

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 pressurizer pressure > 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 valve identified in SR 3.5.1.5 with control power restored.	B.1 Verify control power or air is removed to all valves identified in SR 3.5.2.1 and SR 3.5.2.7.	Immediately
	<u>AND</u> B.2 Remove control power to valve.	4 hours
C. One accumulator inoperable for reasons other than Condition A.	C.1 Restore accumulator to OPERABLE status.	4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A or B not met.	D.1 Be in MODE 3. <u>AND</u> D.2 Reduce pressurizer pressure to $\leq 1000$ psig.	6 hours  12 hours
E. Two or more accumulators inoperable.	E.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.5.1.1 Verify each accumulator isolation valve is fully open.	Once prior to removing power from the valve operator
SR 3.5.1.2 Verify borated water volume in each accumulator is $\geq 825$ ft <sup>3</sup> and $\leq 841$ ft <sup>3</sup> .	12 hours
SR 3.5.1.3 Verify nitrogen cover pressure in each accumulator is $\geq 600$ psig and $\leq 660$ psig.	12 hours

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.5.1.4    Verify boron concentration in each accumulator is <math>\geq 1950</math> ppm and <math>\leq 2400</math> ppm.</p>	<p>31 days</p> <p><u>AND</u></p> <p>-----NOTE----- Only required to be performed for affected accumulators -----</p> <p>Once within 6 hours after each solution volume increase of <math>\geq 70</math> gallons that is not the result of addition from the refueling water storage tank</p>
<p>SR 3.5.1.5    Verify control power is removed from each accumulator isolation valve operator.</p>	<p>31 days</p>

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

-----NOTES-----

1. In MODE 3, one cold leg safety injection (SI) pump flow path may be isolated by closing the isolation valves for up to 24 hours to perform pressure isolation valve testing per SR 3.4.14.1.
  2. Operation in MODE 3 with one required SI pump declared inoperable pursuant to LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," is allowed for up to 4 hours or until the temperature of all RCS cold legs exceeds 375°F, whichever comes first.
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ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One or more trains inoperable.</p> <p><u>AND</u></p> <p>At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.</p>	<p>A.1 Restore train(s) to OPERABLE status.</p>	<p>72 hours</p>
<p>B. One valve identified in SR 3.5.2.1 or SR 3.5.2.7 with control power or air restored.</p>	<p>B.1 Verify control power is removed to all valves identified in SR 3.5.1.5.</p> <p><u>AND</u></p>	<p>Immediately</p> <p>(continued)</p>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.2 Remove control power or air to valve.	24 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3.	6 hours
	<u>AND</u> C.2 Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY												
SR 3.5.2.1	<p>Verify the following valves are in the listed position with control power to the valve operator removed.</p> <table border="1"> <thead> <tr> <th><u>Number</u></th> <th><u>Position</u></th> <th><u>Function</u></th> </tr> </thead> <tbody> <tr> <td>SI-862 A&amp;B</td> <td>Open</td> <td>Low Head Safety Injection (LHSI)</td> </tr> <tr> <td>SI-863 A&amp;B SI-864 A&amp;B</td> <td>Closed Open</td> <td>LHSI LHSI, High Head Safety Injection (HHSI)</td> </tr> <tr> <td>SI-866 A&amp;B SI-878 A&amp;B</td> <td>Closed Open</td> <td>HHSI HHSI</td> </tr> </tbody> </table>	<u>Number</u>	<u>Position</u>	<u>Function</u>	SI-862 A&B	Open	Low Head Safety Injection (LHSI)	SI-863 A&B SI-864 A&B	Closed Open	LHSI LHSI, High Head Safety Injection (HHSI)	SI-866 A&B SI-878 A&B	Closed Open	HHSI HHSI	12 hours
<u>Number</u>	<u>Position</u>	<u>Function</u>												
SI-862 A&B	Open	Low Head Safety Injection (LHSI)												
SI-863 A&B SI-864 A&B	Closed Open	LHSI LHSI, High Head Safety Injection (HHSI)												
SI-866 A&B SI-878 A&B	Closed Open	HHSI HHSI												
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												

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
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
SR 3.5.2.6    Verify, by visual inspection, the 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.	18 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE			FREQUENCY
SR 3.5.2.7	Verify the following valves in the listed position:		31 days
	<u>Number</u>	<u>Position</u> <u>Function</u>	
	FCV-605	Closed/Motive      RHR Air Isolated	
	HCV-758	Closed/Motive      RHR Air Isolated	
SR 3.5.2.8	Verify the following manual valve is locked in the listed position		92 days
	<u>Number</u>	<u>Position</u> <u>Function</u>	
	RHR-764	Locked Open      LHSI	

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.3 ECCS – Shutdown

LC0 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 high head injection subsystem inoperable.	B.1 Restore required ECCS high head injection 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.....</p> <p>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.</p> <p>.....</p> <p>The following SRs are applicable for all equipment required to be OPERABLE:</p> <p>SR 3.5.2.3                      SR 3.5.2.6</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>	<p>A.1 Restore RWST to OPERABLE status.</p>	<p>8 hours</p>
<p>B. RWST inoperable for reasons other than Condition A.</p>	<p>B.1 Restore RWST to OPERABLE status.</p>	<p>1 hour</p>
<p>C. Required Action and associated Completion Time not met.</p>	<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 &lt; 45°F or &gt; 100°F.                      .....</p> <p>Verify RWST borated water temperature is                      ≥ 45°F and ≤ 100°F.</p>	24 hours
SR 3.5.4.2	Verify RWST borated water volume is ≥ 300,000 gallons.	7 days
SR 3.5.4.3	Verify RWST boron concentration is ≥ 1950 ppm and ≤ 2400 ppm.	7 days