3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.1 ECCS - Operating

LCO 3.5.1 Each ECCS injection/spray subsystem and the Automatic Depressurization System (ADS) function of five safety/relief valves shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3, except high pressure coolant injection (HPCI) and ADS valves are not required to be OPERABLE with reactor steam dome pressure ≤ 10.5kg/cm^2 (150 psig.)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One LPCI Pump inoperable	A.1 Restore LPCI Pump to OPERABLE status	30 days
B. One low pressure ECCS injection/ spray subsystem inoperable.	B.1 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	7 days
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	12 hours 36 hours
D. HPCI System inoperable.	D.1 Verify by administrative means RCIC System is OPERABLE. AND D.2 Restore HPCI System to OPERABLE status.	1 hours 14 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. HPCI System inoperable. AND One low pressure ECCS injection/spray subsystem is inoperable.	E.1 Restore HPCI System to OPERABLE status. OR E.2 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours 72 hours
F. One ADS valve inoperable.	F.1 Restore ADS valve to OPERABLE status.	30 days
G. One ADS valve inoperable. AND One low pressure ECCS injection/spray subsystem inoperable.	G.1 Restore ADS valve to OPERABLE status. OR G.2 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	72 hours 72 hours
H. Two or more ADS valves inoperable. OR Required Action and associated Completion Time of Condition D, E, F, or G not met.	H.1 Be in MODE 3. AND H.2 Reduce reactor steam dome pressure to ≤ 10.5kg/cm^2 (150 psig.)	12 hours 36 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. Two or more low pressure ECCS injection/spray subsystems inoperable. OR HPCI System and one or more ADS valves inoperable.	I.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify, for each ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	31 days (for CS & LPCI) 1 day (for HPCI)
SR 3.5.1.2	----------NOTE---------- Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the Residual Heat Removal (RHR) cut in permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable. ---------- Verify each ECCS injection/spray subsystem 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 3.5.1.3	Verify ADS pneumatic supply pressure is ≥ 5.6 kg/cm^2 (80 psig.)	31 days
SR 3.5.1.4	----------NOTE---------- Not required to be performed if performed within the previous 31 days. ---------- Verify each recirculation pump discharge valve cycles through one complete cycle of full travel	Once each startup prior to exceeding 25% RTP when in Mode 4 ≥ 48 hours.
SR 3.5.1.5	Verify the following ECCS pumps develop the specified flow rate against a system head corresponding to the specified reactor pressure. SYSTEM: Core Spray — FLOW RATE: ≥ 235 LPS (3720 gpm) — NO. OF PUMPS: 1 — SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF: ≥ 7.9 kg/cm^2 (113 psid) SYSTEM: LPCI — FLOW RATE: ≥1240 LPS (19670 gpm) — NO. OF PUMPS: 3 — SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF: ≥ 1.4 kg/cm^2 (20 psid)	In accordance with the Inservice Testing Program or 92 days
SR 3.5.1.6	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure is adequate to perform the test. ---------- Verify, with reactor pressure ≤ 71.8kg/cm^2 (1020psig) and ≥ 64.7kg/cm^2 (920 psig), the HPCI pump can develop a flow rate ≥ 268 LPS (4250 gpm) against a system head corresponding to reactor pressure.	92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.7	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure is adequate to perform the test. ---------- Verify, with reactor pressure ≤ 11.6kg/cm^2 (165 psig) and ≥ 10.5kg/cm^2 (150 psig), the HPCI pump can develop a flow rate ≥ 268 LPS (4250 gpm) against a system head corresponding to reactor pressure.	18 months
SR 3.5.1.8	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Verify each ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	18 months
SR 3.5.1.9	----------NOTE---------- Valve actuation may be excluded. ---------- Verify the ADS actuates on an actual or simulated automatic initiation signal.	18 months
SR 3.5.1.10	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure and flow are adequate to perform the test. ---------- Verify each ADS valve opens when manually actuated.	18 months on a STAGGERED TEST BASIS for each valve solenoid

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.11	----------NOTE---------- ECCS actuation instrumentation is excluded. ---------- Verify the ECCS RESPONSE TIME for each ECCS injection/spray subsystem is within lmits.	18 months

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.2 ECCS—Shutdown

LCO 3.5.2 Two low pressure ECCS injection/spray subsystems shall be OPERABLE.

APPLICABILITY: MODE 4,
MODE 5, only one low pressure ECCS injection/spray subsystem is required to be OPERABLE with the spent fuel storage pool gates removed and water level ≥ 6.8m(22ft-4in) over the top of the reactor pressure vessel flange.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required ECCS injection/spray subsystem inoperable.	A.1 Restore required ECCS injection/spray subsystem to OPERABLE status.	4 hours
B. Required Action and associated Completion time of Condition A not met.	B.1 Initiate action to suspend operations with a potential for draining the reactor vessel (OPDRVs).	Immediately
C. Two required ECCS injection/spray subsystems inoperable.	C.1 Initiate action to suspend OPDRVs. AND C.2 Restore one ECCS injection/spray subsystem to OPERABLE status.	Immediately 4 hours
D. Required Action C.2 and associated Completion Time not met.	D.1 Initiate action to restore secondary containment to OPERABLE status. AND	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. (continued)	D.2 Initiate action to restore one standby gas treatment subsystem to OPERABLE status. AND	Immediately
	D.3 Initiate action to restore isolation capability in each required secondary containment penetration flow path not isolated.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify, for each required low pressure coolant injection (LPCI) subsystem, the suppression pool water level is ≥ -10cm(-3.9 in) (narrow range).	12 hours
SR 3.5.2.2	Verify, for each required core spray (CS) subsystem, the: a. Suppression pool water level is ≥ -10cm (-3.9in) (narrow range) ; or b. ----------NOTE---------- Only one required CS subsystem may take credit for this option during OPDRVs. ---------- Condensate storage tank water level is ≥ 4.15m (13.6ft).	12 hours
SR 3.5.2.3	Verify, for each required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve.	31 days

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.4	----------NOTE---------- One LPCI subsystem may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable. ---------- Verify each required ECCS injection/spray subsystem 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 3.5.2.5	Verify the following ECCS pumps develop the specified flow rate against a system head corresponding to the specified reactor pressure. SYSTEM: CS; FLOW RATE: ≥ 235 LPS (3720 gpm); NO. OF PUMPS: 1; SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF: ≥ 7.9 kg/cm^2 (113 psid) SYSTEM: LPCI; FLOW RATE: ≥ 413 LPS (6557 gpm); NO. OF PUMPS: 1; SYSTEM HEAD CORRESPONDING TO A REACTOR PRESSURE OF: ≥ 1.4 kg/cm^2 (20 psid)	In accordance with the Pre-Defueled Service Testing Program or 92 days
SR 3.5.2.6	----------NOTE---------- 1.Vessel injection/spray may be excluded. 2. LPCI subsystem is not required to be performed. ---------- Verify each required ECCS injection/spray subsystem actuates on an actual or simulated automatic initiation signal.	18 months

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.3 RCIC System

LCO 3.5.3 The RCIC System shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3 with reactor steam dome pressure > 10.5kg/cm^2(150 psig.)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCIC System inoperable.	A.1 Verify by administrative means High Pressure Coolant Injection System is OPERABLE. AND A.2 Restore RCIC System to OPERABLE status.	1 hour 14 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Reduce reactor steam dome pressure to ≤ 10.5kg/cm^2(150 psig).	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	Verify the RCIC System piping is filled with water from the pump discharge valve to the injection valve.	1 day

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.3.2	Verify each RCIC System 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 3.5.3.3	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure is adequate to perform the test. ---------- Verify, with reactor pressure ≤ 71.8kg/cm^2(1020 psig) and ≥ 64.7kg/cm^2 (920psig), the RCIC pump can develop a flow rate ≥ 25.2 LPS (400 gpm) against a system head corresponding to reactor pressure.	92 days
SR 3.5.3.4	----------NOTE---------- Not required to be performed until 12 hours after reactor steam pressure is adequate to perform the test. ---------- Verify, with reactor pressure ≤ 11.6kg/cm^2(165 psig) and ≥ 10.5kg/cm^2 (150psig), the RCIC pump can develop a flow rate ≥ 25.2 LPS (400 gpm) against a system head corresponding to reactor pressure.	18 months
SR 3.5.3.5	----------NOTE---------- Vessel injection may be excluded. ---------- Verify the RCIC System actuates on an actual or simulated automatic initiation signal.	18 months