2.2 Nuclear Island Systems

2.2.1 Reactor Coolant System

Design Description

1.0 System Description

The reactor coolant system (RCS) is a closed, four-loop system. The RCS contains one reactor pressure vessel (RPV), four steam generators (SG), four reactor coolant pumps (RCP), one pressurizer (PZR), a PZR relief system, and the piping that connects all equipment. The RCPs are fitted with an oil-collection system.

The RCS equipment (RPV, RCP, SG, and PZR) are supported by the RCS equipment supports. The supports are designed to account for the movement of the equipment due to thermal expansion.

The RCS provides the following safety-related functions:

- The RCS equipment provides reactor coolant pressure boundary (RCPB) integrity.
- The PZR relief system provides overpressure protection.
- The RCS transfers decay heat from the reactor core to the SGs or to the residual heat removal (RHR) system.
- The RCS provides depressurization down to the RHR system operating pressures.
- The water of the RCS is used as a neutron moderator, neutron reflector, and solvent for concentrated boric acid solutions. The RCS receives borated water from the chemical and volume control system (CVCS) and from the extra borating system (EBS).

The RCS provides the following non-safety-related functions:

- The RCS provides forced circulation of reactor coolant between the SGs and the reactor core.
- In case of a total loss of heat removal through the SGs, the RCS performs the bleed function in the feed and bleed mode of core cooling in concert with the medium head safety injection and RHR (MHSI/RHR) system.
- Primary depressurization system valves lower RCS pressure in the event of a severe accident.

2.0 Arrangement

2.1 The functional arrangement of the RCS is as described in the Design Description of Section 2.2.1, Tables 2.2.1-1—RCS Equipment Mechanical Design, 2.2.1-2—

Equipment and Valve Actuator Power Supplies and Controls, 2.2.1-3—Instrumentation Power Supplies, Classification, and Displays, and 2.2.1-4—Minimum Flow (% of Initial Flow) During Four Pump Coastdown, and as shown on Figure 2.2.1-1—RCS Functional Arrangement.

2.2 The functional arrangement of the RPV and heavy reflector is as described in the Design Description of Section 2.2.1, Table 2.2.1-6—RPV Key Dimensions and Acceptable Variations, and as shown on Figure 2.2.1-2—RPV Functional Arrangement.

2.3 Deleted.

2.4 The RCS loops are physically separated from each other.

3.0 Mechanical Design Features

3.1 Valves listed in Table 2.2.1-1 will be functionally designed and qualified such that each valve is capable of performing its intended function under the full range of fluid flow, differential pressure, electrical conditions, and temperature conditions up to and including design basis accident conditions.

3.2 Check valves listed in Table 2.2.1-1 will function to change position as listed in Table 2.2.1-1 under normal operating conditions.

3.3 Equipment identified as Seismic Category I in Table 2.2.1-1 can withstand seismic design basis loads without a loss of safety function(s).

3.4 Deleted.

3.5 The SG outlet nozzles include flow-limiting devices.

3.6 Deleted.

3.7 The piping and interconnected equipment nozzles listed in Table 2.2.1-1 are evaluated for leak-before-break (LBB).

3.8 The RPV internals will withstand the effects of flow-induced vibration.

3.9 The RCS allows movement of the equipment for thermal expansion and contraction.

3.10 Deleted.

3.11 Deleted.

3.12 Deleted.

3.13 Deleted.

3.14 Deleted.

3.15 As-built RPV internals listed as ASME Code Section III in Table 2.2.1-1 are reconciled with the design requirements.

3.16 As-built RPV internals listed as ASME Code Section III in Table 2.2.1-1 are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.

3.17 Core support structure welds meet ASME Code Section III non-destructive examination requirements.

3.18 The RPV internals are provided with irradiation specimen guide baskets to hold a capsule containing RPV material surveillance specimens.

3.19 Each RCP contains an oil collection system.

3.20 Deleted.

3.21 Deleted.

3.22 Deleted.

3.23 Deleted.

3.24 Deleted.

3.25 ASME Code Class 1, 2 and 3 piping systems are designed in accordance with ASME Code Section III requirements.

3.26 As-built ASME Code Class 1, 2 and 3 components listed in Table 2.2.1-1 are reconciled with the design requirements.

3.27 Pressure-boundary welds in ASME Code Class 1, 2 and 3 components listed in Table 2.2.1-1 meet ASME Code Section III non-destructive examination requirements.

3.28 ASME Code Class 1, 2 and 3 components listed in Table 2.2.1-1 retain their pressure-boundary integrity at their design pressure.

3.29 The RCP flywheel maintains its structural integrity during an overspeed event.

3.30 ASME Code Class 1, 2 and 3 components listed in Table 2.2.1-1 are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.

4.0 I&C Design Features, Displays, and Controls

4.1 Displays listed in Tables 2.2.1-2 and 2.2.1-3 are indicated on the PICS operator workstations in the main control room (MCR) and the remote shutdown station (RSS).

4.2 Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.2.1-2.

4.3 Equipment listed as being controlled by a priority and actuator control system (PACS) module in Table 2.2.1-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.

4.4 Deleted.

5.0 Electrical Power Design Features

5.1 Equipment designated as Class 1E listed in Tables 2.2.1-2 and 2.2.1-3 are powered from the Class 1E division as listed in Tables 2.2.1-2 and 2.2.1-3 in a normal or alternate feed condition.

5.2 Deleted.

5.3 The power supply design is such that only two EDGs are required to operate to supply power to the minimum number of PZR heaters.

6.0 Environmental Qualifications

6.1 Equipment designated as harsh environment in Table 2.2.1-2 can perform the function listed in Table 2.2.1-1 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.

6.2 Instrumentation designated as harsh environment in Table 2.2.1-3 will display as listed in Table 2.2.1-3 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.

7.0 Equipment and System Performance

7.1 Class 1E valves listed in Table 2.2.1-2 will function to change position as listed in Table 2.2.1-1 under normal operating conditions.

7.2 The RCPs have rotational inertia to provide coastdown flow of reactor coolant as listed in Table 2.2.1-4 on loss of power to the RCP pump motors.

7.3 The RCPs provide flow.

7.4 The RCP standstill seal system (SSSS) can be engaged when the RCP is stopped.

7.5 The PZR safety relief valves (PSRVs) listed in Table 2.2.1-2 open.

7.6 The PSRVs listed in Table 2.2.1-2 open below the maximum setpoint.

7.7 The PSRVs listed in Table 2.2.1-2 provide relief capacity.

7.8 Each RCP breaker and RCP bus breaker is tripped by a protection system signal.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.2.1-5 lists the RCS ITAAC.

Table 2.2.1-1—RCS Equipment Mechanical Design
Sheet 1 of 8

Description	Tag Number(1)	Location	ASME Code Section III	LBB Eval	Function	Seismic Category
RPV	30JAA10BB001	Reactor Building	Yes	Yes (2)	RCPB	I
SG 1	30JEA10AC001	Reactor Building	Yes	Yes (2)	RCPB	I
SG 2	30JEA20AC001	Reactor Building	Yes	Yes (2)	RCPB	I
SG 3	30JEA30AC001	Reactor Building	Yes	Yes(2))	RCPB	I
SG 4	30JEA40AC001	Reactor Building	Yes	Yes (2)	RCPB	I
RCP 1 – RCP Pump Casing Only	30JEB10AP001	Reactor Building	Yes	Yes (2)	RCPB	I
RCS Hot Leg Piping Loop 1 to SG 1	30JEC10BR001	Reactor Building	Yes	Yes	RCPB	I
RCS Crossover Piping from SG 1 to RCP 1	30JEC10BR002	Reactor Building	Yes	Yes	RCPB	I
RCS Cold Leg Piping Loop 1 to RPV	30JEC10BR003	Reactor Building	Yes	Yes	RCPB	I
RCP 2 – RCP Pump Casing Only	30JEB20AP001	Reactor Building	Yes	Yes (2)	RCPB	I
RCS Hot Leg Piping Loop 2 to SG 2	30JEC20BR001	Reactor Building	Yes	Yes	RCPB	I
RCS Crossover Piping from SG 2 to RCP 2	30JEC20BR002	Reactor Building	Yes	Yes	RCPB	I
RCS Cold Leg Piping Loop 2 to RPV	30JEC20BR003	Reactor Building	Yes	Yes	RCPB	I
RCP 3 – RCP Pump Casing Only	30JEB30AP001	Reactor Building	Yes	Yes(2)	RCPB	I
RCS Hot Leg Piping Loop 3 to SG 3	30JEC30BR001	Reactor Building	Yes	Yes	RCPB	I
RCS Crossover Piping from SG 3 to RCP 3	30JEC30BR002	Reactor Building	Yes	Yes	RCPB	I

Table 2.2.1-1—RCS Equipment Mechanical Design
Sheet 2 of 8

Description	Tag Number(1)	Location	ASME Code Section III	LBB Eval	Function	Seismic Category
RCS Cold Leg Piping Loop 3 to RPV	30JEC30BR003	Reactor Building	Yes	Yes	RCPB	I
RCP 4 – RCP Pump Casing Only	30JEB40AP001	Reactor Building	Yes	Yes (2)	RCPB	I
RCS Hot Leg Piping Loop 4 to SG 4	30JEC40BR001	Reactor Building	Yes	Yes	RCPB	I
RCS Crossover Piping from SG 4 to RCP 4	30JEC40BR002	Reactor Building	Yes	Yes	RCPB	I
RCS Cold Leg Piping Loop 4 to RPV	30JEC40BR003	Reactor Building	Yes	Yes	RCPB	I
PZR	30JEF10BB001	Reactor Building	Yes	Yes(2)	RCPB	I
PZR Surge Line	30JEC30BR004	Reactor Building	Yes	Yes	RCPB	I
PRT	30JEG10BB001	Reactor Building	No	N/A	N/A	II
PZR Auxiliary Spray Check Valve	30JEF10AA008	Reactor Building	Yes	N/A	Close/ RCPB	I
PZR Safety Relief Valve Assembly 1	30JEF10AA191	Reactor Building	Yes	N/A	Open/Close	I
PZR Safety Relief Valve Assembly 2	30JEF10AA192	Reactor Building	Yes	N/A	Open/Close	I
PZR Safety Relief Valve Assembly 3	30JEF10AA193	Reactor Building	Yes	N/A	Open/ Close	I
Post-Accident RPV High Point Vent Valve	30JAA10AA508	Reactor Building	Yes	N/A	Open/ RCPB	I
Post-Accident RPV High Point Vent Valve	30JAA10AA509	Reactor Building	Yes	N/A	Open/ RCPB	I
Post-Accident RPV High Point Vent Valve	30JAA10AA510	Reactor Building	Yes	N/A	Open/ RCPB	I

Table 2.2.1-1—RCS Equipment Mechanical Design
Sheet 3 of 8

Description	Tag Number(1)	Location	ASME Code Section III	LBB Eval	Function	Seismic Category
Post-Accident RPV High Point Vent Valve	30JAA10AA511	Reactor Building	Yes	N/A	Open/ RCPB	I
Post-Accident RPV High Point Vent Valve	30JAA10AA501	Reactor Building	Yes	N/A	RCPB	I
RPV High Point Vent Valve	30JAA10AA502	Reactor Building	Yes	N/A	RCPB	I
Primary Depressurization System (PDS) Isolation Valve	30JEF10AA004	Reactor Building	Yes	N/A	Open/ RCPB	I
PDS Valve	30JEF10AA005	Reactor Building	Yes	N/A	Open/ RCPB	I
PDS Isolation Valve	30JEF10AA006	Reactor Building	Yes	N/A	Open/ RCPB	I
PDS Valve	30JEF10AA007	Reactor Building	Yes	N/A	Open/ RCPB	I
PZR Vent Isolation Valve	30JEF10AA501	Reactor Building	Yes	N/A	RCPB	I
PZR Vent Isolation Valve	30JEF10AA502	Reactor Building	Yes	N/A	RCPB	I
PZR Degassing Isolation Valve	30JEF10AA503	Reactor Building	Yes	N/A	RCPB	I
PZR Degassing Isolation Valve	30JEF10AA504	Reactor Building	Yes	N/A	RCPB	I
RCP 1 Thermal Barrier Cooling Component Cooling Water (CCW) Supply Check Valve	30JEB10AA001	Reactor Building	Yes	N/A	Close	I
RCP 1 Thermal Barrier Cooling CCW Return SOV	30JEB10AA003	Reactor Building	Yes	N/A	Close	I
RCP 1 Seal 1 Injection 1st Check Valve	30JEB10AA004	Reactor Building	Yes	N/A	Close/ RCPB	I
RCP 1 Seal 1 Injection 2nd Check Valve	30JEB10AA005	Reactor Building	Yes	N/A	Close/ RCPB	I
RCP 1 Seal 1 Outlet Isolation Valve	30JEB10AA009	Reactor Building	Yes	N/A	Close	I

Table 2.2.1-1—RCS Equipment Mechanical Design
Sheet 4 of 8

Description	Tag Number(1)	Location	ASME Code Section III	LBB Eval	Function	Seismic Category
RCP 1 SSSS N2 Supply	30JEB10AA018	Reactor Building	N/A	N/A	Open	II
RCP 1 SSSS Check Valve	30JEB10AA019	Reactor Building	N/A	N/A	Open	II
RCP 1 SSSS N2 Discharge	30JEB10AA020	Reactor Building	N/A	N/A	Close	II
RCP 1 SSSS N2 Check Valve	30JEB10AA026	Reactor Building	N/A	N/A	Close	II
RCP 1 SSSS N2 Accumulator	30JEB10BB003	Reactor Building	N/A	N/A	Storage volume	II
RCP 1 Thermal Barrier Cooling CCW Supply Isolation Valve	30JEB10AA021	Reactor Building	Yes	N/A	Close	I
RCP 1 Thermal Barrier Cooling Safety Valve (CCW)	30JEB10AA191	Reactor Building	Yes	N/A	Open/Close	I
RCP 2 Thermal Barrier Cooling CCW Supply Check Valve	30JEB20AA001	Reactor Building	Yes	N/A	Close	I
RCP 2 Thermal Barrier Cooling CCW Return SOV	30JEB20AA003	Reactor Building	Yes	N/A	Close	I
RCP 2 Seal 1 Injection 1st Check Valve	30JEB20AA004	Reactor Building	Yes	N/A	Close/ RCPB	I
RCP 2 Seal 1 Injection 2nd Check Valve	30JEB20AA005	Reactor Building	Yes	N/A	Close/ RCPB	I
RCP 2 Seal 1 Outlet Isolation Valve	30JEB20AA009	Reactor Building	Yes	N/A	Close	I
RCP 2 SSSS N2 Supply	30JEB20AA018	Reactor Building	N/A	N/A	Open	II
RCP 2 SSSS Check Valve	30JEB20AA019	Reactor Building	N/A	N/A	Open	II
RCP 2 SSSS N2 Discharge	30JEB20AA020	Reactor Building	N/A	N/A	Close	II
RCP 2 SSSS N2 Check Valve	30JEB20AA026	Reactor Building	N/A	N/A	Close	II
RCP 2 SSSS N2 Accumulator	30JEB20BB003	Reactor Building	N/A	N/A	Storage volume	II

Table 2.2.1-1—RCS Equipment Mechanical Design
Sheet 5 of 8

Description	Tag Number(1)	Location	ASME Code Section III	LBB Eval	Function	Seismic Category
RCP 2 Thermal Barrier Cooling CCW Supply Isolation Valve	30JEB20AA021	Reactor Building	Yes	N/A	Close	I
RCP 2 Thermal Barrier Cooling Safety Valve (CCW)	30JEB20AA191	Reactor Building	Yes	N/A	Open/Close	I
RCP 3 Thermal Barrier Cooling CCW Supply Check Valve	30JEB30AA001	Reactor Building	Yes	N/A	Close	I
RCP 3 Thermal Barrier Cooling CCW Return SOV	30JEB30AA003	Reactor Building	Yes	N/A	Close	I
RCP 3 Seal 1 Injection 1st Check Valve	30JEB30AA004	Reactor Building	Yes	N/A	Close/ RCPB	I
RCP 3 Seal 1 Injection 2nd Check Valve	30JEB30AA005	Reactor Building	Yes	N/A	Close/ RCPB	I
RCP 3 Seal 1 Outlet Isolation Valve	30JEB30AA009	Reactor Building	Yes	N/A	Close	I
RCP 3 SSSS N2 Supply	30JEB30AA018	Reactor Building	N/A	N/A	Open	II
RCP 3 SSSS Check Valve	30JEB30AA019	Reactor Building	N/A	N/A	Open	II
RCP 3 SSSS N2 Discharge	30JEB30AA020	Reactor Building	N/A	N/A	Close	II
RCP 3 SSSS N2 Check Valve	30JEB30AA026	Reactor Building	N/A	N/A	Close	II
RCP 3 SSSS N2 Accumulator	30JEB30BB003	Reactor Building	N/A	N/A	Storage volume	II
RCP 3 Thermal Barrier Cooling CCW Supply Isolation Valve	30JEB30AA021	Reactor Building	Yes	N/A	Close	I
RCP 3 Thermal Barrier Cooling Safety Valve (CCW)	30JEB30AA191	Reactor Building	Yes	N/A	Open/Close	I
RCP 4 Thermal Barrier Cooling CCW Supply Check Valve	30JEB40AA001	Reactor Building	Yes	N/A	Close	I

Table 2.2.1-1—RCS Equipment Mechanical Design
Sheet 6 of 8

Description	Tag Number(1)	Location	ASME Code Section III	LBB Eval	Function	Seismic Category
RCP 4 Thermal Barrier Cooling CCW Return SOV	30JEB40AA003	Reactor Building	Yes	N/A	Close	I
RCP 4 Seal 1 Injection 1st Check Valve	30JEB40AA004	Reactor Building	Yes	N/A	Close/ RCPB	I
RCP 4 Seal 1 Injection 2nd Check Valve	30JEB40AA005	Reactor Building	Yes	N/A	Close/ RCPB	I
RCP 4 Seal 1 Outlet Isolation Valve	30JEB40AA009	Reactor Building	Yes	N/A	Close	I
RCP 4 SSSS N2 Supply	30JEB40AA018	Reactor Building	N/A	N/A	Open	II
RCP 4 SSSS Check Valve	30JEB40AA019	Reactor Building	N/A	N/A	Open	II
RCP 4 SSSS N2 Discharge	30JEB40AA020	Reactor Building	N/A	N/A	Close	II
RCP 4 SSSS N2 Check Valve	30JEB40AA026	Reactor Building	N/A	N/A	Close	II
RCP 4 SSSS N2 Accumulator	30JEB40BB003	Reactor Building	N/A	N/A	Storage volume	II
RCP 4 Thermal Barrier Cooling CCW Supply Isolation Valve	30JEB40AA021	Reactor Building	Yes	N/A	Close	I
RCP 4 Thermal Barrier Cooling Safety Valve (CCW)	30JEB40AA191	Reactor Building	Yes	N/A	Open/Close	I

Table 2.2.1-1—RCS Equipment Mechanical Design
Sheet 7 of 8

Description	Tag Number[1]	Location	ASME Code Section III	LBB Eval	Function	Seismic Category
PZR Heater – Mechanical Pressure Boundary	30JEF10 AH111 to 114A/B/C, AH121 to 123A/B/C, AH131 to 132A/B/C, AH211 to 215A/B/C, AH221 to 222A/B/C, AH233 to 234A/B/C, AH311 to 315A/B/C, AH321 to 322A/B/C, AH331 to 332A/B/C, AH411 to 414A/B/C, AH421 to 423A/B/C, AH433 to 434A/B/C	Reactor Building	Yes	N/A	RCPB	I
Control Rod Drive Mechanism (CRDM) Pressure Housing	30JDA01 to 30JDA22, 30JDA26 to 30JDA47, 30JDA51 to 30JDA72, 30JDA76 to 30JDA97, and 30JDA99	Reactor Building	Yes	N/A	RCPB	I
RPV Internals – Core Barrel	N/A	Reactor Building	Yes	N/A	Support	I
RPV Internals – Lower Support Plate	N/A	Reactor Building	Yes	N/A	Support	I
RPV Internals – Heavy Reflector Slabs	N/A	Reactor Building	Yes	N/A	Support	I
RPV Internals – Heavy Reflector Tie Rods	N/A	Reactor Building	Yes	N/A	Support	I

Table 2.2.1-1—RCS Equipment Mechanical Design
Sheet 8 of 8

Description	Tag Number(1)	Location	ASME Code Section III	LBB Eval	Function	Seismic Category
RPV Internals – Upper Support Plate	N/A	Reactor Building	Yes	N/A	Support	I
RPV Internals – Upper Core Plate	N/A	Reactor Building	Yes	N/A	Support	I
RPV Internals – Normal Support Columns	N/A	Reactor Building	Yes	N/A	Support	I
RPV Internals – Control Rod Guide Assembly Columns	N/A	Reactor Building	Yes	N/A	Support	I
RPV Refueling Cavity Ring	30JAB	Reactor Building	No	N/A	Leak Tightness	I

1. Equipment tag numbers are provided for information only and are not part of the certified design.
2. LBB analysis is applicable to piping and interconnected equipment nozzles.

Table 2.2.1-2—Equipment and Valve Actuator Power Supplies and Controls
Sheet 1 of 5

Description	Tag Number[1]	Location	IEEE Class 1E[2]	EQ – Harsh Env.	PACS	MCR/RSS Displays	MCR/RSS Controls	Fail Position
RCP 1	30JEB10AP001	Reactor Building	N/A	Yes	N/A	On-Off/On-Off	Start-Stop/ Start-Stop	N/A
RCP 2	30JEB20AP001	Reactor Building	N/A	Yes	N/A	On-Off/On-Off	Start-Stop/ Start-Stop	N/A
RCP 3	30JEB30AP001	Reactor Building	N/A	Yes	N/A	On-Off/On-Off	Start-Stop/ Start-Stop	N/A
RCP 4	30JEB40AP001	Reactor Building	N/A	Yes	N/A	On-Off/On-Off	Start-Stop/ Start-Stop	N/A
Post-Accident RPV High Point Vent Valve	30JAA10AA508	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	Closed
Post-Accident RPV High Point Vent Valve	30JAA10AA509	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	Closed
Post-Accident RPV High Point Vent Valve	30JAA10AA510	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	Closed
Post-Accident RPV High Point Vent Valve	30JAA10AA511	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	Closed
PSRV Assembly 1 (LTOP - 2 SOVs)	30JEF10AA191 (30JEF10AA717) (30JEF10AA718)	Reactor Building	(1^N 2^A) (2^N 1^A)	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	Closed
PSRV Assembly 2 (LTOP - 2 SOVs)	30JEF10AA192 (30JEF10AA727) (30JEF10AA728)	Reactor Building	(3^N 4^A) (4^N 3^A)	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	Closed

Table 2.2.1-2—Equipment and Valve Actuator Power Supplies and Controls
Sheet 2 of 5

Description	Tag Number(1)	Location	IEEE Class 1E(2)	EQ – Harsh Env.	PACS	MCR/RSS Displays	MCR/RSS Controls	Fail Position
PSRV Assembly 3 (LTOP - 2 SOVs)	30JEF10AA193 (30JEF10AA737) (30JEF10AA738)	Reactor Building	(2^N 1^A) (3^N 4^A)	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	Closed
PDS Isolation Valve	30JEF10AA004	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	N/A
PDS Valve	30JEF10AA005	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	N/A
PDS Isolation Valve	30JEF10AA006	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	N/A
PDS Valve	30JEF10AA007	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	N/A
PZR Vent Isolation Valve	30JEF10AA501	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	N/A
PZR Vent Isolation Valve	30JEF10AA502	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	N/A
PZR Degassing Isolation Valve	30JEF10AA503	Reactor Building	(Note 3) 2	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	N/A
PZR Degassing Isolation Valve	30JEF10AA504	Reactor Building	(Note 3) 4	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	N/A
RCP 1 Thermal Barrier Cooling CCW Return (SOV)	30JEB10AA003	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	Open
RCP 1 Seal 1 Outlet Isolation Valve	30JEB10AA009	Reactor Building	(Note 3) 1	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	N/A

Table 2.2.1-2—Equipment and Valve Actuator Power Supplies and Controls
Sheet 3 of 5

Description	Tag Number(1)	Location	IEEE Class 1E(2)	EQ – Harsh Env.	PACS	MCR/RSS Displays	MCR/RSS Controls	Fail Position
RCP 1 SSSS N2 Supply	30JEB10AA018	Reactor Building	(Note 3) 1	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	N/A
RCP 1 SSSS N2 Discharge	30JEB10AA020	Reactor Building	(Note 3) 1	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	N/A
RCP 1 Thermal Barrier Cooling CCW Supply Isolation Valve	30JEB10AA021	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	N/A
RCP 2 Thermal Barrier Cooling CCW Return (SOV)	30JEB20AA003	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	Open
RCP 2 Seal 1 Outlet Isolation Valve	30JEB20AA009	Reactor Building	(Note 3) 2	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	N/A
RCP 2 SSSS N2 Supply	30JEB20AA018	Reactor Building	(Note 3) 2	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	N/A
RCP 2 SSSS N2 Discharge	30JEB20AA020	Reactor Building	(Note 3) 2	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	N/A
RCP 2 Thermal Barrier Cooling CCW Supply Isolation Valve	30JEB20AA021	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	N/A
RCP 3 Thermal Barrier Cooling CCW Return (SOV)	30JEB30AA003	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	Open
RCP 3 Seal 1 Outlet Isolation Valve	30JEB30AA009	Reactor Building	(Note 3) 3	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	N/A

Table 2.2.1-2—Equipment and Valve Actuator Power Supplies and Controls
Sheet 4 of 5

Description	Tag Number(1)	Location	IEEE Class 1E(2)	EQ – Harsh Env.	PACS	MCR/RSS Displays	MCR/RSS Controls	Fail Position
RCP 3 SSSS N2 Supply	30JEB30AA018	Reactor Building	(Note 3) 3	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	N/A
RCP 3 SSSS N2 Discharge	30JEB30AA020	Reactor Building	(Note 3) 3	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	N/A
RCP 3 Thermal Barrier Cooling CCW Supply Isolation Valve	30JEB30AA021	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	N/A
RCP 4 Thermal Barrier Cooling CCW Return (SOV)	30JEB40AA003	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	Open
RCP 4 Seal 1 Outlet Isolation Valve	30JEB40AA009	Reactor Building	(Note 3) 4	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	N/A
RCP 4 SSSS N2 Supply	30JEB40AA018	Reactor Building	(Note 3) 4	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	N/A
RCP 4 SSSS N2 Discharge	30JEB40AA020	Reactor Building	(Note 3) 4	Yes	Yes	Position/Position	Open/Closed/ Open/Closed	N/A
RCP 4 Thermal Barrier Cooling CCW Supply Isolation Valve	30JEB40AA021	Reactor Building	N/A	Yes	N/A	Position/Position	Open/Closed/ Open/Closed	N/A
On-Off PZR Heater (144 KW) Emergency Supplied	30JEF10 AH131A/B/C, AH132A/B/C	Reactor Building	(Note 3) 1 1	Yes	Yes	Energize/Energize	On-Off/On-Off	N/A
On-Off PZR Heater (144KW) Emergency Supplied	30JEF10 AH233A/B/C, AH234A/B/C	Reactor Building	(Note 3) 2 2	Yes	Yes	Energize/Energize	On-Off/On-Off	N/A

Table 2.2.1-2—Equipment and Valve Actuator Power Supplies and Controls
Sheet 5 of 5

Description	Tag Number[1]	Location	IEEE Class 1E[2]	EQ – Harsh Env.	PACS	MCR/RSS Displays	MCR/RSS Controls	Fail Position
On-Off PZR Heater (144KW) Emergency Supplied	30JEF10 AH331A/B/C, AH332A/B/C	Reactor Building	(Note 3) 3 3	Yes	Yes	Energize/Energize	On-Off/On-Off	N/A
On-Off PZR Heater (144KW) Emergency Supplied	30JEF10 AH433A/B/C, AH434A/B/C	Reactor Building	(Note 3) 4 4	Yes	Yes	Energize/Energize	On-Off/On-Off	N/A
Accumulator Isolation Valve Division 1 (Division 2, Division 3, Division 4)	30JNG13AA008 (30JNG23AA008) (30JNG33AA008) (30JNG43AA008)	Reactor Building	(Note 3) 1 (Note 3) 2 (Note 3) 3 (Note 3) 4	Yes	Yes	Position/Position	Open-Close / Open-Close	N/A

1. Equipment tag numbers are provided for information only and are not part of the certified design.

2. ^{N} denotes the division the equipment is normally powered from. ^{A} denotes the division the equipment is powered from when alternate feed is implemented.

3. The operation of the equipment is non-safety-related and not Class 1E; however it is powered from a Class 1E source.

Table 2.2.1-3—Instrumentation Power Supplies, Classification, and Displays
Sheet 1 of 6

Equipment Description	Tag Number[1]	Equipment Location	IEEE Class 1E	EQ – Harsh Environment	MCR/RSS Displays
CRDM Position Sensor	30JDA01CG801 to 30JDA22CG801	Reactor Building	Yes	Yes	Position/Position
CRDM Position Sensor	30JDA26CG801 to 30JDA47CG801	Reactor Building	Yes	Yes	Position/Position
CRDM Position Sensor	30JDA51CG801 to 30JDA72CG801	Reactor Building	Yes	Yes	Position/Position
CRDM Position Sensor	30JDA76CG801 to 30JDA97CG801	Reactor Building	Yes	Yes	Position/Position
CRDM Position Sensor	30JDA99CG801	Reactor Building	Yes	Yes	Position/Position
CRDM Bottom Position Limit Sensor	30JDA01CG803 to 30JDA22CG803	Reactor Building	Yes	Yes	Position/Position
CRDM Bottom Position Limit Sensor	30JDA26CG803 to 30JDA47CG803	Reactor Building	Yes	Yes	Position/Position
CRDM Bottom Position Limit Sensor	30JDA51CG803 to 30JDA72CG803	Reactor Building	Yes	Yes	Position/Position
CRDM Bottom Position Limit Sensor	30JDA76CG803 to 30JDA97CG803	Reactor Building	Yes	Yes	Position/Position
CRDM Bottom Position Limit Sensor	30JDA99CG803	Reactor Building	Yes	Yes	Position/Position
CRDM Temperature Sensor	30JDA01CT801 to 30JDA22CT801	Reactor Building	Yes	Yes	Temperature/Temperature
CRDM Temperature Sensor	30JDA26CT801 to 30JDA47CT801	Reactor Building	Yes	Yes	Temperature/Temperature
CRDM Temperature Sensor	30JDA51CT801 to 30JDA72CT801	Reactor Building	Yes	Yes	Temperature/Temperature

Table 2.2.1-3—Instrumentation Power Supplies, Classification, and Displays
Sheet 2 of 6

Equipment Description	Tag Number[1]	Equipment Location	IEEE Class 1E	EQ – Harsh Environment	MCR/RSS Displays
CRDM Temperature Sensor	30JDA76CT801 to 30JDA97CT801	Reactor Building	Yes	Yes	Temperature/Temperature
CRDM Temperature Sensor	30JDA99CT801	Reactor Building	Yes	Yes	Temperature/Temperature
RCS Hot Leg (HL) Wide Range (WR) Temperature	30JEC10CT805 30JEC20CT805 30JEC30CT805 30JEC40CT805	Reactor Building	1 2 3 4	Yes	Temperature/Temperature
CRDM Bottom Position Sensor	30JDA01CG803 to 30JDA22CG803 30JDA26CG803 to 30JDA47CG803 30JDA51CG803 to 30JDA72CG803 30JDA76CG803 to 30JDA97CG803	Reactor Building	Yes	Yes	Position/Position
RCS Cold Leg (CL) WR Temperature	30JEC10CT811 30JEC20CT811 30JEC30CT811 30JEC40CT811	Reactor Building	1 2 3 4	Yes	Temperature/Temperature

Table 2.2.1-3—Instrumentation Power Supplies, Classification, and Displays
Sheet 3 of 6

Equipment Description	Tag Number[1]	Equipment Location	IEEE Class 1E	EQ – Harsh Environment	MCR/RSS Displays
RCS HL Narrow Range (NR) Temperature	30JEC10CT801 30JEC10CT802 30JEC10CT803 30JEC10CT804 30JEC20CT801 30JEC20CT802 30JEC20CT803 30JEC20CT804 30JEC30CT801 30JEC30CT802 30JEC30CT803 30JEC30CT804 30JEC40CT801 30JEC40CT802 30JEC40CT803 30JEC40CT804	Reactor Building	1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4	Yes	Temperature/Temperature
CL NR Temperature	30JEC10CT807 30JEC10CT808 30JEC20CT807 30JEC20CT808 30JEC30CT807 30JEC30CT808 30JEC40CT807 30JEC40CT808	Reactor Building	1 1 2 2 3 3 4 4	Yes	Temperature/Temperature
RCS Loop Level	30JEC10CL823 30JEC20CL823 30JEC30CL823 30JEC40CL823	Reactor Building	1 2 3 4	Yes	Level/Level

Table 2.2.1-3—Instrumentation Power Supplies, Classification, and Displays
Sheet 4 of 6

Equipment Description	Tag Number(1)	Equipment Location	IEEE Class 1E	EQ – Harsh Environment	MCR/RSS Displays
RCS Flowrate (Elbow Delta P)	30JEC10CF815 30JEC10CF817 30JEC10CF819 30JEC10CF821 30JEC20CF815 30JEC20CF817 30JEC20CF819 30JEC20CF821 30JEC30CF815 30JEC30CF817 30JEC30CF819 30JEC30CF821 30JEC40CF815 30JEC40CF817 30JEC40CF819 30JEC40CF821	Reactor Building	1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4	Yes	Flow/Flow
RCS Flowrate (Delta P across RCP)	30JEC10CP801 30JEC10CP802 30JEC20CP801 30JEC20CP802 30JEC30CP801 30JEC30CP802 30JEC40CP801 30JEC40CP802	Reactor Building	1 1 2 2 3 3 4 4	Yes	Flow/Flow
PZR Pressure	30JEF10CP801 30JEF10CP803 30JEF10CP805 30JEF10CP807	Reactor Building	1 2 3 4	Yes	Pressure/Pressure

Table 2.2.1-3—Instrumentation Power Supplies, Classification, and Displays
Sheet 5 of 6

Equipment Description	Tag Number(1)	Equipment Location	IEEE Class 1E	EQ – Harsh Environment	MCR/RSS Displays
PZR Level	30JEF10CL802 30JEF10CL804 30JEF10CL806 30JEF10CL808	Reactor Building	1 2 3 4	Yes	Level/Level
SG WR Level	30JEA10CL809 30JEA10CL810 30JEA10CL811 30JEA10CL812 30JEA20CL809 30JEA20CL810 30JEA20CL811 30JEA20CL812 30JEA30CL809 30JEA30CL810 30JEA30CL811 30JEA30CL812 30JEA40CL809 30JEA40CL810 30JEA40CL811 30JEA40CL812	Reactor Building	1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4	Yes	Level/Level

Table 2.2.1-3—Instrumentation Power Supplies, Classification, and Displays
Sheet 6 of 6

Equipment Description	Tag Number(1)	Equipment Location	IEEE Class 1E	EQ – Harsh Environment	MCR/RSS Displays
SG NR Level	30JEA10CL801	Reactor Building	1	Yes	Level/Level
	30JEA10CL802		2		
	30JEA10CL803		3		
	30JEA10CL804		4		
	30JEA20CL801		1		
	30JEA20CL802		2		
	30JEA20CL803		3		
	30JEA20CL804		4		
	30JEA30CL801		1		
	30JEA30CL802		2		
	30JEA30CL803		3		
	30JEA30CL804		4		
	30JEA40CL801		1		
	30JEA40CL802		2		
	30JEA40CL803		3		
	30JEA40CL804		4		
RCP Speed Sensor	30JEB10CS896	Reactor Building	1	Yes	Speed/Speed
	30JEB20CS896		2		
	30JEB30CS896		3		
	30JEB40CS896		4		
	30JEB10CS897		1		
	30JEB20CS897		2		
	30JEB30CS897		3		
	30JEB40CS897		4		

1. Equipment tag numbers are provided for information only and are not part of the certified design.

Table 2.2.1-4—Minimum Flow (% of Initial Flow) During Four Pump Coastdown

Time (s)	Flow (%)
0	100
1	94.03
2	87.59
4	77.01
6	68.66
8	61.81
10	56.1
20	38

Table 2.2.1-5—Reactor Coolant System ITAAC
Sheet 1 of 11

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
2.1	The functional arrangement of the RCS is as described in the Design Description of Section 2.2.1, Tables 2.2.1-1, 2.2.1-2, 2.2.1-3, 2.2.1-4, and as shown on Figure 2.2.1-1.	An inspection of the as-built RCS functional arrangement will be performed.	The RCS conforms to the functional arrangement as described in the Design Description of Section 2.2.1, Tables 2.2.1-1, 2.2.1-2, 2.2.1-3, 2.2.1-4, and as shown on Figure 2.2.1-1.
2.2	The functional arrangement of the RPV and heavy reflector is as described in the Design Description of Section 2.2.1, Table 2.2.1-6, and as shown on Figure 2.2.1-2.	An inspection of the as-built RPV and heavy reflector functional arrangement will be performed.	The RPV and heavy reflector conforms to the functional arrangement as described in the Design Description of Section 2.2.1, Table 2.2.1-6, and as shown on Figure 2.2.1-2.
2.3	Deleted.	Deleted.	Deleted.
2.4	The RCS loops are physically separated from each other.	An inspection will be performed to verify physical separation of the as-built RCS loops.	The RCS loops are physically separated from each other by a wall as shown on Figure 2.1.1-6.
3.1	Valves listed in Table 2.2.1-1 will be functionally designed and qualified such that each valve is capable of performing its intended function under the full range of fluid flow, differential pressure, electrical conditions, and temperature conditions up to and including design basis accident conditions.	Tests or type tests of valves will be performed to demonstrate that the valves function under the full range of fluid flow, differential pressure, electrical conditions, and temperature conditions up to and including design basis accident conditions.	A report concludes that the valves listed in Table 2.2.1-1 are capable of performing their intended function under the full range of fluid flow, differential pressure, electrical conditions, and temperature conditions up to and including design basis accident conditions.
3.2	Check valves listed in Table 2.2.1-1 will function to change position as listed in Table 2.2.1-1 under normal operating conditions.	Tests will be performed to verify the ability of check valves to change position under normal operating conditions.	The check valves change position as listed in Table 2.2.1-1 under normal operating conditions.

Table 2.2.1-5—Reactor Coolant System ITAAC
Sheet 2 of 11

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.3	Equipment identified as Seismic Category I in Table 2.2.1-1 can withstand seismic design basis loads without a loss of safety function(s).	a. Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment identified as Seismic Category I in Table 2.2.1-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements. b. An inspection will be performed of the as-built equipment identified as Seismic Category I in Table 2.2.1-1 to verify that the equipment, including anchorage, are installed in a condition bounded by the tested or analyzed condition.	a. Test/analysis reports conclude that the equipment identified as Seismic Category I in Table 2.2.1-1 can withstand seismic design basis loads without a loss of safety function(s). b. Inspection reports conclude that the equipment identified as Seismic Category I in Table 2.2.1-1, including anchorage, are installed in a condition bounded by the tested or analyzed condition.
3.4	Deleted.	Deleted.	Deleted.
3.5	The SG outlet nozzles include flow-limiting devices.	An inspection will be performed to verify the as-built SG outlet nozzles include flow limiting devices.	The flow area through each SG outlet nozzle flow-limiting device is a maximum of 1.39 ft^2.
3.6	Deleted.	Deleted.	Deleted.
3.7	The piping and interconnected equipment nozzles listed in Table 2.2.1-1 are evaluated for LBB.	An analysis will be performed to verify the piping and interconnected equipment nozzles are evaluated for LBB. {{DAC}}	A report exists and concludes that design LBB analysis remains bounding for each piping system and provides a summary of the results of the as-built, plant-specific LBB analysis, including material properties of piping and welds, stress analyses, leakage detection capability, and degradation mechanisms. {{DAC}}

Table 2.2.1-5—Reactor Coolant System ITAAC
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Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
3.8	The RPV internals will withstand the effects of flow-induced vibration.	a. Tests and analyses of test results will be performed on a plant containing RPV internals representative of the U.S. EPR to verify that the RPV internals have no observable damage, no loose parts, and stress is within ASME Code Section III limits.	a. A comprehensive vibration assessment program report concludes that RPV internals have no observable damage, no loose parts, and stress is within ASME Code Section III limits.
		b. An inspection will be performed after hot functional testing to verify the as-built RPV internals have no observable damage or loose parts.	b. The RPV internals have no observable damage or loose parts.
		c. An analysis will be performed on the effects of the RCP acoustic frequencies on RPV internals to verify that the RPV internals stress is within ASME Code Section III limits.	c. An analysis of the effects of RCP acoustic frequencies on RPV internals concludes that RPV internals stress is within ASME Code Section III limits.
		d. An analysis will be performed of the acoustic frequencies of the RCS volume to verify that the RCS stress is within the ASME Code Section III limits.	d. An analysis of the acoustic frequencies of the RCS volume concludes that stresses due to their loading impact to the RCS equipment when considering sources of flow excitation created by vortex shedding frequencies of the applicable structures and blade passing frequencies of the RCP is within the ASME Code Section III limits.

Table 2.2.1-5—Reactor Coolant System ITAAC
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	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.9	The RCS allows movement of the equipment for thermal expansion and contraction.	a. An analysis will be performed to determine the clearances and gaps between as-built RCS piping system and its supports. b. An inspection of the RCS will be performed to verify the clearances and gaps for as-built RCS piping system and its supports conform to the approved design.	a. A report defines clearances and gaps between RCS piping system and its supports. b. The measured clearances and gaps conform to the approved design for RCS piping system and its supports.
3.10	Deleted.	Deleted.	Deleted.
3.11	Deleted.	Deleted.	Deleted.
3.12	Deleted.	Deleted.	Deleted.
3.13	Deleted.	Deleted.	Deleted.
3.14	Deleted.	Deleted.	Deleted.
3.15	As-built RPV internals listed as ASME Code Section III in Table 2.2.1-1 are reconciled with the design requirements.	A reconciliation analysis of RPV internals listed as ASME Code Section III in Table 2.2.1-1 will be performed.	ASME Code Design Report(s) exist that meet the requirements of NCA-3550, conclude that the design reconciliation has been completed for the as-built RPV internals listed as ASME Code Section III in Table 2.2.1-1, and document that the results of the reconciliation analysis comply with the requirements of ASME Code Section III, Subsection NG.
3.16	As-built RPV internals listed as ASME Code Section III in Table 2.2.1-1 are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.	An inspection of the as-built construction activities and documentation for RPV internals listed as ASME Code Section III in Table 2.2.1-1 will be conducted.	ASME Code Data Report(s) exist that conclude that RPV internals listed as ASME Code Section III in Table 2.2.1-1 are fabricated, installed, and inspected in accordance with ASME Code Section III, Subsection NG.

Table 2.2.1-5—Reactor Coolant System ITAAC
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	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.17	Core support structure welds meet ASME Code Section III non-destructive examination requirements.	An inspection of the as-built core support structure welds will be performed.	ASME Code reports(s) exist that conclude that ASME Code Section III requirements are met for non-destructive examination of core support structure welds.
3.18	The RPV internals are provided with irradiation specimen guide baskets to hold a capsule containing RPV material surveillance specimens.	An inspection will be performed to verify the as-built RPV internals are provided with irradiation specimen guide baskets and capsules containing RPV material surveillance specimens.	Two guide baskets are installed and are located on opposite sides of the RPV. One capsule containing RPV material surveillance specimens is installed in each guide basket.
3.19	Each RCP contains an oil collection system.	a. An analysis will be performed to verify the as-built oil collection system 1) will withstand a safe-shutdown earthquake, 2) will collect lube oil from leakage sites in the RCP lube oil system, and 3) is sized so that the drain line and collection tank are large enough to accommodate the largest potential oil leak. b. An inspection will be performed to verify an oil collection system is installed on each as-built RCP.	a. A report concludes the oil collection system 1) will withstand a safe-shutdown earthquake, 2) will collect lube oil from leakage sites in the RCP lube oil system, and 3) is sized so that the drain line and collection tank are large enough to accommodate the largest potential oil leak. b. An oil collection system is installed on each RCP.
3.20	Deleted.	Deleted.	Deleted.
3.21	Deleted.	Deleted.	Deleted.
3.22	Deleted.	Deleted.	Deleted.
3.23	Deleted.	Deleted.	Deleted.
3.24	Deleted.	Deleted.	Deleted.

**Table 2.2.1-5—Reactor Coolant System ITAAC
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Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
3.25	ASME Code Class 1, 2 and 3 piping systems are designed in accordance with ASME Code Section III requirements.	An inspection of piping design and analysis documentation required by ASME Code Section III will be performed. {{DAC}}	ASME Code Section III Design Report(s) exist that meet the requirements of NCA-3550 and conclude that the design of ASME Code Class 1, 2 and 3 piping systems complies with the requirements of ASME Code Section III. {{DAC}}
3.26	As-built ASME Code Class 1, 2 and 3 components are reconciled with the design requirements.	A reconciliation analysis of ASME Code Class 1, 2 and 3 components will be performed.	ASME Code Design Report(s) exist that meet the requirements of NCA-3550, conclude that the design reconciliation has been completed for as-built ASME Code Class 1, 2 and 3 components listed in Table 2.2.1-1, and document that the results of the reconciliation analysis comply with the requirements of ASME Code Section III.
3.27	Pressure-boundary welds in ASME Code Class 1, 2 and 3 components listed in Table 2.2.1-1 meet ASME Code Section III non-destructive examination requirements.	An inspection of the as-built pressure-boundary welds in ASME Code Class 1, 2 and 3 components will be performed.	ASME Code reports(s) exist that conclude that ASME Code Section III requirements are met for non-destructive examination of pressure-boundary welds in ASME Code Class 1, 2 and 3 components listed in Table 2.2.1-1.
3.28	ASME Code Class 1, 2 and 3 components listed in Table 2.2.1-1 retain their pressure-boundary integrity at their design pressure.	A hydrostatic test will be conducted on ASME Code Class 1, 2 and 3 components that are required to be hydrostatically tested by ASME Code Section III.	ASME Code Data Report(s) exist and conclude that the results of the hydrostatic test of ASME Code Class 1, 2 and 3 components listed in Table 2.2.1-1 comply with the requirements of ASME Code Section III.

Table 2.2.1-5—Reactor Coolant System ITAAC
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	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.29	The RCP flywheel maintains its structural integrity during an overspeed event.	A vendor RCP overspeed test will be performed to verify that there is no loss of structural integrity of the RCP flywheel at 125 percent of the motor synchronous speed.	A report concludes that there is no loss of structural integrity of the RCP flywheel at 125 percent of the motor synchronous speed of 1200 rpm.
3.30	ASME Code Class 1, 2 and 3 components listed in Table 2.2.1-1 are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.	An inspection of the as-built construction activities and documentation for ASME Code Class 1, 2 and 3 components will be conducted.	ASME Code Data Report(s) exist that conclude that ASME Code Class 1, 2 and 3 components listed in Table 2.2.1-1 are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.
4.1	Displays listed in Tables 2.2.1-2 and 2.2.1-3 are indicated on the PICS operator workstations in the MCR and the RSS.	a. Tests will be performed to verify that the displays listed in Tables 2.2.1-2 and 2.2.1-3 are indicated on the PICS operator workstations in the MCR. b. Tests will be performed to verify that the displays listed in Tables 2.2.1-2 and 2.2.1-3 are indicated on the PICS operator workstations in the RSS.	a. Displays listed in Tables 2.2.1-2 and 2.2.1-3 are indicated on the PICS operator workstations in the MCR. b. Displays listed in Tables 2.2.1-2 and 2.2.1-3 are indicated on the PICS operator workstations in the RSS.
4.2	Controls on the PICS operator workstations in the MCR and the RSS perform the function listed in Table 2.2.1-2.	a. Tests will be performed using controls on the PICS operator workstations in the MCR. b. Tests will be performed using controls on the PICS operator workstations in the RSS.	a. Controls on the PICS operator workstations in the MCR perform the function listed in Table 2.2.1-2. b. Controls on the PICS operator workstations in the RSS perform the function listed in Table 2.2.1-2.

Table 2.2.1-5—Reactor Coolant System ITAAC
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	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
4.3	Equipment listed as being controlled by a PACS module in Table 2.2.1-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.	A test will be performed using test input signals to verify equipment controlled by a PACS module responds to the state requested and provides drive monitoring signals back to the PACS module.	Equipment listed as being controlled by a PACS module in Table 2.2.1-2 responds to the state requested and provides drive monitoring signals back to the PACS module. The PACS module will protect the equipment by terminating the output command upon the equipment reaching the requested state.
4.4	Deleted.	Deleted.	Deleted.
5.1	Equipment designated as Class 1E in Tables 2.2.1-2 and 2.2.1-3 are powered from the Class 1E division as listed in Tables 2.2.1-2 and 2.2.1-3 in a normal or alternate feed condition.	a. Testing will be performed by providing a test input signal in each normally aligned division. b. Testing will be performed by providing a test input signal in each division with the alternate feed aligned to the divisional pair.	a. The test input signal provided in the normally aligned division is present at the respective Class 1E equipment identified in Tables 2.2.1-2 and 2.2.1-3. b. The test input signal provided in each division with the alternate feed aligned to the divisional pair is present at the respective Class 1E equipment identified in Tables 2.2.1-2 and 2.2.1-3.
5.2	Deleted.	Deleted.	Deleted.
5.3	The power supply design is such that only two EDGs are required to operate to supply power to the minimum number of PZR heaters.	An analysis will be performed to verify that only two EDGs are required to operate to supply power to the minimum number of PZR heaters.	An analysis concludes that only two EDGs are required to operate to supply power to the two groups of emergency PZR heaters, which are rated at 144 kW per heater.

Table 2.2.1-5—Reactor Coolant System ITAAC
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	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
6.1	Equipment designated as harsh environment in Table 2.2.1-2 can perform the function listed in Table 2.2.1-1 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.	a. Type tests or type tests and analysis will be performed to demonstrate the ability of the equipment designated as harsh environment in Table 2.2.1-2 to perform the function listed in Table 2.2.1-1 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.	a. EQDPs conclude that the equipment designated as harsh environment in Table 2.2.1-2 can perform the function listed in Table 2.2.1-1 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions, including the time required to perform the listed function.
		b. An inspection will be performed of the as-built equipment designated as harsh environment in Table 2.2.1-2 to verify that the equipment, including the associated cables, wiring, and terminations located in a harsh environment, are bounded by the type test or combination of type tests and analyses.	b. A report exists and concludes that the equipment designated as harsh environment in Table 2.2.1-2, including the associated cables, wiring, and terminations located in a harsh environment, are bounded by the type test or combination of type tests and analyses.

Table 2.2.1-5—Reactor Coolant System ITAAC
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	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
6.2	Instrumentation designated as harsh environment in Table 2.2.1-3 will display as listed in Table 2.2.1-3 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.	a. Type tests or type tests and analysis will be performed to demonstrate the ability of the equipment designated as harsh environment in Table 2.2.1-3 to perform the function listed in Table 2.2.1-3 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions.	a. EQDPs conclude that the equipment designated as harsh environment in Table 2.2.1-3 can perform the function listed in Table 2.2.1-3 under normal environmental conditions, containment test conditions, anticipated operational occurrences, and accident and post-accident environmental conditions, including the time required to perform the listed function.
		b. An inspection will be performed of the as-built equipment designated as harsh environment in Table 2.2.1-3 to verify that the equipment, including the associated cables, wiring, and terminations located in a harsh environment, are bounded by the type test or combination of type tests and analyses.	b. A report exists and concludes that the equipment designated as harsh environment in Table 2.2.1-3, the associated cables, wiring, and terminations located in a harsh environment, are bounded by the type test or combination of type tests and analyses.
7.1	Class 1E valves listed in Table 2.2.1-2 will function to change position as listed in Table 2.2.1-1 under normal operating conditions.	Tests will be performed to verify the ability of Class 1E valves to change position under normal operating conditions.	Class 1E valves listed in Table 2.2.1-2 change position as listed in Table 2.2.1-1 under normal operating conditions.
7.2	The RCPs have rotational inertia to provide coast down flow of reactor coolant as listed in Table 2.2.1-4 on loss of power to the RCP motors.	A test will be performed to verify the RCPs have rotational inertia to provide coast down flow of reactor coolant on loss of power to the RCP motors.	The RCPs provide the minimum coastdown flow of reactor coolant as listed in Table 2.2.1-4 on loss of power to the RCP motors.

Table 2.2.1-5—Reactor Coolant System ITAAC
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	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
7.3	The RCPs provide flow.	A test will be performed to verify the RCPs provide flow.	The RCPs provide flow greater than 124,741 gpm/loop and less than 134,662 gpm/loop.
7.4	The RCP SSSS can be engaged when the RCP is stopped.	A test will be performed to verify the RCP SSSS can be engaged when the RCP is stopped.	The RCP SSSS can be engaged when the RCP is stopped.
7.5	PSRVs listed in Table 2.2.1-2 open.	A test will be performed to verify that upon receipt of a test input signal, each PSRV opens.	Each PSRV opens within 0.70 seconds (including pilot valve opening time) after receipt of a test input signal from the PACS module.
7.6	PSRVs listed in Table 2.2.1-2 open below the maximum setpoint.	Vendor tests will be performed to verify that each PSRV opens below the maximum setpoint.	Each PSRV opens below a maximum lift setting of 2600.4 psia.
7.7	PSRVs listed in Table 2.2.1-2 provide relief capacity.	Vendor tests and analysis will be performed to verify relief capacity of PSRVs listed in Table 2.2.1-2.	Each PSRV listed in Table 2.2.1-2 provides relief capacity ≥ 661,400 lbm/hr at 2535 psig.
7.8	Each RCP breaker and RCP bus breaker is tripped by a protection system signal.	A test will be performed to verify that upon receipt of a protection system signal, each RCP breaker and RCP bus breaker trips.	Each RCP breaker and RCP bus breaker is tripped by a protection system signal.

Table 2.2.1-6—RPV Key Dimensions and Acceptable Variations

Description	Dimension/ Elevation	Nominal Value (inches)	Acceptable Variation (inches)
Vessel Inside Diameter at Beltline (to cladding)	A	191.73	+1.0 / -1.0
Vessel Beltline Shell Thickness (without cladding)	B	9.84	+0.88 / -0.12
Vessel Lower Head Thickness (without cladding)	C	5.71	+1.0 / -0.12
Vessel Inlet / Outlet Nozzle Inside Diameter (at safe end)	D	30.71	+0.37 / -0.12
Elevation from Mating Surface to Centerline of Inlet/ Outlet Nozzle	E	70.87	+0.25 / -0.25
Elevation from Mating Surface to Inside of Bottom Head (to cladding)	F	408.66	+1.0 / -0.5

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