3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.1 Accumulators

LCO 3.5.1 Four ECCS accumulators shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS pressure > 1000 psig.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One accumulator inoperable due to boron concentration or enrichment not within limits.	A.1	Restore boron concentration and enrichment to within limits.	72 hours
B. One accumulator inoperable for reasons other than Condition A.	B.1	Restore accumulator to OPERABLE status.	1 hour
C. Required Action and associated Completion Time of Condition A or B not met.	C.1	Be in MODE 3.	6 hours
	AND		
	C.2	Reduce RCS pressure to ≤ 1000 psig.	12 hours
D. Two or more accumulators inoperable.	D.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each accumulator isolation valve is fully open.	12 hours
SR 3.5.1.2	Verify borated water volume in each accumulator is ≥ 1236 ft^3 and ≤ 1412 ft^3.	12 hours
SR 3.5.1.3	Verify nitrogen cover pressure in each accumulator is ≥ 638 psig and ≤ 696 psig.	12 hours
SR 3.5.1.4	Verify boron concentration in each accumulator is ≥ 1700 ppm and ≤ 1900 ppm enriched boron.	31 days AND --------NOTE-------- Only required to be performed for affected accumulators ---------- Once within 6 hours after each solution volume increase of ≥ 145 gallons, that is not the result of addition from the in-containment refueling water storage tank

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.5	----------NOTE---------- Only required to be met when RCS pressure is ≥ 2000 psig. ---------- Verify power is removed from each accumulator isolation valve operator.	31 days
SR 3.5.1.6	Verify isotopic concentration of B-10 in each accumulator is ≥ 37%.	24 months

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 ECCS - Operating

LCO 3.5.2 Four ECCS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Medium Head Safety Injection (MHSI) train inoperable.	A.1 Restore MHSI train to OPERABLE status.	120 days
B. One Low Head Safety Injection (LHSI) train inoperable.	B.1 Open both ECCS cold leg cross connections. AND B.2 Restore LHSI train to OPERABLE status.	72 hours 120 days
C. Two ECCS trains inoperable.	C.1 Restore one inoperable train to OPERABLE status.	72 hours
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	6 hours 12 hours
E. Less than 100% of the ECCS flow equivalent to two OPERABLE ECCS trains available.	E.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify each ECCS manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.5.2.2	Verify ECCS piping is full of water.	31 days
SR 3.5.2.3	Verify each ECCS pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.5.2.4	Verify each ECCS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	24 months
SR 3.5.2.5	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	24 months
SR 3.5.2.6	Verify, by visual inspection, each ECCS train suction inlet from the In-Containment Refueling Water Storage Tank is not restricted by debris and the suction inlet trash racks and screens show no evidence of structural distress or abnormal corrosion.	24 months
SR 3.5.2.7	Verify that the flow split for hot leg injection is ≥ 75% of LHSI flow.	24 months
SR 3.5.2.8	Verify that the containment heat removal capability of the LHSI heat exchangers is sufficient to maintain post-accident conditions within design limits.	24 months on a STAGGERED TEST BASIS

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.3 ECCS - Shutdown, MODE 4

LCO 3.5.3 Three Medium Head Safety Injection (MHSI) trains shall be OPERABLE.

APPLICABILITY: MODE 4.

ACTIONS

----------NOTE----------
LCO 3.0.4.b is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required MHSI train inoperable.	A.1 Restore required MHSI train to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met. OR Two required MHSI trains inoperable.	B.1 Be in MODE 5.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	The following SRs are applicable for all required MHSI trains: SR 3.5.2.2, SR 3.5.2.3, SR 3.5.2.4, SR 3.5.2.5, and SR 3.5.2.6.	In accordance with applicable SRs

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.4 In-Containment Refueling Water Storage Tank (IRWST) - Operating

LCO 3.5.4 The IRWST shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. IRWST temperature, water volume, boron concentration, or enrichment not within limits.	A.1 Restore IRWST temperature, water volume, boron concentration, and enrichment to within limits.	8 hours
B. One or more motor-operated passive flooding line valves not closed. OR Power is not removed from one or more motor-operated passive flooding line valves.	B.1 Restore motor-operated passive flooding line valves to the closed position with power removed.	1 hour
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.4.1	Verify each motor-operated IRWST passive flooding line valve is closed and power is removed from each valve operator.	12 hours
SR 3.5.4.2	Verify IRWST borated water temperature is ≥ 59°F and ≤ 122°F.	24 hours
SR 3.5.4.3	Verify IRWST borated water volume is ≥ 500,342 gallons and ≤ 523,703 gallons.	7 days
SR 3.5.4.4	Verify IRWST boron concentration is ≥ 1700 ppm and ≤ 1900 ppm enriched boron.	7 days
SR 3.5.4.5	Verify isotopic concentration of B-10 in the IRWST is ≥ 37%.	24 months

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.5 Extra Borating System (EBS)

LCO 3.5.5 Two EBS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or both EBS tanks inoperable due to boron concentration or enrichment not within limits.	A.1	Restore boron concentration and enrichment to within limits.	72 hours
B. One EBS train inoperable for reasons other than Condition A.	B.1	Restore EBS train to OPERABLE status.	7 days
C. Two EBS trains inoperable for reasons other than Condition A.	C.1	Restore one EBS train to OPERABLE status.	8 hours
D. Required Action and associated Completion Time not met.	D.1	Be in MODE 3.	6 hours
	AND		
	D.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.5.1	Verify each EBS tank borated water temperature and EBS pump room is ≥ 68°F.	24 hours
SR 3.5.5.2	Verify total EBS tank borated water volume is ≥ 2372 ft^3.	7 days
SR 3.5.5.3	Verify each EBS tank boron concentration is ≥ 7,000 ppm and ≤ 7,300 ppm enriched boron.	31 days AND Once within 24 hours after water or boron is added to tank AND Once within 24 hours after tank temperature is restored to within limit
SR 3.5.5.4	Verify each EBS train manual and power operated valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position, or can be aligned to the correct position.	31 days
SR 3.5.5.5	Verify each EBS pump develops a flow rate ≥ 49.0 gpm and ≤ 55.4 gpm.	In accordance with the Inservice Testing Program
SR 3.5.5.6	Verify isotopic concentration of B-10 in each EBS tank is ≥ 37%.	24 months

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.5.7	Verify flow through one EBS train from the pump into the RCS.	24 months
SR 3.5.5.8	Verify each EBS train power operated outboard containment isolation valve can be manually aligned to the open position from the main control room (MCR) after automatic closure of the outboard containment isolation valve by the Containment Isolation Signal.	24 months

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.6 In-Containment Refueling Water Storage Tank (IRWST) - Shutdown, MODE 5

LCO 3.5.6 The IRWST shall be OPERABLE.

APPLICABILITY: MODE 5.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. IRWST water volume, boron concentration, or enrichment not within limits.	A.1	Restore IRWST water volume, boron concentration, and enrichment to within limits.	8 hours
B. One or more motor-operated passive flooding line valves not closed. OR Power is not removed from one or more motor-operated passive flooding line valves.	B.1	Restore motor-operated passive flooding line valves to the closed position with power removed.	1 hour
C. Required Action and associated Completion Time Condition A or B not met.	C.1	Initiate action to ensure the RCS pressure boundary is intact with ≥ 25% pressurizer level.	Immediately
	AND		
	C.2	Suspend positive reactivity additions.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.6.1	SRs 3.5.4.1, 3.5.4.3, and 3.5.4.4 of Specification 3.5.4, “In-Containment Refueling Water Storage Tank (IRWST) – Operating” are applicable.	In accordance with applicable SRs.

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.7 In-Containment Refueling Water Storage Tank (IRWST) - Shutdown, MODE 6

LCO 3.5.7 The IRWST shall be OPERABLE.

APPLICABILITY: MODE 6 with the refueling cavity not filled.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. IRWST water volume not within limits.	A.1	Restore IRWST water volume to within limits.	8 hours
B. One or more motor-operated passive flooding line valves not closed. OR Power is not removed from one or more motor-operated passive flooding line valves.	B.1	Restore motor operated passive flooding line valves to the closed position with power removed.	1 hour
C. Required Action and associated Completion Time not met.	C.1	Initiate action to achieve refueling cavity water level ≥ 23 feet above the reactor vessel flange.	Immediately
	AND		
	C.2	Suspend positive reactivity additions.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.7.1	Verify IRWST, refueling canal, and refueling cavity borated water volume is ≥ 500,342 gallons.	24 hours
SR 3.5.7.2	SR 3.5.4.1 of Specification 3.5.4, “In-Containment Refueling Water Storage Tank (IRWST) – Operating” is applicable.	In accordance with applicable SR.

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.8 ECCS - Shutdown, MODES 5 and 6

LCO 3.5.8 Two Medium Head Safety Injection (MHSI) trains shall be OPERABLE.

APPLICABILITY: MODE 5,
MODE 6 with the refueling cavity not filled.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One required MHSI train inoperable.	A.1	Restore required MHSI train to OPERABLE status.	72 hours
B. Two required MHSI trains inoperable.	B.1	Initiate action to restore at least one MHSI train to OPERABLE status.	Immediately
C. Required Action and associated Completion Time not met.	C.1.1	Initiate action to be in MODE 5 with the RCS pressure boundary intact and ≥ 25% pressurizer level.	Immediately
	OR		
	C.1.2	Initiate action to achieve refueling cavity water level ≥ 23 feet above the reactor vessel flange.	Immediately
	AND		
	C.2	Suspend positive reactivity additions.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.8.1	The following SRs are applicable for all required MHSI trains: SR 3.5.2.2, SR 3.5.2.3, SR 3.5.2.4, SR 3.5.2.5, and SR 3.5.2.6.	In accordance with applicable SRs