ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

TECHNICAL REVIEW

PORC REVIEW DATE 4/4/90

Joseph A. Widay
PLANT SUPERINTENDENT

4/9/90
EFFECTIVE DATE

QA X NON-QA _____ CATEGORY 1.0

REVIEWED BY: _____

GINNA STATION
START:
DATE _____
TIME _____
COMPLETED:
DATE _____
TIME: _____

A. PURPOSE - This procedure provides actions for a SGTR with coincident loss of normal and auxiliary PRZR sprays and PORVs.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

a. E-3, STEAM GENERATOR TUBE RUPTURE, when PRZR pressure control is not available.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: o Foldout page should be open AND monitored periodically.

o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr.

1	Check Ruptured S/G Narrow Range Level - LESS THAN 67% [55% adverse CNMT]	Go to Step 8.
2	Check RCP Status - AT LEAST ONE RUNNING	Try to start one RCP: a. Establish conditions for starting RCP. o Bus 11A and Bus 11B energized o Refer to Attachment RCP START b. Start one RCP. IF no RCP can be started, THEN go to Step 4.
3	Check IF Normal PRZR Spray Available:	
	a. Verify IA to CNMT - AVAILABLE	a. Perform the following: 1) Place PRZR heater control group to PULL STOP. 2) Place PRZR heater backup group to OFF. 3) Place normal spray valve controllers to MANUAL at 0%. 4) Go to Step 4.
	b. Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 20	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Try To Restore PRZR PORV:	
	a. Block valves - AT LEAST ONE OPEN • MOV-516 for PCV-430 • MOV-515 for PCV-431C	a. Open one block valve unless it was closed to isolate an open PORV. If block valves can NOT be opened, THEN dispatch AO to locally ensure breakers to block valves closed. • MOV-515, MCC C position 6C • MOV-516, MCC D position 6C
	b. Check IA to CNMT - AVAILABLE	b. Refer to Attachment N2 PORVS to operate PORVs.
	c. Verify at least one PRZR PORV flow path - AVAILABLE	c. Go to Step 5.
	d. Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 21	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: If auxiliary spray is the only means of RCS pressure control, THEN the 320°F ΔT limit between the spray line and PRZR does not apply.

5 Try To Establish Auxiliary Spray:

a. Charging pumps - AT LEAST ONE RUNNING

a. Perform the following:

1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN locally isolate seal injection to affected RCP.

- RCP A, V-300A
- RCP B, V-300B

2) Ensure HCV-142 demand at 0%.

3) Start charging pumps as necessary.

IF charging not available, THEN go to Step 6.

b. Establish auxiliary spray flow:

1) Open auxiliary spray valve (AOV-296)

2) Close charging valve to loop B cold leg (AOV-294)

b. IF auxiliary spray can NOT be established, THEN go to Step 6.

c. Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 20b

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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CAUTION

IF CST LEVEL DECREASES TO LESS THAN 5 FEET, THEN ALTERNATE WATER SOURCES FOR AFW PUMPS WILL BE NECESSARY (REFER TO ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

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NOTE: TDAFW pump flow control valves fail open on loss of IA.

6	Check Intact S/G Level:	
	a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]	a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in at least one S/G.
	b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	b. IF narrow range level in intact S/G continues to increase in an uncontrolled manner, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
7	Check PRZR Level - GREATER THAN 5% [30% adverse CNMT]	Return to Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Check If SI Can Be Terminated:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING	a. Do NOT stop SI pumps. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	b. Secondary heat sink: o Total feed flow to S/Gs - GREATER THAN 200 GPM AVAILABLE -OR- o Narrow range level in intact S/G - GREATER THAN 5% [25% adverse CNMT]	b. IF neither condition satisfied, THEN do NOT stop SI pumps. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	c. RVLIS indication o Level (no RCPs) - GREATER THAN 68% [73% adverse CNMT] -OR- o Fluid fraction (any RCP running) - GREATER THAN 80%	c. Do NOT stop SI pumps. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	d. Any ruptured S/G narrow range level - INCREASING IN AN UNCONTROLLED MANNER OR OFFSCALE HIGH	d. Do NOT stop SI pumps. Return to Step 2.
9	Stop SI Pumps and Place In AUTO	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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CAUTION

ALIGNING SI PUMP SUCTION TO RWST BEFORE ISOLATING BAST MAY RESULT IN BACKFLOW FROM RWST TO BASTS.

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10	Verify SI Pump Suction Aligned To RWST:	
	a. SI pump suction valves from BASTs - CLOSED • MOV-826A • MOV-826B • MOV-826C • MOV-826D	a. Ensure at least one valve in each flow path closed. • MOV-826A or MOV-826B • MOV-826C or MOV-826D
	b. SI pump suction valves from RWST - OPEN • MOV-825A • MOV-825B	b. Ensure at least one valve is open.
	c. Consult TSC to determine if SI flush is required (Refer to Attachment SI FLUSH)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Check If Charging Flow Has Been Established:	
	a. Charging pumps - ANY RUNNING	a. Perform the following: 1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN dispatch AO with key to RWST gate to close seal injection needle valve(s) to affected RCP: • RCP A, V-300A • RCP B, V-300B 2) Ensure HCV-142 open, demand at 0%.
	b. Charging pump suction aligned to RWST: o LCV-112B - OPEN o LCV-112C - CLOSED	b. Manually align valves as necessary. IF LCV-112B can NOT be opened, THEN perform the following: 1) Verify charging pump A NOT running and place in PULL STOP. 2) Dispatch AO to locally open manual charging pump suction from RWST (V-358 located in charging pump room). 3) WHEN V-358 open, THEN direct AO to close V-268 to isolate charging pumps B and C from VCT (V-268 located in charging pump room).
	c. Start charging pumps as necessary and adjust charging flow to restore PRZR level	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Verify SI Flow Not Required: o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING o RVLIS indication o Level (no RCPs) - GREATER THAN 68% [73% adverse CNMT] -OR- o Fluid fraction (any RCP running) - GREATER THAN 80%	Perform the following: a. Manually operate SI pumps as necessary. b. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
13	Verify Adequate SW Flow To CCW Hx: a. Verify at least two SW pumps - RUNNING b. Verify AUX BLDG SW isolation valves - OPEN • MOV-4615 and MOV-4734 • MOV-4616 and MOV-4735 c. Verify CNMT RECIRC fan annunciator C-2, HIGH TEMPERATURE ALARM - EXTINGUISHED	a. Manually start pumps as power supply permits (258 kw per pump). IF less than two SW pumps can be operated, THEN go to Step 20. b. Establish SW to AUX BLDG (Refer to Attachment AUX BLDG SW). c. Dispatch AO to locally throttle flow to CCW Hx to between 5000 gpm and 6000 gpm total flow.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Check If Normal CVCS Operation Can Be Established	
	a. Verify IA restored: o IA to CNMT (AOV-5392) - OPEN o IA pressure - GREATER THAN 60 PSIG	a. Continue with Step 19. WHEN IA restored, THEN do Steps 14 through 18.
	b. Verify instrument bus D - ENERGIZED	b. Energize MCC B. IF MCC B NOT available, THEN perform the following: 1) Verify MCC A energized. 2) Place instrument bus D on maintenance supply.
	c. CCW pumps - ANY RUNNING	c. Perform the following: 1) IF any RCP #1 seal outlet temperature offscale high, THEN isolated CCW to thermal barrier of affected RCP(s). • RCP A, MOV-749A and MOV-759A • RCP B, MOV-749B and MOV-759B 2) Manually start one CCW pump.
	d. Charging pump - ANY RUNNING	d. Continue with Step 20. WHEN any charging pump running, THEN do Steps 15 through 19.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Check If Seal Return Flow Should Be Established:	
	a. Verify RCP #1 seal outlet temperature - LESS THAN 235°F	a. Go to Step 16.
	b. Verify RCP seal outlet valves - OPEN • AOV-270A • AOV-270B	b. Manually open valves as necessary.
	c. Reset both trains of XY relays for RCP seal return isolation valve MOV-313	
	d. Open RCP seal return isolation valve MOV-313	d. Perform the following: 1) Place MOV-313 switch to OPEN. 2) Dispatch AO with key to RWST gate to locally open MOV-313.
	e. Verify RCP #1 seal leakoff flow - LESS THAN 5.5 GPM	e. IF any RCP seal leakoff flow greater than 5.5 gpm THEN: o Close the affected RCP seal discharge valve • RCP A, AOV-270A • RCP B, AOV-270B o Trip the affected RCP IF both RCP seal discharge valves are shut, THEN go to Step 16.
	f. Verify RCP #1 seal leakoff flow - GREATER THAN 0.25 GPM	f. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: If PRZR level is less than 13%, letdown may be established by placing AOV-427 to OPEN.

16 Establish Normal Letdown:

a. Establish charging line flow to REGEN Hx - GREATER THAN 20 GPM

b. Place the following switches to CLOSE:

- Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202)
- AOV-371, letdown isolation valve
- AOV-427, loop B cold leg to REGEN Hx

c. Place letdown controllers TCV-130 and PCV-135 in MANUAL at 25% open

d. Reset both trains of XY relays for AOV-371 and AOV-427

e. Open AOV-371 and AOV-427

f. Open letdown orifice valves as necessary

g. Place TCV-130 in AUTO at 105°F

h. Place PCV-135 in AUTO at 250 psig

i. Adjust charging pump speed and HCV-142 as necessary

IF RCP seal return has been established, THEN establish excess letdown as follows:

- o Place excess letdown divert valve, AOV-312, to NORMAL.
- o Ensure CCW from excess letdown open, (AOV-745).
- o Open excess letdown isolation valve AOV-310.
- o Slowly open HCV-123 to maintain excess letdown temperature less than 195°F and pressure less than 100 psig.
- o Adjust charging pump speed as necessary.

IF RCP seal return NOT established, THEN consult TSC to determine if excess letdown should be placed in service.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

17 Check VCT Makeup System:

a. BAST levels - ANY GREATER THAN 5%

a. Go to Step 18.

b. Check Annunciator B-23, BORIC ACID TANK LO LO LEVEL - EXTINGUISHED

b. Perform the following:

1) Adjust boric acid flow control valve to required flow from table.

BAST LEVEL	BORIC ACID FLOW (GPM)
<10%	4.5
10-15%	6.7
15-20%	8.9
>20%	10.0

2) Go to Step 17d.

c. Adjust boric acid flow control valve in AUTO to 4.5 gpm

d. Verify the following:

d. Adjust controls as necessary.

1) RMW mode selector switch in AUTO

2) RMW control armed - RED LIGHT LIT

e. Check VCT level:

- Level - GREATER THAN 20%

-OR-

- Level - STABLE OR INCREASING

e. Manually increase VCT makeup flow as follows:

1) Ensure BA transfer pumps and RMW pumps running. IF NOT, THEN reset MCC C and MCC D UV lockouts as necessary.

2) Place RMW flow control valve HCV-111 in MANUAL.

3) Increase RMW flow.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Check Charging Pump Suction Aligned To VCT:	
	a. VCT level - GREATER THAN 20%	a. IF VCT level can NOT be maintained greater than 5%, THEN perform the following: 1) Ensure charging pump suction aligned to RWST o LCV-112B open o LCV-112C closed 2) Continue with Step 19. WHEN VCT level greater than 40%, THEN do Step 18b.
	b. Verify charging pumps aligned to VCT o LCV-112C - OPEN o LCV-112B - CLOSED	b. Manually align valves as necessary.
19	Equalize Charging And Letdown Flows:	
	a. Verify charging pump controllers in manual	
	b. Control charging and seal injection flows to equal letdown and seal leakoff flows	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	Check If Emergency D/Gs Should Be Stopped:	
	a. Verify AC emergency busses energized by offsite power: o Emergency D/G output breakers - OPEN o AC emergency bus voltage - GREATER THAN 420 VOLTS o AC emergency bus normal feed breakers - CLOSED	a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
	b. Stop any unloaded emergency D/G and place in standby (Refer to Attachment D/G STOP)	
21	Minimize Secondary System Contamination:	
	a. Isolate reject from hotwell to CST: o Place hotwell level controller (HC-107) in MANUAL at 50% o Verify hotwell level - STABLE	a. IF hotwell level increasing, THEN direct HP to sample hotwells for activity.
	b. Verify local actions to complete isolation of ruptured S/G complete (Refer to Attachment RUPTURED S/G)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	Check RCP Cooling: a. Check CCW to RCPs: o Annunciator A-7, RCP 1A CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED o Annunciator A-15, RCP 1B CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED b. Check RCP seal injection: o Labyrinth seal D/Ps - GREATER THAN 15 INCHES OF WATER -OR- o RCP seal injection flow to each RCP - GREATER THAN 6 GPM	Establish normal cooling to RCPs (Refer to Attachment SEAL COOLING).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Adverse CNMT conditions or loss of forced air cooling may result in failure of NIS detectors.

23	Check If Source Range Detectors Should Be Energized:	
	a. Source range channels - DEENERGIZED	a. Go to Step 23e.
	b. Check intermediate range flux - EITHER CHANNEL LESS THAN 10^{-10} AMPS	b. Perform the following: 1) IF neither intermediate range channel is decreasing, THEN initiate boration. 2) Continue with Step 24. WHEN flux is LESS THAN 10^{-10} amps on any operable channel, THEN do Steps 23c through e.
	c. Check the following: o Both intermediate range channels - LESS THAN 10^{-10} AMPS -OR- o Greater than 20 minutes since reactor trip	c. Continue with Step 24. WHEN either condition met, THEN do Steps 23d and e.
	d. Verify source range detectors - ENERGIZED	d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2). IF source ranges can NOT be restored, THEN refer to ER-NIS.1, SR MALFUNCTION and go to Step 23.
	e. Transfer Rk-45 recorder to one source range and one intermediate range channel	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	Establish Normal Shutdown Alignment:	
	a. Check condenser - AVAILABLE	a. Dispatch AO to perform Attachment SD-2.
	b. Perform the following: o Open generator disconnects • 1G13A71 • 9X13A73 o Place voltage regulator to OFF o Open turbine drain valves o Rotate reheater steam supply controller cam to close valves o Place reheater dump valve switches to HAND o Stop all but one condensate pump	
	c. Verify adequate Rx head cooling:	
	1) Check IA to CNMT - AVAILABLE	1) Go to Step 25.
	2) Verify at least one control rod shroud fan - RUNNING	2) Manually start one fan as power supply permits (45 kw)
	3) Verify one Rx compartment cooling fan - RUNNING	3) Perform the following: o Dispatch AO to reset UV relays at MCC C and MCC D. o Manually start one fan as power supply permits (23 kw)
	d. Verify Attachment SD-1 - COMPLETE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Plant staff should decide whether to repair PRZR pressure control systems or continue with this procedure. If PRZR pressure control is established, PRZR level should be restored to greater than 5% [30% adverse CNMT] and then further recovery should continue with 37.

25 Check If SI ACCUMs Should Be Isolated:

a. Check the following:

- o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING
- o RVLIS indication - GREATER THAN 68% [73% adverse CNMT]

a. Return to Step 12.

b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves

- MOV-841, MCC C position 12F
- MOV-865, MCC D position 12C

c. Close SI ACCUM discharge valves

- MOV-841
- MOV-865

c. Vent any unisolated ACCUMs:

1) Open vent valves for unisolated SI ACCUMs.

- ACCUM A, AOV-834A
- ACCUM B, AOV-834B

2) Open HCV-945.

d. Locally reopen breakers for MOV-841 and MOV-865

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Leakage from ruptured S/G into RCS will dilute RCS boron concentration.

26	Verify Adequate Shutdown Margin	
	a. Direct HP to sample RCS and ruptured S/G for boron concentration	
	b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIGURE SDM	b. Borate as necessary.
27	Maintain Required RCP Seal Injection Flow And Labyrinth Seal D/P:	Perform the following: o Adjust charging flow to REGEN Hx, HCV-142 as necessary. -OR- o Dispatch AO to adjust seal injection needle valves V-300A and V-300B if necessary.
	o Labyrinth seal D/P to each RCP - GREATER THAN 15 INCHES OF WATER	
	o RCP seal injection flow - GREATER THAN 6 GPM	
28	Initiate RCS Cooldown to 350°F In RCS Cold Legs:	
	a. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Dump steam to condenser from intact S/G	b. Manually or locally dump steam using intact S/G ARV. IF no intact S/G available, THEN use faulted S/G.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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CAUTION

RCS AND RUPTURED S/G PRESSURES MUST BE MAINTAINED LESS THAN THE RUPTURED S/G ARV SETPOINT.

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29	Control Charging Flow To Maintain RCS Subcooling:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 20°F USING FIGURE MIN SUBCOOLING	a. Increase charging flow to maintain subcooling greater than 20°F using Figure MIN SUBCOOLING and go to Step 30.
	b. Ruptured S/G narrow range level - LESS THAN 90% [85% adverse CNMT]	b. Control charging flow to maintain RCS pressure at ruptured S/G pressure and go to Step 30.
	c. Ruptured S/G narrow range level - STABLE OR DECREASING	c. IF ruptured S/G level increasing, THEN decrease charging flow to stabilize level. Maintain RCS subcooling greater than 20°F using Figure MIN SUBCOOLING.
30	Check If RCS Cooldown Should Be Stopped:	
	a. RCS cold leg temperatures - LESS THAN 350°F	a. Return to Step 26.
	b. Stop RCS cooldown	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31	Check RCS Pressure - GREATER THAN 400 PSIG [300 PSIG adverse CNMT]	Go to Step 34.
32	Check Ruptured S/G Narrow Range Level - GREATER THAN 17% [25% adverse CNMT]	Refill ruptured S/G to 67% [55% adverse CNMT] using feed flow. IF either of the following conditions occurs, THEN stop feed flow to ruptured S/G: o Ruptured S/G pressure decreases in an uncontrolled manner. -OR- o Ruptured S/G pressure increases to 1020 psig.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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CAUTION

- STEAM SHOULD NOT BE RELEASED FROM A RUPTURED S/G IF WATER MAY EXIST IN ITS STEAMLINE.
- RUPTURED S/G PRESSURE MAY DECREASE RAPIDLY WHEN STEAM IS RELEASED.

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NOTE: The upper head region may void during RCS depressurization if RCPs are not running. This may result in a rapidly increasing PRZR level.

33 Depressurize RCS And Ruptured S/G To 400 PSIG [300 PSIG adverse CNMT]

a. Perform the following:

- Decrease charging and increase letdown to initiate backfill

-OR-

- Initiate blowdown from ruptured S/G

-OR-

- Dump steam from ruptured S/G

b. Check RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]

b. Return to Step 32.

c. Stop RCS depressurization

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34	Check If RHR Normal Cooling Can Be Established:	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Return to Step 28.
	b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Return to Step 32.
	c. Place RCS overpressure protection system in service (Refer to O-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	c. IF RCS overpressure protection system can NOT be placed in service, THEN notify TSC of potential Tech Spec violation if RHR system is placed in service.
	d. Establish RHR normal cooling (Refer to Attachment RHR COOL)	
	NOTE: Leakage from ruptured S/G into RCS will dilute RCS boron concentration.	
35	Verify Adequate Shutdown Margin	
	a. Direct HP to sample RCS and ruptured S/G for boron concentration	
	b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIGURE SDM	b. Borate as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
36	Initiate RCS Cooldown To Cold Shutdown:	
	a. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Use RHR system if in service	
	c. Dump steam to condenser from intact S/G	c. Manually or locally dump steam from intact S/G using ARVs. IF no intact S/G available and RHR system NOT in service, THEN use faulted S/G.
37	Control Charging Flow To Maintain RCS Subcooling:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 20°F USING FIGURE MIN SUBCOOLING	a. Increase charging flow to maintain subcooling greater than 20°F using Figure MIN SUBCOOLING and go to Step 38.
	b. Ruptured S/G narrow range level - LESS THAN 90% [85% adverse CNMT]	b. Control charging flow to maintain RCS pressure at ruptured S/G pressure and go to Step 38.
	c. Ruptured S/G narrow range level - STABLE OR DECREASING	c. IF ruptured S/G level increasing, THEN decrease charging flow to stabilize level. Maintain RCS subcooling greater than 20°F using Figure MIN SUBCOOLING.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38	Check If RCPs Must Be Stopped:	
	a. RCPs - ANY RUNNING	a. Go to Step 39.
	b. Check the following:	b. Go to Step 39.
	o RCP #1 seal D/P - LESS THAN 220 PSID -OR- o Check RCP seal leakage - LESS THAN 0.25 GPM	
	c. Stop affected RCP(s)	
39	Check Core Exit T/Cs - LESS THAN 200°F	Return to Step 35.
40	Evaluate Long Term Plant Status:	
	a. Maintain cold shutdown conditions	
	b. Consult TSC	

-END-

ECA-3.3 APPENDIX LIST

RED PATH SUMMARY

a. SUBCRITICALITY - Nuclear power greater than 5%

b. CORE COOLING - Core exit T/Cs greater than 1200°F
-OR-
Core exit T/Cs greater than 700°F AND RVLIS level (no RCPs) less than 43% [46% adverse CNMT]

c. HEAT SINK - Narrow range level in all S/Gs less than 5% [25% adverse CNMT] AND total feedwater flow less than 200 gpm

d. INTEGRITY - Cold leg temperatures decrease greater than 100°F in last 60 minutes AND RCS cold leg temperature less than 285°F

e. CONTAINMENT - CNMT pressure greater than 60 psig

FIGURE MIN SUBCOOLING

NOTE: Subcooling Margin = Saturation Temperature From Figure Below [-] Core Exit T/C Indication

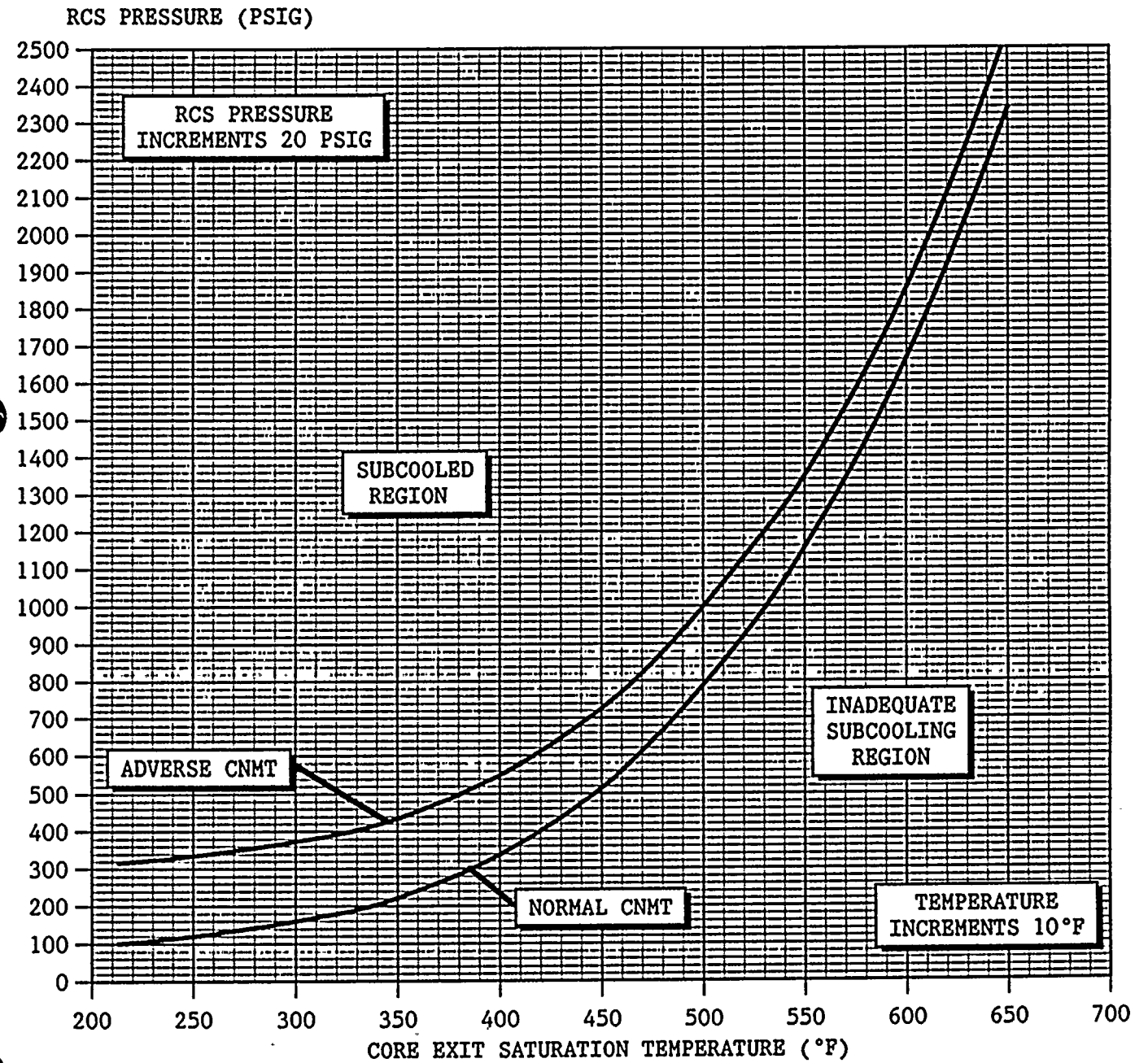
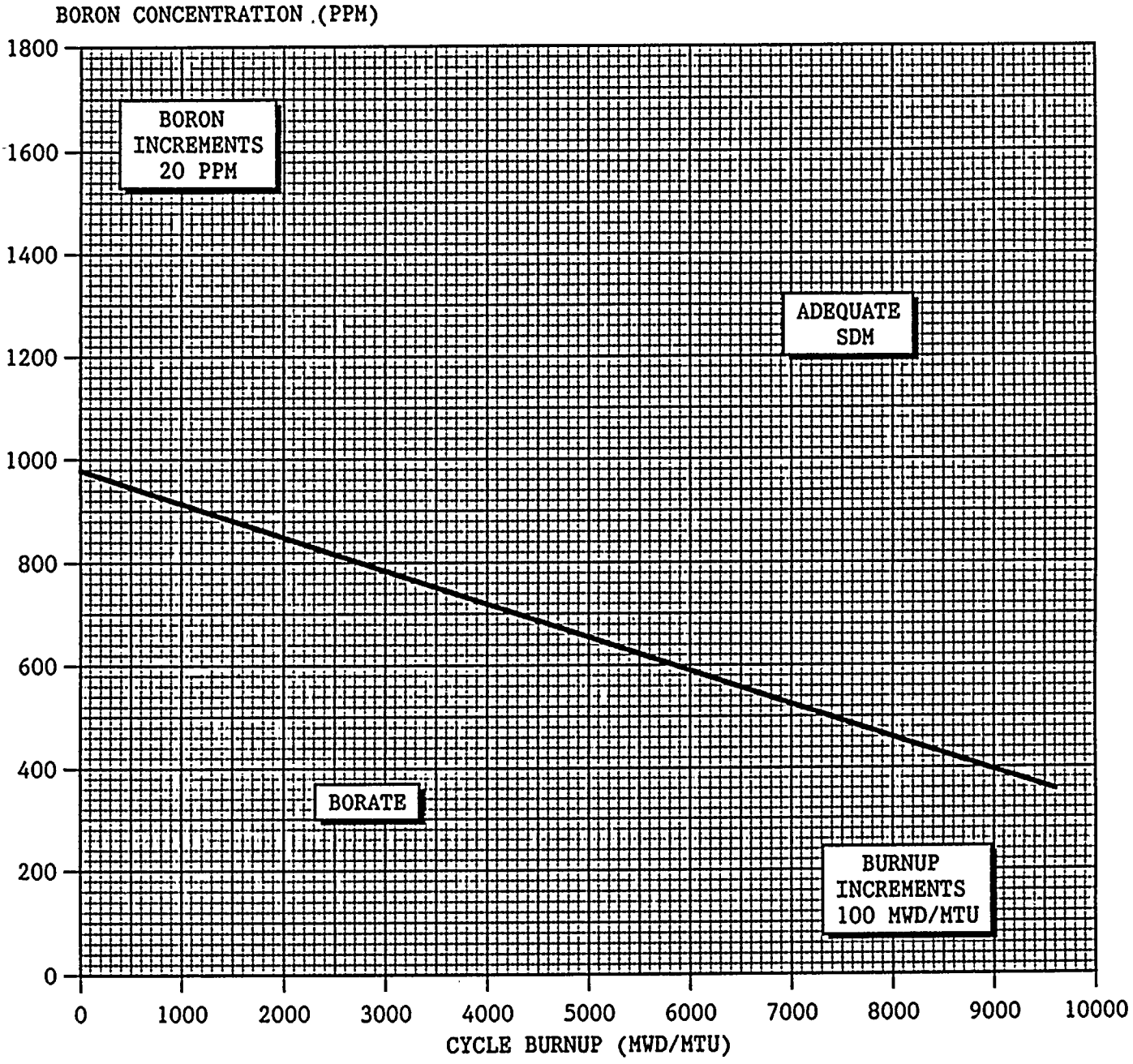


FIGURE SDM



NOTE: To obtain core burnup, use PPCS turn on code BURNUP.

FOLDOUT PAGE

1. SI REINITIATION CRITERIA

IF EITHER condition listed below occurs, THEN manually operate SI pumps as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1:

- o RCS subcooling based on core exit TCs - LESS THAN 0°F USING REQUIREMENTS OF FIGURE MIN SUBCOOLING

- OR -

- o RVLIS level (no RCPs) - LESS THAN 68% [73% adverse CNMT]

2. SECONDARY INTEGRITY CRITERIA

IF any S/G pressure is decreasing in an uncontrolled manner or is completely depressurized AND has not been isolated, THEN go to E-2, FAULTED S/G ISOLATION, Step 1, unless S/G needed for RCS cooldown.

3. COLD LEG RECIRCULATION SWITCHOVER CRITERION

IF RWST level decreases to less than 28%, THEN go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

4. AFW SUPPLY SWITCHOVER CRITERION

IF CST level decreases to less than 5 feet, THEN switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).