3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.1 RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits

LCO 3.4.1 RCS DNB parameters for pressurizer pressure, RCS average temperature, and RCS total flow rate shall be within the limits specified below:

a. Pressurizer pressure ≥ 155.05 kg/cm^2 (2205.3psig) ;

b. RCS average temperature ≤ 311.0℃ (591.8℉); and | 3

c. RCS total flow rate ≥ 6.46 × 10^4 m^3/hr (284340gpm).

APPLICABILITY: MODE 1.

----------NOTE----------
Pressurizer pressure limit does not apply during either:

a. THERMAL POWER ramp > 5% RTP per minute; or

b. THERMAL POWER step > 10% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more RCS DNB parameters not within limits.	A.1 Restore RCS DNB parameter(s) to within limit.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	Verify pressurizer pressure is ≥ 155.05 kg/cm^2 (2205.3 psig.)	12 hours
SR 3.4.1.2	Verify RCS average temperature is ≤ 311.0℃ (591.8℉.)	12 hours
SR 3.4.1.3	Verify RCS total flow rate is ≥ 6.46×10^4 m^3/hr (284340gpm).	12 hours
SR 3.4.1.4	----------NOTE---------- Not required to be performed until 24 hours after ≥ 90% RTP. ---------- Verify by precision heat balance that RCS total flow rate is ≥ 6.46×10^4 m^3/hr (284340gpm).	18 months

3

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.2 RCS Minimum Temperature for Criticality

LCO 3.4.2 Each RCS loop average temperature (Tavg)shall be ≥ 288.3℃(551°F).

APPLICABILITY: MODE 1,
MODE 2 with k_{eff} ≥ 1.0.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. T_{avg} in one or more RCS loops not within limit.	A.1 Restore Tavg to within Its limit. OR A.2 Be in MODE 3.	15 minutes 30 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.2.1 Verify RCS T_{avg} in each loop ≥ 288.3℃ (551°F).	--------NOTE-------- Only required if low Tavg alarm not reset and any RCS loop Tavg < 293.9℃ (561°F). ---------- 30 minutes thereafter

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.3 RCS Pressure and Temperature (P/T) Limits

LCO 3.4.3 RCS pressure, RCS temperature, and RCS heatup and cooldown rates shall be maintained within the pressure and temperature limits as specified in the bases.

APPLICABILITY: At all times.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ----------NOTE---------- Required Action A.2 shall be completed whenever this Condition is entered. ---------- Requirements of LCO not met in MODE 1, 2, 3, or 4.	A.1 Restore parameter(s) to within limits. AND A.2 Determine RCS is acceptable for continued operation.	30 minutes 72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5 with RCS pressure < 35.15kg/CM^2 (500 psig.)	6 hours 36 hours
C. ----------NOTE---------- Required Action C.2 shall be completed whenever this Condition is entered. ----------	C.1 Initiate action to restore parameter(s) to within limits. AND	Immediately

(continued)

ACTIONS(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued) Requirements of LCO not met any time in other than MODE 1, 2, 3, or 4.	C.2 Determine RCS is acceptable for continued operation.	Prior to entering MODE 4

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	----------NOTE---------- Only required to be performed during RCS heatup and cooldown operations and RCS inservice leak and hydrostatic testing. ----------	
	Verify RCS pressure, RCS temperature, and RCS heatup and cooldown rates are within the pressure and temperature limits.	30 minutes

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 RCS Loops-MODES 1 and 2

LCO 3.4.4 Three RCS loops shall be OPERABLE and in operation.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of LCO not met.	A.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.4.1 Verify each RCS loop is in operation.	12 hours

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.5 RCS Loops-MODE 3

LCO 3.4.5 Two RCS loops shall be OPERABLE, and either:

a. Two RCS loops shall be in operation when the Rod Control System is capable of rod withdrawal; or

b. One RCS loop shall be in operation when the Rod Control System is not capable of rod withdrawal.

----------NOTE----------
All reactor coolant pumps may be de-energized for ≤ 1 hour per 8 hour period provided:

a. No operations are permitted that would cause reduction of the RCS boron concentration; and

b. Core outlet temperature is maintained at least 5.6℃ (10℉) below saturation temperature.

APPLICABILITY: MODE 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required RCS loop inoperable.	A.1 Restore required RCS loop to OPERABLE status.	72 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 4.	12 hours
C. One required RCS loop not in operation, and	C.1 Restore required RCS loop to operation.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued) reactor trip breakers closed and Rod Control System capable of rod withdrawal.	OR C.2 De-energize all control rod drive mechanisms (CRDMs).	1 hour
D. Two required RCS loops inoperable. OR No RCS loop in operation.	D.1 De-energize all CRDMs. AND D.2 Suspend all operations involving a reduction of RCS boron concentration. AND D.3 Initiate action to restore one RCS loop to OPERABLE status and operation.	Immediately Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Verify required RCS loops are in operation.	12 hours
SR 3.4.5.2	Verify steam generator secondary side water levels are ≥ 19% for required RCS loops.	12 hours
SR 3.4.5.3	Verify correct breaker alignment and indicated power are available to the required pump that is not in operation.	7 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.6 RCS Loops - MODE 4

LCO 3.4.6 Two loops consisting of any combination of RCS loops and residual heat removal (RHR) loops shall be OPERABLE, and one loop shall be in operation.

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

1. All reactor coolant pumps (RCPs) and RHR pumps may be de-energized for ≤ 1 hour per 8 hour period provided:

   a. No operations are permitted that would cause reduction of the RCS boron concentration; and

   b. Core outlet temperature is maintained at least 5.6℃ (10℉) below saturation temperature.

2. No RCP shall be started with any RCS cold leg temperature ≤ 125.6℃ (258℉) unless the secondary side water temperature of each steam generator (SG) is ≤ 27.8℃ (50℉) above each of the RCS cold leg temperatures. 3

APPLICABILITY: MODE 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required loop inoperable.	A.1 Initiate action to restore a second loop to OPERABLE status. AND	Immediately
	A.2 ----------NOTE---------- Only required if RHR loop is operable. ---------- Be in Mode 5.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Two required loops inoperable. OR Required loop not in operation.	B.1 Suspend all operations involving a reduction of RCS boron concentration. AND B.2 Initiate action to restore one loop to OPERABLE status and operation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Verify one RHR or RCS loop is in operation.	12 hours
SR 3.4.6.2	Verify steam generator (SG) secondary side water levels are ≥ 19% for required RCS loops.	12 hours
SR 3.4.6.3	Verify correct breaker alignment and indicated power are available to the required pump that is not in operation.	7 days

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.7 RCS Loops-MODE 5, Loops Filled

LCO 3.4.7 One residual heat removal (RHR) loop shall be OPERABLE and in operation, and either:

a. One additional RHR loop shall be OPERABLE; or

b. The secondary side water level of at least two steam generators (SGs) shall be ≥ 19%.

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

1. The RHR pump of the loop in operation may be de-energized for ≤ 1 hour per 8 hour period provided:

   a. No operations are permitted that would cause reduction of the RCS boron concentration; and

   b. Core outlet temperature is maintained at least 5.6°C (10°F) below saturation temperature.

2. One required RHR loop may be inoperable for up to 2 hours for surveillance testing provided that the other RHR loop is OPERABLE and in operation.

3. No reactor coolant pump shall be started with any RCS cold leg temperatures ≤ 125.6℃ (258°F) unless the secondary side water temperature of each steam generator (SG) is ≤ 27.8℃ (50°F) above each of the RCS cold leg temperatures. | 3

4. All RHR loops may be removed from operation during planned heatup to MODE 4 when at least one RCS loop is in operation.

5. One piping path of NSCW and CCW is adequate when it supports both RHR loops. The support systems needed before entering into the desired configuration (e.g., one nuclear service cooling water loop out for maintenance in Modes 5 and 6) are controlled by procedures, and include the following requirement: | 7
   Two CCW and two NSCW pumps, powered from the bus with two different AC electrical sources (1 offsite power and 1 DG) are operable.

APPLICABILITY: MODE 5 with RCS loops filled.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHR loop inoperable. AND Required SGs with secondary side water level not within limit.	A.1 Initiate action to restore a second RHR loop to OPERABLE status. OR A.2 Initiate action to restore required SGs secondary side water level to within limit.	Immediately Immediately
B. Required RHR loops inoperable. OR No RHR loop in operation.	B.1 Suspend all operations involving a reduction of RCS boron concentration. AND B.2 Initiate action to restore one RHR loop to OPERABLE status and operation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify one RHR loop is in operation.	12 hours
SR 3.4.7.2	Verify steam generator side water levels are ≥ 19% for required RCS loops.	12 hours
SR 3.4.7.3	Verify correct breaker alignment and indicated power are available to the required RHR pump that is not in operation.	7 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.7.4	Verify the required RHR loops have two CCW and two NSCW pumps, powered from the bus with two different AC electrical sources (1 offsite power and 1 DG) be kept operable.	24 hours
SR 3.4.7.5	Verify each manual, automatic, and power operated valves (except EG-HV152 and EG-HV252) in each supporting system flow path for the required RHR loops, that is not locked, sealed, or otherwise secured in position, is in the correct position.	24 hours

7

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.8 RCS Loops - MODE 5, Loops Not Filled

LCO 3.4.8 Two residual heat removal (RHR) loops shall be OPERABLE and one RHR loop shall be in operation.

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

1. All RHR pumps may be de-energized for ≤ 15 minutes when switching from one loop to another provided:

   a. The core outlet temperature is maintained > 5.6℃ (10℉) below saturation temperature.

   b. No operations are permitted that would cause a reduction of the RCS boron concentration; and

   c. No draining operations to further reduce the RCS water volume are permitted.

2. One RHR loop may be inoperable for ≤ 2 hours for surveillance testing provided that the other RHR loop is OPERABLE and in operation.

3. One piping path of NSCW and CCW is adequate when it supports both RHR loops. The support systems needed before entering into the desired configuration (e.g., one nuclear service cooling water loop out for maintenance in Modes 5 and 6) are controlled by procedures, and include the following requirement: 7
   Two CCW and two NSCW pumps, powered from the bus with two different AC electrical sources (1 offsite power and 1 DG) are operable.

APPLICABILITY: MODE 5 with RCS loops not filled.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One RHR loop inoperable.	A.1 Initiate action to restore RHR loop to OPERABLE status.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required RHR loops inoperable. OR No RHR loop in operation.	B.1 Suspend all operations involving reduction in RCS boron concentration. AND B.2 Initiate action to restore one RHR loop to OPERABLE status and operation.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify one RHR loop is in operation.	12 hours
SR 3.4.8.2	Verify correct breaker alignment and indicated power are available to the required RHR pump that is not in operation.	7 days
SR 3.4.8.3	Verify the required RHR loops have two CCW and two NSCW pumps, powered from the bus with two different AC electrical sources (1 offsite power and 1 DG) be kept operable.	24 hours
SR 3.4.8.4	Verify each manual, automatic, and power operated valves (except EG-HV152 and EG-HV252) in each supporting system flow path for the required RHR loops, that is not locked, sealed, or otherwise secured in position, is in the correct position.	24 hours

7

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.9 Pressurizer

LCO 3.4.9 The pressurizer shall be OPERABLE with:

a. Pressurizer water level ≤ 92%; and

b. Two groups of pressurizer heaters OPERABLE with the capacity of each group ≥ 125 kW and capable of being powered from an emergency power supply. 5

c.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Pressurizer water level not within limit.	A.1 Be in MODE 3 with reactor trip breakers open. AND A.2 Be in MODE 4.	6 hours 12 hours
B. One required group of pressurizer heaters inoperable.	B.1 Restore required group of pressurizer heaters to OPERABLE status.	72 hours 5
C. Required Action and associated Completion Time of Condition B not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify pressurizer water level is ≤ 92%.	12 hours
SR 3.4.9.2	Verify capacity of each required group of pressurizer heaters is ≥ 125 kW.	92 days
SR 3.4.9.3	Verify required pressurizer heaters are capable of being powered from an emergency power supply.	18 months

5

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.10 Pressurizer Safety Valves

LCO 3.4.10 Three pressurizer safety valves shall be OPERABLE with lift settings 174.71kg/cm^2 (2485 psig) ± 1%.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 with all RCS cold leg temperatures > 125.6℃ (258℉). 3

----------NOTE----------
The lift settings are not required to be within the LCO limits during MODES 3 and 4 for the purpose of setting the pressurizer safety valves under ambient (hot) conditions. This exception is allowed for 54 hours following entry into MODE 3 provided a preliminary cold setting was made prior to heatup.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One pressurizer safety valve inoperable.	A.1 Restore valve to OPERABLE status.	15 minutes
B. Required Action and associated Completion Time not met. OR Two or more pressurizer safety valves inoperable.	B.1 Be in MODE 3. AND B.2 Be in MODE 4 with any RCS cold leg temperatures ≤ 125.6℃ (258 ℉).	6 hours 12 hours

3

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.10.1	Verify each pressurizer safety valve is OPERABLE in accordance with the Inservice Testing Program. Following testing, lift settings shall be within ± 1%.	In accordance with the Inservice Testing Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.11 Pressurizer Power Operated Relief Valves (PORVs)

LCO 3.4.11 Each PORV and associated block valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

----------NOTE----------
1. Separate Condition entry is allowed for each PORV.

2. LCO 3.0.4 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more PORVs inoperable and capable of being manually cycled.	A.1 Close and maintain power to associated block valve.	1 hour
BA. Either PORV 445A or PORV 445B inoperable and not being capable of being manually cycled.	BA.1 Close associated block valve. AND	1 hour
	BA.2 Remove power from Associated block valve.	1 hour
BB. Both PORV 445A and PORV 445B inoperable and not being capable of being manually cycled.	BB.1 Close associated block valve. AND	1 hour
	BB.2 Remove power from Associated block valve. AND	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
BB. (continued)	BB.3 Restore either PORV 445A or PORV 445B to OPERABLE status	72 hours
BC. PORV 444B inoperable and not being capable of being manually cycled.	BC.1 Close associated block valve. AND BC.2 Remove power from Associated block valve. AND BC.3 Restore PORV to OPERABLE status	1 hour 1 hour 72 hours
C. One block valve inoperable.	C.1 Place associated PORV in manual control. AND C.2 ----------NOTE---------- Only required if block valve (BB-HV6) of PORV 444B is inoperable. ---------- Restore block valve to OPERABLE status.	1 hour 72 hours
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	6 hours 12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Three PORVs inoperable and not capable of being manually cycled.	E.1 Close associated block valves. AND E.2 Remove power from associated block valves. AND E.3 Be in MODE 3. AND E.4 Be in MODE 4.	1 hour 1 hour 6 hours 12 hours
F. More than one block valve inoperable.	F.1 Place associated PORVs in manual control. AND F.2 Restore one block valve to OPERABLE status if three block valves are inoperable. AND F.3 Restore remaining block valve(s) to OPERABLE status.	1 hour 2 hours 72 hours
G. Required Action and associated Completion Time of Condition F not met.	G.1 Be in MODE 3. AND G.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.11.1	----------NOTE---------- Not required to be met with block valve closed in accordance with the Required Action of Condition B or E. ---------- Perform a complete cycle of each block valve.	92 days
SR 3.4.11.2	Perform a complete cycle of each PORV.	18 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.12 Low Temperature Overpressure Protection (LTOP) System

LCO 3.4.12 An LTOP System shall be OPERABLE with a maximum of one charging pump capable of injecting into the RCS and the accumulators isolated and either a or b below.

a. Two RCS relief valves, as follows:

1. Two power operated relief valves (PORVs) with lift settings within the limits specified in the bases, or

2. Two residual heat removal (RHR) suction relief valves with setpoints at 31.64 Kg/CM2 (450psig) ± 3%, or

3. One PORV with a lift setting within the limits specified in the bases and one RHR suction relief valve with a setpoint at 31.64 Kg/CM2 (450) ±3%

b. The RCS depressurized and an RCS vent with relief capacity ≥ 123.78m^3/hr (545 gpm) at 38.32 Kg/CM2 (545psig) RCS pressure and 21.1℃(70℉).

APPLICABILITY: MODE 4 when all RCS cold leg temperature is ≤ 125.6℃(258℉), 3
MODE 5,
MODE 6 when the reactor vessel head is on.

----------NOTE----------
Accumulator isolation is only required when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the bases.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Two or more charging pumps capable of injecting into the RCS.	A.1 ----------NOTE---------- Two charging pumps may be capable of injecting into the RCS during pump swap operation for ≤15 minutes. ---------- Initiate action to verify a maximum of one charging pump is capable of injecting into the RCS.	Immediately
B. An accumulator not isolated when the accumulator pressure is greater than or equal to the maximum RCS pressure for existing cold leg temperature allowed in the bases.	B.1 Isolate affected accumulator.	1 hour
C. Required Action and associated Completion Time of Condition B not met.	C.1 Increase RCS cold leg temperature to > 125.6℃(258°F). OR C.2 Depressurize affected accumulator to less than the maximum RCS pressure for existing cold leg temperature allowed in the bases.	12 hours 12 hours
D. One required RCS relief valve inoperable in MODE 4.	D.1 Restore required RCS relief valve to OPERABLE status.	7 days

3

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. One required RCS relief valve inoperable in MODE 5 or 6.	E.1 Restore required RCS relief valve to OPERABLE status.	24 hours
F. Two required RCS relief valves inoperable. OR Required Action and associated Completion Time of Condition A, C, D, or E not met. OR LTOP System inoperable for any reason other than Condition A, B, C, D, or E.	F.1 Depressurize RCS and establish RCS vent with relief capacity ≥ 123.78 m^3/hr (545 gpm) at 38.32 Kg/cm^2 (545 psig) RCS pressure and 21.1℃(70°F).	8 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.12.1	Verify a maximum of one charging pump is capable of injecting into the RCS.	12 hours
SR 3.4.12.2	Verify each accumulator is isolated.	12 hours

(continued)

SURVEILLANCE REQUIREMENTS(continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.3	Verify RHR suction valve is open for each required RHR suction relief valve.	12 hours
SR 3.4.12.4	----------NOTE---------- Only required to be met when complying with LCO 3.4.12.b. ----------	
	Verify required RCS vent with relief capacity ≥ 123.78 m^3/hr (545 gpm) at 38.32 Kg/cm^2 (545 psig) RCS pressure and 21.1℃(70°F)open.	12 hours for unlocked open vent valve(s) AND 31 days for locked open vent valve(s)
SR 3.4.12.5	Verify PORV block valve is open for each required PORV.	72 hours
SR 3.4.12.6	Verify associated RHR suction isolation valve is locked open with operator power removed for each required RHR suction relief valve.	31 days
SR 3.4.12.7	----------NOTE---------- Not required to be performed until 12 hours after decreasing RCS cold leg temperature to ≤ 125.6 ℃ (258°F). ----------	3
	Perform a COT on each required PORV, excluding actuation.	31 days
SR 3.4.12.8	Perform CHANNEL CALIBRATION for each required PORV actuation channel.	18 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.13 RCS Operational LEAKAGE

LCO 3.4.13 RCS operational LEAKAGE shall be limited to:

a. No pressure boundary LEAKAGE;

b. 0.227 m^3/hr (1 gpm) unidentified LEAKAGE;

c. 2.27 m^3/hr (10 gpm) identified LEAKAGE; and

d. 0.567 m^3 (150 gallons) per day primary to secondary LEAKAGE through any one steam generator (SG). | 2

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCS operational LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE or primary to secondary LEAKAGE.	A.1 Reduce LEAKAGE to within limits.	4 hours
B. Required Action and associated Completion Time of Condition A not met. OR Pressure boundary LEAKAGE exists. OR Primary to secondary LEAKAGE not within limit	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

2

2

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.13.1 ----------NOTES---------- 1. Not required to be performed until 12 hours after establishment of steady state operation and RCS pressure ≥ 140.65 kg/cm^2 (2000psig). 2.Not applicable to primary to secondary LEAKAGE. ---------- Verify RCS operational LEAKAGE is within limits by performance of RCS water inventory balance.	---------- 72 hours
----------NOTE---------- Not required to be performed until 12 hours after establishment of steady state operation and RCS pressure ≥ 140.65 kg/cm^2 (2000psig). ---------- SR 3.4.13.2 Verify primary to secondary LEAKAGE is ≦150 gallons per day through any one SG.	72 hours

2

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.14 RCS Pressure Isolation Valve (PIV) Leakage

LCO 3.4.14 Leakage from each RCS PIV shall be within limit.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4, except valves in the residual heat removal (RHR) flow path when in, or during the transition to or from, the RHR mode of operation.

ACTIONS

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

1. Separate Condition entry is allowed for each flow path.

2. Enter applicable Conditions and Required Actions for systems made inoperable by an inoperable PIV.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more flow paths with leakage from one or more RCS PIVs not within limit.	----------NOTE---------- Each valve used to satisfy Required Action A.1 and Required Action A.2 must have been verified to meet SR 3.4.14.1 and be in the reactor coolant pressure boundary or the high pressure portion of the system. ---------- A.1 Isolate the high pressure portion of the affected system from the low pressure portion by use of one closed manual, deactivated automatic, or check valve.	4 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	AND	
	A.2.1 Isolate the high pressure portion of the affected system from the low pressure portion by use of a second closed manual, deactivated automatic, or check valve.	72 hours
	OR	
	A.2.2 Restore RCS PIV to within limits.	72 hours
B. Required Action and associated Completion Time for Condition A not met.	B.1 Be in MODE 3.	6 hours
	AND	
	B.2 Be in MODE 5.	36 hours
C. RHR System autoclosure interlock function inoperable.	C.1 Isolate the affected penetration by use of one closed manual or deactivated automatic valve.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.14.1	----------NOTE---------- 1. Not required to be performed in MODES 3 and 4. 2. Not required to be performed on the RCS PIVs located in the RHR flow path when in the shutdown cooling mode of operation. 3. RCS PIVs actuated during the performance of this Surveillance are not required to be tested more than once if a repetitive testing loop cannot be avoided. ----------	
	Verify leakage from each RCS PIV is equivalent to ≤ 0.5 gpm per nominal inch of valve size up to a maximum of 5 gpm at an RCS pressure 157.14±1.4Kg/CM2 (2235±20psig).	In accordance with the Inservice Testing Program, and 18 months AND Prior to entering MODE 2 whenever the unit has been in MODE 5 for 7 days or more, if leakage testing has not been performed in the previous 9 months AND Within 24 hours following valve actuation due to automatic or manual action or flow through the valve.

(continued)

SURVEILLANCE REQUIREMENTS(continued)

SURVEILLANCE		FREQUENCY
SR 3.4.14.2	----------NOTE---------- Not required to be met when the RHR System autoclosure interlock is disabled in accordance with SR3.4.12.6. ---------- Verify RHR System autoclosure interlock prevents the valves from being opened with a simulated or actual RCS pressure signal ≥ 30 kg/cm^2 (425 psig).	18 months
SR 3.4.14.3	----------NOTE---------- Not required to be met when the RHR System autoclosure interlock is disabled in accordance with SR3.4.12.6. ---------- Verify RHR System autoclosure interlock causes the valves to close automatically with a simulated or actual RCS pressure signal ≥ 53kg/cm^2 (750 psig).	18 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.15 RCS Leakage Detection Instrumentation

LCO 3.4.15 The following RCS leakage detection instrumentation shall be OPERABLE:

a. The containment normal sumps level and reactor cavity sump level monitors;

b. The containment airborne gaseous and particulate radioactivity monitoring system

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

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Required containment sump monitor inoperable.	----------NOTE---------- LCO 3.0.4 is not applicable. ---------- A.1 Perform SR 3.4.13.1.	Once per 24 hours
B. Two or more containment sump monitors inoperable.	----------NOTE---------- LCO 3.0.4 is not applicable. ---------- B.1 Perform SR 3.4.13.1 AND B.1 Restore at least two containment sump monitors OPERABLE status.	Once per 24 hours 30 days

(continued)

ACTIONS(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required gaseous and particulate radioactive monitoring system inoperable.	----------NOTE---------- LCO 3.0.4 is not applicable. ----------	
	C1.1 Analyze grab samples of the containment atmosphere.	Once per 24 hours
	OR	
	C.1.2 Perform SR 3.4.13.1.	Once per 24 hours
	AND	
	C.2 Restore required containment atmosphere radioactivity monitor to OPERABLE status.	30 days
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
E. All required monitors inoperable.	E.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Monitoring the containment sump inventory and discharge.	12 hours
SR 3.4.15.2	Perform CHANNEL CHECK of the required containment atmosphere radioactivity monitor.	12 hours
SR 3.4.15.3	Perform COT of the required containment atmosphere radioactivity monitor.	92 days
SR 3.4.15.4	Perform CHANNEL CALIBRATION of the required containment sump monitor.	18 months
SR 3.4.15.5	Perform CHANNEL CALIBRATION of the required containment atmosphere radioactivity monitor.	18 months

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.16 RCS Specific Activity

LCO 3.4.16 The specific activity of the reactor coolant shall be within limits.

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS average temperature (T_{avg}) ≥ 260℃(500℉)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. DOSE EQUIVALENT I-131 > 1.0 μCi/gm.	----------NOTE---------- LCO 3.0.4 is not applicable. ---------- A.1 Verify DOSE EQUIVALENT I-131 within the acceptable region of Figure 3.4.16-1. AND A.2 Restore DOSE EQUIVALENT I-131 to within limit.	Once per 4 hours 48 hours
B. Gross specific activity of the reactor coolant not within limit.	----------NOTE---------- LCO 3.0.4 is not applicable. ---------- B.1 Perform SR 3.4.16.2. AND B.2 Be in MODE 3 with Tavg < 260℃ (500℉).	4 hours 6 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A not met. OR DOSE EQUIVALENT I-131 in the unacceptable region of Figure 3.4.16-1.	C.1 Be in MODE 3 with Tavg < 260℃ (500°F).	6 hours

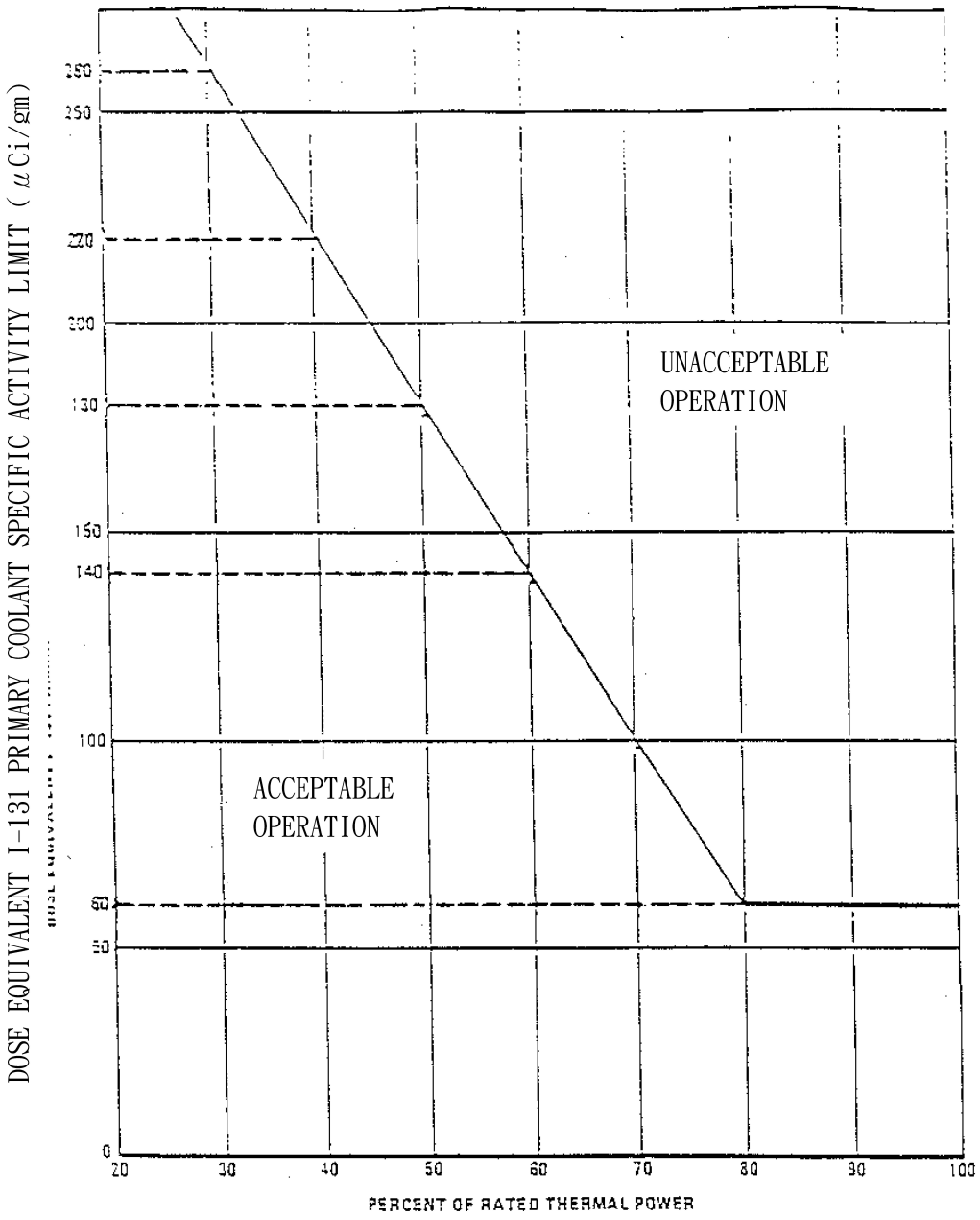
SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.16.1	Verify reactor coolant gross specific activity ≤ 100/Ē μCi/gm.	7 days
SR 3.4.16.2	----------NOTE---------- Only required to be performed in MODE 1. ---------- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 1.0 μCi/gm.	14 days AND Between 2 and 6 hours after a THERMAL POWER change of ≥ 15% RTP within a 1 hour period

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.16.3	----------NOTE---------- Not required to be performed until 31 days after a minimum of 2 effective full power days and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for ≥ 48 hours. ---------- Determine $\bar{E}$ from a sample taken in MODE 1 after a minimum of 2 effective full power days and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for ≥ 48 hours.	184 days



台灣電力公司 TAIWAN POWER COMPANY MAANSHAN NUCLEAR POWER STATION UNITS NO. 1 & 2 FSAR
DOSE EQUIVALENT I-131 PRIMARY COOLANT SPECIFIC ACTIVITY LIMIT VS PERCENT OF RATED THERMAL POWER WITH THE PRIMARY COOLANT SPECIFIC ACTIVITY > 1.0 μCi/GRAM DOSE EQUIVALENT I-131 Figure 3.4.16-1

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.17 RCS Loops -Test Exceptions

LCO 3.4.17 The requirements of LCO 3.4.4, "RCS Loops -MODES 1 and 2," may be suspended, with THERMAL POWER < P-7.

APPLICABILITY: MODES 1 and 2 during startup and PHYSICS TESTS.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. THERMAL POWER ≥ P-7.	A.1 Open reactor trip breakers.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.17.1	Verify THERMAL POWER is < P-7.	1 hour
SR 3.4.17.2	Perform a COT for each power range neutron flux -low and intermediate range neutron flux channel and P-7.	Within 12 hours prior to initiation of startup and PHYSICS TESTS

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.18 Steam Generator (SG) Tube Integrity

LCO 3.4.18 SG tube integrity shall be maintained.

AND

All SG tubes satisfying the tube repair criteria shall be plugged or repaired in accordance with the Steam Generator Program.

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

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each SG tube.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more SG tubes satisfying the tube repair criteria and not plugged or repaired in accordance with the Steam Generator Program.	A.1 Verify tube integrity of the affected tube(s) is maintained until the next refueling outage or SG tube inspection. AND A.2 Plug or repair the affected tube(s) in accordance with the Steam Generator Program.	7 days Prior to entering MODE 4 following the next refueling outage or SG tube inspection
B. Required Action and associated Completion Time of Condition A not met. OR SG tube integrity not maintained.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

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SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.18.1	Verify SG tube integrity in accordance with the Steam Generator Program.	In accordance with the Steam Generator Program
SR 3.4.18.2	Verify that each inspected SG tube that satisfies the tube repair criteria is plugged or repaired in accordance with the Steam Generator Program.	Prior to entering MODE 4 following a SG tube inspection

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