## 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 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 accumulator inoperable for reasons other than Condition A. | B.1 | Restore accumulator to OPERABLE status. | 24 hours |
| C. Required Action and associated Completion Time of Condition A or B not met. | C.1<br><br>AND<br><br>C.2 | Be in MODE 3.<br><br><br><br>Reduce pressurizer pressure to ≤ 1000 psig. | 6 hours<br><br><br><br>12 hours |
| D. Two or more accumulators inoperable. | C.3 | 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 ≥ 7630 gallons and ≤ 8000 gallons. | 12 hours |
| SR 3.5.1.3 | Verify nitrogen cover pressure in each accumulator is ≥ 610 psig and ≤ 660 psig. | 12 hours |
| SR 3.5.1.4 | Verify boron concentration in each accumulator is ≥ 3000 ppm and ≤ 3300 ppm. | 31 days<br><br>AND<br><br>----------NOTE---------<br>Only required to be performed for affected accumulators<br>----------<br><br>Once within 6 hours after each solution volume increase of ≥ 75 gallons, 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 pressurizer pressure is ≥ 1000 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.

----------NOTE----------

1. 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.

2. In MODE 3, the safety injection pumps and charging pumps may be made incapable of injecting to support transition into or from the Applicability of the LCO 3.4.12, Cold Overpressure Mitigation System (COMS) for up to four hours or until the temperature of all the RCS cold legs exceeds 375°F, whichever occurs first.

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APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more trains inoperable.<br><br>AND<br><br>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.<br><br>AND<br><br>B.2 Be in MODE 4. | 6 hours<br><br><br><br>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.<br><br>Number / Position / Function<br>2FCV-63-1 / Open / RHR Supply<br>2FCV-63-22 / Open / SIS Discharge | 12 hours |
| 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 ECCS piping is full of water. | 31 days |
| SR 3.5.2.4 | 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 3.5.2.5 | 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 3.5.2.6 | Verify each ECCS pump starts automatically on an actual or simulated actuation signal. | 18 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.2.7 | Verify, for each ECCS throttle valve listed below, each position stop is in the correct position.<br><br>Valve Number<br><br>CCP Discharge Throttle Valves: 263-582, 263-583, 263-584, 263-585<br>SI Cold Leg Throttle Valves: 263-550, 263-552, 263-554, 263-556<br>SI Hot Leg Throttle Valves: 263-542, 263-544, 263-546, 263-548 | 18 months |
| SR 3.5.2.8 | 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. | 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

----------NOTE----------
LCO 3.0.4.b is not applicable to ECCS high head (centrifugal charging) subsystem.
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| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Required ECCS residual heat removal (RHR) subsystem inoperable. | ----------NOTE----------<br>The required ECCS residual heat removal (RHR) subsystem may be inoperable for up to 1 hour for surveillance testing of valves provided that alternate heat removal methods are available via the steam generators to maintain the Reactor Coolant System $T_{avg}$ less than 350°F and provided that the required subsystem is capable of being manually realigned to the ECCS mode of operation from the main control room.<br>----------<br>A.1 Initiate action to restore required ECCS RHR subsystem to OPERABLE status | Immediately |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| 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 |
|---|---|---|
| SR 3.5.3.1 | ----------NOTE----------<br>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.<br>---<br>The following SRs are applicable for all equipment required to be OPERABLE:<br>SR 3.5.2.1<br>SR 3.5.2.3<br>SR 3.5.2.4<br>SR 3.5.2.7<br>SR 3.5.2.8 | In accordance with applicable SRs |

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 |
|---|---|---|---|
| A. RWST boron concentration not within limits.<br><br>OR<br><br>RWST borated water temperature not within limits. | 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. | C.1<br><br>AND<br><br>C.2 | Be in MODE 3.<br><br><br><br>Be in MODE 5. | 6 hours<br><br><br><br>36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.4.1 | ----------NOTE----------<br>Only required to be performed when ambient air temperature is < 60°F or > 105°F.<br>----------<br><br>Verify RWST borated water temperature is ≥ 60°F and ≤ 105°F. | 24 hours |
| SR 3.5.4.2 | Verify RWST borated water volume is ≥ 370,000 gallons. | 7 days |
| SR 3.5.4.3 | Verify boron concentration in the RWST is ≥ 3100 ppm and ≤ 3300 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 ≤ 40 gpm with charging pump discharge header pressure ≥ 2430 psig and the pressurizer level 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 charging pump discharge header pressure ≥ 2430 psig and the pressurizer level control valve full open. | 4 hours |
| B. Required Action and associated Completion Time not met. | B.1<br><br>AND<br><br>B.2 | Be in MODE 3.<br><br><br><br>Be in MODE 4. | 6 hours<br><br><br><br>12 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.5.5.1 | ----------NOTE----------<br>Required to be performed within 4 hours after the Reactor Coolant System pressure stabilizes at ≥ 2215 psig and ≤ 2255 psig.<br>----------<br><br>Verify manual seal injection throttle valves are adjusted to give a flow within limit with charging pump discharge header pressure ≥ 2430 psig and the pressurizer level control valve full open. | 31 days |