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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

TECHNICAL REVIEW

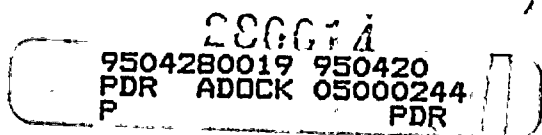
PORC REVIEW DATE 4-19-95

Thomas A. Markov
PLANT SUPERINTENDENT

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A. PURPOSE - This procedure provides actions to mitigate and minimize a loss of secondary coolant from both steam generators.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. E-2, FAULTED STEAM GENERATOR ISOLATION, when an uncontrolled depressurization of both steam generators occurs.



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>IF THE TDAFW PUMP IS THE ONLY AVAILABLE SOURCE OF FEED FLOW, THEN STEAM SUPPLY TO THE TDAFW PUMP MUST BE MAINTAINED FROM ONE S/G.</p> <p>*****</p> <p><u>NOTE:</u> o FOLDOUT page should be open AND monitored periodically.</p> <p> o Conditions should be evaluated for Site Contingency Reporting (Refer to EPIP 1-0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION).</p> <p> 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.</p>		
1	<p>Check Secondary Pressure Boundary:</p> <ul style="list-style-type: none"> o MSIVs - CLOSED o MFW flow control valves - CLOSED <ul style="list-style-type: none"> • MFW regulating valves • MFW bypass valves o MFW pump discharge valves - CLOSED o S/G blowdown and sample valves - CLOSED o TDAFW pump steam supply valves - PULL STOP o TDAFW pump flow control valves - CLOSED o S/G ARVs - CLOSED o Dispatch A0 to locally isolate S/Gs (Refer to Attachment FAULTED S/G) 	<p>Manually close valves one loop at a time.</p> <p><u>IF</u> valves can <u>NOT</u> be closed, <u>THEN</u> dispatch A0 to locally isolate flowpaths, as necessary, one loop at a time.</p>



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION

A MINIMUM FEED FLOW OF 50 GPM MUST BE MAINTAINED TO EACH S/G WITH A NARROW RANGE LEVEL LESS THAN 5% [25% ADVERSE CNMT].

2 Control Feed Flow To Minimize
RCS Cooldown:

- | | |
|--|---|
| a. Check cooldown rate in RCS cold legs - LESS THAN 100°F/HR | a. Decrease feed flow to 50 gpm to each S/G and go to Step 2c. |
| b. Check narrow range level in both S/Gs - LESS THAN 50% | b. Control feed flow to maintain narrow range level less than 50% in both S/Gs. |
| c. Check RCS hot leg temperatures - STABLE OR DECREASING | c. Control feed flow or dump steam to stabilize RCS hot leg temperatures. |

3 Check If RCPs Should Be Stopped:

- | | |
|---|------------------|
| a. RCP status - ANY RCP RUNNING | a. Go to Step 4. |
| b. SI pumps - AT LEAST TWO RUNNING | b. Go to Step 4. |
| c. RCS pressure minus maximum S/G pressure - LESS THAN 175 psig [400 psig adverse CNMT] | c. Go to Step 4. |
| d. Stop both RCPs | |

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Check CST Level - GREATER THAN 5 FEET	Switch to alternate AFW suction supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).
***** CAUTION *****		
IF ANY PRZR PORV OPENS BECAUSE OF HIGH PRZR PRESSURE, IT SHOULD BE CLOSED AFTER PRESSURE DECREASES TO LESS THAN 2335 PSIG (REFER TO STEP 5B).		

* 5	Monitor PRZR PORVs And Block Valves:	
	a. Power to PORV block valves - AVAILABLE	a. Restore power to block valves unless block valve was closed to isolate an open PORV: • MOV-515, MCC C position 6C • MOV-516, MCC D position 6C
	b. PORVs - CLOSED	b. IF PRZR pressure less than 2335 psig, THEN manually close PORVs. IF any PORV can NOT be closed, THEN manually close its block valve. IF block valve can NOT be closed, THEN dispatch A0 to locally check breaker. • MOV-515, MCC C position 6C • MOV-516, MCC D position 6C
	c. Block valves - AT LEAST ONE OPEN	c. Open one block valve unless it was closed to isolate an open PORV.



STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Check Secondary Radiation Levels - NORMAL	Go to E-3, STEAM GENERATOR TUBE RUPTURE; Step 1.
	<ul style="list-style-type: none">o Steamline radiation monitor (R-31 and R-32)o Dispatch AO to locally check steamline radiationo Request RP sample S/Gs for activity	

CAUTION		
IF OFFSITE POWER IS LOST AFTER SI RESET, THEN SELECTED SW PUMPS AND ONE CCW PUMP WILL AUTO START ON EMERGENCY D/G. MANUAL ACTION WILL BE REQUIRED TO RESTART SAFEGUARDS EQUIPMENT.		

7	Reset SI	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
***** CAUTION RCS PRESSURE SHOULD BE MONITORED. IF RCS PRESSURE DECREASES TO LESS THAN 250 PSIG [465 PSIG ADVERSE CNMT], THEN THE RHR PUMPS MUST BE MANUALLY RESTARTED TO SUPPLY WATER TO THE RCS. *****		
* 8 Monitor If RHR Pumps Should Be Stopped:		
a. RHR pumps - ANY RUNNING		a. Go to Step 9.
b. Check RCS Pressure:		
1) Pressure - GREATER THAN 250 psig [465 psig adverse CNMT]		1) Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
2) Pressure - STABLE OR INCREASING .		2) Go to Step 9.
c. Stop RHR pumps and place in AUTO		



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 9	Monitor If CNMT Spray Should Be Stopped:	
	a. CNMT spray pumps - RUNNING	a. Go to Step 10.
	b. Check the following:	b. Continue with Step 10. <u>WHEN</u> BOTH conditions satisfied, <u>THEN</u> do Steps 9c through f.
	o CNMT pressure - LESS THAN 4 PSIG	
	o Sodium hydroxide tank level - LESS THAN 55%	
	c. Reset CNMT spray	
	d. Check NaOH tank outlet valves - CLOSED	d. Place NaOH tank outlet valve controllers to MANUAL and close valves.
	• AOV-836A	• AOV-836A
	• AOV-836B	• AOV-836B
	e. Stop CNMT spray pumps and place in AUTO	
	f. Close CNMT spray pump discharge valves	
	• MOV-860A	
	• MOV-860B	
	• MOV-860C	
	• MOV-860D	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check RWST Level - GREATER THAN 28%	Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.
11	Reset CI: a. Depress CI reset pushbutton b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED	b. Perform the following: 1) Reset SI. 2) Depress CI reset pushbutton.
12	Verify Adequate SW Flow: a. Check at least two SW pumps - RUNNING b. Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1)	a. Manually start SW pumps as power supply permits (258 kw each). <u>IF</u> less than two SW pumps running, <u>THEN</u> perform the following: 1) Ensure SW isolation. 2) Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1) 3) Go to Step 14.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	Establish IA to CNMT:	
a.	Verify non-safeguards busses energized from offsite power <ul style="list-style-type: none"> o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED 	a. Perform the following: <ol style="list-style-type: none"> 1) Close non-safeguards bus tie breakers: <ul style="list-style-type: none"> • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each). IF NOT, THEN evaluate if CNMT RECIRC fans should be stopped (Refer to Attachment CNMT RECIRC FANS). 3) WHEN bus 15 restored, THEN reset control room lighting.
b.	Verify SW isolation valves to turbine building - OPEN <ul style="list-style-type: none"> • MOV-4613 and MOV-4670 • MOV-4614 and MOV-4664 	b. Manually align valves.
c.	Verify at least two air compressors - RUNNING	c. Manually start air compressors as power supply permits (75 kw each). IF air compressors can NOT be started, THEN dispatch AO to locally reset compressors as necessary.
d.	Check IA supply: <ul style="list-style-type: none"> o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING 	d. Perform the following: <ol style="list-style-type: none"> 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR). 2) Continue with Step 14. WHEN IA restored, THEN do Steps 13e and f.
e.	Reset both trains of XY relays for IA to CNMT AOV-5392	
f.	Verify IA to CNMT AOV-5392 - OPEN	



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	<p>Check If SI ACCUMs Should Be Isolated:</p> <ul style="list-style-type: none"> a. Both RCS hot leg temperatures - LESS THAN 400°F b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves <ul style="list-style-type: none"> • MOV-841, MCC C position 12F • MOV-865, MCC D position 12C c. Close SI ACCUM discharge valves <ul style="list-style-type: none"> • MOV-841 • MOV-865 d. Locally reopen breakers for MOV-841 and MOV-865 	<ul style="list-style-type: none"> a. Go to Step 15. c. Vent any unisolated ACCUMs: <ul style="list-style-type: none"> 1) Open vent valves for unisolated SI ACCUMs, <ul style="list-style-type: none"> • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945.
15	<p>Check Normal Power Available To Charging Pumps:</p> <ul style="list-style-type: none"> o Bus 14 normal feed breaker - CLOSED o Bus 16 normal feed breaker - CLOSED 	<p>Verify adequate emergency D/G capacity to run charging pumps (75 kw each).</p> <p><u>IF NOT, THEN</u> evaluate if CNMT RECIRC fans can be stopped (Refer to Attachment CNMT RECIRC FANS).</p>

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

16 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. Align charging pump suction to RWST:

b. IF LCV-112B can NOT be opened, THEN perform the following:

- o LCV-112B - OPEN
- o LCV-112C - CLOSED

- 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

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12

13

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*17	Monitor SI Termination Criteria:	
	a. SI pumps - ANY RUNNING	a. Go to Step 19.
	b. Check RCS pressure:	b. DO <u>NOT</u> stop SI pumps. Perform the following:
	o Pressure - GREATER THAN 1625 psig [1825 psig adverse CNMT]	1) Energize PRZR heaters and operate PRZR spray as necessary to stabilize RCS pressure greater than 1625 psig [1825 psig adverse CNMT]
	o Pressure - STABLE OR INCREASING	2) Return to Step 2.
	c. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING	c. DO <u>NOT</u> stop SI pumps. Return to Step 2.
	d. PRZR level - GREATER THAN 5% [30% adverse CNMT]	d. Do <u>NOT</u> stop SI pumps. Perform the following:
		1) <u>IF</u> normal PRZR spray available, <u>THEN</u> try to stabilize RCS pressure with PRZR spray.
		2) Return to Step 17a.
	NOTE: Foldout Page E-2 transition criteria does not apply while performing steps 18 and 19.	
18	Stop SI and RHR Pumps And Place In Auto	



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*19	Monitor SI Reinitiation Criteria:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING	a. Manually operate SI pumps as necessary and return to Step 2.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level. IF PRZR level can <u>NOT</u> be maintained, <u>THEN</u> manually operate SI pumps as necessary and return to Step 2.
20	Check RCS Hot Leg Temperatures - STABLE OR DECREASING	Control feed flow or dump steam to stabilize RCS hot leg temperatures.
21	Check Narrow Range Level In Both S/Gs - LESS THAN 50%	Control feed flow to maintain narrow range level less than 50% in both S/Gs.
22	Verify Adequate SW Flow To CCW Hx:	
	a. Verify at least two SW pumps - RUNNING	a. Manually start pumps as power supply permits (258 kw per pump). IF less than two SW pumps can be operated, <u>THEN</u> go to Step 28.
	b. Verify AUX BLDG SW isolation valves - OPEN • MOV-4615 and MOV-4734 • MOV-4616 and MOV-4735	b. Establish SW to AUX BLDG (Refer to Attachment AUX BLDG SW).
	c. Verify CNMT RECIRC fan annunciator C-2, HIGH TEMPERATURE ALARM - EXTINGUISHED	c. Dispatch AO to locally throttle flow to CCW Hx to between 5000 gpm and 6000 gpm total flow.



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	Check If Normal CVCS Operation Can Be Established	
a.	Verify IA restored: <ul style="list-style-type: none"> o IA to CNMT (AOV-5392) - OPEN o IA pressure - GREATER THAN 60 PSIG 	a. Continue with Step 28. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 23 through 27.
b.	Verify instrument bus D - ENERGIZED	b. Energize MCC B. <u>IF</u> MCC B <u>NOT</u> available, <u>THEN</u> perform the following: <ol style="list-style-type: none"> 1) Verify MCC A energized. 2) Place instrument bus D on maintenance supply.
c.	CCW pumps - ANY RUNNING	c. Perform the following: <ol style="list-style-type: none"> 1) <u>IF</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> isolate CCW to thermal barrier of affected RCP(s). <ul style="list-style-type: none"> • 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 28. <u>WHEN</u> any charging pump running, <u>THEN</u> do Steps 24 through 27.



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	Verify PRZR Level - GREATER THAN 13% [40% adverse CNMT]	Continue with Step 26. <u>WHEN</u> PRZR level increases to greater than 13% [40% adverse CNMT], <u>THEN</u> do Step 25.
25	Establish Normal Letdown: a. Verify 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 in MANUAL at 40% open • TCV-130 • PCV-135 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	<u>IF</u> RCP seal return has been established, <u>THEN</u> 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. <u>IF</u> RCP seal return <u>NOT</u> established, <u>THEN</u> consult TSC to determine if excess letdown should be placed in service.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

26 Check VCT Makeup System:

a. Adjust boric acid flow control
valve in AUTO to 9.5 gpm

b. Verify the following:

1) RMW mode selector switch in
AUTO

2) RMW control armed - RED LIGHT
LIT

c. Check VCT level:

o Level - GREATER THAN 20%

-OR-

o Level - STABLE OR INCREASING

b. Adjust controls as necessary.

c. 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 and
increase RMW flow.

3) Increase boric acid flow as
necessary.



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
27	Check Charging Pump Suction Aligned To VCT:	
a.	VCT level - GREATER THAN 20%	<p>a. <u>IF</u> VCT level can <u>NOT</u> be maintained greater than 5%, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> 1) Ensure charging pump suction aligned to RWST <ul style="list-style-type: none"> o LCV-112B open o LCV-112C closed 2) Continue with Step 28. <u>WHEN</u> VCT level greater than 40%, <u>THEN</u> do Step 27b.
b.	Verify charging pumps aligned to VCT:	b. Manually align valves as necessary.
	<ul style="list-style-type: none"> o LCV-112C - OPEN o LCV-112B - CLOSED 	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28	<p>Check RCP Cooling:</p> <p>a. Check CCW to RCPs:</p> <ul style="list-style-type: none"> 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 <p>b. Check RCP seal injection:</p> <ul style="list-style-type: none"> o Labyrinth seal D/Ps - GREATER THAN 15 INCHES OF WATER <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o RCP seal injection flow to each RCP - GREATER THAN 6 GPM 	<p>Establish normal cooling to RCPs (Refer to Attachment SEAL COOLING).</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29	Check If Seal Return Flow Should Be Established:	
a.	Verify RCP #1 seal outlet temperature - LESS THAN 235°F	a. Go to Step 30.
b.	Verify RCP seal outlet valves - OPEN <ul style="list-style-type: none"> • 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: <ol style="list-style-type: none"> 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. Perform the following: <ol style="list-style-type: none"> 1) Trip the affected RCP 2) Allow 3 minutes for pump coast down, <u>THEN</u> close the affected RCP seal discharge valve <ul style="list-style-type: none"> • RCP A, AOV-270A • RCP B, AOV-270B <p><u>IF</u> both RCP seal discharge valves are shut, <u>THEN</u> go to Step 30.</p>
f.	Verify RCP #1 seal leakoff flow - GREATER THAN 0.8 GPM	f. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p><u>NOTE:</u> o If auxiliary spray is in use, spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves.</p> <p> o When using PRZR PORV, select one with an operable block valve.</p>	
30	Energize Heaters And Operate Normal Spray As Necessary To Maintain RCS Pressure Stable	<p><u>IF</u> normal spray <u>NOT</u> available and letdown is in service, <u>THEN</u> use auxiliary spray valve (AOV-296).</p> <p><u>IF</u> PRZR spray <u>NOT</u> available, <u>THEN</u> use one PRZR PORV.</p> <p><u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to Attachment N2 PORVS.</p>



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31	<p>Verify All AC Busses - ENERGIZED BY OFFSITE POWER</p> <ul style="list-style-type: none"> o Normal feed breakers to all 480 volt busses - CLOSED o 480 bus voltage - GREATER THAN 420 VOLTS o Emergency D/G output breakers - OPEN 	<p>Perform the following:</p> <ul style="list-style-type: none"> a. <u>IF</u> any AC emergency bus normal feed breaker open, <u>THEN</u> ensure associated D/G breaker closed. b. Perform the following, as necessary: <ul style="list-style-type: none"> 1) Close non-safeguards bus tie breakers: <ul style="list-style-type: none"> • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Place the following pumps in PULL STOP: <ul style="list-style-type: none"> • EH pumps • Turning gear oil pump • HP seal oil backup pump 3) Restore power to MCCs. <ul style="list-style-type: none"> • A from Bus 13 • B from Bus 15 • E from Bus 15 • F from Bus 15 4) <u>WHEN</u> bus 15 restored, <u>THEN</u> reset control room lighting. 5) Refer to Attachment SI/UV for other equipment lost with loss of offsite power. c. Try to restore offsite power to all AC busses (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.</p> <p>*****</p>		
32	Check RCP Status - AT LEAST ONE RUNNING	<p>Try to start one RCP:</p> <ul style="list-style-type: none"> a. Establish conditions for starting an RCP. <ul style="list-style-type: none"> o Bus 11A or 11B energized o Refer to Attachment RCP START. b. Start one RCP. <p><u>IF</u> an RCP can <u>NOT</u> be started, <u>THEN</u> verify natural circulation (Refer to Attachment NC).</p> <p><u>IF</u> natural circulation can <u>NOT</u> be verified, <u>THEN</u> increase feed flow or dumping steam.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p><u>NOTE:</u> Adverse CNMT conditions or loss of forced air cooling may result in failure of NIS detectors.</p>		
33	Check If Source Range Detectors Should Be Energized:	
a.	Source range channels - DEENERGIZED	a. Go to Step 33e.
b.	Check intermediate range flux - EITHER CHANNEL LESS THAN 10 ⁻¹⁰ AMPS	b. Perform the following: <ul style="list-style-type: none"> 1) <u>IF</u> neither intermediate range channel is decreasing <u>THEN</u> initiate boration. 2) Continue with Step 34. <u>WHEN</u> flux is LESS THAN 10⁻¹⁰ amps on any operable channel, <u>THEN</u> do Steps 33c, d and e.
c.	Check the following: <ul style="list-style-type: none"> o Both intermediate range channels - LESS THAN 10⁻¹⁰ AMPS <p>-OR-</p> <ul style="list-style-type: none"> o Greater than 20 minutes since reactor trip 	c. Continue with step 34. <u>WHEN</u> either condition met, <u>THEN</u> do Steps 33d and e.
d.	Verify source range detectors - ENERGIZED	d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2). <p><u>IF</u> source ranges can <u>NOT</u> be restored, <u>THEN</u> refer to ER-NIS.1, SR MALFUNCTION and go to Step 34.</p>
e.	Transfer Rk-45 recorder to one source range and one intermediate range channel.	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34	<p>Check If Emergency D/Gs Should Be Stopped:</p> <ul style="list-style-type: none"> a. Verify AC emergency busses energized by offsite power: <ul style="list-style-type: none"> o Emergency D/G output breakers - OPEN o AC emergency bus voltage - GREATER THAN 420 VOLTS o AC emergency bus normal feed breakers - CLOSED b. Stop any unloaded emergency D/G and place in standby (Refer to Attachment D/G STOP) 	<ul style="list-style-type: none"> a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
35	Establish Normal Shutdown Alignment:	
	<ul style="list-style-type: none"> a. Check condenser - AVAILABLE b. Perform the following: <ul style="list-style-type: none"> o Open generator disconnects <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> 1) Check IA to CNMT - AVAILABLE 2) Verify at least one control rod shroud fan - RUNNING 3) Verify one Rx compartment cooling fan - RUNNING d. Verify Attachment SD-1 - COMPLETE 	<ul style="list-style-type: none"> a. Dispatch AO to perform Attachment SD-2. 1) Go to Step 36. 2) Manually start one fan as power supply permits (45 kw) 3) Perform the following: <ul style="list-style-type: none"> o Dispatch AO to reset UV relays at MCC C and MCC D. o Manually start one fan as power supply permits (23 kw)



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
36	Maintain Plant Conditions - STABLE o RCS pressure o PRZR level o RCS temperatures	Control plant systems as necessary to maintain conditions stable.
*37	Monitor SI Reinitiation Criteria: a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	a. Manually operate SI pumps as necessary. Return to Step 2. b. Control charging flow to maintain PRZR level. <u>IF</u> PRZR level can <u>NOT</u> be maintained, <u>THEN</u> manually operate SI pumps as necessary. Return to Step 2.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38	<p>Check If SI ACCUMs Should Be Isolated:</p> <p>a. Check the following:</p> <ul style="list-style-type: none"> o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING o PRZR level - GREATER THAN 5% [30% adverse CNMT] <p>b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves</p> <ul style="list-style-type: none"> • MOV-841, MCC C position 12F • MOV-865, MCC D position 12C <p>c. Close SI ACCUM discharge valves</p> <ul style="list-style-type: none"> • MOV-841 • MOV-865 <p>d. Locally reopen breakers for MOV-841 and MOV-865</p>	<p>a. Go to Step 39.</p> <p>c. Vent any unisolated ACCUMs:</p> <p>1) Open vent valves for unisolated SI ACCUMs.</p> <ul style="list-style-type: none"> • ACCUM A, AOV-834A • ACCUM B, AOV-834B <p>2) Open HCV-945.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
39	Check RCS Hot Leg Temperatures - LESS THAN 350°F	Control feed flow and dump steam to establish RCS cooldown rate less than 100°F/hr in RCS cold legs.
<p><u>NOTE:</u> o If auxiliary spray is in use, spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves.</p> <p> o When using PRZR PORV, select one with operable block valve.</p>		
40	Check RCS Pressure - LESS THAN 400 PSIG [300 PSIG adverse CNMT]	<p>Use normal PRZR spray.</p> <p><u>IF</u> normal spray <u>NOT</u> available and letdown is in service, <u>THEN</u> use auxiliary spray.</p> <p><u>IF NOT</u>, <u>THEN</u> use one PRZR PORV.</p> <p><u>IF IA NOT</u> available, <u>THEN</u> refer to Attachment N2 PORVS.</p>



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
41	Check If RHR Normal Cooling Can Be Established:	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Return to Step 37.
	b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Return to Step 40.
	c. Place letdown pressure controller (PCV-135) in MANUAL CLOSED	
	d. Check following valves - OPEN <ul style="list-style-type: none"> • AOV-371, letdown isolation valve • AOV-427, loop B cold leg to REGEN Hx • At least one letdown orifice valve (AOV-200A, AOV-200B, or AOV-202) 	d. Perform the following: <ol style="list-style-type: none"> 1) Reset both trains of XY relays for AOV-371 and AOV-427. 2) Open AOV-371 and AOV-427. 3) Open one letdown orifice valve.
	e. Verify pressure on PI-135 - LESS THAN 400 PSIG	e. Return to Step 40.
	f. Place RCS overpressure protection system in service (Refer to 0-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	f. <u>IF</u> RCS overpressure protection system can <u>NOT</u> be placed in service, <u>THEN</u> notify TSC of potential Tech Spec violation if RHR system is placed in service.
	g. Establish RHR normal cooling (Refer to Attachment RHR COOL)	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
42	Continue RCS Cooldown To Cold Shutdown: a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR b. Check narrow range level in both S/Gs - LESS THAN 50%	b. Control feed flow to maintain narrow range level less than 50% in both S/Gs.
43	Check Core Exit T/Cs - LESS THAN 200°F	Return to Step 42.
44	Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions b. Consult TSC	
-END-		



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ECA-2.1 APPENDIX LIST

<u>TITLE</u>	<u>PAGES</u>
1) RED PATH SUMMARY	1
2) FIGURE MIN SUBCOOLING	1
3) ATTACHMENT FAULTED S/G	1
4) ATTACHMENT CNMT RECIRC FANS	1
5) ATTACHMENT NC	1
6) ATTACHMENT RCP START	2
7) ATTACHMENT N2 PORVS	1
8) ATTACHMENT SEAL COOLING	2
9) ATTACHMENT SI/UV	1
10) ATTACHMENT D/G STOP	1
11) ATTACHMENT SD-1	1
12) ATTACHMENT SD-2	1
13) ATTACHMENT RHR COOL	2
14) ATTACHMENT AUX BLDG SW	1
15) FOLDOUT	1

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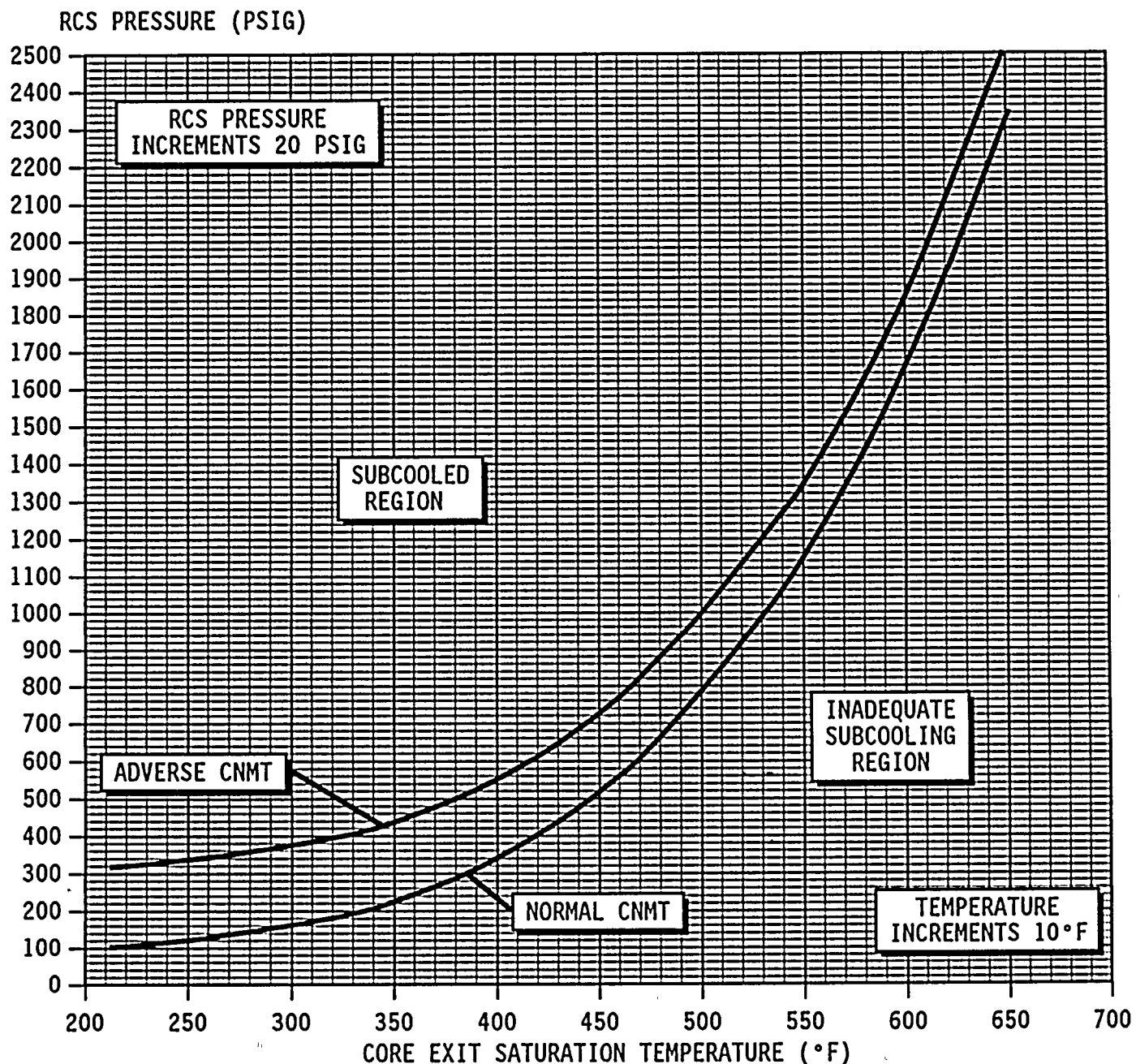
RED PATH SUMMARY

- 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

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FIGURE MIN SUBCOOLING

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





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FOLDOUT PAGE

1. SI REINITIATION CRITERIA

Manually operate SI pumps as necessary if EITHER condition listed below occurs:

- o RCS subcooling based on core exit TCs - LESS THAN 0°F USING REQUIREMENTS OF FIGURE MIN SUBCOOLING
- o PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN 5% [30% ADVERSE CNMT]

2. E-2 TRANSITION CRITERIA

IF any S/G pressure increases at any time (except while performing SI termination in Steps 18 and 19), THEN go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.

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. LOSS OF EMERGENCY COOLANT RECIRCULATION CRITERION

IF emergency coolant recirculation is established and subsequently lost, THEN go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.

5. 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).

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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

TECHNICAL REVIEW

PORC REVIEW DATE 6-8-94

Bill Ham
PLANT SUPERINTENDENT

6-9-94
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

*Supervised for Rev
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- A. PURPOSE - This procedure provides actions to mitigate and minimize a loss of secondary coolant from both steam generators.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS - This procedure is entered from:
 - a. E-2, FAULTED STEAM GENERATOR ISOLATION, when an uncontrolled depressurization of both steam generators occurs.

[illegible]

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>***** <u>CAUTION</u> o IF ANY S/G PRESSURE INCREASES AT ANY TIME DURING THIS PROCEDURE, THEN E-2, FAULTED STEAM GENERATOR ISOLATION, SHOULD BE PERFORMED. o IF THE TDAFW PUMP IS THE ONLY AVAILABLE SOURCE OF FEED FLOW, THEN STEAM SUPPLY TO THE TDAFW PUMP MUST BE MAINTAINED FROM ONE S/G. *****</p> <p><u>NOTE:</u> o FOLDOUT page should be open AND monitored periodically. o Conditions should be evaluated for Site Contingency Reporting (Refer to EPIP 1-0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION). 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.</p>		
1	<p>Check Secondary Pressure Boundary:</p> <ul style="list-style-type: none"> o MSIVs - CLOSED o MFW flow control valves - CLOSED <ul style="list-style-type: none"> • MFW regulating valves • MFW bypass valves o MFW pump discharge valves - CLOSED o S/G blowdown and sample valves - CLOSED o TDAFW pump steam supply valves - PULL STOP o TDAFW pump flow control valves - CLOSED o S/G ARVs - CLOSED o Dispatch AO to locally isolate S/Gs (Refer to Attachment FAULTED S/G) 	<p>Manually close valves one loop at a time.</p> <p><u>IF</u> valves can <u>NOT</u> be closed, <u>THEN</u> dispatch AO to locally isolate flowpaths, as necessary, one loop at a time.</p>

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

A MINIMUM FEED FLOW OF 50 GPM MUST BE MAINTAINED TO EACH S/G WITH A NARROW
RANGE LEVEL LESS THAN 5% [25% ADVERSE CNMT].

2 Control Feed Flow To Minimize RCS Cooldown:

- | | |
|--|---|
| a. Check cooldown rate in RCS cold legs - LESS THAN 100°F/HR | a. Decrease feed flow to 50 gpm to each S/G and go to Step 2c. |
| b. Check narrow range level in both S/Gs - LESS THAN 50% | b. Control feed flow to maintain narrow range level less than 50% in both S/Gs. |
| c. Check RCS hot leg temperatures - STABLE OR DECREASING | c. Control feed flow or dump steam to stabilize RCS hot leg temperatures. |

3 Check If RCPs Should Be Stopped:

- | | |
|---|------------------|
| a. RCP status - ANY RCP RUNNING | a. Go to Step 4. |
| b. SI pumps - AT LEAST TWO RUNNING | b. Go to Step 4. |
| c. RCS pressure minus maximum S/G pressure - LESS THAN 175 psig [400 psig adverse CNMT] | c. Go to Step 4. |
| d. Stop both RCPs | |

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Check CST Level - GREATER THAN 5 FEET	Switch to alternate AFW suction supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).
***** <u>CAUTION</u> IF ANY PRZR PORV OPENS BECAUSE OF HIGH PRZR PRESSURE, IT SHOULD BE CLOSED AFTER PRESSURE DECREASES TO LESS THAN 2335 PSIG (REFER TO STEP 5B). *****		
* 5	Monitor PRZR PORVs And Block Valves:	
	a. Power to PORV block valves - AVAILABLE	a. Restore power to block valves unless block valve was closed to isolate an open PORV: • MOV-515, MCC C position 6C • MOV-516, MCC D position 6C
	b. PORVs - CLOSED	b. <u>IF</u> PRZR pressure less than 2335 psig, <u>THEN</u> manually close PORVs. <u>IF</u> any PORV can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve. <u>IF</u> block valve can <u>NOT</u> be closed, <u>THEN</u> dispatch AO to locally check breaker. • MOV-515, MCC C position 6C • MOV-516, MCC D position 6C
	c. Block valves - AT LEAST ONE OPEN	c. Open one block valve unless it was closed to isolate an open PORV.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	<p>Check Secondary Radiation Levels - NORMAL</p> <ul style="list-style-type: none"> Steamline radiation monitor (R-31 and R-32) Dispatch AO to locally check steamline radiation Request RP sample S/Gs for activity 	<p>Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.</p>
<p>***** <u>CAUTION</u> IF OFFSITE POWER IS LOST AFTER SI RESET, THEN SELECTED SW PUMPS AND ONE CCW PUMP WILL AUTO START ON EMERGENCY D/G. MANUAL ACTION WILL BE REQUIRED TO RESTART SAFEGUARDS EQUIPMENT. *****</p>		
7	Reset SI	

[illegible]

五、六、七、八、九、十、十一、十二、十三、十四、十五、十六、十七、十八、十九、二十、二十一、二十二、二十三、二十四、二十五、二十六、二十七、二十八、二十九、三十、三十一、三十二、三十三、三十四、三十五、三十六、三十七、三十八、三十九、四十、四十一、四十二、四十三、四十四、四十五、四十六、四十七、四十八、四十九、五十、五十一、五十二、五十三、五十四、五十五、五十六、五十七、五十八、五十九、六十、六十一、六十二、六十三、六十四、六十五、六十六、六十七、六十八、六十九、七十、七十一、七十二、七十三、七十四、七十五、七十六、七十七、七十八、七十九、八十、八十一、八十二、八十三、八十四、八十五、八十六、八十七、八十八、八十九、九十、九十一、九十二、九十三、九十四、九十五、九十六、九十七、九十八、九十九、一百。

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>RCS PRESSURE SHOULD BE MONITORED. IF RCS PRESSURE DECREASES TO LESS THAN 250 PSIG [465 PSIG ADVERSE CNMT], THEN THE RHR PUMPS MUST BE MANUALLY RESTARTED TO SUPPLY WATER TO THE RCS.</p> <p>*****</p>		
8	Check If RHR Pumps Should Be Stopped:	
	a. RHR pumps - ANY RUNNING	a. Go to Step 9.
	b. Check RCS Pressure:	
	1) Pressure - GREATER THAN 250 psig [465 psig adverse CNMT]	1) Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	2) Pressure - STABLE OR INCREASING	2) Go to Step 9.
	c. Stop RHR pumps and place in AUTO	

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EOP:

ECA-2.1

TITLE:

UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM
GENERATORS

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

* 9 Monitor If CNMT Spray Should
Be Stopped:

a. CNMT spray pumps - RUNNING

a. Go to Step 10.

b. Check the following:

b. Continue with Step 10. WHEN
BOTH conditions satisfied, THEN
do Steps 9c through f.o CNMT pressure - LESS THAN
4 PSIGo Sodium hydroxide tank level -
LESS THAN 55%

c. Reset CNMT spray

d. Check NaOH tank outlet valves -
CLOSEDd. Place NaOH tank outlet valve
controllers to MANUAL and close
valves.

• AOV-836A

• AOV-836B

• AOV-836A

• AOV-836B

e. Stop CNMT spray pumps and place
in AUTOf. Close CNMT spray pump discharge
valves

• MOV-860A

• MOV-860B

• MOV-860C

• MOV-860D

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check RWST Level - GREATER THAN 28%	Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.
11	Reset CI: <ul style="list-style-type: none"> a. Depress CI reset pushbutton b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED 	<ul style="list-style-type: none"> b. Perform the following: <ul style="list-style-type: none"> 1) Reset SI. 2) Depress CI reset pushbutton.
12	Verify Adequate SW Flow: <ul style="list-style-type: none"> a. Check at least two SW pumps - RUNNING b. Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1) 	<ul style="list-style-type: none"> a. Manually start SW pumps as power supply permits (258 kw each). <p><u>IF</u> less than two SW pumps running, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> 1) Ensure SW isolation. 2) Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1) 3) Go to Step 14.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	Establish IA to CNMT:	
	<p>a. Verify non-safeguards busses energized from offsite power</p> <ul style="list-style-type: none"> o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED <p>b. Verify SW isolation valves to turbine building - OPEN</p> <ul style="list-style-type: none"> • MOV-4613 and MOV-4670 • MOV-4614 and MOV-4664 <p>c. Verify at least two air compressors - RUNNING</p> <p>d. Check IA supply:</p> <ul style="list-style-type: none"> o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING <p>e. Reset both trains of XY relays for IA to CNMT AOV-5392</p> <p>f. Verify IA to CNMT AOV-5392 - OPEN</p>	<p>a. Perform the following:</p> <ol style="list-style-type: none"> 1) Close non-safeguards bus tie breakers: <ul style="list-style-type: none"> • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each). <u>IF NOT</u>, <u>THEN</u> evaluate if CNMT RECIRC fans should be stopped (Refer to Attachment CNMT RECIRC FANS). 3) <u>WHEN</u> bus 15 restored, <u>THEN</u> reset control room lighting. <p>b. Manually align valves.</p> <p>c. Manually start air compressors as power supply permits (75 kw each). <u>IF</u> air compressors can <u>NOT</u> be started, <u>THEN</u> dispatch A0 to locally reset compressors as necessary.</p> <p>d. Perform the following:</p> <ol style="list-style-type: none"> 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR). 2) Continue with Step 14. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 13e and f.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Check If SI ACCUMs Should Be Isolated:	
	<ul style="list-style-type: none"> a. Both RCS hot leg temperatures - LESS THAN 400°F b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves <ul style="list-style-type: none"> • MOV-841, MCC C position 12F • MOV-865, MCC D position 12C c. Close SI ACCUM discharge valves <ul style="list-style-type: none"> • MOV-841 • MOV-865 d. Locally reopen breakers for MOV-841 and MOV-865 	<ul style="list-style-type: none"> a. Go to Step 15. c. Vent any unisolated ACCUMs: <ul style="list-style-type: none"> 1) Open vent valves for unisolated SI ACCUMs, <ul style="list-style-type: none"> • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945.
15	Check Normal Power Available To Charging Pumps:	Verify adequate emergency D/G capacity to run charging pumps (75 kw each).
	<ul style="list-style-type: none"> o Bus 14 normal feed breaker - CLOSED o Bus 16 normal feed breaker - CLOSED 	<p><u>IF NOT, THEN</u> evaluate if CNMT RECIRC fans can be stopped (Refer to Attachment CNMT RECIRC FANS).</p>

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EOP: ECA-2.1	TITLE: UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS	REV: 10 PAGE 12 of 31
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Check If Charging Flow Has Been Established:	
	a. Charging pumps - ANY RUNNING	<p>a. Perform the following:</p> <ol style="list-style-type: none"> 1) <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> dispatch AO with key to RWST gate to close seal injection needle valve(s) to affected RCP: <ul style="list-style-type: none"> • RCP A, V-300A • RCP B, V-300B 2) Ensure HCV-142 open, demand at 0%.
	b. Align charging pump suction to RWST: <ul style="list-style-type: none"> o LCV-112B - OPEN o LCV-112C - CLOSED 	<p>b. <u>IF</u> LCV-112B can <u>NOT</u> be opened, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> 1) Verify charging pump A <u>NOT</u> 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) <u>WHEN</u> V-358 open, <u>THEN</u> 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	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*17	Monitor SI Termination Criteria:	
	a. SI pumps - ANY RUNNING	a. Go to Step 19.
	b. Check RCS pressure:	b. DO <u>NOT</u> stop SI pumps. Perform the following:
	o Pressure - GREATER THAN 1625 psig [1825 psig adverse CNMT]	1) Energize PRZR heaters and operate PRZR spray as necessary to stabilize RCS pressure greater than 1625 psig [1825 psig adverse CNMT]
	o Pressure - STABLE OR INCREASING	2) Return to Step 2.
	c. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING	c. DO <u>NOT</u> stop SI pumps. Return to Step 2.
	d. PRZR level - GREATER THAN 5% [30% adverse CNMT]	d. Do <u>NOT</u> stop SI pumps. Perform the following:
		1) <u>IF</u> normal PRZR spray available, <u>THEN</u> try to stabilize RCS pressure with PRZR spray.
		2) Return to Step 17a.
18	Stop SI and RHR Pumps And Place In Auto	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*19	Monitor SI Reinitiation Criteria:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING	a. Manually operate SI pumps as necessary and return to Step 2.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level. IF PRZR level can <u>NOT</u> be maintained, <u>THEN</u> manually operate SI pumps as necessary and return to Step 2.
20	Check RCS Hot Leg Temperatures - STABLE OR DECREASING	Control feed flow or dump steam to stabilize RCS hot leg temperatures.
21	Check Narrow Range Level In Both S/Gs - LESS THAN 50%	Control feed flow to maintain narrow range level less than 50% in both S/Gs.
22	Verify Adequate SW Flow To CCW Hx:	
	a. Verify at least two SW pumps - RUNNING	a. Manually start pumps as power supply permits (258 kw per pump). IF less than two SW pumps can be operated, <u>THEN</u> go to Step 28.
	b. Verify AUX BLDG SW isolation valves - OPEN • MOV-4615 and MOV-4734 • MOV-4616 and MOV-4735	b. Establish SW to AUX BLDG (Refer to Attachment AUX BLDG SW).
	c. Verify CNMT RECIRC fan annunciator C-2, HIGH TEMPERATURE ALARM - EXTINGUISHED	c. Dispatch AO to locally throttle flow to CCW Hx to between 5000 gpm and 6000 gpm total flow.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	Check If Normal CVCS Operation Can Be Established	
a.	Verify IA restored: <ul style="list-style-type: none"> o IA to CNMT (AOV-5392) - OPEN o IA pressure - GREATER THAN 60 PSIG 	a. Continue with Step 28. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 23 through 27.
b.	Verify instrument bus D - ENERGIZED	b. Energize MCC B. <u>IF</u> MCC B <u>NOT</u> available, <u>THEN</u> perform the following: <ol style="list-style-type: none"> 1) Verify MCC A energized. 2) Place instrument bus D on maintenance supply.
c.	CCW pumps - ANY RUNNING	c. Perform the following: <ol style="list-style-type: none"> 1) <u>IF</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> isolate CCW to thermal barrier of affected RCP(s). <ul style="list-style-type: none"> • 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 28. <u>WHEN</u> any charging pump running, <u>THEN</u> do Steps 24 through 27.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	Verify PRZR Level - GREATER THAN 13% [40% adverse CNMT]	Continue with Step 26. <u>WHEN</u> PRZR level increases to greater than 13% [40% adverse CNMT], <u>THEN</u> do Step 25.
25	<p>Establish Normal Letdown:</p> <ol style="list-style-type: none"> Verify charging line flow to REGEN Hx - GREATER THAN 20 GPM Place the following switches to CLOSE: <ul style="list-style-type: none"> Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202) AOV-371, letdown isolation valve AOV-427, loop B cold leg to REGEN Hx Place letdown controllers in MANUAL at 40% open <ul style="list-style-type: none"> TCV-130 PCV-135 Reset both trains of XY relays for AOV-371 and AOV-427 Open AOV-371 and AOV-427 Open letdown orifice valves as necessary Place TCV-130 in AUTO at 105°F Place PCV-135 in AUTO at 250 psig Adjust charging pump speed and HCV-142 as necessary 	<p><u>IF</u> RCP seal return has been established, <u>THEN</u> establish excess letdown as follows:</p> <ul style="list-style-type: none"> Place excess letdown divert valve, AOV-312, to NORMAL. Ensure CCW from excess letdown open, (AOV-745). Open excess letdown isolation valve AOV-310. Slowly open HCV-123 to maintain excess letdown temperature less than 195°F and pressure less than 100 psig. Adjust charging pump speed as necessary. <p><u>IF</u> RCP seal return <u>NOT</u> established, <u>THEN</u> consult TSC to determine if excess letdown should be placed in service.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26	Check VCT Makeup System:	
	a. Adjust boric acid flow control valve in AUTO to 9.5 gpm	
	b. Verify the following:	b. Adjust controls as necessary.
	1) RMW mode selector switch in AUTO	
	2) RMW control armed - RED LIGHT LIT	
	c. Check VCT level:	c. Manually increase VCT makeup flow as follows:
	o Level - GREATER THAN 20%	
	-OR-	1) Ensure BA transfer pumps and RMW pumps running. <u>IF NOT</u> , <u>THEN</u> reset MCC C and MCC D UV lockouts as necessary.
	o Level - STABLE OR INCREASING	2) Place RMW flow control valve HCV-111 in MANUAL and increase RMW flow.
		3) Increase boric acid flow as necessary.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
27	<p>Check Charging Pump Suction Aligned To VCT:</p> <p>a. VCT level - GREATER THAN 20%</p> <p>b. Verify charging pumps aligned to VCT:</p> <ul style="list-style-type: none"> o LCV-112C - OPEN o LCV-112B - CLOSED 	<p>a. <u>IF</u> VCT level can <u>NOT</u> be maintained greater than 5%, <u>THEN</u> perform the following:</p> <p>1) Ensure charging pump suction aligned to RWST</p> <ul style="list-style-type: none"> o LCV-112B open o LCV-112C closed <p>2) Continue with Step 28. <u>WHEN</u> VCT level greater than 40%, <u>THEN</u> do Step 27b.</p> <p>b. Manually align valves as necessary.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28	<p>Check RCP Cooling:</p> <p>a. Check CCW to RCPs:</p> <ul style="list-style-type: none"> 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 <p>b. Check RCP seal injection:</p> <ul style="list-style-type: none"> o Labyrinth seal D/Ps - GREATER THAN 15 INCHES OF WATER <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o RCP seal injection flow to each RCP - GREATER THAN 6 GPM 	<p>Establish normal cooling to RCPs (Refer to Attachment SEAL COOLING).</p>

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29 Check If Seal Return Flow
Should Be Established:

- a. Verify RCP #1 seal outlet temperature - LESS THAN 235°F
- b. Verify RCP seal outlet valves - OPEN
 - AOV-270A
 - AOV-270B
- c. Reset both trains of XY relays for RCP seal return isolation valve MOV-313
- d. Open RCP seal return isolation valve MOV-313
- e. Verify RCP #1 seal leakoff flow - LESS THAN 5.5 GPM
- f. Verify RCP #1 seal leakoff flow - GREATER THAN 0.25 GPM

- a. Go to Step 30.
- b. Manually open valves as necessary.
- 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. 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 30.
- f. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p><u>NOTE:</u></p> <ul style="list-style-type: none"> o If auxiliary spray is in use, spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves. o When using PRZR PORV, select one with an operable block valve. 	
30	Energize Heaters And Operate Normal Spray As Necessary To Maintain RCS Pressure Stable	<p><u>IF</u> normal spray <u>NOT</u> available and letdown is in service, <u>THEN</u> use auxiliary spray valve (AOV-296).</p> <p><u>IF</u> PRZR spray <u>NOT</u> available, <u>THEN</u> use one PRZR PORV.</p> <p><u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to Attachment N2 PORVS.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31	<p>Verify All AC Busses - ENERGIZED BY OFFSITE POWER</p> <ul style="list-style-type: none"> o Normal feed breakers to all 480 volt busses - CLOSED o 480 bus voltage - GREATER THAN 420 VOLTS o Emergency D/G output breakers - OPEN 	<p>Perform the following:</p> <ul style="list-style-type: none"> a. <u>IF</u> any AC emergency bus normal feed breaker open, <u>THEN</u> ensure associated D/G breaker closed. b. Perform the following, as necessary: <ul style="list-style-type: none"> 1) Close non-safeguards bus tie breakers: <ul style="list-style-type: none"> • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Place the following pumps in PULL STOP: <ul style="list-style-type: none"> • EH pumps • Turning gear oil pump • HP seal oil backup pump 3) Restore power to MCCs. <ul style="list-style-type: none"> • A from Bus 13 • B from Bus 15 • E from Bus 15 • F from Bus 15 4) <u>WHEN</u> bus 15 restored, <u>THEN</u> reset control room lighting. 5) Refer to Attachment SI/UV for other equipment lost with loss of offsite power. c. Try to restore offsite power to all AC busses (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.</p> <p>*****</p>		
32	Check RCP Status - AT LEAST ONE RUNNING	<p>Try to start one RCP:</p> <ul style="list-style-type: none"> a. Establish conditions for starting an RCP. <ul style="list-style-type: none"> o Bus 11A or 11B energized o Refer to Attachment RCP START. b. Start one RCP. <p><u>IF</u> an RCP can <u>NOT</u> be started, <u>THEN</u> verify natural circulation (Refer to Attachment NC).</p> <p><u>IF</u> natural circulation can <u>NOT</u> be verified, <u>THEN</u> increase feed flow or dumping steam.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p><u>NOTE:</u> Adverse CNMT conditions or loss of forced air cooling may result in failure of NIS detectors.</p>		
33	Check If Source Range Detectors Should Be Energized:	
a.	Source range channels - DEENERGIZED	a. Go to Step 33e.
b.	Check intermediate range flux - EITHER CHANNEL LESS THAN 10 ⁻¹⁰ AMPS	b. Perform the following: <ul style="list-style-type: none"> 1) <u>IF</u> neither intermediate range channel is decreasing <u>THEN</u> initiate boration. 2) Continue with Step 34. <u>WHEN</u> flux is LESS THAN 10⁻¹⁰ amps on any operable channel, <u>THEN</u> do Steps 33c, d and e.
c.	Check the following: <ul style="list-style-type: none"> o Both intermediate range channels - LESS THAN 10⁻¹⁰ AMPS <p>-OR-</p> <ul style="list-style-type: none"> o Greater than 20 minutes since reactor trip 	c. Continue with step 34. <u>WHEN</u> either condition met, <u>THEN</u> do Steps 33d and e.
d.	Verify source range detectors - ENERGIZED	d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2). <p><u>IF</u> source ranges can <u>NOT</u> be restored, <u>THEN</u> refer to ER-NIS.1, SR MALFUNCTION and go to Step 34.</p>
e.	Transfer Rk-45 recorder to one source range and one intermediate range channel.	

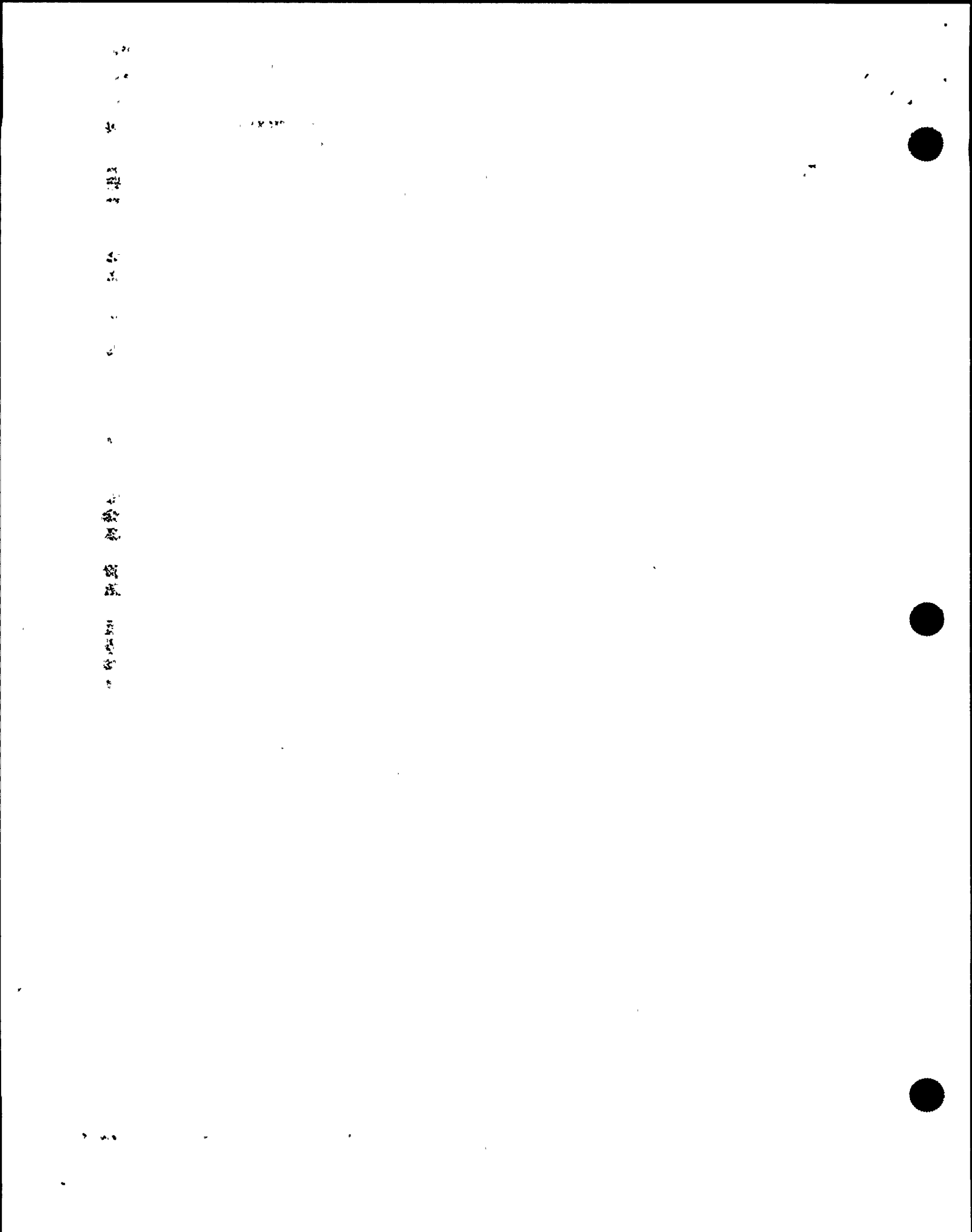


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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34	<p>Check If Emergency D/Gs Should Be Stopped:</p> <ul style="list-style-type: none"> a. Verify AC emergency busses energized by offsite power: <ul style="list-style-type: none"> o Emergency D/G output breakers - OPEN o AC emergency bus voltage - GREATER THAN 420 VOLTS o AC emergency bus normal feed breakers - CLOSED b. Stop any unloaded emergency D/G and place in standby (Refer to Attachment D/G STOP) 	<ul style="list-style-type: none"> a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
35	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 36.
	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	



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
36	Maintain Plant Conditions - STABLE o RCS pressure o PRZR level o RCS temperatures	Control plant systems as necessary to maintain conditions stable.
*37	Monitor SI Reinitiation Criteria: a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	a. Manually operate SI pumps as necessary. Return to Step 2. b. Control charging flow to maintain PRZR level. . <u>IF</u> PRZR level can <u>NOT</u> be maintained, <u>THEN</u> manually operate SI pumps as necessary. Return to Step 2.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38	<p>Check If SI ACCUMs Should Be Isolated:</p> <p>a. Check the following:</p> <ul style="list-style-type: none"> o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING o PRZR level - GREATER THAN 5% [30% adverse CNMT] <p>b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves</p> <ul style="list-style-type: none"> • MOV-841, MCC C position 12F • MOV-865, MCC D position 12C <p>c. Close SI ACCUM discharge valves</p> <ul style="list-style-type: none"> • MOV-841 • MOV-865 <p>d. Locally reopen breakers for MOV-841 and MOV-865</p>	<p>a. Go to Step 39.</p> <p>c. Vent any unisolated ACCUMs:</p> <p>1) Open vent valves for unisolated SI ACCUMs.</p> <ul style="list-style-type: none"> • ACCUM A, AOV-834A • ACCUM B, AOV-834B <p>2) Open HCV-945.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
39	Check RCS Hot Leg Temperatures - LESS THAN 350°F	Control feed flow and dump steam to establish RCS cooldown rate less than 100°F/hr in RCS cold legs.
<p><u>NOTE:</u> o If auxiliary spray is in use, spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves.</p> <p> o When using PRZR PORV, select one with operable block valve.</p>		
40	Check RCS Pressure - LESS THAN 400 PSIG [300 PSIG adverse CNMT]	<p>Use normal PRZR spray.</p> <p><u>IF</u> normal spray <u>NOT</u> available and letdown is in service, <u>THEN</u> use auxiliary spray.</p> <p><u>IF NOT</u>, <u>THEN</u> use one PRZR PORV.</p> <p><u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to Attachment N2 PORVS.</p>



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
41	Check If RHR Normal Cooling Can Be Established:	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Return to Step 37.
	b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Return to Step 40.
	c. Place letdown pressure controller (PCV-135) in MANUAL CLOSED	
	d. Check following valves - OPEN <ul style="list-style-type: none"> • AOV-371, letdown isolation valve • AOV-427, loop B cold leg to REGEN Hx • At least one letdown orifice valve (AOV-200A, AOV-200B, or AOV-202) 	d. Perform the following: <ol style="list-style-type: none"> 1) Reset both trains of XY relays for AOV-371 and AOV-427. 2) Open AOV-371 and AOV-427. 3) Open one letdown orifice valve.
	e. Verify pressure on PI-135 - LESS THAN 400 PSIG	e. Return to Step 40.
	f. Place RCS overpressure protection system in service (Refer to O-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	f. <u>IF</u> RCS overpressure protection system can <u>NOT</u> be placed in service, <u>THEN</u> notify TSC of potential Tech Spec violation if RHR system is placed in service.
	g. Establish RHR normal cooling (Refer to Attachment RHR COOL)	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
42	Continue RCS Cooldown To Cold Shutdown: a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR b. Check narrow range level in both S/Gs - LESS THAN 50%	b. Control feed flow to maintain narrow range level less than 50% in both S/Gs. "
43	Check Core Exit T/Cs - LESS THAN 200°F	Return to Step 42.
44	Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions b. Consult TSC	
		-END-

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2) FIGURE MIN SUBCOOLING	1
3) ATTACHMENT FAULTED S/G	1
4) ATTACHMENT CNMT RECIRC FANS	1
5) ATTACHMENT NC	1
6) ATTACHMENT RCP START	1
7) ATTACHMENT N2 PORVS	1
8) ATTACHMENT SEAL COOLING	2
9) ATTACHMENT SI/UV	1
10) ATTACHMENT D/G STOP	1
11) ATTACHMENT SD-1	1
12) ATTACHMENT SD-2	1
13) ATTACHMENT RHR COOL	2
14) ATTACHMENT AUX BLDG SW	1
15) FOLDOUT	1



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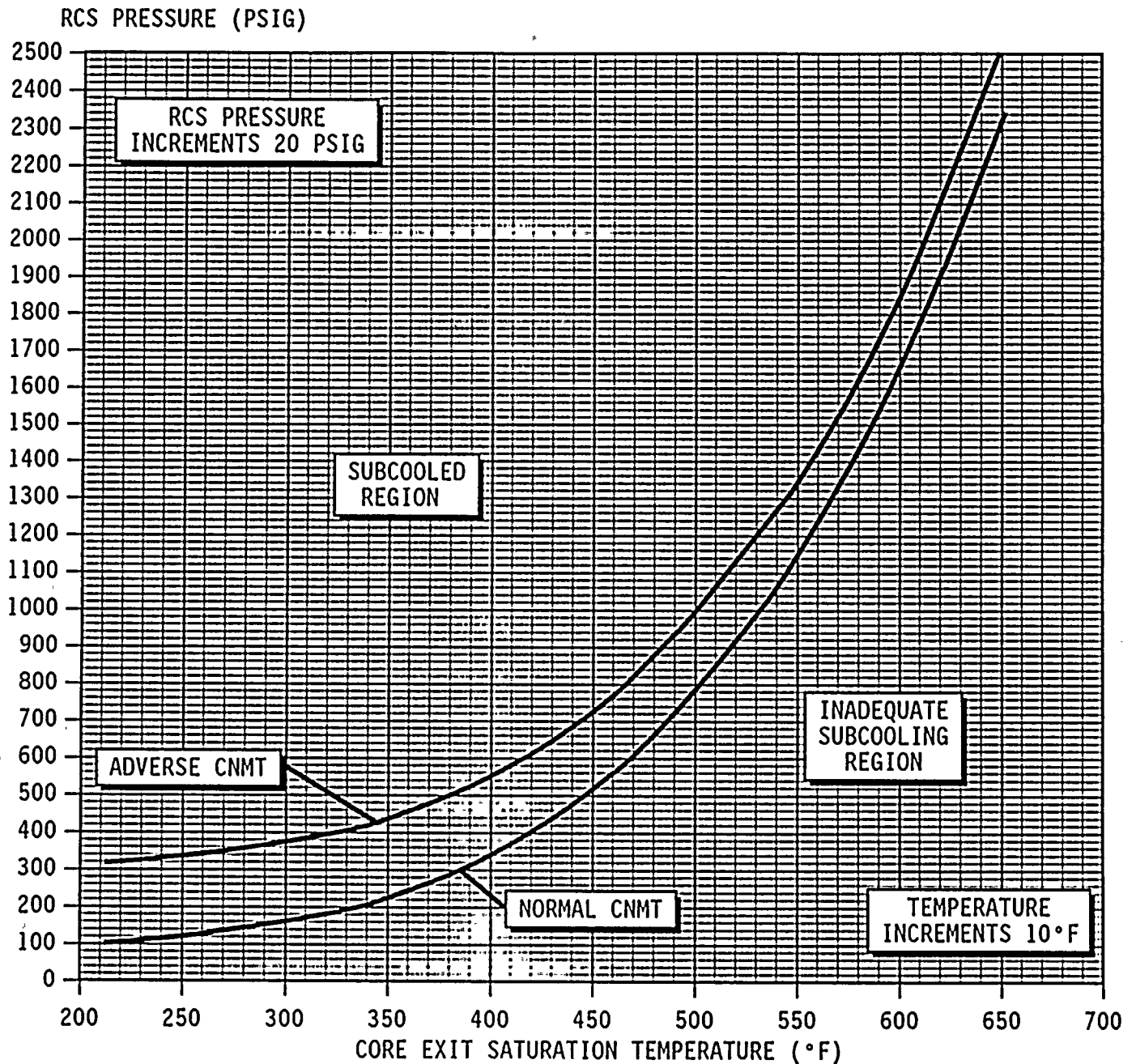
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FIGURE MIN SUBCOOLING

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





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FOLDOUT PAGE

1. SI REINITIATION CRITERIA

Manually operate SI pumps as necessary if EITHER condition listed below occurs:

- o RCS subcooling based on core exit TCs - LESS THAN 0°F USING REQUIREMENTS OF FIGURE MIN SUBCOOLING
- o PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN 5% [30% ADVERSE CNMT]

2. E-2 TRANSITION CRITERIA

IF any S/G pressure increases at any time, THEN go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.

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).

