-030B Valve	2.82 MPaG, 104°C, 3B, As	Was 1.37 MPaG
	xxA-HPCF-xxx Pipe	2.82 MPaG, 104°C, 3B, As	Was 1.37 MPaG
	400A-HPCF-009 Pipe	0.310 MPaG, 104°C,3B,As	No change
	400A-HPCF-D003B Suction Str. Suppression Pool	0.310 MPaG, 104°C,3B,As	No change

HPCF Subsystem B suction piping from the Condensate Storage Tank.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 2	400A-HPCF-006 Pipe	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	50A-HPCF-018 Pipe	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	50A-HPCF-F012B Valve	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	50A-HPCF-F011B Valve	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	50A-HPCF-017 Pipe	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	50A-HPCF-F002B Check V.	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	400A-HPCF-F001B MO.Valve	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	400A-HPCF-005 SS Pipe	1.37 MPaG, 66°C,B(S1,S2)	No change
	500A-HPCF-004 SS Pipe	1.37 MPaG, 66°C,B(S1,S2)	No change
	400A-HPCF-105 SS Pipe	1.37 MPaG, 66°C,B(S1,S2)	No change
	200A-HPCF-015 SS Pipe	1.37 MPaG, 66°C,B(S1,S2)	No change
	200A-HPCF-016 SS Pipe	1.37 MPaG, 66°C,B(S1,S2)	No change
	* 300A-HPCF-001 SS Pipe	1.37 MPaG, 66°C,B(S1,S2)	No change
	* 300A-HPCF-002 SS Pipe	1.37 MPaG, 66°C,B(S1,S2)	No change
	* 300A-HPCF-003 SS Pipe	1.37 MPaG, 66°C,B(S1,S2)	No change

* Connects to lock open valves at condensate storage tank vented to atmosphere.

HPCF Subsystem B test and minimum flow piping to the suppression pool.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 2	80A-HPCF-014 Pipe	0.310 MPaG, 104°C,3B,As	No change
	200A-HPCF-012 Pipe	0.310 MPaG, 104°C,3B,As	No change
	50A-HPCF-024 Pipe	0.310 MPaG, 104°C,3B,As	No change
	250A-RHR- 109 Pipe Suppression Pool	0.310 MPaG, 104°C,3B,As	No change

HPCF Subsystem B keep fill line interface.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	20A-MUWC-135 Pipe	1.37 MPaG, 66°C,6D,C	No change
	25A-HPCF-F013B Valve	10.79 MPaG, 100°C,3B,As	No change
	25A-HPCF-D006B R0	10.79 MPaG, 100°C,3B,As	No change
	50A-HPCF-019 Pipe	10.79 MPaG, 100°C,3B,As	No change
	50A-HPCF-020 Pipe	10.79 MPaG, 100°C,3B,As	No change
	50A-HPCF-F016B Valve	10.79 MPaG, 100°C,3B,As	No change
	20A-HPCF-707 Pipe	10.79 MPaG, 100°C, 3B, As	No change
	20A-HPCF-716B Valve	10.79 MPaG, 100°C, 3B, As	No change
	20A-HPCF-717B Valve	10.79 MPaG, 100°C, 3B, As	No change
	20A-HPCF-PX010B Press.Pt.	10.79 MPaG, 100°C, 3B, As	No change

HPCF Subsystem C suction piping from the suppression pool and condensate storage tank.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 2	400A-HPCF-110 Pipe	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-801 Pipe	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-F701C Valve	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-PX004C Press. Pt.	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-D001C Temp. Str.	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-800 Pipe	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-F700C Valve	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-PI001C Press.Ind.	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-PT002C Press.Trn.	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-PT003C Press.Trn.	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	400A-HPCF-106 Pipe	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	50A-HPCF-118 Pipe	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	50A-HPCF-F012C Valve	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	50A-HPCF-F011C Valve	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	50A-HPCF-117 Pipe	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	50A-HPCF-F002C Check V.	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	400A-HPCF-F001C MO.Valve	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	25A-HPCF-123 Pipe	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	25A-HPCF-F020C Relief V.	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	400A-HPCF-F007C Check V.	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-125 Pipe	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	20A-HPCF-F022C T.Valve&cap	2.82 MPaG, 100°C,3B,As	Was 1.37 MPaG
	400A-HPCF-F006B MO.Valve	2.82 MPaG, 104°C,3B,As	Was 1.37 MPaG
	20A-HPCF-F030C Valve	2.82 MPaG, 100°C, 3B, As	Was 1.37 MPaG
	20A-HPCF-xxx- Pipe	2.82 MPaG, 100°C, 3B, As	Was 1.37 MPaG
	400A-HPCF-105 Pipe	1.37 MPaG, 66°C, 3B, B(S1,S2)	No change
	400A-HPCF-109 Pipe	0.310 MPaG, 104°C,3B,As	No change
	400A-HPCF-D003C Suction Str.	0.310 MPaG, 104°C,3B,As	No change
	Suppression Pool		

HPCF Subsystem C test and minimum flow piping to the suppression pool.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 2	80A-HPCF-114 Pipe	0.310 MPaG, 104°C,3B,As	No change
	200A-HPCF-112 Pipe	0.310 MPaG, 104°C,3B,As	No change
	50A-HPCF-124 Pipe	0.310 MPaG, 104°C,3B,As	No change
	250A-RHR- 209 Pipe	0.310 MPaG, 104°C,3B,As	No change
	Suppression Pool		

HPCF Subsystem C keep fill line interface.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	20A-MUWC-138 Pipe	1.37 MPaG, 66°C,6D,C	No change
Sheet 1	25A-HPCF-F013C Valve	10.79 MPaG, 100°C,3B,As	No change
	25A-HPCF-D006C R0	10.79 MPaG, 100°C,3B,As	No change
	50A-HPCF-119 Pipe	10.79 MPaG, 100°C,3B,As	No change
	50A-HPCF-120 Pipe	10.79 MPaG, 100°C,3B,As	No change
	50A-HPCF-F016C Valve	10.79 MPaG, 100°C,3B,As	No change
	20A-HPCF-807 Pipe	10.79 MPaG, 100°C, 3B, As	No change
	20A-HPCF-716C Valve	10.79 MPaG, 100°C, 3B, As	No change

20A-HPCF-717C Valve	10.79 MPaG, 100°C, 3B, As	No change
20A-HPCF-PX010C Press.Pt.	10.79 MPaG, 100°C, 3B, As	No change

* Connects to locked open valves from condensate storage tank which is vented to atmosphere.

3MA.4 Reactor Core Isolation Cooling System

3MA.4.1 Upgrade Description

The RCIC System pump suction piping was low pressure and has been upgraded to the URS design pressure. The RCIC has two suction sources, the primary source being the CST and the suppression pool as an alternate.

The URS boundary was terminated at the last RCIC valve in the pipeline to the CST, E51-F001. Beyond this valve, the pipeline is open to the CST except for three locked open maintenance valves in parallel adjacent to the CST. The pipeline to the CST is a large pipe (500A) providing a common supply to the RCIC, HPCF, and SPCU System. Because of the open communication to the CST, and the CST is vented to atmosphere, this line cannot be pressurized. The CST is a large structure, impractical to upgrade to the URS design pressure.

The URS boundary was terminated at the last valve before the suppression pool, which is valve E51-F006 and is normally closed. The suppression pool is a large structure, impractical to upgrade to the URS design pressure. The only portions of the RCIC System that are not upgraded to the URS design pressure is unobstructed piping to the suppression pool.

3MA.4.2 Downstream Interfaces

Other systems are listed below that interface with RCIC and could possibly be exposed to reactor pressure. A description of the interface location and a statement of its applicability to ISLOCA is given.

- Makeup Water (Condensate) System upstream of the injection valve for the purpose of providing the piping keep-fill water source and a filling and flushing water source. The MUWC System is discussed in Section 3MA.11.

- High Conductivity Waste System for drainage is located downstream of CST suction check valve. HCW is discussed in Section 3MA.13.

- Reactor Core Isolation Cooling System shares common CST suction. The CST suction has open communication to the CST, and the CST is vented to atmosphere; this line cannot be pressurized and was not practical to upgrade to the URS design pressure.

- Suppression Pool Cleanup System shares common CST suction. The CST suction has open communication to the CST, and the CST is vented to atmosphere; this line cannot be pressurized and was not practical to upgrade to the URS design pressure.

3MA.4.3 Upgraded Components — RCIC System

A detailed listing of the components upgraded for the RCIC System follows, including identification of those interfacing system components not requiring upgrade.

REACTOR CORE ISOLATION COOLING SYSTEM, Tier 2 Figure 5.4-8, Sheets 1 & 3.

RCIC pump suction piping

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	200A-RCIC-001-W Pipe	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	20A-RCIC-703-W Pipe	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	20A-RCIC-F701 Valve	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	20A-RCIC-PX015 P.Test	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	200A-RCIC-D001 Strainer	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	20A-RCIC-700-W Pipe	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	20A-RCIC-F700 Valve	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	20A-RCIC-PT001 P.Trans	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	20A-RCIC-701-W Pipe	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	20A-RCIC-702-W Pipe	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	20A-RCIC-PI003 P.Ind.	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	20A-RCIC-PT002 P.Trans	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	50A-RCIC-018-W Pipe	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	50A-RCIC-F017 R.Valve	2.82 MPaG, 104°C,3B,As	Was 1.37 MPaG
	200A-RCIC-F002 T.Check	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	20A-RCIC-F060 Valve	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	20A-RCIC-xxx Pipe	2.82 MPaG, 77°C, 3B, As	Was 1.37 MPaG
	xxA-RCIC-F062 Valve	2.82 MPaG, 104°C, 3B, As	Was 1.37 MPaG
	xxA-RCIC-xxx- Pipe	2.82 MPaG, 104°C, 3B, As	Was 1.37 MPaG
	* 200A-RCIC-F001 MO Valve	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	** 200A-RCIC-005-W Pipe	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	** 200A-RCIC-F007 Check V.	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	** 20A-RCIC-025-W Pipe	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
	** 20A-RCIC-F027 T.Valve	2.82 MPaG, 77°C,3B,As	Was 1.37 MPaG
Sheet 1	** 200A-RCIC-F006 MO Valve	2.82 MPaG, 104°C,3B,As	Was 1.37 MPaG

* HPCF Interface Piping 200A-HPCF-015-S, 1.37 MPaG, 66°C,B (S1,S2), As (open pathway to Condensate Storage Tank with LO valves).

** Suction Piping from Suppression Pool Interface 200A-RCIC-004-W, 0.310 MPaG, 104°C, 3B, As.

RCIC discharge from relief valves and test line valve direct to the suppression pool without restriction.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 2	250A-RHR- 008 Pipe	0.310 MPaG, 104°C, 3B, As	No change
Sheet 1	50A-RCIC-009-W Pipe	0.310 MPaG, 104°C,3B,As	No change
	50A-RCIC-019-W Pipe	0.310 MPaG, 104°C,3B,As	No change
	100A-RCIC-007-W Pipe	0.310 MPaG, 104°C,3B,As	No change
Sheet 1	Suppression Pool		

ABWR High Press. Core Flooder System, Tier 2 Figure 6.3-7, components interfacing with RCIC System are not upgraded because this is the open pathway to the condensate storage tank vented to the atmosphere.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	200A-HPCF-015-W Pipe	1.37 MPaG, 66°C,B (S1,S2), As	No change
	400A-HPCF-105-W Pipe	1.37 MPaG, 66°C,B (S1,S2), As	No change
	500A-HPCF-004-W Pipe	1.37 MPaG, 66°C,B (S1,S2), As	No change
	300A-HPCF-001-W Pipe	1.37 MPaG, 66°C,B (S1,S2), As	No change
	300A-HPCF-002-W Pipe	1.37 MPaG, 66°C,B (S1,S2), As	No change
	300A-HPCF-003-W Pipe	1.37 MPaG, 66°C,B (S1,S2), As	No change

ABWR Makeup Water System (Condensate), Tier 2 Figure 9.2-4, components interfacing with HPCF System are not upgraded due to the open pathway to the condensate storage tank vented to the atmosphere.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	300A-MUWC-F100 Valve	1.37 MPaG, 66°C,6D,C	No change
	300A-MUWC-F101 Valve	1.37 MPaG, 66°C,6D,C	No change
	300A-MUWC-F102 Valve	1.37 MPaG, 66°C,6D,C	No change
	300A-MUWC-100 Pipe	Static Hd, 66°C,6D,C	No change
	300A-MUWC-101 Pipe	Static Hd, 66°C,6D,C	No change
	300A-MUWC-102 Pipe	Static Hd, 66°C,6D,C	No change
	Condensate Storage Tank,	66°C,6D,C	No change

RCIC turbine condensate piping to the suppression pool

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 3	250A-RCIC-037-S Pipe	8.62 MPaG, 302°C,3B,As	Was 0.981 MPaG
	20A-RCIC-720-S Pipe	8.62 MPaG, 302°C,3B,As	Was 0.981 MPaG
	20A-RCIC-F722 Valve	8.62 MPaG, 302°C,3B,As	Was 0.981 MPaG
	20A-RCIC-PI012 P.Ind.	8.62 MPaG, 302°C,3B,As	Was 0.981 MPaG
	350A-RCIC-Cond. Pot	8.62 MPaG, 302°C,3B,As	Was 0.981 MPaG
	350A-RCIC-038-S Pipe	8.62 MPaG, 302°C,3B,As	Was 0.981 MPaG
	20A-RCIC-721-S Pipe	8.62 MPaG, 302°C,3B,As	Was 0.981 MPaG
	20A-RCIC-F723 Valve	8.62 MPaG, 302°C,3B,As	Was 0.981 MPaG
	20A-RCIC-722-S Pipe	8.62 MPaG, 302°C,3B,As	Was 0.981 MPaG
	20A-RCIC-723-S Pipe	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-724-S Pipe	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-725-S Pipe	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-726-S Pipe	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-F724 Valve	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-F725 Valve	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-F726 Valve	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-F727 Valve	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-F728 Valve	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-F729 Valve	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-F730 Valve	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-F731 Valve	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG

	20A-RCIC-F732 Valve	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-F733 Valve	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-F734 Valve	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-PT014A Press.Trans.	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-PT014B Press.Trans.	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-PT014E Press.Trans.	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	20A-RCIC-PT014F Press.Trans.	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	xxA-RCIC-xxx Pipe	8.62 MPaG, 302°C, 3B, As	Was 0.981 MPaG
	80A-RCIC-054-S Pipe	0.981 MPaG, 184°C, 3B, As	No change
	80A-RCIC-F054-S Check V.	0.981 MPaG, 184°C, 3B, As	No change
	80A-RCIC-F055-S Check V.	0.981 MPaG, 184°C, 3B, As	No change
	20A-RCIC-PT013A P.Trans	8.62 MPaG, 302°C,3B,As	Was 1.37 MPaG
	20A-RCIC-PT013E P.Trans	8.62 MPaG, 302°C,3B,As	Was 1.37 MPaG
Sheet 1	350A-RCIC-F038 Check	8.62 MPaG, 302°C,3B,As	Was 1.37 MPaG
	20A-RCIC-053-S Pipe	8.62 MPaG, 302°C,3B,As	Was 0.981 MPaG
	20A-RCIC-F053 T.Valve	8.62 MPaG, 302°C,3B,As	Was 0.981 MPaG
	350A-RCIC-F039 Valve	8.62 MPaG, 302°C,3B,As	Was 0.981 MPaG
	A-RCIC-F069 T.Valve	8.62 MPaG, 302°C,3B,As	Was 10.981 MPaG
	350A-RCIC-039-S Pipe	0.981 MPaG, 184°C,3B,As	No change
Sheet 1	Suppression Pool		

Sheet 2: Instrument piping from RCIC steam supply piping to PT-009, PI-010 and level switch LS-011.

Reference	Components	Press./Temp./Design/ Press. Rating	Remarks
Sh 2,H-6	20A-RCIC-716-S Pipe	8.62 MPaG, 302°C,3B,As	Reactor Press.
	20A-RCIC-F716 Valve	8.62 MPaG, 302°C, 3B, As	Reactor Press
	20A-RCIC-F717 Valve	8.62 MPaG, 302°C, 3B, As	Reactor Press
H-7	20A-RCIC-717-S Pipe	8.62 MPaG, 302°C,3B,As	Reactor Press.
G-5	20A-RCIC-718-S Pipe	8.62 MPaG, 302°C,3B,As	Reactor Press.
	20A-RCIC-F718 Valve	8.62 MPaG, 302°C, 3B, As	Reactor Press
	20A-RCIC-F719 Valve	8.62 MPaG, 302°C, 3B, As	Reactor Press
F-5	0A-RCIC-719-S Pipe	8.62 MPaG, 302°C,3B,As	Reactor Press.
	20A-RCIC-F720 Valve	8.62 MPaG, 302°C, 3B, As	Reactor Press
	20A-RCIC-F721 Valve	8.62 MPaG, 302°C, 3B, As	Reactor Press

No other low Press. components of the RCIC System were identified for upgrading to the higher design Press. as shown on the marked P & ID's. Interface with the LCW Reactor Building sump which is vented to atmosphere, is through open funnel drains with low Press. piping to the sump.

3MA.5 Control Rod Drive System

3MA.5.1 Upgrade Description

The CRD System interfaces with the reactor in a manner that makes low pressure piping over pressurization very unlikely. The minimum failure path from the reactor to the low pressure piping has three check valves in series and the second check valve is 1.27 cm in size. This path is from the purge flow channels of the CRD, out through the first check valve in the CRD housing, through the purge supply line that has the second 1.27 cm check valve, and to the pump

discharge check valve. An alternate path through the accumulator charging line has additionally the normally closed scram valve, and this path is less likely for failure, therefore not considered. The path from the pump discharge, back through the pump to its suction, and back through the suction lines to the condensate storage tank or the condensate feedwater source is an open path. The open pump suction pipeline is a minimum 100 mm diameter except for a 150 mm diameter attachment to the Condensate Storage Tank. The CRD pumps run continuously while the reactor is at operating pressure, which prevents reactor pressure from reaching the low pressure piping unless for the unlikely case when both CRD pumps have failed. Therefore, an ISLOCA condition from a 12.7 mm diameter source could only occur when three check valves in series fail open at the same time both CRD pumps have failed. The ISLOCA guidelines do not provide credit for this rare condition, so the low pressure piping has been upgraded to the URS design criteria over the entire low pressure piping region of the CRD system. The suction path through the Makeup Water System (Condensate) to the Condensate Storage Tank from the CRD interface is an open path whose design pressure was not upgraded to URS design criteria. The piping design of the primary suction path through the Condensate, Feedwater and Condensate Extraction System has not been established, but if a check valve is in the path, the design pressure up to and including the check valve will be the URS design pressure.

The normal key assumption to this evaluation, as stated in the Boundary Limits of URS section above, that the valve adjacent to a low pressure sink remains closed, means that the pump discharge check valve remains closed as a given. however, this valve is in the high pressure piping, which is unique for the CRD system. according to this accepted line of reasoning, the low pressure piping would not have to be upgraded because it would not experience the high reactor pressure. However, the low pressure piping has been upgraded in response to reference 1's guidance that states "for all interfacing systems and components which do not meet the full RCS URS criteria, justification is required, which must include engineering feasibility; not solely a risk benefit analysis." Upgrading the low pressure piping is feasible and was done.

3MA.5.2 Downstream Interfaces

Other systems are listed below that interface with the CRD system and could possibly be exposed to reactor pressure. A description of the interface location and a statement of its applicability to ISLOCA is given.

- Reactor Water Cleanup System at the output of the filter units. The RWCU design pressure exceeds the URS design pressure without upgrade.

- Reactor Recirculation System purge water supplied by the CRD system, has a 8.83 mPaGdesign pressure, which exceeds the URS design pressure and needs no upgrade.

- Makeup Water (Condensate) System provides pump suction from and system return to the CST. The MUWC system is discussed in Section 3MA.11, where it is explained how certain MUWC upgrades were made that provide an open path to the CST. This line cannot be pressurized because of the open communication to the CST, and the CST is vented to

atmosphere. There is no source to pressurize the MUWC line because of closed pump discharge check valves in the CRD system's URS region.

- Condensate, Feedwater and Air Extraction system provides pump suction from the turbine building condensate supply. This system is not part of the Tier 2 design scope, but it is expected to be an open path to a large source similar to the MUWC system. Because of the open path the CFAE system was not upgraded.

- Sampling system at the output of the filter units. The Sampling systems's design pressure exceeds the URS design pressure without upgrade.

- Nuclear Boiler system at a branch off of the CRD purge line provides the water for conducting RPV hydro tests and the 9.81 MPaG design pressure exceeds the URS design pressure and needs no upgrade.

3MA.5.3 Upgraded Components — CRD System

A detailed listing of the components upgraded for the CRD System follows, including identification of those interfacing system components not requiring upgrade.

CONTROL ROD DRIVE SYSTEM, Tier 2 Figure 4.6-8, Sheets 1, 2 & 3. :

CRD pump suction piping Condensate, Feedwater and Condensate Air Extraction System or Condensate Storage Tank of the Makeup Water System (Condensate).

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Note 14	100A-CFDWAO-Fxxx Valve	4.12 MPaG, 66°C,B,(S1,S2),As	No change
Sheet 1	100A-CRD-001 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	150A-MUWC-Fxxx Valve LO	1.37 MPaG, 66°C,3B,As	No change
	150A-CRD-002-S Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
Sheet 1	Condensate Storage Tank,	66°C,6D,C	No change
	50A-MUWC-F103 Valve	1.37 MPaG, 66°C,6D,C	Lock Open
	50A-MUWC-103 Pipe	Static Hd, 66°C,6D,C	No change
	100A-CRD-F001A Gate V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	100A-CRD-003 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	CRD-D001A Filter	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	20A-CRD-500-S Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	20A-CRD-F500A Valve NC	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	20A-CRD-501-S Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	20A-CRD-F501A Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	100A-CRD-004 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	100A-CRD-F002A Gate V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	100A-CRD-F001B Gate V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	100A-CRD-005 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	CRD-D001B Filter	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	20A-CRD-502 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	20A-CRD-F500B Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	20A-CRD-503 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	20A-CRD-F501B Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	100A-CRD-006 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG

	100A-CRD-F002B Gate V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	100A-CRD-007 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	20A-CRD-700 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	20A-CRD-F700 Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	CRD-DPT001 Diff P T	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	20A-CRD-F701 Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	20A-CRD-701 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	100A-CRD-F003A Gate V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	100A-CRD-008 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	25A-CRD-504 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	25A-CRD-F004A Safe.RV	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	20A-CRD-702 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	20A-CRD-F702A Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	CRD-PI002A Press I	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	CRD-PT003A Press T	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	CRD-C001A Pump	18.63 MPaG, 66°C,6D,C	No change
	* CRD-F502A Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	* A-CRD-505 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	* CRD-F503A Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	* CRD-F504A Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	* A-CRD-506 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	* A-CRD-507 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	* CRD-F505A Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	* CRD-F506A Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	100A-CRD-F003B Gate V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	100A-CRD-010 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	25A-CRD-508 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	25A-CRD-F004B Safe.RV	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	20A-CRD-703 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	20A-CRD-F702B Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	CRD-PI002B Press I	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	CRD-PT003B Press T	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	CRD-C001B Pump	18.63 MPaG, 66°C,6D,C	No change
	* A-CRD-509 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	* CRD-F502B Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	* CRD-F503B Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	* A-CRD-510 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	* CRD-F504B Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	* CRD-F505B Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	* A-CRD-511 Pipe	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
	* CRD-F506B Globe V	2.82 MPaG, 66°C,6D,C	Was 1.37 MPaG
Sheet 3	25A-CRD-075 Pipe	2.82 MPaG, 66°C, 6D, C	Was 1.37 MPaG
	25A-CRD-076 Pipe	2.82 MPaG, 66°C, 6D, C	Was 1.37 MPaG
	25A-CRD-077 Pipe	2.82 MPaG, 66°C, 6D, C	Was 1.37 MPaG
	25A-CRD-F062A Valve	2.82 MPaG, 66°C, 6D, C	Was 1.37 MPaG
	25A-CRD-F062B Valve	2.82 MPaG, 66°C, 6D, C	Was 1.37 MPaG

* Size dependent on pump requirements.

CRD interface from pump discharge to the MUWC System condensate storage tank

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	50A-CRD-034 Pipe	18.63 MPaG, 66°C,6D,C	No change
	50A-CRD-F022 Globe V	18.63 MPaG, 66°C,6D,C	No change
	20A-CRD-035 Pipe	18.63 MPaG, 66°C,6D,C	No change
	20A-CRD-F023 Globe V	18.63 MPaG, 66°C,6D,C	No change
	50A-MUWC-xxx Pipe	1.37 MPaG, 66°C,6D,C	No change
	50A-MUWC-Fxxx Globe V	1.37 MPaG, 66°C,6D,C	No change
	Condensate Storage Tank	66°C,6D,C	No change

CRD interface from pump discharge to the RRS System

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	20A-CRD-036 Pipe	18.63 MPaG, 66°C,6D,C	No change
	20A-CRD-F024 Globe V	18.63 MPaG, 66°C,6D,C	No change
	20A-CRD-F025 Globe V	18.63 MPaG, 66°C,6D,C	No change

CRD interface from pump discharge to the CUW System

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	20A-CRD-037 Pipe	18.63 MPaG, 66°C,6D,C	No change
	20A-CRD-F026 Globe V	18.63 MPaG, 66°C,6D,C	No change
	20A-CRD-F027 Globe V	18.63 MPaG, 66°C,6D,C	No change

No other low pressure components of the Control Rod Drive System were identified for upgrading to the higher design pressure as shown on the marked P & ID's. Interface with the LCW Reactor Building sump which is vented to atmosphere, is through open funnel drains with low pressure piping to the sump.

3MA.6 Standby Liquid Control System

3MA.6.1 Upgrade Description

The SLC System interfaces with the reactor through the HPCF injection piping inside the drywell. The leakage path includes three 40A check valves in series with normally closed motor operated valves in addition to the positive displacement pumps piped in parallel. A 40A nominal pipe size test pipe from the pump discharge piping to the test tank has two normally closed valves in series. All of these valves have leakage test features. Short monthly pump operating tests produce demineralized water flow through the test tank.

The 100A pump suction piping between the pumps, the storage tank outlet valve, the test tank and the MUWP System interface is upgraded to URS design criteria. The SLC storage tank is vented to atmosphere and serves as the pressure release sink connecting to the outermost pump suction piping valves.

All low pressure instrumentation, pressure relief, drain piping and valving are upgraded to URS design criteria to reduce the level of pressure challenge to these components.

3MA.6.2 Downstream interfaces.

Other systems are listed below that interface with the SLC System and could possibly be exposed to reactor pressure. A description of the interface location and a statement of its applicability to ISLOCA is given.

- MUWP System 80A piping interface occurs at the SLC check valve connected to a branch off the test loop suction pipe. This SLC branch piping consists of a normally closed flushing valve and a normally open 20A suction piping pressurizing valve to prevent borated solution migrating to the SLC injection pump suction piping. Refer to Section 3MA.12 for upgrade information on the MUWP System.

- MUWP System also provides the makeup water to the SLC System storage tank through block and bleed valves and a piping drain to a portable container to prevent leakage of additional makeup into the SLC storage tank which could dilute the borate solution in the tank.

3MA.6.3 Upgraded Components — SLC System

A detailed listing of the components upgraded for the SLC System follows, including identification of those interfacing system components not requiring upgrade.

STANDBY LIQUID CONTROL SYSTEM, Tier 2 Figure 9.3-1, Sheet 1. :

SLC Injection Pump A suction piping from the SLC storage tank.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	SLC-C001A Pump	10.79 MPaG, 66°C,3B,A	No Change
	SLC-F003A Relief V.	10.79 MPaG, 66°C,3B,A	No Change
	50A-SLC Pipe	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	100A-SLC-F002A Valve LO	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	100A-SLC-SS Pipe	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	100A-SLC-F001A Valve MO	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	* SLC-A001 Storage Tk.	Static Hd., 66°C,3B,A	No Change

SLC Injection Pump B suction piping from the SLC storage tank.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	SLC-C001B Pump	10.79 MPaG, 66°C,3B,A	No Change
	SLC-F003B Relief V.	10.79 MPaG, 66°C,3B,A	No Change
	50A-SLC-SS Pipe	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	100A-SLC-F002B Valve LO	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	100A-SLC-SS Pipe	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	20A-SLC-SS Pipe	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	20A-SLC-F500 Valve	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	100A-SLC-F001B Valve MO	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	* SLC-A001 Storage TK.	Static Hd., 66°C,3B,A	No Change

* SLC Storage Tank is vented to atmosphere.

SLC test tank piping.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	** 40A-SLC-F011 Valve LC	10.79 MPaG, 66°C,3B,A	Was ATP
	40A-SLC-SS Pipe	0 MPaG, 66°C,6D,A	Was 1.37 MPaG
	SLC-A002 Test Tank	Static Head, 66°C,6D,A	No change
	100A-SLC-SS Pipe	Static Head, 66°C,6D,A	Was 1.37 MPaG
	100A-SLC-F012 Valve LC	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	25A-SLC-SS Pipe	Static Head, 66°C,6D,A	Was 1.37 MPaG
	SLC-F026 Relief V.	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	20A-SLC-SS Pipe	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	100A-SLC-SS Pipe	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG

** ATP is atmospheric pressure.

SLC interface with MUWP for makeup and pressurization of suction piping from tank. (Pressure higher than static head of SLC storage tank.)

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	80A-MUWP-F163 Valve LO	1.37 MPaG, 66°C,6D,C	No change
	80A-SLC-SS Pipe	2.82 MPaG, 66°C,3B,C	Was 1.37 MPaG
	SLC-F013 Check V.	2.82 MPaG, 66°C,3B,C	Was 1.37 MPaG
	80A-SLC-SS Pipe	2.82 MPaG, 66°C,3B,C	Was 1.37 MPaG
	80A-SLC-F014 Valve LC	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	80A-SLC-SS Pipe	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	20A-SLC-SS Pipe	2.82 MPaG, 66°C,3B,C	Was 1.37 MPaG
	20A-SLC-F020 Valve LO	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	20A-SLC-D002 RO	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG
	20A-SLC-SS Pipe	2.82 MPaG, 66°C,3B,A	Was 1.37 MPaG

SLC storage tank interface with MUWP for purified makeup water.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	80A-MUWP-F163 Valve LO	1.37 MPaG, 66°C,6D,C	No change
	80A-SLC-SS Pipe	1.37 MPaG, 66°C,3B,C	Was 1.37 MPaG
	SLC-F013 Check V.	2.82 MPaG, 66°C,3B,C	Was 1.37 MPaG
	80A-SLC-SS Pipe	2.82 MPaG, 66°C,3B,C	Was 1.37 MPaG
	25A-SLC-SS Pipe	2.82 MPaG, 66°C,3B,C	Was 1.37 MPaG
	25A-SLC-F015 Valve LC	2.82 MPaG, 66°C,3B,C	Was 1.37 MPaG
	20A-SLC-SS Pipe	2.82 MPaG, 66°C,4D,C	Was 1.37 MPaG
	20A-SLC-F505 Valve NO	2.82 MPaG, 66°C,4D,C	Was 1.37 MPaG
	25A-SLC-SS Pipe	2.82 MPaG, 66°C,4D,C	Was 1.37 MPaG
	25A-SLC-F023 Valve LC	2.82 MPaG, 66°C,4D,C	Was 1.37 MPaG
	25A-SLC-SS Pipe	2.82 MPaG, 66°C,4D,C	No change
	*SLC-A001 Storage TK.	Static Head, 66°C,3B,A	No change

* SLC Storage Tank is vented to atmosphere.

3MA.7 Reactor Water Cleanup System

3MA.7.1 Upgrade Description

The Reactor Water Cleanup system (CUW) is a high pressure system that is almost totally designed above the URS design pressure. One pipe connecting to radwaste was upgraded. It is the pipe downstream of valve G31-F023 shown at zone E-14 of Figure 5.4-12, sheet 3. The interface symbol is labeled “LCW Collector Tank”.

3MA.7.2 Downstream Interfaces

A system is listed below that interfaces with CUW and could possibly be exposed to reactor pressure. A description of the interface location and a statement of its applicability to ISLOCA is given.

- Low Conductivity Waste, (Radwaste) connects to a branch of the CUW filter/demineralizer discharge, as described in 3MA.7.1 above. There is not a practical reason to upgrade this interface in CUW as discussed in the Radwaste system, Section 3MA.13.

3MA.7.3 Upgraded Components — CUW System

A detailed listing of the components upgraded for the CUW System follows, including identification of those interfacing system components not requiring upgrade.

REACTOR WATER CLEANUP SYSTEM, Tier 2 Figure 5.4-12, Sheets 1,2 and 3.

CUW System interface with Radwaste System

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	150A-CUW-F023 Valve MO	10.65 MPaG, 66°C,4D,C	No change
	150A-CUW-31-CS Pipe	2.82 MPaG, 66°C,6D,C	Was 0.981 MPaG
	xxA-CUW-xxx Pipe(Sam)	2.82 MPaG, 66°C, 6D, C	Was 0.981 MPaG
	xxA-CUW-xxx Pipe(RV)	2.82 MPaG, 66°C, 6D, C	Was 0.981 MPaG
	* LCW Collector Tank A	0 MPaG	No change

3MA.8 Fuel Pool Cooling Cleanup System

3MA.8.1 Upgrade Description

The fuel pool cooling system interfaces with the RHR system at two locations that could possibly expose the FPC system to reactor pressure. One location is the discharge from the FPC to RHR in the line downstream from the skimmer surge tank; the other location is the RHR return to the FPC in the line to the reactor well. See Figure 9.1-1a, upper right and left hand corners respectively.

Upgrading of components and new pipeline with testable check valve FPC-F105 and gate valve FPC-F106 were added to the first interface of the discharge from the FPC to the RHR. This new line has the gate valve locked open with the check valve's flow direction into the skimmer surge tank and provides an open path into the skimmer surge tank from valves RHR F016A, RHR-F016B, and RHR-F016C. Valve FPC-F029 has an open path to the skimmer surge tank as provided by the existing design. This new line and its two new valves provides an open path to the skimmer surge tank that prevents FPC-F031 from overpressure. Valve FPC-F031 is open only during the mode of draining the dryer/separator pool or the reactor well pool, at which time the new locked open valve FPC-F106 must be closed, otherwise water could be pumped back into the surge tank. Closing FPC-F106 does not jeopardize ISLOCA protection because the reactor is shutdown during this mode. All the piping between the FPC valves, FPC-F029, FPC-F031, and FPC-F106 and the RHR valves, RHR F016A, RHR-F016B, and RHR-F016C, were upgraded to the URS design pressure of 2.82 MPaG.

The second interface, the RHR return to the FPC in the line to the reactor well, was not upgraded because of the continuous open path to the spent fuel storage pool and cask pit. Valves FPC-F093 and FPC-F017 are always locked open and provide an open path from the RHR valves, RHR F015A, RHR-F015B, and RHR-F015C, to the spent fuel storage pool and cask pit.

3MA.8.2 Downstream Interfaces

The fuel pool cleanup system has no further downstream system interfaces that could allow reactor pressure from RHR to proceed further than the FPC system.

3MA.8.3 Upgraded Components — FPC System

A detailed listing of the components upgraded for the FPC System follows, including identification of those interfacing system components not requiring upgrade.

FUEL POOL COOLING AND CLEANUP SYSTEM, Tier 2 Figure 9.1-1, Sheets 1,2 and 3.

FPC System interface with makeup from RHR System or SPCU System.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	300A-RHR-F015A Valve MO	3.43 MPaG, 182°C,3B,As	No Change
	300A-FPC-SS Pipe	1.57 MPaG, 66°C,4C,A(S2)	No Change
	300A-RHR-F016A Valve MO	2.82 MPaG, 182°C,3B,As	No Change
	300A-FPC-SS Pipe	2.82 MPaG, 66°C,4C,B(S1,S2)	No Change
	300A-RHR-F015C Valve MO	3.43 MPaG, 182°C,3B,As	No change
	300A-FPC-SS Pipe	1.57 MPaG, 66°C,4C,A(S2)	No change
	300A-RHR-F015B Valve MO	3.43 MPaG, 182°C,3B,As	No change
	250A-FPC-SS Pipe	1.57 MPaG, 66°C,4C,A(S2)	No change
	250A-FPC-F094 Check Valve	1.57 MPaG, 66°C,4C,A(S2)	No change
	250A-FPC-SS Pipe	1.57 MPaG, 66°C,4C,A(S2)	No change
	20A-FPC-SS Pipe	1.57 MPaG, 66°C,4C,A(S2)	No change
	20A-FPC-F506 Valve	1.57 MPaG, 66°C,4C,A(S2)	No change
	250A-FPC-SS Pipe	1.57 MPaG, 66°C,4C,A(S2)	No change
	250A-FPC-F022 Valve LC	1.57 MPaG, 66°C,4C,A(S2)	No change
	250A-FPC-SS Pipe	1.57 MPaG, 66°C,4C,B(S1,S2)	No change
	250A-FPC-F023 Check Valve	1.57 MPaG, 66°C,4C,B(S1,S2)	No change
	250A-FPC-SS Pipe	1.57 MPaG, 66°C,4C,B(S1,S2)	No change
	20A-FPC-F097 Valve	1.57 MPaG, 66°C, 4C, A(S2)	No change
	20A-FPC-xxx SS Pipe	1.57 MPaG, 66°C, 4C, A(S2)	No change
	80A-FPC-F096 Valve	1.57 MPaG, 66°C, 4C, A(S2)	No change
	REACTOR WELL		No change
	250A-FPC-SS Pipe	1.57 MPaG, 66°C,4C,A(S2)	No change
	250A-FPC-F093 Valve LO	1.57 MPaG, 66°C,4C,A(S2)	No change
	80A-SPCU F014 Valve MO	1.57 MPaG, 66°C,4D,B	No change
	80A-FPC-SS Pipe	1.57 MPaG, 66°C,4C,A(S2)	No change
	80A-FPC-F091 Check Valve	1.57 MPaG, 66°C,4C,A(S2)	No change
	80A-FPC-SS Pipe	1.57 MPaG, 66°C,4C,A(S2)	No change
	80A-FPC-D011 RO	1.57 MPaG, 66°C,4C,A(S2)	No change
	80A-FPC-SS Pipe	1.57 MPaG, 66°C,4C,A(S2)	No change
	250A-FPC-SS Pipe	1.57 MPaG, 66°C,4C,A(S2)	No change
	250A-FPC-F016 Check Valve	1.57 MPaG, 66°C,4C,A(S2)	No change
	250A-FPC-F017 Valve LO	1.57 MPaG, 66°C,4C,A(S2)	No change
	250A-FPC-F018 Check Valve	1.57 MPaG, 66°C,4C,A(S2)	No change
	SPENT FUEL STORAGE POOL		

FPC System interface with suction of RHR System for cooling.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	300A-RHR-F016C Valve MO	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	300A-FPC-SS Pipe	2.82 MPaG, 66°C,4C,B(S1,S2)	Was 1.37 MPaG
	300A-RHR-F016B Valve MO	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	300A-FPC-SS Pipe	2.82 MPaG, 66°C,4C,B(S1,S2)	Was 1.37 MPaG
	300A-FPC-F029 Valve NC	2.82 MPaG, 66°C,4C,B(S1,S2)	Was 1.37 MPaG
	300A-FPC-SS Pipe	Static Hd. atg, 66°C,4C,B(S1,S2)	No change
	* SPENT FUEL STORAGE POOL		
	250A-FPC-SS Pipe	2.82 MPaG, 66°C,4C,B(S1,S2)	Was 1.37 MPaG
	250A-FPC-F031 Valve NC	2.82 MPaG, 66°C,4C,B(S1,S2)	Was 1.37 MPaG
	250A-FPC-SS Pipe	1.57 MPaG, 66°C,6D,C	No change
	** FILTER DEMINERALIZER		No change
	300A-FPC-SS Pipe	2.82 MPaG, 66°C,4C,B(S1,S2)	New Branch
	300A-FPC-F105 Check Valve	2.82 MPaG, 66°C,4C,B(S1,S2)	New Valve
	300A-FPC-SS Pipe	2.82 MPaG, 66°C,4C,B(S1,S2)	New Branch
	300A-FPC-F106 Valve LO	2.82 MPaG, 66°C, 4C,B(S1,S2)	New Valve
	300A-FPC-SS Pipe	Static Hd. MPaG, 66°C,3B,A(S2)D	New Branch
	*** SKIMMER SURGE TANK		No change

* FPC Valve F029 is open only for fuel pool cooling mode B (maximum heat load operation with RHR System A, B or C operating in parallel with FPC System).

** FPC Valve F031 is open only for fuel pool cooling mode B (refueling when Dryer/Separator Pool is drained and pumped to Radwaste LCW collector tank by RHR System A, B or C).

*** FPC Valve F031 leakage is directed to skimmer surge tank through a lock open valve and a check valve into skimmer surge tank.

3MA.9 Nuclear Boiler System

3MA.9.1 Upgrade Description

The NBS piping and instrumentation are designed for reactor pressure. One low pressure level transmitter and level indicator with the associated piping and two normally closed globe valves are upgraded to URS design criteria. This level instrumentation is used to measure the level in the reactor well during refueling and is selected for the required sensitivity. A relief valve downstream of the two normally closed globe valves discharges to a LCW funnel drain to the Reactor Building LCW sump.

3MA.9.2 Downstream Interfaces

Other systems are listed below that interface with the NBS and could possibly be exposed to reactor pressure. A description of the interface location and a statement of its applicability to ISLOCA is given.

CRD, RCIC, RPV, RHR, HPCF, CUW, MS, are high pressure interfaces of the NBS and RW(LCW, HCW, VG) are low pressure interfaces of the NBS. Interfacing systems at high pressure have low pressure interfaces addressed in their specific system listings.

3MA.9.3 Upgraded Components — NBS System

A detailed listing of the components upgraded for the NBS System follows.

NUCLEAR BOILER SYSTEM, Tier 2 Figure 5.1-3, Sheets 1 & 5. :

Refueling level transmitter piping

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	20A-NBS-F708 Relief V	2.82 MPaG, 20°C,1A, As	Was 0.686 MPaG
	* 20A-NBS-LT004 Level XT	2.82 MPaG, 20°C,1A, As	Was 0.686 MPaG
	20A-NBS-Interconn. Pipe	2.82 MPaG, 20°C,1A, As	Was 0.686 MPaG

* LT-004 must be low pressure rated for level sensitivity during refueling.

Other fluid piping components of the NBS System are rated for reactor pressure, except the main steam drain header interface with the Condensate and Feedwater System piping to be designed for at least 2.82 MPaGand other drains including valve gland leakage, LCW and HCW funnel drains to the drywell equipment drain sump.

3MA.10 Reactor Recirculation System

3MA.10.1 Upgrade Description

Ten Reactor Internal Recirculation Pumps (RIP) are installed around the perimeter of the reactor vessel and operate at reactor pressure.

3MA.10.2 Downstream Interfaces

Other systems are listed below that interface with the RRS System and could possibly be exposed to reactor pressure. A description of the interface location and a statement of its applicability to ISLOCA is given.

- MUWP System interfaces with each reactor recirculation pump to provide RIP casing makeup water. Another MUWP System interface exists during refueling or maintenance shutdown to provide water for the RIP shaft inflatable seal subsystem. Pressure upgrades are required for the interfacing components of the MUWP System.

- RCW System interfaces with each RRS RIP motor cooling subsystem through a heat exchanger designed for 8.62 MPaG .and utilizes RCW water for cooling the RIP motors. No upgrade is needed for the RCW System connecting piping designed to 1.37 MPaG.

- CRD System piping connects to ten RIP motor purge subsystems. Control Rod Drive System Tier 2 Figure 4.6-8, sheet 1 at C-2, the 20A-CRD-036 pipe and 20A-CRD-F025 valve interface with the 20A-RRS-003A pipe connecting to the ten RIP motors. No upgrade is required because the design pressure for both the CRD and RRS is 18.63 MPaG.

- RWS Open funnel drain piping connects to the LCW and HCW sumps in the drywell.

- MUWP Makeup Water System (Purified) Tier 2 Figure 9.2-5 shows other components interfacing with RRS System. These are not upgraded because they are part of the open pathway to the Condensate Storage Tank which is vented to the atmosphere. Another MUWP System interface is connected to a portable inflatable shaft seal pump and tank only during refueling or when the reactor is shut down for maintenance.

3MA.10.3 Upgraded Components — RRS System

A detailed listing of the components upgraded for the RRS System follows, including identification of those interfacing system components not requiring upgrade.

REACTOR RECIRCULATION SYSTEM Tier 2 Figure 5.4-4, Sheets 1 & 2.

RRS interface with MUWP System for Reactor Internal Pump (RIP) casing makeup water.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	20A-RRS-502A-K Pipes	8.62 MPaG,302°C, 4A,As	No change
	20A-RRS-F504A-K Valves NC	8.62 MPaG,302°C, 4A,As	No change
	15A-MUWP-189-198 Pipes	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	50A-MUWP-185 Pipe	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	50A-MUWP-F142 Check Valve	2.82 MPaG,171°C, 3B,As	Was 1.37 MPaG
	50A-MUWP-184 Pipe	2.82 MPaG,171°C, 3B,As	Was 1.37 MPaG
	50A-MUWP-F141 Valves NC	2.82 MPaG,171°C, 3B,As	Was 1.37 MPaG
	xxA-MUWP-xxx Pipe	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	xxA-MUWP-Fxxx Valve	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	15A-MUWP-188 Pipe	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	15A-MUWP-F145 Valve	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	50A-MUWP-186 Pipe	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	50A-MUWP-F143 Valve	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	50A-MUWP-187 Pipe	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	50A-MUWP-F144 Valve	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	xxA-MUWP-xxx Pipe	2.82 MPaG, 171°C, 3B,As	Was 1.37 MPaG
	xxA-MUWP-Fxxx Valve	2.82 MPaG, 171°C, 3B,As	Was 1.37 MPaG
	50A-MUWP-183 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	80A-MUWP-181 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	80A-MUWP-F140 Valve LO	1.37 MPaG, 66°C, 6D,C	No change
	125A-MUWP-101 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	125A-MUWP-F101 Valve LO	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-602 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F602 Valve NC	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-601 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F601 Valve NC	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-FQ102 Flow Integr.	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-801 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F801 Valve NC	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-800 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F800 Valve NC	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-PX101 Press. Pt.	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-600 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F600 Valve NC	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F100 Valve LO	1.37 MPaG, 66°C, 6D,C	No change

125A-MUWP-102	Pipe	1.37 MPaG, 66°C, 6D,C	No change
125A-MUWP-F102	Valve NC	1.37 MPaG, 66°C, 6D,C	No change
150A-MUWP-xxx	Pipe	1.37 MPaG, 66°C, 6D,C	No change
150A-MUWP-xxx	Pipe	1.37 MPaG, 66°C, 6D,C	No change
150A-MUWP-Fxxx	Check Valve	1.37 MPaG, 66°C, 6D,C	No change
Condensate Storage Tank,		66°C, 6D,C	No change

3MA.11 Makeup Water System Condensate

3MA.11.1 Upgrade Description

The MUWC System has extensive system interfaces throughout the plant for makeup water to fill systems and serve flushing connections. The extent of the piping and the size of the Condensate Storage Tank of the MUWC System makes it impractical to upgrade. Instead valves are changed to lock open type to create a clear path from the URS boundary to the Condensate Storage Tank which is vented to atmosphere.

3MA.11.2 Downstream Interfaces

HPCF System is a downstream interface of the MUWC System at three outlets of the Condensate Storage Tank. The CRD piping is not upgraded to the URS design pressure because the maximum static head is 0.159 MPaG. The first closed valve of the HPCF System suction piping is upgraded to URS design pressure based on data provided in Section 2.

CRD System 150A suction piping interfaces with Condensate Storage Tank.

Other interfaces include the HPCF System fill line, RHR flushing lines, CRD makeup and discharge, and MUWP System are not upgraded due to the impractical nature of upgrades for such an extensive piping system with lock open type valves and open piping paths to the vented condensate storage tank.

All MUWC valves between the interfacing system connections and the Condensate Storage Tank are lock open type to provide an open pathway to relieve pressure to this tank which is vented to the atmosphere.

3MA.11.3 Upgraded Components — MUWC System

A detailed listing of the components upgraded for the MUWC System follows, including identification of those interfacing system components not requiring upgrade.

MAKEUP WATER SYSTEM (CONDENSATE) Tier 2 Figure 9.2-4, Sheets 1.

HPCF Subsystem B keep fill line interface.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	* 50A-MUWC-135 Pipe	1.37 MPaG, 66°C,6D,C	No change
	25A-HPCF-F013B Valve LO	1.37 MPaG, 100°C,3B,As	No change
	25A-HPCF-D006B R0	1.37 MPaG, 100°C,3B,As	No change
	25A-HPCF-019 Pipe	1.37 MPaG, 100°C,3B,As	No change
	50A-HPCF-F016B Valve	1.37 MPaG, 100°C,3B,As	No change
	50A-HPCF-F014B Check V.	10.79 MPaG, 100°C,3B,As	No change
	50A-HPCF-F015B Check V.	10.79 MPaG, 100°C,3B,As	No change
	50A-HPCF-020 Pipe	10.79 MPaG, 100°C,3B,As	No change

HPCF Subsystem C keep fill line interface.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	* 50A-MUWC-138 Pipe	1.37 MPaG, 66°C,6D,C	No change
	25A-HPCF-F013C Valve LO	1.37 MPaG, 100°C,3B,As	No change
	25A-HPCF-D006C R0	1.37 MPaG, 100°C,3B,As	No change
	25A-HPCF-119 Pipe	1.37 MPaG, 100°C,3B,As	No change
	50A-HPCF-F016C Valve	1.37 MPaG, 100°C,3B,As	No change
	50A-HPCF-F014C Check V.	10.79 MPaG, 100°C,3B,As	No change
	50A-HPCF-F015C Check V.	10.79 MPaG, 100°C,3B,As	No change
	50A-HPCF-120 Pipe	10.79 MPaG, 100°C,3B,As	No change

MUWC System interface with HPCF System

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	300A-HPCF-001 SS Pipe	1.37 MPaG, 66°C,B(S1,S2)	No change
	300A-HPCF-002 SS Pipe	1.37 MPaG, 66°C,B(S1,S2)	No change
	300A-HPCF-003 SS Pipe	1.37 MPaG, 66°C,B(S1,S2)	No change

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	300A-MUWC-F100 Valve LO	1.37 MPaG, 66°C,6D,C	No change
	300A-MUWC-F101 Valve LO	1.37 MPaG, 66°C,6D,C	No change
	300A-MUWC-F102 Valve LO	1.37 MPaG, 66°C,6D,C	No change
	300A-MUWC-100 Pipe	Static Hd. 66°C,6D,C	No change
	300A-MUWC-101 Pipe	Static Hd. 66°C,6D,C	No change
	300A-MUWC-102 Pipe	Static Hd. 66°C,6D,C	No change

RHR Subsystem A flushing line interface at branch discharging to feedwater.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	* 100A-MUWC-134 Pipe	1.37 MPaG, 66°C,6D,C	No change
Sheet 3	100A-RHR -F032A Valve	3.43 MPaG, 182°C,3B,As	No change
	100A-RHR -026 Pipe	3.43 MPaG, 182°C,3B,As	No change
	100A-RHR -F033A Check V.	3.43 MPaG, 182°C,3B,As	No change

RHR Subsystem A flushing line interface at suction shutdown branch from RPV.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	* 100A-MUWC-133 Pipe	1.37 MPaG, 66°C,6D,C	No change
Sheet 2	100A-RHR -F040A Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	100A-RHR -031 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	100A-RHR -F041A Check V.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG

RHR Subsystem B flushing line interface at branch discharging to RPV.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	* 100A-MUWC-137 Pipe	1.37 MPaG, 66°C,6D,C	No change
Sheet 5	100A-RHR -F032B Valve	3.43 MPaG, 182°C,3B,As	No change
	100A-RHR -132 Pipe	3.43 MPaG, 182°C,3B,As	No change
	100A-RHR -F033B Check V.	3.43 MPaG, 182°C,3B,As	No change

RHR Subsystem B flushing line interface at suction of shutdown branch from RPV.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	* 100A-MUWC-136 Pipe	1.37 MPaG, 66°C,6D,C	No change
Sheet 2	100A-RHR -F040B Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	100A-RHR -138 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	100A-RHR -F041B Check V.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG

RHR Subsystem C flushing line interface at branch discharge to RPV.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	* 100A-MUWC-140 Pipe	1.37 MPaG, 66°C,6D,C	No change
Sheet 2	100A-RHR -F032C Valve	3.43 MPaG, 182°C,3B,As	No change
	100A-RHR -233 Pipe	3.43 MPaG, 182°C,3B,As	No change
	100A-RHR -F033C Check V.	3.43 MPaG, 182°C,3B,As	No change

RHR Subsystem C flushing line interface at suction of shutdown branch from RPV.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	* 100A-MUWC-139 Pipe	1.37 MPaG, 66°C,6D,C	No change
Sheet 2	100A-RHR-F040C Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	100A-RHR-239 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	100A-RHR-F041C Check V.	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG

* Makeup Water System (Condensate) piping designed with open pathway to Condensate Storage Tank.

MUWC System changes and upgrades.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	150A-MUWC-F131 Valve LO	1.37 MPaG, 66°C,6D,C	No change
	250A-MUWC-F111 Valve LO	1.37 MPaG, 66°C,6D,C	No change
	250A-MUWC-F110 Valve LO	1.37 MPaG, 66°C,6D,C	No change
	** 250A-MUWC-110 Pipe	1.37 MPaG, 66°C,6D,C	No change

** Interface with new MUWC System pump minimum flow bypass pipe with check valve and LO service valves connecting to Condensate Storage Tank.

MUWC System interface with MUWP

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	125A-MUWP-101 SS Pipe	1.37 MPaG, 66°C,6D,C	No change
	150A-MUWP-Fxxx SS Valve LO	1.37 MPaG, 66°C,6D,C	No change
	150A-MUWP-Fxxx SS Check V.	1.37 MPaG, 66°C,6D,C	No change
	Condensate Storage Tank		

MUWC interface with the CRD System pump suction piping.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	150A-CRD-002-S Pipe	2.82 MPaG, 20°C,4D,B	Was 1.37 MPaG
Sheet 1	150A-MUWC-Fxxx LO Valve	1.37 MPaG, 66°C,6D,C	Lock Open
	150A-MUWC-xxx Pipe	1.37 MPaG, 66°C,6D,C	No change
	150A-MUWC-Fxxx LO Valve	1.37 MPaG, 66°C,6D,C	Lock Open
	150A-MUWC-xxx Pipe	1.37 MPaG, 66°C,6D,C	No change
	150A-MUWC-Fxxx LO Valve	1.37 MPaG, 66°C,6D,C	Lock Open
	150A-MUWC-xxx Pipe	Static Hd, 66°C,6D,C	No change
	Condensate Storage Tank,	66°C,6D,C	No change

MUWC interface with the CRD System pump discharge piping.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	50A-CRD-034-S Pipe	18.63 MPaG, 20°C,4C,B	No change
	50A-CRD-F021 Valve MO	18.63 MPaG, 20°C,4C,B	No change
	50A-CRD-F022Valve	18.63 MPaG, 20°C,4C,B	No change
	50A-CRD-035-S Pipe	18.63 MPaG, 20°C,4C,B	No change
	50A-CRD-F023 Valve	18.63 MPaG, 20°C,4C,B	No change
Sheet 1	50A-MUWC-F10 Valve	1.37 MPaG, 66°C,6D,C	Lock Open
	50A-MUWC-F103 Valve	1.37 MPaG, 77°C,6D,C	Lock Open
	50A-MUWC-xxx Pipe	Static Hd, 66°C,6D,C	No change
	Condensate Storage Tank,	66°C,6D,C	No change

3MA.12 Makeup Water System Purified

3MA.12.1 Upgrade Description

The MUWP System is not upgraded due to the extensive nature of the piping distribution, but instead all valves between the interface of potential reactor pressure sources and the Condensate Storage Tank are changed to the lock open type. This provides a clear path for the release of

pressure to the Condensate Storage Tank which is vented to atmosphere. The potential reactor pressure sources are the SLC System makeup seal, the RRS ten RIP casing makeup water connections, and shaft (RIP) inflatable seal capped connections. The piping and valves connected to the RIPs within the primary containment were upgraded to the URS design pressure.

3MA.12.2 Downstream Interfaces

The Makeup Water System Purified System has no further downstream system interfaces that could allow reactor pressure to proceed further than the MUWP System.

3MA.12.3 Upgraded Components — MUWP System

A detailed listing of the components upgraded for the MUWP System follows, including identification of those interfacing system components not requiring upgrade.

MAKEUP WATER SYSTEM (PURIFIED) Tier 2 Figure 9.2-5, Sheets 1,2 and 3.

MUWP interface with the SLC System makeup seal and storage tank fill line.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	80A-SLC -F013 Check Valve	2.82 MPaG, 66°C, 4A,A	No change
	80A-MUWP-F019 Valve LO	1.37 MPaG, 66°C, 6D,C	No change
Sheet 2	80A-MUWP-F163 Valve LO	1.37 MPaG, 66°C, 6D,C	No change
	80A-MUWP-217 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	80A-MUWP-214 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	80A-MUWP-F162 Valve LO	1.37 MPaG, 66°C, 6D,C	No change
	100A-MUWP-180 Pipe	1.37 MPaG, 66°C, 6D,C	No change
Sheet 1	125A-MUWP-101 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	125A-MUWP-F101 Valve LO	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-602 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F602 Valve NC	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-601 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F601 Valve NC	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-FQ102 Flow Integr.	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-801 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F801 Valve NC	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-800 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F800 Valve NC	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-PX101 Press. Pt.	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-600 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F600 Valve NC	1.37 MPaG, 66°C, 6D,C	No change
	125A-MUWP-F100 Valve LO	1.37 MPaG, 66°C, 6D,C	No change
	125A-MUWP-102 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	125A-MUWP-F102 Valve NC	1.37 MPaG, 66°C, 6D,C	No change
Sheet 3	150A-MUWP-xxx Pipe	1.37 MPaG, 66°C, 6D,C	No change
	150A-MUWP-Fxxx Check Valve	1.37 MPaG, 66°C, 6D,C	No change
	150A-MUWP-xxx Pipe	Static Head, 66°C, 6D,C	No change
	Condensate Storage Tank,	66°C, 6D,C	No change

MUWP System interface with RRS for Reactor Internal Pump (RIP) casing makeup water.

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
Sheet 1	20A-RRS-502A-K Pipes	8.62 MPaG,302°C, 4A,As	No change
	20A-RRS-F504A-K Valves NC	8.62 MPaG,302°C, 4A,As	No change
	15A-MUWP-189-198 Pipes	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	50A-MUWP-185 Pipe	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	xxA-MUWP-xxx Pipe	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	xxA-MUWP-Fxxx Valve	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	15A-MUWP-188 Pipe	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	15A-MUWP-F145 Valve	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	50A-MUWP-186 Pipe	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	50A-MUWP-F143 Valve	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	50A-MUWP-187 Pipe	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	50A-MUWP-F144 Valve	2.82 MPaG, 66°C, 6D,C	Was 1.37 MPaG
	xxA-MUWP-xxx Pipe	2.82 MPaG, 171°C, 3B,As	Was 1.37 MPaG
	xxA-MUWP-Fxxx Valve	2.82 MPaG, 171°C, 3B,As	Was 1.37 MPaG
	50A-MUWP-F142 Check Valve	2.82 MPaG,171°C, 3B,As	Was 1.37 MPaG
	50A-MUWP-184 Pipe	2.82 MPaG,171°C, 3B,As	Was 1.37 MPaG
	50A-MUWP-F141 Valves NC	2.82 MPaG,171°C, 3B,As	Was 1.37 MPaG
	50A-MUWP-183 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	80A-MUWP-181 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	80A-MUWP-F140 Valve LO	1.37 MPaG, 66°C, 6D,C	No change
	125A-MUWP-101 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	125A-MUWP-F101 Valve LO	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-602 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F602 Valve NC	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-601 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F601 Valve NC	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-FQ102 Flow Integr.	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-801 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F801Valve NC	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-800 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F800 Valve NC	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-PX101 Press. Pt.	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-600 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F600 Valve NC	1.37 MPaG, 66°C, 6D,C	No change
	20A-MUWP-F100 Valve LO	1.37 MPaG, 66°C, 6D,C	No change
	125A-MUWP-102 Pipe	1.37 MPaG, 66°C, 6D,C	No change
	125A-MUWP-F102 Valve NC	1.37 MPaG, 66°C, 6D,C	No change
	150A-MUWP-xxx Pipe	1.37 MPaG, 66°C, 6D,C	No change
	150A-MUWP-xxx Pipe	1.37 MPaG, 66°C, 6D,C	No change
	150A-MUWP-Fxxx Check Valve	1.37 MPaG, 66°C, 6D,C	No change
	150A-MUWP-xxx Pipe	Static Head, 66°C, 6D,C	No change
	Condensate Storage Tank,	66°C, 6D,C	No change

3MA.13 Radwaste System

3MA.13.1 Upgrade Description

The Radwaste System LCW and HCW inlet piping header connects to each interfacing system at a valve. The header is not upgraded because it is an open pathway to the collector tanks. The four LCW tanks rotate the fill mode one at a time through a level controlled AO valve at the inlet of each tank. The maintenance valve is a lock open type. The three HCW tanks operate similarly to the LCW tanks.

3MA.13.2 Downstream Interfaces

Other systems are listed below that interface with the RW System and could possibly be exposed to reactor pressure. A description of the interface location and a statement of its applicability to ISLOCA is given.

There are no downstream interfaces because the LCW and HCW collector tanks and associated piping are all at atmospheric pressure since the HVAC System tank exhaust vents each tank.

3MA.13.3 Upgraded Components — RW System

A detailed listing of the components upgraded for the RW System follows, including identification of those interfacing system components not requiring upgrade.

RW LCW Subsystem interface with the RHR System

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	50A-RHR 129 Pipe	3.43 MPaG, 182°C,3B,As	No change
Sheet 3	150A-LCW-F006Valve	2.82 MPaG, 66°C,4D,B	Was 0.981 MPaG
	150A-LCW-CS Pipe	0.981 MPaG, 66°C,4D,B	No change
	200A-LCW-SS Pipe	0.981 MPaG, 66°C,4D,B	No change
	200A-LCW Valve LO	0.981 MPaG, 66°C,4D,B	No change
	200A-LCW-F001A AO Valve	0.981 MPaG, 66°C,4D,B	No change
	* LCW Collector Tank A	0 MPaG, 66°C,4D,B	No change
	200A-LCW- Valve LO	0.981 MPaG, 66°C,4D,B	No change
	200A-LCW-F001B AO Valve	0.981 MPaG, 66°C,4D,B	No change
	* LCW Collector Tank B	0 MPaG, 66°C,4D,B	No change
	200A-LCW Valve LO	0.981 MPaG, 66°C,4D, B	No change
	200A-LCW-F001C AO Valve	0.981 MPaG, 66°C,4D, B	No change
	* LCW Collector Tank C	0 MPaG, 66°C, 4D, B	No change
	200A-LCW Valve LO	0.981 MPaG, 66°C,4D, B	No change
	200A-LCW-F001D AO Valve	0.981 MPaG, 66°C,4D, B	No change
	* LCW Collector Tank D	0 MPaG, 66°C, 4D, B	No change

* Each LCW collector tank has HVAC tank vent system exhausting tank air through filter to RW Stack.

RW HCW interface with the RHR System, Subsystem A

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	50A-RHR 018 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	150A-RHR-F026A Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
Sheet 7	150A-HCW-SS Valve	2.82 MPaG, 66°C, 4D,B	Was 0.981 MPaG
	150A-HCW-SS Pipe	0.981 MPaGg, 66°C,4D,B	No change
	150A-HCW-SS Valve LO	0.981 MPaG, 66°C,4D,B	No change
	150A-HCW-F002A Valve AO	0.981 MPaG, 66°C,4D,B	No change
	* HCW Collector Tank A	0 MPaG, 66°C,4D,B	No change
	150A-HCW-SS Valve LO	0.981 MPaG, 66°C,4D,B	No change
	150A-HCW-F002B Valve	0.981 MPaG, 66°C,4D,B	No change
	* HCW Collector Tank B	0 MPaG, 66°C,4D,B	No change
	150A-HCW-SS Valve LO	0.981 MPaG, 66°C,4D, B	No change
	150A-HCW-F002C Valve AO	0.981 MPaG, 66°C,4D, B	No change
	* HCW Collector Tank C	0 MPaG, 66°C, 4D, B	No change

* Each HCW collector tank has HVAC tank vent system exhausting tank air through filter to RW Stack.

RW HCW interface with the RHR System, Subsystem B

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	50A-RHR 124 Pipe	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
	50A-RHR-F026B Valve	2.82 MPaG, 182°C,3B,As	Was 1.37 MPaG
Sheet 7	150A-HCW-SS Valve	2.82 MPaG, 66°C,4D,B	Was 0.981 MPaG
	150A-HCW-SS Pipe	0.981 MPaG, 66°C,4D,B	No change
	150A-HCW-SS Valve LO	0.981MPaG, 66°C,4D,B	No change
	150A-HCW-F002A Valve AO	0.981 MPaG, 66°C,4D,B	No change
	*HCW Collector Tank A	0 MPaG, 66°C,4D,B	No change
	150A-HCW-SS Valve LO	0.981 MPaG, 66°C,4D,B	No change
	150A-HCW-F002B Valve	0.981 MPaG, 66°C,4D,B	No change
	*HCW Collector Tank B	0 MPaG, 66°C,4D,B	No change
	150A-HCW-SS Valve LO	0.981 MPaG, 66°C,4D, B	No change
	150A-HCW-F002C Valve AO	0.981 MPaG, 66°C,4D, B	No change
	* HCW Collector Tank C	0 MPaG, 66°C, 4D, B	No change

*Each HCW collector tank has HVAC tank vent system exhausting tank air through filter to RW Stack.

RW HCW interface with the RHR System, Subsystem C

Reference	Components	Press./Temp./Design/ Seismic Class	Remarks
	50A-RHR 225 Pipe	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
	50A-RHR-F-26C Valve	2.82 MPaG, 182°C, 3B, As	Was 1.37 MPaG
Sheet 7	150A-HCW-SS Valve	2.82 MPaG, 66°C,4D,B	Was 1.37 MPaG
	150A-HCW-SS Pipe	0.981 MPaG, 66°C, 4D,B	No change
	150A-HCW-SS Valve LO	0.981 MPaG, 66°C, 4D,B	No change
	150A-HCW-F002A Valve AO	0.981 MPaG, 66°C, 4D,B	No change
	* HCW Collector Tank A	0 MPaG, 66°C, 4D,B	No change
	150A-HCW-SS Valve LO	0.981 MPaG, 66°C, 4D,B	No change
	150A-HCW-F002B Valve	0.981 MPaG, 66°C, 4D,B	No change
	* HCW Collector Tank B	0 MPaG, 66°C, 4D,B	No change

150A-HCW-SS Valve LO	0.981 MPaG, 66°C,4D, B	No change
150A-HCW-F002C Valve AO	0.981 MPaG, 66°C,4D, B	No change
* HCW Collector Tank C	0 MPaG, 66°C, 4D, B	No change

*Each HCW collector tank has HVAC tank vent system exhausting tank air through filter to RW Stack.

3MA.14 Condensate and Feedwater (CFS) System

3MA.14.1 Upgrade Description

The CFS System provides high pressure feedwater to the reactor, and all of the system is designed for high pressure except the condensate pumps suction. The high pressure design includes the condensate polishing (hollow fiber filters and demineralizers) units. The transition to low pressure occurs from the condensate suction into the LP condenser shell (hotwell). The hotwell is a low pressure sink. The last closed valve in the path from the reactor is the condensate pumps discharge check valve. The piping to the condensate pumps suction can remain below the URS design pressure because it connects to the low pressure heat sink hotwell. The maintenance block valves in the condensate pump suction lines were upgraded to a LOCK OPEN status.

3MA.14.2 Downstream Interfaces

None

3MA.14.3 Upgraded Components

The maintenance block valves in the condensate pump suction lines were upgraded to a LOCK OPEN status.

3MA.15 Sampling (SAM) System

3MA.15.1 Upgrade Description

The Sampling System receives water from several of the above systems, and an analysis, as presented below, resulted in not requiring any pressure upgrades. The following interfaces include all of the potential links of SAM to the reactor pressure, and since none of the individual portions need upgrading, SAM as a whole was not upgraded.

(1) **RHR Interface**: Samples can be taken downstream of the RHR heat exchanger, which is from a pipeline with a design pressure of 3.43 MPaG. The SAM System is designed for pressures at least as great as the point in the interfacing system where the sample is obtained. Therefore, the URS design pressure of 2.82 MPaG is exceeded and no upgrade required for this portion of SAM.

(2) **SLC Interface**: Samples can be taken from the SLC main tank, which is one of the low pressure sinks. Therefore, no upgrade is required for this portion of SAM.

(3) **CUW Interface**: Samples can be taken from the inlet and outlet of the filter demineralizer units, which are designed for full reactor pressure. The SAM System is designed for pressures at least as great as the point in the interfacing system where the sample is obtained. Therefore, the URS design pressure of 2.82 MPaG is exceeded and no upgrade required for this portion of SAM.

(4) **FPC Interface**: Samples can be taken from the inlet to the filter demineralizer units and from the heat exchanger outlet. The pipeline sample points have a design pressure of 1.57 MPaG ; however, this region of the FPC System did not need upgrading to the URS design pressure. Therefore, no upgrade is required for this portion of SAM.

(5) **NBS Interface**: Samples can be taken from the points within the NBS which are designed for full reactor pressure. The SAM System is designed for pressures at least as great as the point in the interfacing system where the sample is obtained. Therefore, the URS design pressure of 2.82 MPaG is exceeded and no upgrade required for this portion of SAM.

(6) **MUWP Interface**: Samples can be taken from a point within the MUWP System located in the turbine building that did not need upgrading to the URS design pressure. Therefore, no upgrade is required for this portion of SAM.

(7) **Rad Waste Interface**: Samples can be taken from the LCW and HCW collector tanks, which are low pressure sinks. Therefore, no upgrade is required for this portion of SAM.

3MA.15.2 Downstream Interfaces

None

3MA.15.3 Upgraded Components

None