2.2 Nuclear Island Systems

2.2.1 Reactor Coolant System

1.0 Description

The reactor coolant system (RCS) is a closed, four-loop system. The RCS consists of one reactor pressure vessel (RPV), four steam generators (SG), four reactor coolant pumps (RCP), one pressurizer (PZR), one PZR relief tank (PRT), and the piping that connects all components. The RCPs are fitted with an oil-collection system, which reduces the likelihood of an RCP fire. The RCS is a safety-related system that is in continuous operation whenever irradiated fuel is in the reactor core.

The RCS components (RPV, RCP, SG, and PZR) are supported by the RCS component supports. The RCS component supports maintain the integrity of the reactor coolant pressure boundary (RCPB). The supports are designed to account for the movement of the components due to thermal expansion.

The RCS provides the following safety-related functions:

- The RCPB provides the second barrier against radioactive product leakage.
- The PZR regulates pressure and provides overpressure protection.
- The RCS transfers decay heat from the reactor core to the SGs or to the residual heat removal system.
- The RCS maintains safe depressurization down to residual heat removal (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 low head safety injection and RHR (LHSI/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 shown on Figure 2.2.1-1—RCS Functional Arrangement.

2.2 The functional arrangement of the RPV and heavy reflector is shown on Figure 2.2.1-2—RPV Functional Arrangement.

2.3 The location of the RCS equipment is as listed in Table 2.2.1-1—RCS Equipment Mechanical Design.

2.4 The RCS loops are physically separated from each other.

3.0 Mechanical Design Features

3.1 Equipment listed in Table 2.2.1-1 as ASME Code Section III, other than RPV internals, is designed, welded, and hydrostatically tested in accordance with ASME Code Section III.

3.2 Check valves listed in Table 2.2.1-1 will function as listed in Table 2.2.1-1.

3.3 Equipment identified as Seismic Category 1 in Table 2.2.1-1 can withstand seismic design basis loads without loss of safety function as listed in Table 2.2.1-1.

3.4 Deleted.

3.5 The steam outlet nozzles on the SGs include flow-limiting devices.

3.6 The RCP motors include a device to prevent reverse rotation.

3.7 The applicable piping and interconnected component nozzles listed in Table 2.2.1-1 are evaluated for LBB.

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

3.9 The RCS is designed to allow movement of the components as necessary due to thermal expansion and contraction.

3.10 Deleted.

3.11 Components listed as ASME Code Class I in Table 2.2.1-1 are analyzed for fatigue in accordance with ASME Section III Class I.

3.12 Deleted.

3.13 Deleted.

3.14 Deleted.

3.15 Deleted.

3.16 RPV internals listed in Table 2.2.1-1 are designed in accordance with ASME Code Section III, Subsection NG.

3.17 Core support structure welds meet ASME Code Section III, Subsection NG requirements.

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

3.19 Each RCP contains an oil collection system.

3.20 Portions of the RCS piping shown as ASME Code Section III in Figure 2.2.1-1 are designed in accordance with ASME Code Section III requirements.

3.21 Portions of the RCS piping shown as ASME Code Section III in Figure 2.2.1-1 are installed in accordance with an ASME Code Section III Design Report.

3.22 Pressure boundary welds in portions of the RCS piping shown as ASME Code Section III in Figure 2.2.1-1 are in accordance with ASME Code Section III.

3.23 Portions of the RCS piping shown as ASME Code Section III in Figure 2.2.1-1 retain their pressure boundary integrity at their design pressure.

3.24 Portions of the RCS piping shown as ASME Code Section III in Figure 2.2.1-1 are installed in accordance with ASME Code Section III requirements.

4.0 Instrumentation and Controls (I&C) Design Features, Displays, and Controls

4.1 Displays listed in Tables 2.2.1-2—Equipment and Valve Actuator Power Supplies and Controls and 2.2.1-3—Instrumentation Power Supplies, Classification, and Displays are retrievable in the main control room (MCR) and remote shutdown station (RSS) as listed in Tables 2.2.1-2 and 2.2.1-3.

4.2 The RCS system equipment controls are provided in the MCR and RSS as 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 by a test signal.

5.0 Electrical Power Design Features

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

5.2 Valves listed in Table 2.2.1-2 fail to the position noted in Table 2.2.1-2 on loss of power.

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

6.0 Environmental Qualifications

6.1 Equipment listed in Table 2.2.1-2 for harsh environment can perform the function listed in Table 2.2.1-1 following exposure to the design basis environments for the time required.

6.2 Instrumentation listed in Table 2.2.1-3 for harsh environment can display following exposure to the design basis environments.

7.0 Equipment and System Performance

7.1 Class 1E valves listed in Table 2.2.1-2 can perform the function listed in Table 2.2.1-1 under system design conditions.

7.2 The RCPs have rotational inertia to provide coastdown flow of reactor coolant on loss of power to the pump motors.

7.3 The RCPs provide flow.

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

7.5 The PZR safety relief valves (PSRVs) open.

7.6 The PSRVs open below their maximum design setpoint.

7.7 The PSRVs provide relief capacity.

7.8 Each RCP is tripped by a protection system signal.

8.0 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.2.1-5 lists the RCS ITAAC.

Table 2.2.1-1—RCS Equipment Mechanical Design (9 Sheets)

Equipment Description	Equipment Tag Number[1]	Equipment Location	ASME Code Section III	LBB Eval	Function	Seismic Category
RPV	30JAA10 BB001	Reactor Building	Yes (class 1)	Yes [2]	RCPB	I
SG 1	30JEA10 AC001	Reactor Building	Yes (class 1)	Yes [2]	Heat Transfer	I
SG 2	30JEA20 AC001	Reactor Building	Yes (class 1)	Yes [2]	Heat Transfer	I
SG 3	30JEA30 AC001	Reactor Building	Yes (class 1)	Yes [2]	Heat Transfer	I
SG 4	30JEA40 AC001	Reactor Building	Yes (class 1)	Yes [2]	Heat Transfer	I
RCP 1 – RCP Pump Casing Only	30JEB10 AP001	Reactor Building	Yes (class 1)	Yes [2]	RCPB, Heat Transport	I
RCS Hot Leg Piping Loop1 to SG 1	30JEC10BR001	Reactor Building	Yes (class 1)	Yes	RCPB	I
RCS Crossover Piping from SG 1 to RCP 1	30JEC10BR002	Reactor Building	Yes (class 1)	Yes	RCPB	I
RCS Cold Leg Piping Loop 1 to RV	30JEC10BR003	Reactor Building	Yes (class 1)	Yes	RCPB	I
RCP 2 – RCP Pump Casing Only	30JEB20 AP001	Reactor Building	Yes (class 1)	Yes [2]	RCPB	I
RCS Hot Leg Piping Loop 2 to SG 2	30JEC20BR001	Reactor Building	Yes (class 1)	Yes	RCPB	I
RCS Crossover Piping from SG 2 to RCP 2	30JEC20BR002	Reactor Building	Yes (class 1)	Yes	RCPB	I
RCS Cold Leg Piping Loop 2 to RV	30JEC20BR003	Reactor Building	Yes (class 1)	Yes	RCPB	I

Table 2.2.1-1—RCS Equipment Mechanical Design (9 Sheets)

Equipment Description	Equipment Tag Number[1]	Equipment Location	ASME Code Section III	LBB Eval	Function	Seismic Category
RCP 3 – RCP Pump Casing Only	30JEB30 AP001	Reactor Building	Yes (class 1)	Yes [2]	RCPB	I
RCS Hot Leg Piping Loop 2 to SG 3	30JEC30BR001	Reactor Building	Yes (class 1)	Yes	RCPB	I
RCS Crossover Piping from SG 3 to RCP 3	30JEC30BR002	Reactor Building	Yes (class 1)	Yes	RCPB	I
RCS Cold Leg Piping Loop 3 to RV	30JEC30BR003	Reactor Building	Yes (class 1)	Yes	RCPB	I
RCP 4 – RCP Pump Casing Only	30JEB40 AP001	Reactor Building	Yes (class 1)	Yes [2]	RCPB	I
RCS Hot Leg Piping Loop 4 to SG 4	30JEC40BR001	Reactor Building	Yes (class 1)	Yes	RCPB	I
RCS Crossover Piping from SG 4 to RCP 4	30JEC40BR002	Reactor Building	Yes (class 1)	Yes	RCPB	I
RCS Cold Leg Piping Loop 4 to RV	30JEC40BR003	Reactor Building	Yes (class 1)	Yes	RCPB	I
PZR	30JEF10 BB001	Reactor Building	Yes (class 1)	Yes [2]	Storage Volume	I
PZR Surge Line	30JEC30 BR004	Reactor Building	Yes (class 1)	Yes [2]	RCPB	I
PRT	30JEG10 BB001	Reactor Building	No	N/A	N/A	II
PZR Auxiliary Spray Check Valve	30JEF10 AA008	Reactor Building	Yes (class 1)	N/A	Open/Close	I
PZR Spray Valve (Cold Leg 2)	30JEF10 AA102	Reactor Building	Yes (class 1)	N/A	Open/Close	I

Table 2.2.1-1—RCS Equipment Mechanical Design (9 Sheets)

Equipment Description	Equipment Tag Number[1]	Equipment Location	ASME Code Section III	LBB Eval	Function	Seismic Category
PZR Spray Valve (Cold Leg 3)	30JEF10 AA103	Reactor Building	Yes (class 1)	N/A	Open/Close	I
PZR Safety Relief Valve Assembly 1	30JEF10 AA191	Reactor Building	Yes (class 1)	N/A	Open/Close	I
PZR Safety Relief Valve Assembly 2	30JEF10 AA192	Reactor Building	Yes (class 1)	N/A	Open/Close	I
PZR Safety Relief Valve Assembly 3	30JEF10 AA193	Reactor Building	Yes (class 1)	N/A	Open/Close	I
RPV High Point Vent Valve	30JAA10 AA508	Reactor Building	Yes (class 1)	N/A	Open/Close	I
RPV High Point Vent Valve	30JAA10 AA509	Reactor Building	Yes (class 1)	N/A	Open/Close	I
RPV High Point Vent Valve	30JAA10 AA510	Reactor Building	Yes (class 1)	N/A	Open/Close	I
RPV High Point Vent Valve	30JAA10 AA511	Reactor Building	Yes (class 1)	N/A	Open/Close	I
RPV Vent Isolation Valve	30JAA10 AA501	Reactor Building	Yes (class 1)	N/A	Close	I
RPV Vent Isolation Valve	30JAA10 AA502	Reactor Building	Yes (class 1)	N/A	Close	I
Primary Depressurization System (PDS) Isolation Valve	30JEF10 AA004	Reactor Building	Yes (class 1)	N/A	Open/Close	I
PDS Valve	30JEF10 AA005	Reactor Building	Yes (class 1)	N/A	Open/Close	I

Table 2.2.1-1—RCS Equipment Mechanical Design (9 Sheets)

Equipment Description	Equipment Tag Number[1]	Equipment Location	ASME Code Section III	LBB Eval	Function	Seismic Category
PDS Isolation Valve	30JEF10 AA006	Reactor Building	Yes (class 1)	N/A	Open/Close	I
PDS Valve	30JEF10 AA007	Reactor Building	Yes (class 1)	N/A	Open/Close	I
PZR Vent Isolation Valve	30JEF10 AA501	Reactor Building	Yes (class 1)	N/A	Close	I
PZR Vent Isolation Valve	30JEF10 AA502	Reactor Building	Yes (class 1)	N/A	Close	I
PZR Degassing Isolation Valve	30JEF10 AA503	Reactor Building	Yes	N/A	Close	I
PZR Degassing Isolation Valve	30JEF10 AA504	Reactor Building	Yes	N/A	Close	I
SG 1 Secondary Sampling Isolation Valve	30JEA10 AA601	Reactor Building	Yes	N/A	Close	I
SG 2 Secondary Sampling Isolation Valve	30JEA20 AA601	Reactor Building	Yes	N/A	Close	I
SG 3 Secondary Sampling Isolation Valve	30JEA30 AA601	Reactor Building	Yes	N/A	Close	I
SG 4 Secondary Sampling Isolation Valve	30JEA40 AA601	Reactor Building	Yes	N/A	Close	I
RCP 1 Thermal Barrier Cooling CCW Supply Check Valve	30JEB10 AA001	Reactor Building	Yes	N/A	Open/Close	I
RCP 1 Thermal Barrier Cooling CCW Return SOV	30JEB10 AA003	Reactor Building	Yes	N/A	Open/Close	I

Table 2.2.1-1—RCS Equipment Mechanical Design (9 Sheets)

Equipment Description	Equipment Tag Number[1]	Equipment Location	ASME Code Section III	LBB Eval	Function	Seismic Category
RCP 1 Seal 1 Injection 1st Check Valve	30JEB10 AA004	Reactor Building	Yes (class 1)	N/A	Open/Close	I
RCP 1 Seal 1 Injection 2nd Check Valve	30JEB10 AA005	Reactor Building	Yes (class 1)	N/A	Open/Close	I
RCP 1 Seal 1 Outlet Isolation Valve	30JEB10 AA009	Reactor Building	Yes	N/A	Open/Close	I
RCP 1 SSSS N2 Supply	30JEB10 AA018	Reactor Building	N/A	N/A	Open/Close	II
RCP 1 SSSS Check Valve	30JEB10 AA019	Reactor Building	N/A	N/A	Open/Close	II
RCP 1 SSSS N2 Discharge	30JEB10 AA020	Reactor Building	N/A	N/A	Close	II
RCP 1 Thermal Barrier Cooling CCW Supply Isolation Valve	30JEB10 AA021	Reactor Building	Yes	N/A	Open/Close	I
RCP 1 Thermal Barrier Cooling Safety Valve (CCW)	30JEB10 AA191	Reactor Building	Yes	N/A	Open/Close	I
RCP 2 Thermal Barrier Cooling CCW Supply Check Valve	30JEB20 AA001	Reactor Building	Yes	N/A	Open/Close	I
RCP 2 Thermal Barrier Cooling CCW Return SOV	30JEB20 AA003	Reactor Building	Yes	N/A	Open/Close	I
RCP 2 Seal 1 injection 1st Check Valve	30JEB20 AA004	Reactor Building	Yes (class 1)	N/A	Open/Close	I

Table 2.2.1-1—RCS Equipment Mechanical Design (9 Sheets)

Equipment Description	Equipment Tag Number[1]	Equipment Location	ASME Code Section III	LBB Eval	Function	Seismic Category
RCP 2 Seal 1 injection 2nd Check Valve	30JEB20 AA005	Reactor Building	Yes (class 1)	N/A	Open/Close	I
RCP 2 Seal 1 Outlet Isolation Valve	30JEB20 AA009	Reactor Building	Yes	N/A	Open/Close	I
RCP 2 SSSS N2 Supply	30JEB20 AA018	Reactor Building	N/A	N/A	Open	II
RCP 2 SSSS Check Valve	30JEB20 AA019	Reactor Building	N/A	N/A	Open/Close	II
RCP 2 SSSS N2 Discharge	30JEB20 AA020	Reactor Building	N/A	N/A	Close	II
RCP 2 Thermal Barrier Cooling CCW Supply Isolation Valve	30JEB20 AA021	Reactor Building	Yes	N/A	Open/Close	I
RCP 2 Thermal Barrier Cooling Safety Valve (CCW)	30JEB20 AA191	Reactor Building	Yes	N/A	Open/Close	I
RCP 3 Thermal Barrier Cooling CCW Supply Check Valve	30JEB30 AA001	Reactor Building	Yes	N/A	Open/Close	I
RCP 3 Thermal Barrier Cooling CCW Return SOV	30JEB30 AA003	Reactor Building	Yes	N/A	Open/Close	I
RCP 3 Seal 1 injection 1st Check Valve	30JEB30 AA004	Reactor Building	Yes (class 1)	N/A	Open/Close	I
RCP 3 Seal 1 injection 2nd Check Valve	30JEB30 AA005	Reactor Building	Yes (class 1)	N/A	Open/Close	I

Table 2.2.1-1—RCS Equipment Mechanical Design (9 Sheets)

Equipment Description	Equipment Tag Number[1]	Equipment Location	ASME Code Section III	LBB Eval	Function	Seismic Category
RCP 3 Seal 1 Outlet Isolation Valve	30JEB30 AA009	Reactor Building	Yes	N/A	Open/Close	I
RCP 3 SSSS N2 Supply	30JEB30 AA018	Reactor Building	N/A	N/A	Open	II
RCP 3 SSSS Check Valve	30JEB30 AA019	Reactor Building	N/A	N/A	Open/Close	II
RCP 3 SSSS N2 Discharge	30JEB30 AA020	Reactor Building	N/A	N/A	Close	II
RCP 3 Thermal Barrier Cooling CCW Supply Isolation Valve	30JEB30 AA021	Reactor Building	Yes	N/A	Open/Close	I
RCP 3 Thermal Barrier Cooling Safety Valve (CCW)	30JEB30 AA191	Reactor Building	Yes	N/A	Open/Close	I
RCP 4 Thermal Barrier Cooling CCW Supply Check Valve	30JEB40 AA001	Reactor Building	Yes	N/A	Open/Close	I
RCP 4 Thermal Barrier Cooling CCW Return SOV	30JEB40 AA003	Reactor Building	Yes	N/A	Open/Close	I
RCP 4 Seal 1 injection 1st Check Valve	30JEB40 AA004	Reactor Building	Yes (class 1)	N/A	Open/Close	I
RCP 4 Seal 1 injection 2nd Check Valve	30JEB40 AA005	Reactor Building	Yes (class 1)	N/A	Open/Close	I
RCP 4 Seal 1 Outlet Isolation Valve	30JEB40 AA009	Reactor Building	Yes	N/A	Open/Close	I

Table 2.2.1-1—RCS Equipment Mechanical Design (9 Sheets)

Equipment Description	Equipment Tag Number[1]	Equipment Location	ASME Code Section III	LBB Eval	Function	Seismic Category
RCP 4 SSSS N2 Supply	30JEB40 AA018	Reactor Building	N/A	N/A	Open	II
RCP 4 SSSS Check Valve	30JEB40 AA019	Reactor Building	N/A	N/A	Open/Close	II
RCP 4 SSSS N2 Discharge	30JEB40 AA020	Reactor Building	N/A	N/A	Close	II
RCP 4 Thermal Barrier Cooling CCW Supply Isolation Valve	30JEB40 AA021	Reactor Building	Yes	N/A	Open/Close	I
RCP 4 Thermal Barrier Cooling Safety Valve (CCW)	30JEB40 AA191	Reactor Building	Yes	N/A	Open/Close	I
PZR Heater – Mechanical Pressure Boundary	30JEF10 AH111 to 114A/B/C, AH121 to 123A/B/C, AH211 to 215A/B/C, AH221 to 222A/B/C, AH231 to 234A/B/C, AH311 to 315A/B/C, AH321 to 322A/B/C, AH331 to 334A/B/C, AH411 to 414A/B/C, AH421 to 423A/B/C	Reactor Building	Yes (class 1)	N/A	RCPB	I
CRDM Pressure Housing	30JDA01 to 30JDA22, 30JDA26 to 30JDA47, 30JDA51 to 30JDA72, 30JDA76 to 30JDA97, and 30JDA99	Reactor Building	Yes (class 1)	N/A	RCPB	I
RPV Internals – Core Barrel	N/A	Reactor Building	Yes	N/A	Support	I

Table 2.2.1-1—RCS Equipment Mechanical Design (9 Sheets)

Equipment Description	Equipment Tag Number[1]	Equipment Location	ASME Code Section III	LBB Eval	Function	Seismic Category
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
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

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

2) Leak-before-break (LBB) analysis is applicable to piping and interconnected component nozzles.

Table 2.2.1-2—Equipment and Valve Actuator Power Supplies and Controls (6 Sheets)

Equipment Description	Equipment Tag Number(1)	Equipment Location	IEEE Class 1E(2)	EQ – Harsh Env.	PACS	MCR/RSS Displays	MCR/RSS Controls	Fail Position
RCP 1	30JEB10 AP001	Reactor Building	Yes (4)	Yes	Yes	On-Off/On-Off	Start-Stop/ Start-Stop	N/A
RCP 2	30JEB20 AP001	Reactor Building	Yes (4)	Yes	Yes	On-Off/On-Off	Start-Stop/ Start-Stop	N/A
RCP 3	30JEB30 AP001	Reactor Building	Yes (4)	Yes	Yes	On-Off/On-Off	Start-Stop/ Start-Stop	N/A
RCP 4	30JEB40 AP001	Reactor Building	Yes (4)	Yes	Yes	On-Off/On-Off	Start-Stop/ Start-Stop	N/A
RPV High Point Vent Valve	30JAA10 AA508	Reactor Building	1^N 2^A	Yes	Yes	Position/Position	Open/Closed	Closed
RPV High Point Vent Valve	30JAA10 AA509	Reactor Building	2^N 1^A	Yes	Yes	Position/Position	Open/Closed	Closed
RPV High Point Vent Valve	30JAA10 AA510	Reactor Building	3^N 4^A	Yes	Yes	Position/Position	Open/Closed	Closed
RPV High Point Vent Valve	30JAA10 AA511	Reactor Building	4^N 3^A	Yes	Yes	Position/Position	Open/Closed	Closed
RPV Head Vent Isolation Valve	30JAA10 AA501	Reactor Building	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-Is
RPV Head Vent Isolation Valve	30JAA10 AA502	Reactor Building	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
RPV Head Seal Leak-off Isolation Valve	30JAA10 AA004	Reactor Building	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is

Table 2.2.1-2—Equipment and Valve Actuator Power Supplies and Controls (6 Sheets)

Equipment Description	Equipment Tag Number[1]	Equipment Location	IEEE Class 1E[2]	EQ – Harsh Env.	PACS	MCR/RSS Displays	MCR/RSS Controls	Fail Position
PSRV Assembly 1 (LTOP - 2 SOVs)	30JEF10 AA191 (30JEF10 AA717) (30JEF10 AA718)	Reactor Building	(1^N 2^A) (2^N 1^A)	Yes	Yes	Position/Position	Open/Closed	Closed
PSRV Assembly 2 (LTOP - 2 SOVs)	30JEF10 AA192 (30JEF10 AA727) (30JEF10 AA728)	Reactor Building	(3^N 4^A) (4^N 3^A)	Yes	Yes	Position/Position	Open/Closed	Closed
PSRV Assembly 3 (LTOP - 2 SOVs)	30JEF10 AA193 (30JEF10 AA737) (30JEF10 AA738)	Reactor Building	(2^N 1^A) (3^N 4^A)	Yes	Yes	Position/Position	Open/Closed	Closed
PZR Spray Valve (Cold Leg 2)	30JEF10 AA102	Reactor Building	N/A	Yes	Yes	Position/Position	Open/Closed	Closed
PZR Spray Valve (Cold Leg 3)	30JEF10 AA103	Reactor Building	N/A	Yes	Yes	Position/Position	Open/Closed	Closed
PDS Isolation Valve	30JEF10 AA004	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
PDS Valve	30JEF10 AA005	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is

Table 2.2.1-2—Equipment and Valve Actuator Power Supplies and Controls (6 Sheets)

Equipment Description	Equipment Tag Number(1)	Equipment Location	IEEE Class 1E(2)	EQ – Harsh Env.	PACS	MCR/RSS Displays	MCR/RSS Controls	Fail Position
PDS Isolation Valve	30JEF10 AA006	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
PDS Valve	30JEF10 AA007	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
PZR Vent Isolation Valve	30JEF10 AA501	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
PZR Vent Isolation Valve	30JEF10 AA502	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
PZR Degassing Isolation Valve	30JEF10 AA503	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
PZR Degassing Isolation Valve	30JEF10 AA504	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
PRT Cooling Return Isolation Valve	30JEG10 AA012	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
PRT Fill Isolation Valve	30JEG10 AA013	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
PRT Gaseous Waste Processing Isolation Valve	30JEG10 AA014	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
PRT Degassing Isolation Valve	30JEG10 AA025	Reactor Building(UJA)	1^N 2^A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
PRT Cooling Supply and Drain Isolation Valve	30JEG10 AA401	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
SG 1 Secondary Sampling Isolation Valve	30JEA10 AA601	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is

Table 2.2.1-2—Equipment and Valve Actuator Power Supplies and Controls (6 Sheets)

Equipment Description	Equipment Tag Number(1)	Equipment Location	IEEE Class 1E(2)	EQ – Harsh Env.	PACS	MCR/RSS Displays	MCR/RSS Controls	Fail Position
SG 2 Secondary Sampling Isolation Valve	30JEA20 AA601	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
SG 3 Secondary Sampling Isolation Valve	30JEA30 AA601	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
SG 4 Secondary Sampling Isolation Valve	30JEA40 AA601	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
RCP 1 Thermal Barrier Cooling CCW Return Isolation Valve (SOV)	30JEB10 AA003	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Open
RCP 1 Seal 1 Outlet Isolation Valve (SOV)	30JEB10 AA009	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Open
RCP 1 SSSS N2 Supply	30JEB10 AA018	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Closed
RCP 1 SSSS N2 Discharge Isolation Valve	30JEB10 AA020	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
RCP 1 Thermal Barrier Cooling CCW Supply Isolation Valve	30JEB10 AA021	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
RCP 2 Thermal Barrier Cooling CCW Return Isolation Valve (SOV)	30JEB20 AA003	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Open
RCP 2 Seal 1 Outlet Isolation Valve SOV)	30JEB20 AA009	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Open
RCP 2 SSSS N2 Supply	30JEB20 AA018	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Closed

Table 2.2.1-2—Equipment and Valve Actuator Power Supplies and Controls (6 Sheets)

Equipment Description	Equipment Tag Number(1)	Equipment Location	IEEE Class 1E(2)	EQ – Harsh Env.	PACS	MCR/RSS Displays	MCR/RSS Controls	Fail Position
RCP 2 SSSS N2 Discharge Isolation Valve	30JEB20 AA020	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
RCP 2 Thermal Barrier Cooling CCW Supply Isolation Valve	30JEB20 AA021	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
RCP 3 Thermal Barrier Cooling CCW Return Isolation Valve (SOV)	30JEB30 AA003	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Open
RCP 3 Seal 1 Outlet Isolation Valve (SOV)	30JEB30 AA009	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Open
RCP 3 SSSS N2 Supply	30JEB30 AA018	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Closed
RCP 3 SSSS N2 Vent Valve Discharge Isolation Valve	30JEB30 AA020	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
RCP 3 Thermal Barrier Cooling CCW Supply Isolation Valve	30JEB30 AA021	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
RCP 4 Thermal Barrier Cooling CCW Return Isolation Valve (SOV)	30JEB40 AA003	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Open
RCP 4 Seal 1 Outlet Isolation Valve (SOV)	30JEB40 AA009	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Open
RCP 4 SSSS N2 Supply	30JEB40 AA018	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Closed

Table 2.2.1-2—Equipment and Valve Actuator Power Supplies and Controls (6 Sheets)

Equipment Description	Equipment Tag Number(1)	Equipment Location	IEEE Class 1E(2)	EQ – Harsh Env.	PACS	MCR/RSS Displays	MCR/RSS Controls	Fail Position
RCP 4 SSSS N2 Discharge Isolation Valve	30JEB40 AA020	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
RCP 4 Thermal Barrier Cooling CCW Supply Isolation Valve	30JEB40 AA021	Reactor Building(UJA)	N/A	Yes	Yes	Position/Position	Open/Closed	Fail As-is
On-Off PZR Heater (144 KW) Emergency Supplied	30JEF10 AH131A/B/C, AH132A/B/C	Reactor Building	NS-AQ (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	NS-AQ (Note 3) 2 2	Yes	Yes	Energize/Energize	On-Off/On-Off	N/A
On-Off PZR Heater (144KW) Emergency Supplied	30JEF10 AH331A/B/C, AH332A/B/C	Reactor Building	NS-AQ (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	NS-AQ (Note 3) 4 4	Yes	Yes	Energize/Energize	On-Off/On-Off	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 component is normally powered from. ^{A} denotes the division the component is powered from when alternate feed is implemented.

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

4) The RCP circuit breaker is a Class 1E device.

Table 2.2.1-3—Instrumentation Power Supplies, Classification, and Displays (7 Sheets)

Equipment Description	Equipment Tag Number[1]	Equipment Location	IEEE Class 1E[2]	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 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
CRDM Temperature Sensor	30JDA76CT801 to 30JDA97CT801	Reactor Building	Yes	Yes	Temperature/Temperature
CRDM Temperature Sensor	30JDA99CT801	Reactor Building	Yes	Yes	Temperature/Temperature
RCS HL WR Temperature	30JEC10 CT805 30JEC20 CT805 30JEC30 CT805 30JEC40 CT805	Reactor Building	1 2 3 4	Yes	Temperature/Temperature

Table 2.2.1-3—Instrumentation Power Supplies, Classification, and Displays (7 Sheets)

Equipment Description	Equipment Tag Number[1]	Equipment Location	IEEE Class 1E[2]	EQ – Harsh Environment	MCR/RSS Displays
RCS CL WR Temperature	30JEC10 CT811	Reactor Building	1	Yes	Temperature/Temperature
	30JEC20 CT811		2		
	30JEC30 CT811		3		
	30JEC40 CT811		4		
RCS HL NR Temperature	30JEC10 CT801	Reactor Building	1	Yes	Temperature/Temperature
	30JEC10 CT802		2		
	30JEC10 CT803		3		
	30JEC10 CT804		4		
	30JEC20 CT801		1		
	30JEC20 CT802		2		
	30JEC20 CT803		3		
	30JEC20 CT804		4		
	30JEC30 CT801		1		
	30JEC30 CT802		2		
	30JEC30 CT803		3		
	30JEC30 CT804		4		
	30JEC40 CT801		1		
	30JEC40 CT802		2		
	30JEC40 CT803		3		
	30JEC40 CT804		4		

Table 2.2.1-3—Instrumentation Power Supplies, Classification, and Displays (7 Sheets)

Equipment Description	Equipment Tag Number[1]	Equipment Location	IEEE Class 1E[2]	EQ – Harsh Environment	MCR/RSS Displays
CL NR Temperature	30JEC10 CT807	Reactor Building	1	Yes	Temperature/Temperature
	30JEC10 CT808		1		
	30JEC20 CT807		2		
	30JEC20 CT808		2		
	30JEC30 CT807		3		
	30JEC30 CT808		3		
	30JEC40 CT807		4		
	30JEC40 CT808		4		
RCS Loop Level	30JEC10 CL823	Reactor Building	1	Yes	Level/Level
	30JEC20 CL823		2		
	30JEC30 CL823		3		
	30JEC40 CL823		4		

Table 2.2.1-3—Instrumentation Power Supplies, Classification, and Displays (7 Sheets)

Equipment Description	Equipment Tag Number[1]	Equipment Location	IEEE Class 1E[2]	EQ – Harsh Environment	MCR/RSS Displays
RCS Flowrate (Elbow Delta P)	30JEC10 CF815	Reactor Building	1	Yes	Flow/Flow
	30JEC10 CF817		2		
	30JEC10 CF819		3		
	30JEC10 CF821		4		
	30JEC20 CF815		1		
	30JEC20 CF817		2		
	30JEC20 CF819		3		
	30JEC20 CF821		4		
	30JEC30 CF815		1		
	30JEC30 CF817		2		
	30JEC30 CF819		3		
	30JEC30 CF821		4		
	30JEC40 CF815		1		
	30JEC40 CF817		2		
	30JEC40 CF819		3		
	30JEC40 CF821		4		
RCS Flowrate (Delta P across RCP)	30JEC10 CP801	Reactor Building	1	Yes	Flow/Flow
	30JEC10 CP802		1		
	30JEC10 CP801		2		
	30JEC10 CP802		2		
	30JEC10 CP801		3		
	30JEC10 CP802		3		
	30JEC10 CP801		4		
	30JEC40 CP802		4		

Table 2.2.1-3—Instrumentation Power Supplies, Classification, and Displays (7 Sheets)

Equipment Description	Equipment Tag Number[1]	Equipment Location	IEEE Class 1E[2]	EQ – Harsh Environment	MCR/RSS Displays
PZR Pressure	30JEF10 CP801	Reactor Building	1	Yes	Pressure/Pressure
	30JEF10 CP803		2		
	30JEF10 CP805		3		
	30JEF10 CP807		4		
PZR Level	30JEF10 CL802	Reactor Building	1	Yes	Level/Level
	30JEF10 CL804		2		
	30JEF10 CL806		3		
	30JEF10 CL808		4		
SG WR Level	30JEA10 CL809	Reactor Building	1	Yes	Level/Level
	30JEA10 CL810		2		
	30JEA10 CL811		3		
	30JEA10 CL812		4		
	30JEA20 CL809		1		
	30JEA20 CL810		2		
	30JEA20 CL811		3		
	30JEA20 CL812		4		
	30JEA30 CL809		1		
	30JEA30 CL810		2		
	30JEA30 CL811		3		
	30JEA30 CL812		4		
	30JEA40 CL809		1		
	30JEA40 CL810		2		
	30JEA40 CL811		3		
	30JEA40 CL812		4		

Table 2.2.1-3—Instrumentation Power Supplies, Classification, and Displays (7 Sheets)

Equipment Description	Equipment Tag Number(1)	Equipment Location	IEEE Class 1E(2)	EQ – Harsh Environment	MCR/RSS Displays
SG NR Level	30JEA10 CL801	Reactor Building	1	Yes	Level/Level
	30JEA10 CL802		2		
	30JEA10 CL803		3		
	30JEA10 CL804		4		
	30JEA20 CL801		1		
	30JEA20 CL802		2		
	30JEA20 CL803		3		
	30JEA20 CL804		4		
	30JEA30 CL801		1		
	30JEA30 CL802		2		
	30JEA30 CL803		3		
	30JEA30 CL804		4		
	30JEA40 CL801		1		
	30JEA40 CL802		2		
	30JEA40 CL803		3		
	30JEA40 CL804		4		

Table 2.2.1-3—Instrumentation Power Supplies, Classification, and Displays (7 Sheets)

Equipment Description	Equipment Tag Number(1)	Equipment Location	IEEE Class 1E(2)	EQ – Harsh Environment	MCR/RSS Displays
RCP Current Sensors	30JEB10 CE889	Reactor Building	1	No	Current/Current
	30JEB10 CE890		1		
	30JEB10 CE891		1		
	30JEB20 CE889		2		
	30JEB20 CE890		2		
	30JEB20 CE891		2		
	30JEB30 CE889		3		
	30JEB30 CE890		3		
	30JEB30 CE891		3		
	30JEB40 CE889		4		
	30JEB40 CE890		4		
	30JEB40 CE891		4		
RCP Speed Sensor	30JEB10 CS896	Reactor Building	1	Yes	Speed/Speed
	30JEB20 CS896		2		
	30JEB30 CS896		3		
	30JEB40 CS896		4		
RCP Speed Sensor - Standby	30JEB10 CS897	Reactor Building	1	Yes	Speed/Speed
	30JEB20 CS897		2		
	30JEB30 CS897		3		
	30JEB40 CS897		4		

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

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

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—RCS ITAAC (9 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
2.1	The functional arrangement of the RCS is shown on Figure 2.2.1-1.	Inspections of the as-built system will be conducted.	The as-built RCS conforms to the functional arrangement shown on Figure 2.2.1-1.
2.2	The functional arrangement of the RPV and heavy reflector is shown on Figure 2.2.1-2.	Inspections of the as-built system will be conducted.	The as-built RPV and heavy reflector conforms to the functional arrangement shown on Figure 2.2.1-2 and Table 2.2.1-6.
2.3	The location of RCS equipment is as listed in Table 2.2.1-1.	An inspection will be performed.	The equipment listed in Table 2.2.1-1 is located as listed in Table 2.2.1-1.
2.4	The RCS loops are physically separated from each other.	An inspection will be performed.	The RCS loops are physically separated from each other.
3.1	Equipment listed in Table 2.2.1-1 as ASME Code Section III, other than RPV internals, is designed, welded, and hydrostatically tested in accordance with ASME Code Section III.	a. Analysis of the equipment identified in Table 2.2.1-1 as ASME Code Section III, other than RPV internals, will be performed per ASME Code Section III design requirements.	a. ASME Code Section III Design Reports (NCA-3550) exist and conclude that the equipment identified in Table 2.2.1-1 as ASME Code Section III, other than RPV internals, meets ASME Code Section III design requirements.
		b. Inspections will be conducted on the equipment identified in Table 2.2.1-1 as ASME Code Section III, other than RPV internals, to verify welding has been performed per ASME Code Section III welding requirements.	b. Equipment identified in Table2.2.1-1 as ASME Code Section III, other than RPV internals, has been welded per ASME Code Section III welding requirements.
		c. Hydrostatic testing of the equipment identified in Table 2.2.1-1 as ASME Code Section III, other than RPV internals, will be performed per ASME Code Section III hydrostatic testing requirements.	c. Equipment identified in Table 2.2.1-1 as ASME Code Section III, other than RPV internals, has been hydrostatically tested per ASME Code Section III hydrostatic testing requirements.

Table 2.2.1-5—RCS ITAAC (9 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
3.2	Check valves listed in Table 2.2.1-1 will function as listed in Table 2.2.1-1.	Tests will be performed for the operation of the check valves listed in Table 2.2.1-1.	The check valves listed in Table 2.2.1-1 perform the functions listed in Table 2.2.1-1.
3.3	Equipment identified as Seismic Category I in Table 2.2.1-1 can withstand seismic design basis loads without loss of safety function as listed in Table 2.2.1-1.	a. Type tests, analyses, or a combination of type tests and analyses will be performed on the equipment designated 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. Inspections will be performed of the as-installed Seismic Category I equipment listed in Table 2.2.1-1, other than RPV internals,to verify that the equipment including anchorage is installed as specified on the construction drawings.	a. Tests/analysis reports exists and conclude that the Seismic Category I equipmentlisted in Table 2.2.1-1 can withstand sesimic design basis loads without loss of safety function. b. Inspection reports exist and conclude that the as-installed Seismic Category I equipment listed in Table 2.2.1-1, other than RPV internals, including anchorage is installed as specified on the construction drawings.
3.4	Deleted.	Deleted.	Deleted.
3.5	The steam outlet nozzles on the SGs include flow-limiting devices.	An inspection will be performed.	The flow area through each flow-limiting device is less than 1.39 ft^2.
3.6	The RCP motors include a device to prevent reverse rotation.	An test will be performed.	Idle RCPs do not rotate in the reverse direction as a result of flow.

Table 2.2.1-5—RCS ITAAC (9 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
3.7	The piping and interconnected component nozzles listed in Table 2.2.1-1 have been evaluated for LBB.	An analysis will be performed.	An analysis exists and concludes that the piping and equipment listed in Table 2.2.1-1 meets the LBB acceptance criteria.
3.8	The RPV internals will withstand the effects of flow-induced vibration.	a. Tests and analysesof test results will be performed on a plant containing RPV internals representative of the U.S. EPR. b. An inspection will be performed after hot functional testing.	a. A report exists and concludes that RPV internals have no observable damage, no loose parts, and stress is within ASME code limits. b. Inspections show that the RPV internals have no observable damage or loose parts.
3.9	The RCS is designed to allow movement of the components as necessary due to thermal expansion and contraction.	A test of the RCS will be performed.	The measured gaps meet the specification requirements for the necessary component supports.
3.10	Deleted.	Deleted.	Deleted.
3.11	Components listed as ASME Code Class I in Table 2.2.1-1 will be analyzed for fatigue per ASME Section III Class I.	An analysis will be performed.	a. Fatigue analysis has been performed for components listed as ASME Code Class I in Table 2.2.1-1. b. For components listed as ASME code Class I in Table 2.2.1-1, operating modes where peak stresses are within ten percent of allowable have been identified.
3.12	Deleted.	Deleted.	Deleted.
3.13	Deleted.	Deleted.	Deleted.
3.14	Deleted.	Deleted.	Deleted.
3.15	Deleted.	Deleted.	Deleted.
3.16	RPV internals listed in Table 2.2.1-1 are designed in accordance with ASME Code Section III, Subsection NG.	An analysis will be performed.	An ASME Code Section III, Subsection NG stress report exists for each RPV internal component listed in Table 2.2.1-1.

Table 2.2.1-5—RCS ITAAC (9 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
3.17	Core support structure welds meet ASME Code Section III, Subsection NG requirements.	Inspections of core support structure welds will be performed.	Inspection reports show that core support structure welds for the following RPV welded components listed in Table 2.2.1-1 meet ASME Code Section III, Subsection NG requirements: core barrel, lower support plate, upper support plate, normal support columns, and control rod guide assembly columns.
3.18	The RPV internals are provided with irradiation specimen guide baskets to hold capsules containing RPV material surveillance specimens.	An inspection will be performed.	Two guide baskets are provided, located on opposite sides of the RPV, and each guide basket includes provisions to hold two material surveillance capsules.
3.19	Each RCP contains an oil collection system.	a. Analyses will be performed. b. An inspection will be performed on each RCP.	a. Analyses demonstrate that the oil collection system is designed 1) to withstand a safe-shutdown earthquake, 2) to collect lube oil from leakage sites in the RCP lube oil system, and 3) So that the drain line and collection tank are large enough to accommodate the largest potential oil leak. b. An inspection of each RCP verifies an oil collection system is installed on each RCP.
3.20	Portions of the RCS piping shown as ASME Code Section III in Figure 2.2.1-1 are designed in accordance with ASME Code Section III requirements.	Inspections will be performed for the existence of ASME Code Section III Design Reports.	ASME Code section III Design Reports (NCA-3550) exist for portions of the RCS piping shown as ASME Code Section III in Figure 2.2.1-1.

Table 2.2.1-5—RCS ITAAC (9 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
3.21	Portions of the RCS piping shown as ASME Code Section III in Figure 2.2.1-1 are installed in accordance with an ASME Code Section III Design Report.	Inspections will be performed to verify the existence of an analysis which reconciles as-fabricated deviations to the ASME Code Design Report as required by ASME Code Section III.	For portions of the RCS piping shown as ASME Code Section III in Figure 2.2.1-1, ASME Code Data Reports (N-5) exist and conclude that reconciliation (NCA-3554) of the as-installed system with the Design Report (NCA-3550) has occurred.
3.22	Pressure boundary welds in portions of the RCS piping shown as ASME Code Section III in Figure 2.2.1-1 are in accordance with ASME Code Section III.	Inspections of pressure boundary welds verify that welding is performed in accordance with ASME Code Section III requirements.	ASME Code Section III Data Reports exist and conclude that pressure boundary welding for portions of the RCS piping shown as ASME Code Section III in Figure 2.2.1-1 has been performed in accordance with ASME Code Section III.
3.23	Portions of the RCS piping shown as ASME Code Section III in Figure 2.2.1-1 retain their pressure boundary integrity at their design pressure.	Hydrostatic tests will be performed on the as-fabricated system.	For portions of the RCS piping shown as ASME Code Section III in Figure 2.2.1-1, ASME Code Section III Data Reports exist and conclude that hydrostatic test results comply with ASME Code Section III requirements.
3.24	Portions of the RCS piping shown as ASME Code Section III in Figure 2.2.1-1 are installed in accordance with ASME code Section III requirements.	An inspection for the existence of ASME N–5 Data Reports will be performed.	For portions of the RCS piping shown as ASME Code Section III in Figure 2.2.1-1, N–5 Data Reports exist and conclude that installation is in accordance with ASME Code Section III requirements.

Table 2.2.1-5—RCS ITAAC (9 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
4.1	Displays listed in Tables 2.2.1-2 and 2.2.1-3 are retrievable in the MCR and RSS as listed in Tables 2.2.1-2 and 2.2.1-3.	Inspections will be performed for the existence or retrievability of the displays in the MCR or the RSS as listed in Tables 2.2.1-2 and 2.2.1-3.	a. The displays listed in Tables 2.2.1-2 and 2.2.1-3 as being retrievable in the MCR can be retrieved in the MCR. b. The displays listed in Tables 2.2.1-2 and 2.2.1-3 as being retrievable in the RSS can be retrieved in the RSS.
4.2	The RCS system equipment controls are provided in the MCR and RSS as identified in Table 2.2.1-2.	Tests will be performed for the existence of control signals from the MCR and the RSS to the equipment listed in Table 2.2.1-2.	a. The controls listed in Table 2.2.1-2 as being in the MCR exist in the MCR. b. The controls listed in Table 2.2.1-2 as being in the RSS exist in the RSS.
4.3	Equipment listed as being controlled by a PACS module in Table 2.2.1-2 responds to the state requested by a test signal.	A test will be performed using test signals.	Equipment listed as being controlled by a PACS module in Table 2.2.1-2 responds to the state requested by the test signal.
5.1	The components 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 for components designated as Class 1E in Tables 2.2.1-2 and 2.2.1-3 by providing a test signal in each normally aligned division. b. Testing will be performed for components designated as Class 1E in Tables 2.2.1-2 and 2.2.1-3 by providing a test signal in each division with the alternate feed aligned to the divisional pair.	a. The test signal provided in the nomally aligned division is present at the respective Class 1E components identified in Tables 2.2.1-2 and 2.2.1-3. b. The test signal provided in each division with the alternate feed aligned to the divisional pair is present at the respective Class 1E components identified in Tables 2.2.1-2 and 2.2.1-3.
5.2	Valves listed in Table 2.2.1-2 fail as indicated in Table 2.2.1-2 on loss of power.	Testing will be performed for the valves listed in Table 2.2.1-2 to fail as indicated in Table 2.2.1-2 on loss of power.	Following loss of power, the valves listed in Table 2.2.1-2 fail as indicated in Table 2.2.1-2.

Table 2.2.1-5—RCS ITAAC (9 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
5.3	The power supply arrangement is such that only two emergency diesels are required to operate to supply power to the minimum number of PZR heaters.	An analysis will be performed.	An analysis exists and concludes that only two emergency diesel generators are required to operate to supply power to the minimum number of emergency PZR heaters, which are rated at 144 kW per heater.
6.1	Components listed in Table 2.2.1-2, which are designated as harsh environment, perform the function listed in Table 2.2.1-1 in the environments that exist before and during the time required to perform their function.	a. Type tests, tests, analyses, or a combination of tests and analyses will be performed to demonstrate the ability of the equipment listed for harsh environment in Table 2.2.1-2 to perform the function listed in Table 2.2.1-1 for the environmental conditions that could occur before and during a design basis accident.	a. The Class 1E equipment listed for harsh environment in Table 2.2.1-2 can perform the function listed in Tables 2.2.1-1 before and during design basis accidents for the time required to perform the listed function.
		b. For equipment listed for harsh environment in Table 2.2.1-2, an inspection will be performed of the as-installed Class 1E equipment and the associated wiring, cables and terminations.	b. Inspection concludes the as-installed Class 1E equipment and associated wiring, cables, and terminations as listed in Table 2.2.1-2 for harsh environment conform with the design.

Table 2.2.1-5—RCS ITAAC (9 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
6.2	Instrumentation listed in Table 2.2.1-3 for harsh environment can display following exposure to the design basis environments for the time required.	a. Type tests, tests, analyses, or a combination of tests and analyses will be performed to demonstrate the ability of the instrumentation listed for harsh environment in Table 2.2.1-3 to display for the environmental conditions that could occur before and during a design basis accident. b. For instrumentation listed for harsh environment in Table 2.2.1-3, an inspection will be performed of the as-installed instrumentation and the associated wiring, cables and terminations.	a. Instrumentation listed for harsh environment in Table 2.2.1-3 can display before and during design basis accidents. b. Inspection concludes the as-installed instrumentation and associated wiring, cables, and terminations as listed in Table 2.2.1-3 for harsh environment conform with the design.
7.1	Class 1E valves listed in Table 2.2.1-2 perform the function listed in Table 2.2.1-1 under system design conditions.	Tests and analyses or a combination of tests and analyses will be performed to demonstrate the ability of the valves listed in Table 2.2.1-2 to change position as listed in Table 2.2.1-1 under system design conditions.	The as-installed valve changes position as listed in Table 2.2.1-1 under system design conditions.
7.2	The RCPs have rotational inertia to provide coast down flow of reactor coolant on simultaneous loss of power to all four pump motors.	Tests will be performed.	The RCPs provide the minimum coastdown flow as listed on Table 2.2.1-4.
7.3	The RCPs provide flow.	a. Testing and analysis will be performed. b. Testing and analysis will be performed.	a. The RCP provides greater than the minimum required flow rate of 119,692 gpm/loop. b. The RCP provides less than the maximum required flow rate of 134,662 gpm/loop.
7.4	RCP standstill seal system (SSSS) can be engaged when the RCP is stopped.	Testing will be performed.	The SSSS can be engaged when the RCP is stopped.

Table 2.2.1-5—RCS ITAAC (9 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
7.5	PSRVs open.	Testing will be performed.	PSRVs open within 0.70 seconds (including pilot valve opening time).
7.6	PSRVs open below their maximum design setpoint.	Testing will be performed.	Each PSRV will lift below its maximum lift setting of 2600.4 psia.
7.7	PSRVs provide relief capacity.	Testing and analysis will be performed.	Each PSRV provides relief capacity ≥ 661,400 lbm/hr at 2535 psig.
7.8	Each RCP is tripped by a protection system signal.	A test will be performed.	Each RCP 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 (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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