

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.1 Accumulators

LCO 3.5.1 Three ECCS accumulators shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS pressure > 70.31Kg/CM²(1000 psig).

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One accumulator inoperable due to boron concentration not within limits.	A.1 Restore boron concentration 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
	<u>AND</u> C.2 Reduce RCS pressure to ≤ 70.31Kg/CM ² (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 $\geq 985\text{ft}^3$ (37.58 %) and $\leq 1015\text{ft}^3$ (63.9 %).	12 hours
SR 3.5.1.3	Verify nitrogen cover pressure in each accumulator is $\geq 43.38\text{Kg}/\text{CM}^2$ (617 psig) and $\leq 46.75\text{Kg}/\text{CM}^2$ (665 psig).	12 hours
SR 3.5.1.4	Verify boron concentration in each accumulator is ≥ 2300 ppm and ≤ 2500 ppm.	31 days <u>AND</u> -----NOTE----- Only required to be performed for affected accumulators ----- Once within 6 hours after each solution volume increase of ≥ 75 gallons, (8.7%) of indicated level that is not the result of addition from the refueling water storage tank
SR 3.5.1.5	Verify power is removed from each accumulator isolation valve operator when RCS pressure is $\geq 140.611\text{Kg}/\text{cm}^2$ (2000 psig).	31 days

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 ECCS-Operating

LCO 3.5.2 Two ECCS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

-----NOTE-----
 In MODE 3, both safety injection (SI) pump flow paths may be isolated by closing the isolation valves for up to 2 hours to perform pressure isolation valve testing per SR 3.4.14.1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more trains inoperable. <u>AND</u> At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	A.1 Restore train(s) to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify the following valves are in the listed position with power to the valve operator removed.	12 hours
<u>Number</u>	<u>Position</u> <u>Function</u>	
HV16,13	Open SIS-Cold Leg Isolation	
HV8,HV5	Open SIS-RHR Pump Suction from RWST	
HV39,HV45,HV51	Open SIS-Accumulator Discharge Isolation	
HV19	Closed SIS-Hot Leg Isolation	
HV21	Closed SIS-Hot Leg Isolation	
HV18	Closed SIS-Hot Leg Isolation	
HV072	Open SIS-BIT Isolation	
HV20	Closed SIS-Cold Leg Isolation	
HV64	Closed SIS-Cold Leg Isolation	
SR 3.5.2.2	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 3.5.2.3	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.	18 months
SR 3.5.2.5	Verify each ECCS pump starts automatically on an actual or simulated actuation signal.	18 months

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SURVEILLANCE REQUIREMENTS(continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.6	<p>Verify, for each ECCS throttle valve listed below, each position is locked in the correct position.</p> <p><u>Valve Number</u></p> <p>V031 V032 V033 V034 V035 V036 V037 V038 V039 V040 V041 V042</p>	18 months
SR 3.5.2.7	<p>Verify, by visual inspection, each ECCS train containment sump suction inlet is not restricted by debris and the suction inlet trash racks and screens show no evidence of structural distress or abnormal corrosion.</p>	18 months

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.3 ECCS -Shutdown

LCO 3.5.3 One ECCS train shall be OPERABLE.

APPLICABILITY: MODE 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required ECCS residual heat removal (RHR) subsystem inoperable.	A.1 Initiate action to restore required ECCS RHR subsystem to OPERABLE status.	Immediately
B. Required ECCS centrifugal charging subsystem inoperable.	B.1 Restore required ECCS centrifugal charging subsystem to OPERABLE status.	1 hour
C. Required Action and associated Completion Time of Condition B not met.	C.1 Be in MODE 5.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.5.3.1 -----NOTE----- An RHR train may be considered OPERABLE during alignment and operation for decay heat removal, if capable of being manually realigned to the ECCS mode of operation. ----- The following SRs are applicable for all equipment required to be OPERABLE: SR 3.5.2.1 SR 3.5.2.2 SR 3.5.2.3 SR 3.5.2.4 SR 3.5.2.5 SR 3.5.2.6 SR 3.5.2.7</p>	<p>In accordance with applicable SRs</p>

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.4 Refueling Water Storage Tank (RWST)

LCO 3.5.4 The RWST shall be OPERABLE.

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. RWST boron concentration not within limits.</p> <p><u>OR</u></p> <p>RWST borated water temperature not within limits.</p>	A.1 Restore RWST to OPERABLE status.	8 hours
B. RWST inoperable for reasons other than Condition A.	B.1 Restore RWST to OPERABLE status.	1 hour
C. Required Action and associated Completion Time not met.	<p>C.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>C.2 Be in MODE 5.</p>	<p>6 hours</p> <p>36 hours</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.4.1	<p>-----NOTE----- Only required to be performed when ambient air temperature is < 9.4°C (49°F). -----</p> <p>Verify RWST borated water temperature is ≥ 9.4 °C (49°F).</p>	24 hours
SR 3.5.4.2	Verify RWST borated water volume is ≥ 464700 gallons (92.5)%.	7 days
SR 3.5.4.3	Verify RWST boron concentration is ≥ 2400ppm and ≤ 2500 ppm.	7 days

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.5 Seal Injection Flow

LCO 3.5.5 Reactor coolant pump seal injection flow shall be $\leq 7.49\text{m}^3/\text{hr}$ (33gpm) with RCS pressure at $157.14 \pm 1.4\text{Kg}/\text{cm}^2$ (2235 ± 20 psig) and the seal injection flow control valve full open..

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Seal injection flow not within limit.	A.1 Adjust manual seal injection throttle valves to give a flow within limit with RCS pressure at $157.14 \pm 1.4 \text{ Kg}/\text{cm}^2$ (2235 ± 20 psig) and the seal injection flow control valve full open.	4 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	6 hours
	<u>AND</u> B.2 Be in MODE 4.	12 hours

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SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.5.5.1 -----NOTE----- Not required to be performed until 4 hours after the Reactor Coolant System pressure stabilizes at $\geq 157.14 \pm 1.4\text{Kg/cm}^2$ (2235 \pm 20 psig). -----</p> <p>Verify manual seal injection throttle valves are adjusted to give a flow within limit with RCS pressure at $157.14 \pm 1.4\text{Kg/cm}^2$ (2235 \pm 20 psig)and the seal injection flow control valve full open.</p>	<p>31 days</p>

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.6 Boron Injection Tank (BIT)

LCO 3.5.6 The BIT shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. BIT boron concentration not within limits. OR BIT borated water temperature not within limits.	A.1 Restore BIT to OPERABLE status.	8 hours
B. BIT inoperable for reasons other than Condition A.	B.1 Restore BIT to OPERABLE status.	1 hours
C. Required Action and associated Completion A OR B Time not met.	C.1 Be in MODE 3. <u>AND</u> C.2 Borate to an SDM equivalent to 1% $\Delta k/k$ at 93.3°C (200°F). <u>AND</u> C.3 Restore BIT to OPERABLE status.	6 hours 6 hours 7 days
D. Required Action and associated Completion C Time not met.	D.1 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.6.1	<p>-----NOTE----- Only required to performed when ambient air temperature is < 9.4°C (49°F). -----</p> <p>Verify BIT borated water temperature is ≥ 9.4°C (49°F).</p>	24 hours
SR 3.5.6.2	Verify BIT borated water volume is ≥ 900 gallons (100%).	7 days
SR 3.5.6.3	Verify BIT boron concentration is ≥ 2000ppm and ≤ 3000 ppm.	7 days