

2.7.8 Spray Deluge System

There are no Tier 1 entries for this system.

2.7.9 Demineralized Water Distribution System

There are no Tier 1 entries for this system.

2.7.10 Potable and Sanitary System

There are no Tier 1 entries for this system.

2.7.11 Essential Service Water System

1.0 Description

The essential service water system (ESWS) is a safety-related system that provides cooling water to the component cooling water system (CCWS) heat exchangers, the emergency diesel generator (EDG) heat exchangers, and the essential service water pump building ventilation system (ESWPBVS) room coolers under normal operating, shutdown/cooldown, design basis events. The Ultimate Heat Sink (UHS) dissipates heat rejected from the ESW during normal operation and post accident shutdown.

The ESWS provides the following safety related functions:

- The ESWS provides the capability to transfer heat from CCWS to the environment following an anticipated operational occurrence (AOO) or postulated accident.
- The ESWS provides continued heat transfer from the fuel pool cooling system (FPCPS) via the CCWS as long as any fuel assemblies are in the spent fuel storage pool located outside containment.
- The ESW normal and emergency makeup water systems and blowdown system piping from pump discharge piping up to and including the isolation valves provided for isolation of the tower basins to prevent loss of tower water inventory.
- Pursuant to NRC Regulatory Guide 1.27 requirements, each UHS cooling tower basin is sized to contain sufficient water to allow for 72 hours of ESW train operation under DBE conditions without addition of makeup water. The water level in the basin at the end of the 72 hour period is sufficient to meet pump minimum suction head (NPSH) requirements.
- After 72 hours have elapsed since the initiation of design basis event, the ESW emergency makeup water system provides water to the ESW system to replenish cooling water lost to evaporation, drift, blowdown and other losses in order to ensure cooling tower basin water levels remain within established limits under DBE conditions.
- The site specific ESW emergency makeup water system will provide this makeup water for at least 27 days following the initial 72 hour post-accident period (balance of 30 day scenario).

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

- The ESWS provides the cooling of the system users during all normal plant operating conditions.
- Deleted.
- The ESW normal makeup water system provides makeup water to the ESW system to replenish cooling water lost to evaporation, drift, and other losses in order to ensure cooling tower basin water levels remain within established limits.

- The ESW system provides the means of transferring heat loads from the dedicated CCW heat exchanger under severe accident conditions to ensure containment integrity.
- Freeze protection is provided by diverting ESW return flow directly to the tower basin and controlling fan operation under low load/low ambient temperature conditions.

The non-safety-related dedicated ESWS train provides water as a cooling medium to the non-safety-related dedicated CCWS train heat exchanger and to the division 4 ESWS ESWPBVS room cooler for the removal of reject heat under severe accident conditions.

2.0 Arrangement

- 2.1 The functional arrangement of the ESWS is as shown in Figure 2.7.11-1—Essential Service Water System Functional Arrangement.
- 2.2 The location of the ESWS equipment is as listed in Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design.
- 2.3 Physical separation exists between divisions of the ESWS.
- 2.4 Deleted.
- 2.5 Deleted.

3.0 Mechanical Design Features

- 3.1 Equipment listed in Table 2.7.11-1 as ASME Code Section III is designed, welded, and hydrostatically tested in accordance with ASME Code Section III.
- 3.2 Check valves listed in Table 2.7.11-1 will function as listed in Table 2.7.11-1.
- 3.3 Deleted.
- 3.4 Equipment identified as Seismic Category I in Table 2.7.11-1 can withstand seismic design basis loads without loss of safety function as listed in Table 2.7.11-1.
- 3.5 Deleted.
- 3.6 Deleted.
- 3.7 Deleted.
- 3.8 Deleted.
- 3.9 Deleted.
- 3.10 Deleted.
- 3.11 Deleted.

- 3.12 Portions of the ESWS piping shown as ASME Code Section III in Figure 2.7.11-1 are designed in accordance with ASME Code Section III requirements.
- 3.13 Portions of the ESWS piping shown as ASME Code Section III in Figure 2.7.11-1 are installed in accordance with an ASME Code Section III Design Report.
- 3.14 Pressure boundary welds in portions of the ESWS piping shown as ASME Code Section III in Figure 2.7.11-1 are in accordance with ASME Code Section III.
- 3.15 Portions of the ESWS piping shown as ASME Code Section III in Figure 2.7.11-1 retain their pressure boundary integrity at their design pressure.
- 3.16 Portions of the ESWS piping shown as ASME Code Section III in Figure 2.7.11-1 are installed in accordance with ASME Code Section III requirements.

4.0 I&C Design Features, Displays and Controls

- 4.1 Displays listed in Table 2.7.11-2— Essential Service Water System Equipment I&C and Electrical Design are retrievable in the main control room (MCR) and the remote shutdown station (RSS) as listed in Table 2.7.11-2.
- 4.2 The ESWS equipment controls are provided in the MCR and the RSS as listed in Table 2.7.11-2.
- 4.3 Equipment listed as being controlled by a priority and actuator control system (PACS) module in Table 2.7.11-2 responds to the state requested by a test signal.
- 4.4 If one ESWS pump (30PEB10/20/30/40 AP001) fails during normal operation, a switchover to the other ESWS train is carried out automatically for the entire cooling train and is initiated by the CCWS Switchover sequence.
- 4.5 A spurious closure of the ESWS pump discharge valve (30PEB10/20/30/40 AA005) results in a switchover to the other ESWS train automatically for the entire cooling train and is initiated by the CCWS Switchover sequence.

4.6 Deleted.

4.7 Deleted.

5.0 Electrical Power Design Features

- 5.1 The components designated as Class 1E in Table 2.7.11-2 are powered from the Class 1E division as listed in Table 2.7.11-2 in a normal or alternate feed condition.
- 5.2 Valves listed in Table 2.7.11-2 fail as-is on loss of power.
- 5.3 Deleted.

6.0 Environmental Qualifications

6.1 Deleted.

7.0 Equipment and System Performance

- 7.1 The ESWS UHS as listed in Table 2.7.11-1 has the capacity to remove the design heat load from the CCWS.
- 7.2 The pumps listed in Table 2.7.11-1 have sufficient net positive suction head absolute.
- 7.3 Class 1E valves listed in Table 2.7.11-2 can perform the function listed in Table 2.7.11-1.
- 7.4 The ESWS provides for flow testing of the ESWS pumps during plant operation.
- 7.5 The non-safety related dedicated ESWS as listed in Table 2.7.11-1 has the capacity to remove the design heat load from the non-safety-related dedicated CCWS heat exchanger and ESWPBVS division 4 room cooler.
- 7.6 The ESWS delivers water to the CCWS and EDG heat exchangers and the ESWPBVS room coolers.

8.0 Interface Information

- 8.1 The site specific emergency makeup water system provides makeup water in order to maintain the minimum water level in the ESW cooling tower basins.

9.0 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.7.11-3 lists the ESWS ITAAC.

Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design (8 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME Code Section III	Function	Seismic Category
ESWS PUMP DIVISION 1	30PEB10 AP001	Essential Service Water Pump Structure Division 1	Yes	Run	I
RECIRC ISOLATION VALVE DIVISION 1	30PEB10 AA002	Essential Service Water Pump Structure Division 1	Yes	Close	I
EMER. BLOWDOWN ISOLATION VALVE DIVISION 1	30PEB10 AA003	Essential Service Water Pump Structure Division 1	Yes	Close	I
PUMP DISCHARGE ISOLATION VALVE DIVISION 1	30PEB10 AA005	Essential Service Water Pump Structure Division 1	Yes	Open	I
FILTER BLOWDOWN ISOLATION VALVE DIVISION 1	30PEB10 AA015	Essential Service Water Pump Structure Division 1	Yes	Close	I
BLOWDOWN ISOLATION VALVE DIVISION 1	30PEB10 AA016	Essential Service Water Pump Structure Division 1	Yes	Close	I
PUMP DISCHARGE CHECK VALVE DIVISION 1	30PEB10 AA204	Essential Service Water Pump Structure Division 1	Yes	Open	I
TOWER ISOLATION VALVE DIVISION 1	30PED10 AA010	Essential Service Water Pump Structure Division 1	Yes	Open	I

Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design (8 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME Code Section III	Function	Seismic Category
TOWER BYPASS ISOLATION VALVE DIVISION 1	30PED10 AA011	Essential Service Water Pump Structure Division 1	Yes	Close	I
MAKEUP WATER ISOLATION VALVE DIVISION 1	30PED10 AA019	Essential Service Water Pump Structure Division 1	Yes	Close	I
EMER. MAKEUP WATER ISOLATION VALVE DIVISION 1	30PED10 AA021	Essential Service Water Pump Structure Division 1	Yes	Open	I
MAKEUP WATER CHECK VALVE DIVISION 1	30PED10 AA220	Essential Service Water Pump Structure Division 1	Yes	Close	I
ESWS PUMP DIVISION 2	30PEB20 AP001	Essential Service Water Pump Structure Division 2	Yes	Run	I
RECIRC ISOLATION VALVE DIVISION 2	30PEB20 AA002	Essential Service Water Pump Structure Division 2	Yes	Close	I
EMER. BLOWDOWN ISOLATION VALVE DIVISION 2	30PEB20 AA003	Essential Service Water Pump Structure Division 2	Yes	Close	I
PUMP DISCHARGE ISOLATION VALVE DIVISION 2	30PEB20 AA005	Essential Service Water Pump Structure Division 2	Yes	Open	I

Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design (8 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME Code Section III	Function	Seismic Category
FILTER BLOWDOWN ISOLATION VALVE DIVISION 2	30PEB20 AA015	Essential Service Water Pump Structure Division 2	Yes	Close	I
BLOWDOWN ISOLATION VALVE DIVISION 2	30PEB20 AA016	Essential Service Water Pump Structure Division 2	Yes	Close	I
PUMP DISCHARGE CHECK VALVE DIVISION 2	30PEB20 AA204	Essential Service Water Pump Structure Division 2	Yes	Open	I
TOWER ISOLATION VALVE DIVISION 2	30PED20 AA010	Essential Service Water Pump Structure Division 2	Yes	Open	I
TOWER BYPASS ISOLATION VALVE DIVISION 2	30PED20 AA011	Essential Service Water Pump Structure Division 2	Yes	Close	I
MAKEUP WATER ISOLATION VALVE DIVISION 2	30PED20 AA019	Essential Service Water Pump Structure Division 2	Yes	Close	I
EMER. MAKEUP WATER ISOLATION VALVE DIVISION 2	30PED20 AA021	Essential Service Water Pump Structure Division 2	Yes	Open	I
MAKEUP WATER CHECK VALVE DIVISION 2	30PED20 AA220	Essential Service Water Pump Structure Division 2	Yes	Close	I

Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design (8 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME Code Section III	Function	Seismic Category
ESWS PUMP DIVISION 3	30PEB30 AP001	Essential Service Water Pump Structure Division 3	Yes	Run	I
RECIRC ISOLATION VALVE DIVISION 3	30PEB30 AA002	Essential Service Water Pump Structure Division 3	Yes	Close	I
EMER. BLOWDOWN ISOLATION VALVE DIVISION 3	30PEB30 AA003	Essential Service Water Pump Structure Division 3	Yes	Close	I
PUMP DISCHARGE ISOLATION VALVE DIVISION 3	30PEB30 AA005	Essential Service Water Pump Structure Division 3	Yes	Open	I
FILTER BLOWDOWN ISOLATION VALVE DIVISION 3	30PEB30 AA015	Essential Service Water Pump Structure Division 3	Yes	Close	I
BLOWDOWN ISOLATION VALVE DIVISION 3	30PEB30 AA016	Essential Service Water Pump Structure Division 3	Yes	Close	I
PUMP DISCHARGE CHECK VALVE DIVISION 3	30PEB30 AA204	Essential Service Water Pump Structure Division 3	Yes	Open	I
TOWER ISOLATION VALVE DIVISION 3	30PED30 AA010	Essential Service Water Pump Structure Division 3	Yes	Open	I

Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design (8 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME Code Section III	Function	Seismic Category
TOWER BYPASS ISOLATION VALVE DIVISION 3	30PED30 AA011	Essential Service Water Pump Structure Division 3	Yes	Close	I
MAKEUP WATER ISOLATION VALVE DIVISION 3	30PED30 AA019	Essential Service Water Pump Structure Division 3	Yes	Close	I
EMER. MAKEUP WATER ISOLATION VALVE DIVISION 3	30PED30 AA021	Essential Service Water Pump Structure Division 3	Yes	Open	I
MAKEUP WATER CHECK VALVE DIVISION 3	30PED30 AA220	Essential Service Water Pump Structure Division 3	Yes	Close	I
ESWS PUMP DIVISION 4	30PEB40 AP001	Essential Service Water Pump Structure Division 4	Yes	Run	I
RECIRC ISOLATION VALVE DIVISION 4	30PEB40 AA002	Essential Service Water Pump Structure Division 4	Yes	Close	I
EMER. BLOWDOWN ISOLATION VALVE DIVISION 4	30PEB40 AA003	Essential Service Water Pump Structure Division 4	Yes	Close	I
PUMP DISCHARGE ISOLATION VALVE DIVISION 4	30PEB40 AA005	Essential Service Water Pump Structure Division 4	Yes	Open	I

Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design (8 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME Code Section III	Function	Seismic Category
FILTER BLOWDOWN ISOLATION VALVE DIVISION 4	30PEB40 AA015	Essential Service Water Pump Structure Division 4	Yes	Close	I
BLOWDOWN ISOLATION VALVE DIVISION 4	30PEB40 AA016	Essential Service Water Pump Structure Division 4	Yes	Close	I
PUMP DISCHARGE CHECK VALVE DIVISION 4	30PEB40 AA204	Essential Service Water Pump Structure Division 4	Yes	Open	I
DEDICATED SYSTEM CHECK VALVE UPSTR 30SAQ40 AC001 DIVISION 4	30PEB41 AA011	Essential Service Water Pump Structure Division 4	Yes	Open	I
TOWER ISOLATION VALVE DIVISION 4	30PED40 AA010	Essential Service Water Pump Structure Division 4	Yes	Open	I
TOWER BYPASS ISOLATION VALVE DIVISION 4	30PED40 AA011	Essential Service Water Pump Structure Division 4	Yes	Close	I
MAKEUP WATER ISOLATION VALVE DIVISION 4	30PED40 AA019	Essential Service Water Pump Structure Division 4	Yes	Close	I
EMER. MAKEUP WATER ISOLATION VALVE DIVISION 4	30PED40 AA021	Essential Service Water Pump Structure Division 4	Yes	Open	I

Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design (8 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME Code Section III	Function	Seismic Category
MAKEUP WATER CHECK VALVE DIVISION 4	30PED40 AA220	Essential Service Water Pump Structure Division 4	Yes	Close	I
ISOLATION VALVE UPSTR KAA80 AC001	30PEB80 AA003	Essential Service Water Dedicated Division Safeguards Building 4	No	Open	N/A
ISOLATION VALVE DNSTR KAA80 AC001	30PEB80 AA004	Essential Service Water Dedicated Division Safeguards Building 4	Yes	Open	I
DEDICATED ESW PUMP	30PEB80 AP001	Essential Service Water Pump Structure Division 4	No	Run	N/A
DEDICATED BLOWDOWN ISOLATION VALVE	30PEB80 AA009	Essential Service Water Pump Structure Division 4	No	Close	N/A
DEDICATED FILTER BLOWDOWN ISOLATION VALVE	30PEB80 AA016	Essential Service Water Pump Structure Division 4	No	Close	N/A
DEDICATED RECIRC ISOLATION VALVE	30PEB80 AA015	Essential Service Water Pump Structure Division 4	No	Close	N/A

Table 2.7.11-1—Essential Service Water System Equipment Mechanical Design (8 Sheets)

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	ASME Code Section III	Function	Seismic Category
DEDICATED FILTER BLOWDOWN ISOLATION CHECK VALVE	30PEB80 AA211	Essential Service Water Pump Structure Division 4	No	Close	N/A
DEDICATED PUMP ISOLATION CHECK VALVE	30PEB80 AA002	Essential Service Water Pump Structure Division 4	No	Open	N/A
DEDICATED EMERGENCY BLOWDOWN ISOLATION VALVE	30PEB80 AA003	Essential Service Water Pump Structure Division 4	No	Close	N/A

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

**Table 2.7.11-2—Essential Service Water System Equipment I&C and Electrical Design
(6 Sheets)**

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	IEEE Class 1E ⁽²⁾	PACS	MCR/RSS Displays	MCR/RSS Controls
ESWS PUMP DIVISION 1	30PEB10 AP001	Essential Service Water Pump Structure Division 1	Division 1	Yes	On-Off/ On-Off	Start-Stop/ Start-Stop
RECIRC ISOLATION VALVE DIVISION 1	30PEB10 AA002	Essential Service Water Pump Structure Division 1	Division 1	No	Pos/N/A	Open-Close/N/A
EMER. BLOWDOWN ISOLATION VALVE DIVISION 1	30PEB10 AA003	Essential Service Water Pump Structure Division 1	Division 1	No	Pos/N/A	Open-Close/N/A
PUMP DISCHARGE ISOLATION VALVE DIVISION 1	30PEB10 AA005	Essential Service Water Pump Structure Division 1	Division 1	Yes	Pos/Pos	Open-Close/Open-Close
FILTER BLOWDOWN ISOLATION VALVE DIVISION 1	30PEB10 AA015	Essential Service Water Pump Structure Division 1	Division 1	No	Pos/N/A	Open-Close/N/A
BLOWDOWN ISOLATION VALVE DIVISION 1	30PEB10 AA016	Essential Service Water Pump Structure Division 1	Division 1	No	Pos/N/A	Open-Close/N/A
TOWER ISOLATION VALVE DIVISION 1	30PED10 AA010	Essential Service Water Pump Structure Division 1	Division 1	No	Pos/N/A	Open-Close/N/A
TOWER BYPASS ISOLATION VALVE DIVISION 1	30PED10 AA011	Essential Service Water Pump Structure Division 1	Division 1	No	Pos/N/A	Open-Close/N/A

**Table 2.7.11-2—Essential Service Water System Equipment I&C and Electrical Design
(6 Sheets)**

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	IEEE Class 1E ⁽²⁾	PACS	MCR/RSS Displays	MCR/RSS Controls
MAKEUP WATER ISOLATION VALVE DIVISION 1	30PED10 AA019	Essential Service Water Pump Structure Division 1	Division 1	No	Pos/N/A	Open-Close/N/A
EMER. MAKEUP WATER ISOLATION VALVE DIVISION 1	30PED10 AA021	Essential Service Water Pump Structure Division 1	Division 1	No	Pos/N/A	Open-Close/N/A
ESWS PUMP DIVISION 2	30PEB20 AP001	Essential Service Water Pump Structure Division 2	Division 2	Yes	On-Off/ On-Off	Start-Stop/ Start-Stop
RECIRC ISOLATION VALVE DIVISION 2	30PEB20 AA002	Essential Service Water Pump Structure Division 2	Division 2	No	Pos/N/A	Open-Close/N/A
EMER. BLOWDOWN ISOLATION VALVE DIVISION 2	30PEB20 AA003	Essential Service Water Pump Structure Division 2	Division 2	No	Pos/N/A	Open-Close/N/A
PUMP DISCHARGE ISOLATION VALVE DIVISION 2	30PEB20 AA005	Essential Service Water Pump Structure Division 2	Division 2	Yes	Pos/Pos	Open-Close/Open-Close
FILTER BLOWDOWN ISOLATION VALVE DIVISION 2	30PEB20 AA015	Essential Service Water Pump Structure Division 2	Division 2	No	Pos/N/A	Open-Close/N/A
BLOWDOWN ISOLATION VALVE DIVISION 2	30PEB20 AA016	Essential Service Water Pump Structure Division 2	Division 2	No	Pos/N/A	Open-Close/N/A

**Table 2.7.11-2—Essential Service Water System Equipment I&C and Electrical Design
(6 Sheets)**

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	IEEE Class 1E ⁽²⁾	PACS	MCR/RSS Displays	MCR/RSS Controls
TOWER ISOLATION VALVE DIVISION 2	30PED20 AA010	Essential Service Water Pump Structure Division 2	Division 2	No	Pos/N/A	Open-Close/N/A
TOWER BYPASS ISOLATION VALVE DIVISION 2	30PED20 AA011	Essential Service Water Pump Structure Division 2	Division 2	No	Pos/N/A	Open-Close/N/A
MAKEUP WATER ISOLATION VALVE DIVISION 2	30PED20 AA019	Essential Service Water Pump Structure Division 2	Division 2	No	Pos/N/A	Open-Close/N/A
EMER. MAKEUP WATER ISOLATION VALVE DIVISION 2	30PED20 AA021	Essential Service Water Pump Structure Division 2	Division 2	No	Pos/N/A	Open-Close/N/A
ESWS PUMP DIVISION 3	30PEB30AP001	Essential Service Water Pump Structure Division 3	Division 3	Yes	On-Off/ On-Off	Start-Stop/ Start-Stop
RECIRC ISOLATION VALVE DIVISION 3	30PEB30 AA002	Essential Service Water Pump Structure Division 3	Division 3	No	Pos/N/A	Open-Close/N/A
EMER. BLOWDOWN ISOLATION VALVE DIVISION 3	30PEB30 AA003	Essential Service Water Pump Structure Division 3	Division 3	No	Pos/N/A	Open-Close/N/A
PUMP DISCHARGE ISOLATION VALVE DIVISION 3	30PEB30 AA005	Essential Service Water Pump Structure Division 3	Division 3	Yes	Pos/Pos	Open-Close/Open-Close

**Table 2.7.11-2—Essential Service Water System Equipment I&C and Electrical Design
(6 Sheets)**

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	IEEE Class 1E ⁽²⁾	PACS	MCR/RSS Displays	MCR/RSS Controls
FILTER BLOWDOWN ISOLATION VALVE DIVISION 3	30PEB30 AA015	Essential Service Water Pump Structure Division 3	Division 3	No	Pos/N/A	Open-Close/N/A
BLOWDOWN ISOLATION VALVE DIVISION 3	30PEB30 AA016	Essential Service Water Pump Structure Division 3	Division 3	No	Pos/N/A	Open-Close/N/A
TOWER ISOLATION VALVE DIVISION 3	30PED30 AA010	Essential Service Water Pump Structure Division 3	Division 3	No	Pos/N/A	Open-Close/N/A
TOWER BYPASS ISOLATION VALVE DIVISION 3	30PED30 AA011	Essential Service Water Pump Structure Division 3	Division 3	No	Pos/N/A	Open-Close/N/A
MAKEUP WATER ISOLATION VALVE DIVISION 3	30PED30 AA019	Essential Service Water Pump Structure Division 3	Division 3	No	Pos/N/A	Open-Close/N/A
EMER. MAKEUP WATER ISOLATION VALVE DIVISION 3	30PED30 AA021	Essential Service Water Pump Structure Division 3	Division 3	No	Pos/N/A	Open-Close/N/A
ESWS PUMP DIVISION 4	30PEB40 AP001	Essential Service Water Pump Structure Division 4	Division 4	Yes	On-Off/ On-Off	Start-Stop/ Start-Stop
RECIRC ISOLATION VALVE DIVISION 4	30PEB40 AA002	Essential Service Water Pump Structure Division 4	Division 4	No	Pos/N/A	Open-Close/N/A

**Table 2.7.11-2—Essential Service Water System Equipment I&C and Electrical Design
(6 Sheets)**

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	IEEE Class 1E ⁽²⁾	PACS	MCR/RSS Displays	MCR/RSS Controls
EMER. BLOWDOWN ISOLATION VALVE DIVISION 4	30PEB40 AA003	Essential Service Water Pump Structure Division 4	Division 4	No	Pos/N/A	Open-Close/N/A
PUMP DISCHARGE ISOLATION VALVE DIVISION 4	30PEB40 AA005	Essential Service Water Pump Structure Division 4	Division 4	Yes	Pos/Pos	Open-Close/Open-Close
FILTER BLOWDOWN ISOLATION VALVE DIVISION 4	30PEB40 AA015	Essential Service Water Pump Structure Division 4	Division 4	No	Pos/N/A	Open-Close/N/A
BLOWDOWN ISOLATION VALVE DIVISION 4	30PEB40 AA016	Essential Service Water Pump Structure Division 4	Division 4	No	Pos/N/A	Open-Close/N/A
TOWER ISOLATION VALVE DIVISION 4	30PED40 AA010	Essential Service Water Pump Structure Division 4	Division 4	No	Pos/N/A	Open-Close/N/A
TOWER BYPASS ISOLATION VALVE DIVISION 4	30PED40 AA011	Essential Service Water Pump Structure Division 4	Division 4	No	Pos/N/A	Open-Close/N/A
MAKEUP WATER ISOLATION VALVE DIVISION 4	30PED40 AA019	Essential Service Water Pump Structure Division 4	Division 4	No	Pos/N/A	Open-Close/N/A
EMER. MAKEUP WATER ISOLATION VALVE DIVISION 4	30PED40 AA021	Essential Service Water Pump Structure Division 4	Division 4	No	Pos/N/A	Open-Close/N/A

**Table 2.7.11-2—Essential Service Water System Equipment I&C and Electrical Design
(6 Sheets)**

Equipment Description	Equipment Tag Number ⁽¹⁾	Equipment Location	IEEE Class 1E ⁽²⁾	PACS	MCR/RSS Displays	MCR/RSS Controls
DEDICATED ESW PUMP	30PEB80 AP001	Essential Service Water Pump Structure Division 4	Division 4 ^N SBO ^A	No	On-Off/ On-Off	Start-Stop/ Start-Stop
DEDICATED FILTER BLOWDOWN ISOLATION VALVE	30PEB80 AA009	Essential Service Water Pump Structure Division 4	Division 4 ^N SBO ^A	No	Pos/N/A	Open-Close/N/A
DEDICATED BLOWDOWN ISOLATION VALVE	30PEB80 AA016	Essential Service Water Pump Structure Division 4	Division 4	No	Pos/N/A	Open-Close/N/A
DEDICATED RECIRC ISOLATION VALVE	30PEB80 AA015	Essential Service Water Pump Structure Division 4	Division 4	No	Pos/N/A	Open-Close/N/A
DEDICATED EMERGENCY BLOWDOWN ISOLATION VALVE	30PEB80 AA003	Essential Service Water Pump Structure Division 4	Division 4	No	Pos/N/A	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 component is normally powered from; ^A denotes the division the component is powered from when alternate feed is implemented.

**Table 2.7.11-3—Essential Service Water System ITAAC
(6 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
2.1	The functional arrangement of the ESWS is as shown on Figure 2.7.11-1.	Inspections of the as-built system as shown on Figure 2.7.11-1 will be conducted	The as-built ESWS conforms to the functional arrangement as shown in Figure 2.7.11-1.
2.2	The location of the ESWS equipment is as listed in Table 2.7.11-1.	An inspection will be performed of the location of the equipment listed in Table 2.7.11-1.	The equipment listed in Table 2.7.11-1 is located as listed in Table 2.7.11-1.
2.3	Physical separation exists between divisions of the ESWS.	An inspection will be performed to verify that the divisions of the ESWS are located in separate ESW and SB buildings.	The divisions of the ESWS system are located in separate ESW and SB buildings.
2.4	Deleted.	Deleted.	Deleted.
2.5	Deleted.	Deleted.	Deleted.
3.1	Equipment listed in Table 2.7.11-1 as ASME Code Section III is designed, welded, and hydrostatically tested in accordance with ASME Code Section III.	<p>a. Analysis of the equipment identified in Table 2.7.11-1 as ASME Code Section III will be performed per ASME Code Section III design requirements.</p> <p>b. Inspections will be conducted on the equipment identified in Table 2.7.11-1 as ASME Code Section III to verify welding has been performed per ASME Code Section III welding requirements.</p> <p>c. Hydrostatic testing of the equipment identified in Table 2.7.11-1 as ASME Code Section III will be performed per ASME Code Section III hydrostatic testing requirements.</p>	<p>a. ASME Code Section III Design Reports (NCA-3550) exist and conclude that the equipment identified in Table 2.7.11-1 as ASME Code Section III meets ASME Code Section III design requirements.</p> <p>b. Equipment identified in Table 2.7.11-1 as ASME Code Section III has been welded per ASME Code Section III welding requirements.</p> <p>c. Equipment identified in Table 2.7.11-1 as ASME Code Section III has been hydrostatically tested per ASME Code Section III hydrostatic testing requirements.</p>
3.2	Check valves listed in Table 2.7.11-1 will function as listed in Table 2.7.11-1.	Tests will be performed for the operation of the check valves listed in Table 2.7.11-1.	The check valves listed in Table 2.7.11-1 perform the functions listed in Table 2.7.11-1.
3.3	Deleted.	Deleted.	Deleted.

**Table 2.7.11-3—Essential Service Water System ITAAC
(6 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
3.4	Equipment identified as Seismic Category I in Table 2.7.11-1 can withstand seismic design basis loads without loss of safety function as listed in Table 2.7.11-1.	<p>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 2.7.11-1 using analytical assumptions, or under conditions, which bound the Seismic Category I design requirements</p> <p>b. Inspections will be performed of the as-installed Seismic Category I equipment listed in Table 2.7.11-1 to verify that the equipment including anchorage is installed as specified on the construction drawings..</p>	<p>a. Tests/analysis reports exist and conclude that the Seismic Category I equipment listed in Table 2.7.11-1 can withstand seismic design basis loads without loss of safety function.</p> <p>b. Inspection reports exist and conclude that the as-installed Seismic Category I equipment listed in Table 2.7.11-1 is installed as specified on the construction drawings.</p>
3.5	Deleted.	Deleted.	Deleted.
3.6	Deleted.	Deleted.	Deleted.
3.7	Deleted.	Deleted.	Deleted.
3.8	Deleted.	Deleted.	Deleted.
3.9	Deleted.	Deleted.	Deleted.
3.10	Deleted.	Deleted.	Deleted.
3.11	Deleted.	Deleted.	Deleted.
3.12	Portions of the ESWS piping shown as ASME Code Section III in Figure 2.7.11-1 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 ESWS piping shown as ASME Code Section III in Figure 2.7.11-1.
3.13	Portions of the ESWS piping shown as ASME Code Section III in Figure 2.7.11-1 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 ESWS piping shown as ASME Code Section III in Figure 2.7.11-1, 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.

**Table 2.7.11-3—Essential Service Water System ITAAC
(6 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
3.14	Pressure boundary welds in portions of the ESWS piping shown as ASME Code Section III in Figure 2.7.11-1 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 ESWS piping shown as ASME Code Section III in Figure 2.7.11-1 has been performed in accordance with ASME Code Section III.
3.15	Portions of the ESWS piping shown as ASME Code Section III in Figure 2.7.11-1 retain their pressure boundary integrity at their design pressure.	Hydrostatic tests will be performed on the as-fabricated system.	For portions of the ESWS piping shown as ASME Code Section III in Figure 2.7.11-1, ASME Code Section III Data Reports exist and conclude that hydrostatic test results comply with ASME Code Section III requirements.
3.16	Portions of the ESWS piping shown as ASME Code Section III in Figure 2.7.11-1 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 ESWS piping shown as ASME Code Section III in Figure 2.7.11-1, N-5 Data Reports exist and conclude that installation is in accordance with ASME Code Section III requirements.
4.1	Displays exist or can be retrieved in the MCR and the RSS as identified in Table 2.7.11-2.	Inspections will be performed for the existence or retrievability of the displays in the MCR or the RSS as listed in Table 2.7.11-2.	<ul style="list-style-type: none"> a. The displays listed in Table 2.7.11-2 as being retrieved in the MCR can be retrieved in the MCR. b. The displays listed in Table 2.7.11-2 as being retrieved in the RSS can be retrieved in the RSS.
4.2	Controls exist in the MCR and the RSS as identified in Table 2.7.11-2.	Tests will be performed for the existence of control signals from the MCR and the RSS to the equipment listed in Table 2.7.11-2.	<ul style="list-style-type: none"> a. The controls listed in Table 2.7.11-2 as being in the MCR exist in the MCR. b. The controls listed in Table 2.7.11-2 as being in the RSS exist in the RSS.

**Table 2.7.11-3—Essential Service Water System ITAAC
(6 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
4.3	Equipment listed as being controlled by a PACS module in Table 2.7.11-2 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 2.7.11-2 responds to the state requested by the test signal.
4.4	If one ESWS pump (30PEB10/20/30/40 AP001) fails during normal operation, a switchover to the other ESWS train is carried out automatically for the entire cooling train and is initiated by the CCWS Switchover sequence.	Tests will be performed using test signals to verify the interlock.	The following interlock responds as specified below when activated by a test signal: If one ESWS pump (30PEB10/20/30/40 AP001) fails during normal operation, a switchover to the other ESWS train is carried out automatically for the entire cooling train and is initiated by the CCWS Switchover sequence.
4.5	A spurious closure of the ESWS pump discharge valve (30PEB10/20/30/40 AA005) results in a switchover to the other ESWS train automatically for the entire cooling train and is initiated by the CCWS switchover sequence.	Tests will be performed using test signals to verify the interlock.	The following interlock responds as specified below when activated by a test signal: A spurious closure of the ESWS pump discharge valve (30PEB10/20/30/40 AA005) results in a switchover to the other ESWS train automatically for the entire cooling train and is initiated by the CCWS Switchover sequence.
4.6	Deleted.	Deleted.	Deleted.
4.7	Deleted.	Deleted.	Deleted.
5.1	The components designated as Class 1E in Table 2.7.11-2 are powered from the Class 1E division as listed in Table 2.7.11-2 in a normal or alternate feed condition.	a. Testing will be performed for components designated as Class 1E in Table 2.7.11-2 by providing a test signal in each normally aligned division.	a. The test signal provided in the normally aligned division is present at the respective Class 1E component identified in Table 2.7.11-2.

**Table 2.7.11-3—Essential Service Water System ITAAC
(6 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
		b. Testing will be performed for components designated as Class 1E in Table 2.7.11-2 by providing a test signal in each division with the alternate feed aligned to the divisional pair.	b. The test signal provided in each division with the alternate feed aligned to the divisional pair is present at the respective Class 1E component identified in Table 2.7.11-2.
5.2	Valves listed in Table 2.7.11-2 fail as-is on loss of power.	Testing will be performed for the valves listed in Table 2.7.11-2 to fail as-is on loss of power.	Following loss of power, the valves listed in Table 2.7.11-2 fail as-is.
5.3	Deleted.	Deleted.	Deleted.
6.1	Deleted.	Deleted.	Deleted.
7.1	The ESW UHS as listed in Table 2.7.11-1 has the capacity to remove the design heat load from the CCWS.	Tests and analyses will be performed to demonstrate the capability of the ESWS UHS as listed in Table 2.7.11-1 to remove the design heat load from CCWS.	The ESWS UHS has the capacity to remove the design heat load from the CCWS of 2.913 E+08 BTU/hr.
7.2	The pumps listed in Table 2.7.11-1 have sufficient NPSHA.	Testing and analyses will be performed to verify NPSHA for pumps listed in Table 2.7.11-1.	A report exists and concludes that the pumps listed in Table 2.7.11-1 have NPSHA that is greater than net positive suction head required (NPSHR) at system run-out flow with consideration for minimum allowable cooling tower basin water level (as corrected to account for actual temperature and atmospheric conditions).
7.3	Class 1E valves listed in Table 2.7.11-2 perform the function listed in Table 2.7.11-1.	Tests and analyses or a combination of tests and analyses will be performed to demonstrate the ability of the valves listed in Table 2.7.11-2 to change position as listed in Table 2.7.11-1.	The as-installed valve changes position as listed Table 2.7.11-1.
7.4	The ESWS has provisions to allow flow testing of the ESWS pumps during plant operation.	Testing for flow of the ESWS pumps back to the ESW cooling tower basin will be performed.	The flow test line allows ESWS pump flow back to the ESW cooling tower basin.

**Table 2.7.11-3—Essential Service Water System ITAAC
(6 Sheets)**

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
7.5	The non-safety related dedicated ESWS as listed in Table 2.7.11-1 has the capacity to remove the design heat load from the non-safety related dedicated CCWS heat exchanger and ESWPBVS division 4 room cooler.	Tests and analyses will be performed to demonstrate the capability of the non-safety-related dedicated ESWS as listed in Table 2.7.11-1 to remove the design heat load from the non-safety related dedicated CCWS heat exchanger and ESWPBVS division 4 room cooler.	The non-safety related dedicated ESWS has the capacity to remove the design heat load from the non-safety-related dedicated CCWS heat exchanger and ESWPBVS division 4 room cooler.
7.6	The ESWS delivers water at the required flow and within the required time due to design basis events.	<p>a. Tests and analyses will be performed to determine the ESWS delivery rate under design conditions.</p> <p>b. An integrated system test will be performed using a simulated actuation signal to verify the startup time of the ESWS.</p>	<p>a. A report exists and concludes that the ESWS system delivers the following combined total design flowrate : 19,340 gpm</p> <p>b. A report exists and concludes that the ESWS starts within the following required time in response to a simulated actuation signal.</p>