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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

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TECHNICAL REVIEW

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Thomas H. Marlow  
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A. PURPOSE - This procedure provides actions to cool down and depressurize the RCS to cold shutdown conditions while minimizing loss of RCS inventory and voiding in the RCS for an SGTR concurrent with a LOCA (i.e. Ruptured-Faulted S/G).

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. E-3, STEAM GENERATOR TUBE RUPTURE, if ruptured S/G can not be isolated from any intact S/G.
- b. E-3, STEAM GENERATOR TUBE RUPTURE, if PRZR PORV can not be isolated by closing its block valve.
- c. E-3, STEAM GENERATOR TUBE RUPTURE, if ruptured S/G is faulted.
- d. E-3, STEAM GENERATOR TUBE RUPTURE, and ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, if no intact S/G is available for RCS cooldown.
- e. E-3, STEAM GENERATOR TUBE RUPTURE, if minimum D/P between ruptured and intact S/G cannot be maintained.
- f. E-3, STEAM GENERATOR TUBE RUPTURE, if RCS subcooling is less than required.
- g. E-3, STEAM GENERATOR TUBE RUPTURE, if RCS pressure does not increase after closing PRZR PORV and block valve.
- h. E-3, STEAM GENERATOR TUBE RUPTURE, and ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, if SI can not be terminated.
- i. E-3, STEAM GENERATOR TUBE RUPTURE, and ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, if SI is reinitiated after termination.
- j. E-3, STEAM GENERATOR TUBE RUPTURE, ES-3.1, POST-SGTR COOLDOWN USING BACKFILL, ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, and ES-3.3, POST-SGTR COOLDOWN USING STEAM DUMP, if SI accumulators should not be isolated.

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- k. ES-3.1, POST-SGTR COOLDOWN USING BACKFILL,  
ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, and  
ES-3.3, POST-SGTR COOLDOWN USING STEAM DUMP, if  
a non-ruptured S/G is not available for RCS cooldown.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>o IF RWST LEVEL DECREASES TO LESS THAN 28%, THEN THE SI SYSTEM SHOULD BE ALIGNED FOR COLD LEG RECIRCULATION USING ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.</p> <p>o IF PRZR LEVEL IS LESS THAN 50% OR IF ADVERSE CNMT CONDITIONS EXIST, THEN PRZR HEATERS SHOULD NOT BE ENERGIZED UNTIL PRZR LEVEL IS EVALUATED BY THE TSC.</p> <p>o 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> <p>*****</p> <p><u>NOTE:</u> o Foldout page should be open AND monitored periodically.</p> <p>o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than <math>10^{+05}</math> R/hr.</p> <p>1 Reset SI</p> <p>2 Reset CI:</p> <p>a. Depress CI reset pushbutton</p> <p>b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED</p> <p>b. Perform the following:</p> <p>1) Reset SI.</p> <p>2) Depress CI reset pushbutton.</p>		



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Verify Adequate SW Flow:	
	a. Check at least two SW pumps - RUNNING	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 5.
	b. Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1)	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Establish IA to CNMT:	
a.	Verify non-safeguards busses energized from offsite power <ul style="list-style-type: none"> <li>o Bus 13 normal feed - CLOSED</li> <li>-OR-</li> <li>o Bus 15 normal feed - CLOSED</li> </ul>	a. Perform the following: <ol style="list-style-type: none"> <li>1) Close non-safeguards bus tie breakers: <ul style="list-style-type: none"> <li>• Bus 13 to Bus 14 tie</li> <li>• Bus 15 to Bus 16 tie</li> </ul> </li> <li>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).</li> </ol>
b.	Verify SW isolation valves to turbine building - OPEN <ul style="list-style-type: none"> <li>• MOV-4613 and MOV-4670</li> <li>• MOV-4614 and MOV-4664</li> </ul>	b. Manually align valves.
c.	Verify at least two air compressors - RUNNING	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 AO to locally reset compressors as necessary.
d.	Check IA supply: <ul style="list-style-type: none"> <li>o Pressure - GREATER THAN 60 PSIG</li> <li>o Pressure - STABLE OR INCREASING</li> </ul>	d. Perform the following: <ol style="list-style-type: none"> <li>1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR).</li> <li>2) Continue with Step 5. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 4e and f.</li> </ol>
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
* 5	<p>Monitor All AC Busses - BUSSES ENERGIZED BY OFFSITE POWER</p> <ul style="list-style-type: none"> <li>o Normal feed breakers to all 480 volt busses - CLOSED</li> <li>o 480 bus voltage - GREATER THAN 420 VOLTS</li> <li>o Emergency D/G output breakers - OPEN</li> </ul>	<p>Perform the following:</p> <ul style="list-style-type: none"> <li>a. <u>IF</u> any AC emergency bus normal feed breaker open, <u>THEN</u> ensure associated D/G breaker closed.</li> <li>b. Perform the following, as necessary: <ul style="list-style-type: none"> <li>1) Close non-safeguards bus tie breakers: <ul style="list-style-type: none"> <li>• Bus 13 to Bus 14 tie</li> <li>• Bus 15 to Bus 16 tie</li> </ul> </li> <li>2) Place the following pumps in PULL STOP: <ul style="list-style-type: none"> <li>• EH pumps</li> <li>• Turning gear oil pump</li> <li>• HP seal oil backup pump</li> </ul> </li> <li>3) Restore power to MCCs. <ul style="list-style-type: none"> <li>• A from Bus 13</li> <li>• B from Bus 15</li> <li>• E from Bus 15</li> <li>• F from Bus 15</li> </ul> </li> <li>4) <u>WHEN</u> bus 15 restored, <u>THEN</u> reset control room lighting.</li> <li>5) Refer to Attachment SI/UV for other equipment lost with loss of offsite power.</li> </ul> </li> <li>c. Try to restore offsite power to all AC busses (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).</li> </ul>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 6	Monitor If CNMT Spray Should Be Stopped:	
a.	CNMT spray pumps - ANY RUNNING	a. Go to Step 7.
b.	Check the following: <ul style="list-style-type: none"> <li>o CNMT pressure - LESS THAN 4 PSIG</li> <li>o Sodium hydroxide tank level - LESS THAN 55%</li> </ul>	b. Continue with Step 7. <u>WHEN</u> BOTH conditions satisfied, <u>THEN</u> do Steps 6c through f.
c.	Reset CNMT spray	
d.	Check NaOH tank outlet valves - CLOSED <ul style="list-style-type: none"> <li>• AOV-836A</li> <li>• AOV-836B</li> </ul>	d. Place NaOH tank outlet valve controllers to MANUAL and close valves.
e.	Stop CNMT spray pumps and place in AUTO	
f.	Close CNMT spray pump discharge valves <ul style="list-style-type: none"> <li>• MOV-860A</li> <li>• MOV-860B</li> <li>• MOV-860C</li> <li>• MOV-860D</li> </ul>	

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. *****		
7	<p>Check If RHR Pumps Should Be Stopped:</p> <p>a. Check RCS pressure:</p> <ul style="list-style-type: none"> <li>o Pressure - GREATER THAN 250 psig [465 psig adverse CNMT]</li> <li>o Pressure - STABLE OR INCREASING</li> </ul> <p>b. Stop RHR pumps and place in AUTO</p>	a. Go to Step 8.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>IF ANY RUPTURED S/G IS FAULTED, FEED FLOW TO THAT S/G SHOULD REMAIN ISOLATED DURING SUBSEQUENT RECOVERY ACTIONS UNLESS NEEDED FOR RCS COOLDOWN.</p> <p>*****</p>		
* 8 Monitor Ruptured S/G Level:		
a.	Narrow range level - GREATER THAN 5% [25% adverse CNMT]	a. <u>IF</u> ruptured S/G <u>NOT</u> faulted, <u>THEN</u> perform the following:
		1) Maintain feed flow to ruptured S/G until level greater than 5% [25% adverse CNMT].
		2) Continue with Step 9. <u>WHEN</u> ruptured S/G level greater than 5% [25% adverse CNMT], <u>THEN</u> do Steps 8b through e.
b.	Close MDAFW pump discharge valve to ruptured S/G	b. Dispatch AO to locally close valve.
	<ul style="list-style-type: none"> <li>• S/G A, MOV-4007</li> <li>• S/G B, MOV-4008</li> </ul>	
c.	Pull stop MDAFW pump for ruptured S/G	
d.	Close TDAFW pump flow control valve to ruptured S/G	d. Dispatch AO with locked valve key to locally close TDAFW pump manual feedwater isolation valve to ruptured S/G.
	<ul style="list-style-type: none"> <li>• S/G A, AOV-4297</li> <li>• S/G B, AOV-4298</li> </ul>	<ul style="list-style-type: none"> <li>• S/G A, V-4005</li> <li>• S/G B, V-4006</li> </ul>
e.	Verify MDAFW pump crosstie valves - CLOSED	e. Manually close valves.
	<ul style="list-style-type: none"> <li>• MOV-4000A</li> <li>• MOV-4000B</li> </ul>	



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Establish 75 GPM Charging Flow:	
	a. Charging pumps - ANY RUNNING	a. Perform the following: <ul style="list-style-type: none"> <li>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 RWST area key to locally isolate seal injection to affected RCP. <ul style="list-style-type: none"> <li>• RCP A, V-300A</li> <li>• RCP B, V-300B</li> </ul> </li> <li>2) Ensure HCV-142 open.</li> </ul>
	b. Align charging pump suction to RWST: <ul style="list-style-type: none"> <li>o LCV-112B - OPEN</li> <li>o LCV-112C - CLOSED</li> </ul>	b. <u>IF</u> LCV-112B can <u>NOT</u> be opened, <u>THEN</u> perform the following: <ul style="list-style-type: none"> <li>1) Verify charging pump A <u>NOT</u> running and place in PULL STOP.</li> <li>2) Dispatch AO to locally open manual charging pump suction from RWST (V-358 located in charging pump room).</li> <li>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).</li> </ul>
	c. Start charging pumps as necessary and establish 75 gpm total charging flow <ul style="list-style-type: none"> <li>• Charging line flow</li> <li>• Seal injection</li> </ul>	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	<p>Check If S/G Secondary Side Is Intact:</p> <ul style="list-style-type: none"> <li>o Pressure in both S/Gs - STABLE OR INCREASING</li> <li>o Pressure in both S/Gs - GREATER THAN 100 PSIG</li> </ul>	<p><u>IF</u> any S/G pressure decreasing in an uncontrolled manner <u>OR</u> completely depressurized, <u>THEN</u> verify faulted S/G isolated unless needed for RCS cooldown:</p> <ul style="list-style-type: none"> <li>• Steamlines</li> <li>• Feedlines</li> </ul> <p><u>IF NOT</u>, <u>THEN</u> go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.</p> <p>*****  <u>CAUTION</u>            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).            *****</p> <p><u>NOTE:</u> TDAFW pump flow control valves fail open on loss of IA.</p>
*12	<p>Monitor Intact S/G Levels:</p> <ul style="list-style-type: none"> <li>a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]</li> <li>b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%</li> </ul>	<ul style="list-style-type: none"> <li>a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in intact S/G.</li> <li>b. <u>IF</u> narrow range level in the intact S/G continues to increase in an uncontrolled manner, <u>THEN</u> consider isolating unnecessary release paths:               <ul style="list-style-type: none"> <li>• TDAFW pump steam supply valves</li> <li>• S/G blowdown valves</li> <li>• Refer to Attachment RUPTURED S/G</li> </ul> </li> </ul>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p><u>NOTE:</u> Shutdown margin should be monitored during RCS cooldown (Refer to Figure SDM).</p>	
13	Initiate RCS Cooldown To Cold Shutdown:	
	<p>a. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR</p> <p>b. Use RHR system if in service</p> <p>c. Dump steam to condenser from intact S/G</p>	<p>c. Manually or locally dump steam using intact S/G ARV.</p> <p><u>IF</u> no intact S/G available, <u>THEN</u> perform the following:</p> <p>o Use faulted S/G.</p> <p>-OR-</p> <p>o <u>IF</u> RHR system <u>NOT</u> in service, <u>THEN</u> use ruptured S/G.</p>
14	Check RCS Subcooling Based On Core Exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING	Go to Step 28.
*15	Monitor Conditions For Subcooled Recovery:	. . .
	<p>a. Check RWST level - GREATER THAN 50%</p> <p>b. Check ruptured S/G narrow level - LESS THAN 90% [85% adverse CNMT]</p>	<p>a. <u>IF</u> CNMT sump B level is less than 113 inches, <u>THEN</u> go to ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED, Step 1.</p> <p>b. Consult TSC to determine if recovery should be completed using ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED.</p>



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	<p>Check Safeguards Pump Status</p> <ul style="list-style-type: none"> <li>o SI pumps - ANY RUNNING</li> </ul> <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> <li>o RHR pumps - ANY RUNNING IN INJECTION MODE</li> </ul>	Go to Step 24.
17	<p>Place PRZR Heater Switches In The Following Positions:</p> <ul style="list-style-type: none"> <li>o PRZR heater control group - PULL STOP</li> <li>o PRZR heater backup group - OFF</li> </ul>	
18	<p>Check PRZR level - LESS THAN 13% [40% adverse CNMT]</p>	Go to Step 20.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
***** <u>CAUTION</u> VOIDING MAY OCCUR IN THE RCS DURING RCS DEPRESSURIZATION. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL. *****		
<p><u>NOTE:</u>   o   When using PRZR PORV, select one with an operable block valve.</p> <p>          o   If auxiliary spray is in use, then spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves.</p>		
19	Depressurize RCS To Refill PRZR:	
	<p>a. Use normal PRZR spray valve associated with running RCP</p> <ul style="list-style-type: none"> <li>• RCP A, PCV-431A</li> <li>• RCP B, PCV-431B</li> </ul>	<p>a. Use one PRZR PORV. <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to Attachment N2 PORVS.</p> <p><u>IF</u> no PORV available, <u>THEN</u> use auxiliary spray valve.</p>
	<p>b. PRZR level - GREATER THAN 13% [40% adverse CNMT]</p>	<p>b. Continue with Step 20. <u>WHEN</u> level greater than 13% [40% adverse CNMT], <u>THEN</u> stop RCS depressurization.</p>
	<p>c. Stop RCS depressurization</p>	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*****		
<p style="text-align: center;"><u>CAUTION</u></p>		
<ul style="list-style-type: none"> <li>o IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.</li> <li>o INADVERTENT CRITICALITY MAY OCCUR FOLLOWING NATURAL CIRCULATION COOLDOWN IF THE RCP IN THE RUPTURED LOOP IS STARTED FIRST.</li> </ul>		
*****		
20	Check If An RCP Should Be Started:	
	<ul style="list-style-type: none"> <li>a. Both RCPs - STOPPED</li> <li>b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING</li> <li>c. PRZR level - GREATER THAN 13% [40% adverse CNMT]</li> <li>d. Try to start an RCP               <ul style="list-style-type: none"> <li>1) Establish conditions for starting an RCP                   <ul style="list-style-type: none"> <li>o Bus 11A or 11B energized</li> <li>o Refer to Attachment RCP START</li> </ul> </li> <li>2) Start one RCP</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>a. Stop all but one RCP and go to Step 21.</li> <li>b. Go to Step 28.</li> <li>c. Return to Step 18.</li> </ul>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	Check If One Of Three SI Pumps Should Be Stopped:	
a.	Three SI pumps - RUNNING	a. Go to Step 22.
b.	RCS subcooling based on core exit T/Cs - GREATER THAN 35°F [90°F adverse CNMT] USING FIGURE MIN SUBCOOLING	b. <u>IF</u> RCS hot leg temperatures greater than 320°F [310°F adverse CNMT], <u>OR IF</u> RHR normal cooling in service, <u>THEN</u> go to Step 28.  <u>IF</u> RHR normal cooling <u>NOT</u> in service <u>AND</u> RCS hot leg temperatures less than 320°F [310°F adverse CNMT], <u>THEN</u> ensure at least one RHR pump running in injection mode and go to Step 21c. <u>IF</u> no RHR pump can be operated in injection mode, <u>THEN</u> go to Step 28.
c.	Check PRZR level - GREATER THAN 13% [40% adverse CNMT]	c. Do <u>NOT</u> stop SI pump. Return to Step 18.
d.	Stop one SI pump	

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

22 Check If One Of Two SI Pumps  
Should Be Stopped:

a. Two SI pumps - RUNNING

a. Go to Step 23.

b. Determine required RCS  
subcooling from table:

Charging Pump Availability	RCS Subcooling Criteria
NONE	120°F [200°F adverse CNMT]
ONE	115°F [190°F adverse CNMT]
TWO	105°F [180°F adverse CNMT]
THREE	100°F [175°F adverse CNMT]

c. RCS subcooling based on core  
exit T/Cs - GREATER THAN VALUE  
FROM TABLE ABOVE USING FIGURE  
MIN SUBCOOLING

c. IF RCS hot leg temperatures  
greater than 320°F [310°F  
adverse CNMT], OR IF RHR normal  
cooling in service, THEN go to  
Step 28.

IF RHR normal cooling NOT in  
service AND RCS hot leg  
temperatures less than 320°F  
[310°F adverse CNMT], THEN  
ensure at least one RHR pump  
running in injection mode and go  
to Step 22d. IF no RHR pump can  
be operated in injection mode,  
THEN go to Step 28.

d. PRZR level - GREATER THAN 13%  
[40% adverse CNMT]

d. Do NOT stop SI pump. Return to  
Step 18.

e. Stop one SI pump

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

23 Check If Last SI Pump Should Be Stopped:

a. One SI pump - RUNNING

a. IF any RHR pump running in injection mode, THEN go to Step 28. IF NOT, THEN go to Step 24.

b. Determine required RCS subcooling from table:

Charging Pump Availability	RCS Subcooling Criteria
NONE	Insufficient subcooling to stop SI pump.
ONE	255°F [295°F adverse CNMT]
TWO	235°F [285°F adverse CNMT]
THREE	210°F [270°F adverse CNMT]

c. RCS subcooling based on core exit T/Cs - GREATER THAN VALUE FROM TABLE ABOVE USING FIGURE MIN SUBCOOLING

c. IF RCS hot leg temperatures greater than 320°F [310°F adverse CNMT] OR IF RHR normal cooling in service, THEN go to Step 28.

IF RHR normal cooling NOT in service AND RCS hot leg temperatures less than 320°F [310°F adverse CNMT], THEN ensure at least one RHR pump running in injection mode and go to Step 23d. IF no RHR pump can be operated in injection mode, THEN go to Step 28.

d. PRZR level - GREATER THAN 13% [40% adverse CNMT]

d. Do NOT stop SI pump. Return to Step 18.

e. Stop running SI pump

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	Check If Charging Flow Should Be Controlled To Maintain PRZR Level:	
	a. Check RHR pumps - RUNNING IN INJECTION MODE	a. Start charging pumps and control charging flow to maintain PRZR level and go to Step 25.
	b. Go to Step 28	
	*****	
	<u>CAUTION</u>	
	o IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.	
	o INADVERTENT CRITICALITY MAY OCCUR FOLLOWING NATURAL CIRCULATION COOLDOWN IF THE RCP IN THE RUPTURED LOOP IS STARTED FIRST.	
	*****	
25	Check RCP Status:	
	a. RCPs - AT LEAST ONE RUNNING	a. Perform the following:
		1) Establish conditions for starting an RCP:
		o Verify bus 11A or 11B energized.
		o Refer to Attachment RCP START.
		2) Start one RCP.
		<u>IF</u> an RCP can <u>NOT</u> be started, <u>THEN</u> verify natural circulation (Refer to Attachment NC).
		<u>IF</u> natural circulation <u>NOT</u> verified, <u>THEN</u> increase dumping steam.
	b. Stop all but one RCP	





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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
***** <u>CAUTION</u> VOIDING MAY OCCUR IN THE RCS DURING RCS DEPRESSURIZATION. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL. *****		
<p><u>NOTE:</u> o WHEN using a PRZR PORV, THEN select one with an operable block valve.</p> <p>o If auxiliary spray is in use, then spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves.</p> <p>26 Depressurize RCS To Minimize RCS Subcooling:</p> <p>a. Depressurize using normal PRZR spray if available</p> <p>a. Depressurize using one PRZR PORV. <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to Attachment N2 PORVS.</p> <p><u>IF</u> no PORV available, <u>THEN</u> use auxiliary spray valve (AOV-296).</p> <p>b. Energize PRZR heaters as necessary</p> <p>c. Depressurize RCS until EITHER of the following conditions satisfied:</p> <p>o RCS subcooling based on core exit T/Cs - LESS THAN 10°F USING FIGURE MIN SUBCOOLING</p> <p>-OR-</p> <p>o PRZR level - GREATER THAN 75% [65% adverse CNMT]</p>		

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p><u>NOTE:</u> Leakage from ruptured S/G into RCS will dilute RCS boron concentration.</p>		
27	Verify Adequate Shutdown Margin	
	<p>a. Direct RP to sample RCS and ruptured S/G for boron concentration</p> <p>b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIGURE SDM</p>	<p>b. Borate as necessary.</p>
*28	Monitor SI Reinitiation Criteria:	
	<p>a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING</p> <p>b. PRZR level - GREATER THAN 5% [30% adverse CNMT]</p>	<p>a. Manually operate SI pumps as necessary and go to Step 29.</p> <p>b. Manually operate SI pumps as necessary and return to Step 18.</p>

EOP:

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SGTR WITH LOSS OF REACTOR COOLANT -  
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

## 29 Check If SI ACCUMs Should Be Isolated:

a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING

a. IF both RCS hot leg temperatures less than 400°F, THEN go to Step 29c.

IF NOT, THEN go to Step 30.

b. PRZR level - GREATER THAN 5% [30% adverse CNMT]

b. Return to Step 18.

c. 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

d. Close SI ACCUM discharge valves

- MOV-841
- MOV-865

d. Vent any unisolated ACCUMs:

1) Open vent valves for unisolated SI ACCUMs.

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

2) Open HCV-945.

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



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30	<p>Check If Emergency D/Gs Should Be Stopped:</p> <ul style="list-style-type: none"> <li>a. Verify AC emergency busses energized by offsite power: <ul style="list-style-type: none"> <li>o Emergency D/G output breakers - OPEN</li> <li>o AC emergency bus voltage - GREATER THAN 420 VOLTS</li> <li>o AC emergency bus normal feed breakers - CLOSED</li> </ul> </li> <li>b. Stop any unloaded emergency D/G and place in standby (Refer to Attachment D/G STOP)</li> </ul>	<ul style="list-style-type: none"> <li>a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).</li> </ul>
31	<p>Minimize Secondary System Contamination:</p> <ul style="list-style-type: none"> <li>a. Isolate reject from hotwell to CST: <ul style="list-style-type: none"> <li>o Place hotwell level controller (HC-107) in MANUAL at 50%</li> <li>o Verify hotwell level - STABLE</li> </ul> </li> <li>b. Verify local actions to complete isolation of ruptured S/G (Refer to Attachment RUPTURED S/G)</li> </ul>	<ul style="list-style-type: none"> <li>a. <u>IF</u> hotwell level increasing, <u>THEN</u> direct RP to sample hotwells for activity.</li> </ul>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
32	Verify Adequate SW Flow To CCW Hx:	
	<ul style="list-style-type: none"> <li>a. Verify at least two SW pumps - RUNNING</li> <li>b. Verify AUX BLDG SW isolation valves - OPEN <ul style="list-style-type: none"> <li>• MOV-4615 and MOV-4734</li> <li>• MOV-4616 and MOV-4735</li> </ul> </li> <li>c. Verify CNMT RECIRC fan annunciator C-2, HIGH TEMPERATURE ALARM - EXTINGUISHED</li> </ul>	<ul style="list-style-type: none"> <li>a. Manually start pumps as power supply permits (258 kw per pump). <u>IF</u> less than two SW pumps can be operated, <u>THEN</u> go to Step 33.</li> <li>b. Establish SW to AUX BLDG (Refer to Attachment AUX BLDG SW).</li> <li>c. Dispatch AO to locally throttle flow to CCW Hx to between 5000 gpm and 6000 gpm total flow.</li> </ul>
33	Check RCP Cooling	Establish normal cooling to RCPs (Refer to Attachment SEAL COOLING).
	<ul style="list-style-type: none"> <li>a. Check CCW to RCPs <ul style="list-style-type: none"> <li>o Annunciator A-7, RCP 1A CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED</li> <li>o Annunciator A-15, RCP 1B CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED</li> </ul> </li> <li>b. Check RCP seal injection <ul style="list-style-type: none"> <li>o Labyrinth seal D/Ps - GREATER THAN 15 INCHES OF WATER</li> </ul> </li> </ul> <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> <li>o RCP seal injection flow to each RCP - GREATER THAN 6 GPM</li> </ul>	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34	Check If Seal Return Flow Should Be Established:	
a.	Verify instrument bus D - ENERGIZED	a. Perform the following: 1) Ensure steam dump mode control in MANUAL. 2) Restore power to instrument bus D from MCC B or MCC A (maintenance supply).
b.	Verify RCP #1 seal outlet temperature - LESS THAN 235°F	b. Go to Step 35.
c.	Verify RCP seal outlet valves - OPEN • AOV-270A • AOV-270B	c. Manually open valves as necessary.
d.	Reset both trains of XY relays for RCP seal return isolation valve MOV-313	
e.	Open RCP seal return isolation valve MOV-313	e. Perform the following: 1) Place MOV-313 switch to OPEN. 2) Dispatch AO with key to RWST gate to locally open MOV-313.
f.	Verify RCP #1 seal leakoff flow - LESS THAN 5.5 GPM	f. Perform the following: 1) Trip the affected RCP 2) Allow 3 minutes for pump coast down, <u>THEN</u> close the affected RCP seal discharge valve • RCP A, AOV-270A • RCP B, AOV-270B <u>IF</u> both RCP seal discharge valves are shut, <u>THEN</u> go to Step 35.
g.	Verify RCP #1 seal leakoff flow - GREATER THAN 0.8 GPM	g. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.

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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>		
35	Check If Source Range Detectors Should Be Energized:	
a.	Source range channels - DEENERGIZED	a. Go to Step 35e.
b.	Check intermediate range flux - EITHER CHANNEL LESS THAN 10 <sup>-10</sup> AMPS	b. Perform the following: <ol style="list-style-type: none"> <li>1) <u>IF</u> neither intermediate range channel is decreasing, <u>THEN</u> initiate boration.</li> <li>2) Continue with Step 36. <u>WHEN</u> flux is LESS THAN 10<sup>-10</sup> amps on any operable channel, <u>THEN</u> do Steps 35c, d and e.</li> </ol>
c.	Check the following: <ul style="list-style-type: none"> <li>o Both intermediate range channels - LESS THAN 10<sup>-10</sup> AMPS</li> </ul> <p>-OR-</p> <ul style="list-style-type: none"> <li>o Greater than 20 minutes since reactor trip</li> </ul>	c. Continue with Step 36. <u>WHEN</u> either condition met, <u>THEN</u> do Steps 35d 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 36.</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
36	<p>Establish Normal Shutdown Alignment:</p> <p>a. Check condenser - AVAILABLE</p> <p>b. Perform the following:</p> <ul style="list-style-type: none"> <li>o Open generator disconnects <ul style="list-style-type: none"> <li>• 1G13A71</li> <li>• 9X13A73</li> </ul> </li> <li>o Place voltage regulator to OFF</li> <li>o Open turbine drain valves</li> <li>o Rotate reheater steam supply controller cam to close valves</li> <li>o Place reheater dump valve switches to HAND</li> <li>o Stop all but one condensate pump</li> </ul> <p>c. Verify Attachment SD-1 - COMPLETE</p>	<p>a. Dispatch A0 to perform Attachment SD-2.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
***** CAUTION *****		
FEED FLOW SHOULD NOT BE ESTABLISHED TO ANY RUPTURED S/G WHICH IS ALSO FAULTED UNLESS IT IS NEEDED FOR RCS COOLDOWN. *****		
*37	Monitor Ruptured S/G(s) Narrow Range Level - GREATER THAN 17% [25% adverse CNMT]	<p>Refill ruptured S/G to 67% [55% adverse CNMT] using feed flow.</p> <p><u>IF</u> either of the following conditions occurs, <u>THEN</u> stop feed flow to ruptured S/G unless needed for RCS cooldown:</p> <ul style="list-style-type: none"> <li>o Ruptured S/G pressure decreases in an uncontrolled manner.</li> </ul> <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> <li>o Ruptured S/G pressure increases to 1020 psig.</li> </ul>
*38	Monitor RCP Operation:	
	a. RCPs - ANY RUNNING	a. Go to Step 39.
	b. Check the following:	b. Stop affected RCP(s).
	<ul style="list-style-type: none"> <li>o RCP #1 seal D/P - GREATER THAN 220 PSID</li> <li>o Check RCP seal leakage - WITHIN THE NORMAL OPERATING RANGE OF FIGURE RCP SEAL LEAKOFF</li> </ul>	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
39	Check Condenser Steam Dump Available - CONDENSER VACUUM GREATER THAN 20 INCHES HG	<p>Manually or locally dump steam using intact S/G ARV.</p> <p><u>IF</u> no intact S/G available, <u>THEN</u>:</p> <ul style="list-style-type: none"> <li>o Use faulted S/G.</li> </ul> <p>-OR-</p> <ul style="list-style-type: none"> <li>o <u>IF</u> RHR system <u>NOT</u> in service, <u>THEN</u> use ruptured S/G.</li> </ul>

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

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p><u>NOTE:</u> This procedure should be continued while obtaining CNMT hydrogen sample in Step 41.</p>		
41	<p>Check CNMT Hydrogen Concentration:</p> <p>a. Direct RP to start CNMT hydrogen monitors as necessary</p> <p>b. Hydrogen concentration - LESS THAN 0.5%</p>	<p>b. Consult TSC to determine if hydrogen recombiners should be placed in service.</p>
42	<p>Check Core Exit T/Cs - LESS THAN 200°F</p>	<p>Return to Step 7.</p>
43	<p>Evaluate Long Term Plant Status:</p> <p>a. Maintain cold shutdown conditions</p> <p>b. Consult TSC</p>	
<p>-END-</p>		

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ECA-3.1 APPENDIX LIST

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





EOP:

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TITLE:

SGTR WITH LOSS OF REACTOR COOLANT --  
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FIGURE MIN SUBCOOLING

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

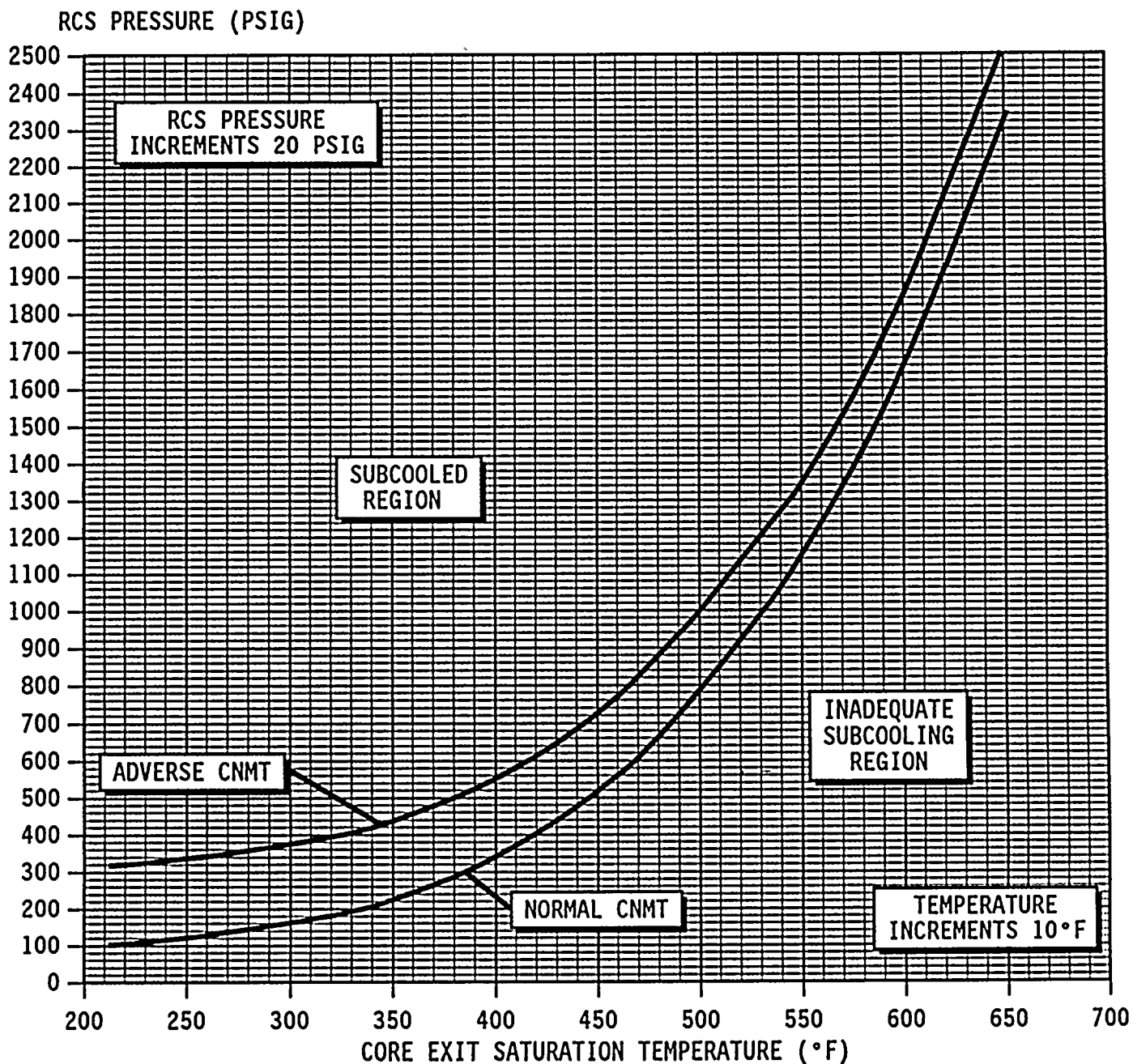


FIGURE SDM

NOTE:   o Curve includes allowance for one stuck rod. Add  
              100 ppm for each additional stuck rod.  
              o To obtain core burnup, use PPCS point ID BURNUP.

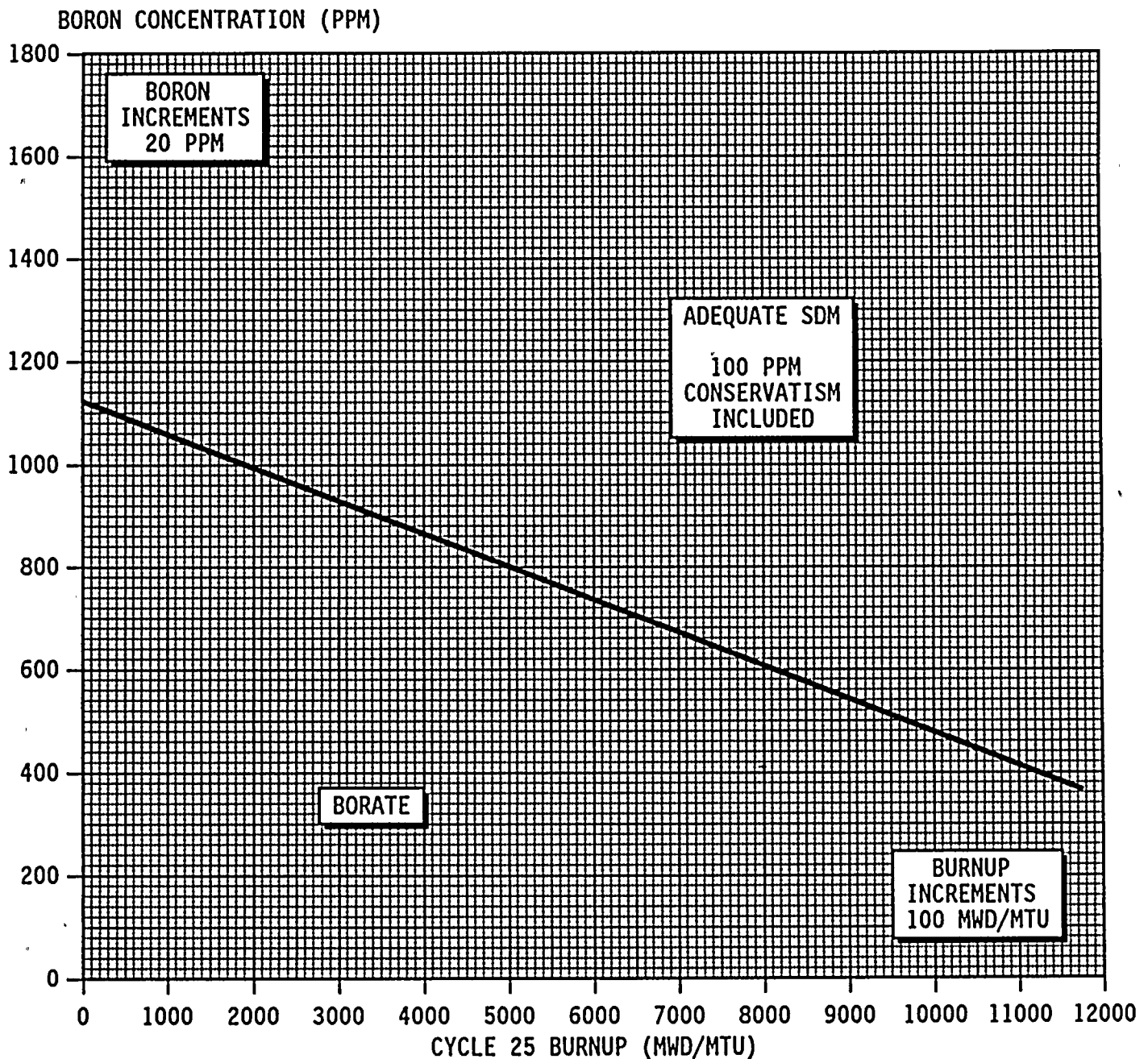
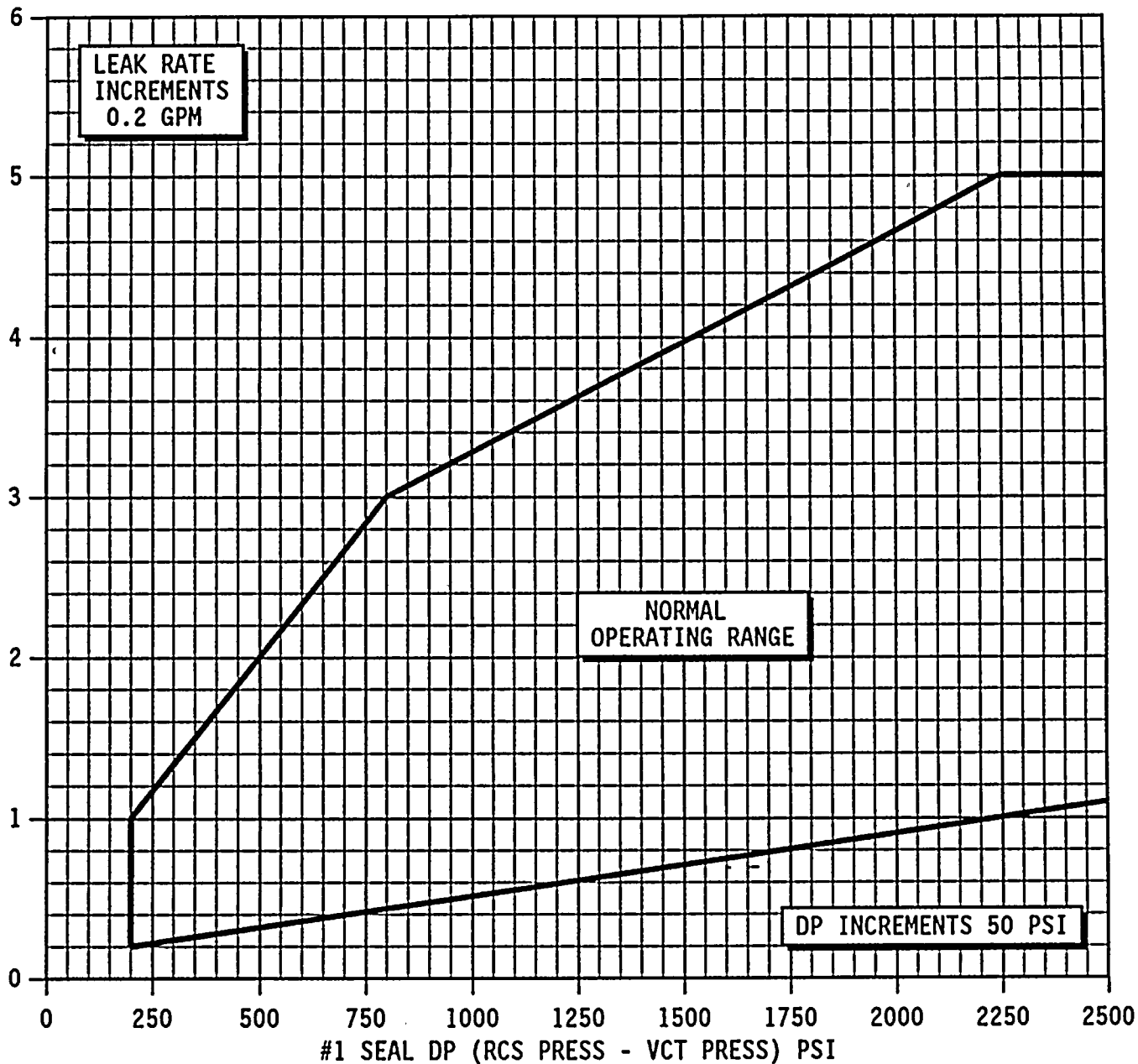




FIGURE RCP SEAL LEAKOFF

#1 SEAL LEAK RATE (GPM)



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FOLDOUT PAGE

1. SI REINITIATION CRITERIA

IF EITHER condition listed below occurs, THEN manually operate SI pumps as necessary:

- 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. SATURATED RECOVERY CRITERIA

IF ruptured S/G narrow range level increases to greater than 90% [85% adverse CNMT], THEN consult TSC to determine if recovery should be completed using ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED.

3. 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 faulted S/G needed for RCS cooldown.

4. 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.

5. 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.

6. 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

Residman  
RESPONSIBLE MANAGER

5-6-98  
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: \_\_\_\_\_

EOP: ECA-3.2	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED	REV: 19  PAGE 2 of 26
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A. PURPOSE - This procedure provides actions to cool down and depressurize the RCS to cold shutdown conditions while minimizing loss of RCS inventory and voiding in the RCS.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, when RWST level is low without a corresponding increase in containment sump level.
- b. ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, when the ruptured S/G level is high and plant staff selects saturated recovery method.



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*****		
CAUTION		
IF RWST LEVEL DECREASES TO LESS THAN 28%. THEN THE SI SYSTEM SHOULD BE ALIGNED FOR COLD LEG RECIRCULATION USING ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.		
*****		
NOTE:   o   Steps 1 through 14 of ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, should be performed before continuing with this procedure.		
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 <sup>+05</sup> R/hr.		
1 Add Makeup To RWST As Necessary:		
o   Refer to S-9J, BLENDING TO RWST		
-OR-		
o   Refer to S-3.2D, TRANSFERRING WATER FROM CVCS HUT(S) TO RWST TO SFP		
-OR-		
o   Refer to Attachment SFP-RWST		



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>IF ANY RUPTURED S/G IS FAULTED, FEED FLOW TO THAT S/G SHOULD REMAIN ISOLATED DURING SUBSEQUENT RECOVERY ACTIONS UNLESS NEEDED FOR RCS COOLDOWN.</p> <p>*****</p>		
2	Check Ruptured S/G Level:	
a.	Narrow range level - GREATER THAN 5% [25% adverse CNMT]	<p>a. <u>IF</u> ruptured S/G <u>NOT</u> faulted, <u>THEN</u> perform the following:</p> <p>1) Maintain feed flow to ruptured S/G until level greater than 5% [25% adverse CNMT].</p> <p>2) Continue with Step 3. <u>WHEN</u> ruptured S/G level greater than 5% [25% adverse CNMT], <u>THEN</u> do Steps 2b through e.</p>
b.	Close MDAFW pump discharge valve to ruptured S/G	b. Dispatch AO to locally close valve.
	<ul style="list-style-type: none"> <li>• S/G A, MOV-4007</li> <li>• S/G B, MOV-4008</li> </ul>	
c.	Pull stop MDAFW pump for ruptured S/G	
d.	Close TDAFW pump flow control valve to ruptured S/G	d. Dispatch AO with locked valve key to locally close TDAFW pump manual feedwater isolation valve to ruptured S/G.
	<ul style="list-style-type: none"> <li>• S/G A, AOV-4297</li> <li>• S/G B, AOV-4298</li> </ul>	<ul style="list-style-type: none"> <li>• S/G A, V-4005</li> <li>• S/G B, V-4006</li> </ul>
e.	Verify MDAFW pump crosstie valves - CLOSED	e. Manually close valves.
	<ul style="list-style-type: none"> <li>• MOV-4000A</li> <li>• MOV-4000B</li> </ul>	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*****		
<u>CAUTION</u>		
<ul style="list-style-type: none"> <li>o 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.</li> <li>o RCS PRESSURE SHOULD BE MONITORED. IF RCS PRESSURE DECREASES IN AN UNCONTROLLED MANNER TO LESS THAN 250 PSIG [465 PSIG ADVERSE CNMT], THEN THE RHR PUMPS MUST BE MANUALLY RESTARTED TO SUPPLY WATER TO THE RCS.</li> </ul>		
*****		
3	Check If RHR Pumps Should Be Stopped:	
	<ul style="list-style-type: none"> <li>a. Check RCS pressure: <ul style="list-style-type: none"> <li>1) Pressure - GREATER THAN 250 psig [465 psig adverse CNMT]</li> <li>2) RCS pressure - STABLE OR INCREASING</li> </ul> </li> <li>b. Stop RHR pumps and place in AUTO</li> </ul>	<ul style="list-style-type: none"> <li>a. Go to Step 4.</li> </ul>
4	Check If S/G Secondary Side Is Intact:	
	<ul style="list-style-type: none"> <li>o Pressure in both S/Gs - STABLE OR INCREASING</li> <li>o Pressure in both S/Gs - GREATER THAN 110 PSIG</li> </ul>	<p><u>IF</u> any S/G pressure decreasing in an uncontrolled manner <u>OR</u> completely depressurized, <u>THEN</u> verify faulted S/G isolated unless needed for RCS cooldown:</p> <ul style="list-style-type: none"> <li>• Steamlines</li> <li>• Feedlines</li> </ul> <p><u>IF NOT</u>, <u>THEN</u> go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.</p>

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

\* 5 Monitor Intact S/G Level:

- |   |  |
|---|--|
| <p>a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]</p> <p>b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%</p> | <p>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.</p> <p>b. <u>IF</u> narrow range level in the intact S/G continues to increase in an uncontrolled manner, <u>THEN</u> consider isolating unnecessary release paths:</p> <ul style="list-style-type: none"> <li>• TDAFW pump steam supply valves</li> <li>• S/G blowdown valves</li> <li>• Refer to Attachment RUPTURED S/G</li> </ul> |
|---|--|

NOTE: Shutdown margin should be monitored during RCS cooldown. Refer to Figure SDM.

6 Initiate RCS Cooldown To Cold Shutdown:

- |   |  |
|---|--|
| <p>a. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR</p> <p>b. Use RHR system if in service</p> <p>c. Dump steam to condenser from intact S/G</p> | <p>c. Manually or locally dump steam using intact S/G ARV.</p> <p><u>IF</u> no intact S/G available, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> <li>o Use faulted S/G.</li> </ul> <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> <li>o <u>IF</u> RHR system <u>NOT</u> in service, <u>THEN</u> use ruptured S/G.</li> </ul> |
|---|--|

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Check RCS Subcooling Based On Core Exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING	Go to Step 19.
8	Check Safeguards Pump Status <ul style="list-style-type: none"> <li>o SI pumps - ANY RUNNING</li> <li>-OR-</li> <li>o RHR pumps - ANY RUNNING IN INJECTION MODE</li> </ul>	Go to Step 15.
9	Place PRZR Heater Switches In The Following Positions: <ul style="list-style-type: none"> <li>o PRZR heater control group - PULL STOP</li> <li>o PRZR heater backup group - OFF</li> </ul>	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*****		
CAUTION		
VOIDING MAY OCCUR IN THE RCS DURING RCS DEPRESSURIZATION. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.		
*****		
NOTE: 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.		
10	Depressurize RCS To Refill PRZR:	
a.	Use normal PRZR spray valve associated with running RCP	a. Use one PRZR PORV. IF IA NOT available, THEN refer to Attachment N2 PORVS.
	<ul style="list-style-type: none"> <li>PCV-431A for A RCP</li> <li>PCV-431B for B RCP</li> </ul>	IF no PORV available, THEN use auxiliary spray valve.
b.	PRZR level - GREATER THAN 13% [40% adverse CNMT]	b. Continue with Step 11. WHEN level greater than 13% [40% adverse CNMT], THEN stop RCS depressurization.
c.	Stop RCS depressurization	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>o IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.</p> <p>o INADVERTENT CRITICALITY MAY OCCUR FOLLOWING NATURAL CIRCULATION COOLDOWN IF THE RCP IN THE RUPTURED LOOP IS STARTED FIRST.</p> <p>*****</p>		
11	<p>Check If An RCP Should Be Started:</p> <p>a. Both RCPs - STOPPED</p> <p>b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING</p> <p>c. PRZR level - GREATER THAN 13% [40% adverse CNMT]</p> <p>d. Try to start an RCP</p> <p>1) Establish conditions for starting an RCP</p> <p>o Bus 11A or 11B energized</p> <p>o Refer to Attachment RCP START</p> <p>2) Start one RCP</p>	<p>a. Stop all but one RCP and go to Step 12.</p> <p>b. Go to Step 19.</p> <p>c. Return to Step 10.</p>



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Check If One Of Three SI Pumps Should Be Stopped:	
a.	Three SI pumps - RUNNING	a. Go to Step 13.
b.	RCS subcooling based on core exit T/Cs - GREATER THAN 10°F [10°F adverse CNMT] USING FIGURE MIN SUBCOOLING	b. <u>IF</u> RCS hot leg temperatures greater than 320°F [310°F adverse CNMT] <u>OR IF</u> RHR normal cooling in service, <u>THEN</u> go to Step 19.  <u>IF</u> RHR normal cooling <u>NOT</u> in service <u>AND</u> RCS hot leg temperatures less than 320°F [310°F adverse CNMT], <u>THEN</u> ensure at least one RHR pump running in injection mode and go to Step 12c. <u>IF</u> no RHR pump can be started in injection mode, <u>THEN</u> go to Step 19.
c.	Check PRZR level - GREATER THAN 13% [40% adverse CNMT]	c. Do <u>NOT</u> stop SI pump. Return to Step 10.
d.	Stop one SI pump	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	<p>Check If One Of Two SI Pumps Should Be Stopped:</p> <p>a. Two SI pumps - RUNNING</p> <p>b. RCS subcooling based on core exit T/Cs - GREATER THAN 35°F [35°F adverse CNMT] USING FIGURE MIN SUBCOOLING</p> <p>c. PRZR level - GREATER THAN 13% [40% adverse CNMT]</p> <p>d. Stop one SI pump</p>	<p>a. Go to Step 14.</p> <p>b. <u>IF</u> RCS hot leg temperatures greater than 320°F [310°F adverse CNMT] <u>OR IF</u> RHR normal cooling in service, <u>THEN</u> go to Step 19.</p> <p><u>IF</u> RHR normal cooling <u>NOT</u> in service <u>AND</u> RCS hot leg temperatures less than 320°F [310°F adverse CNMT], <u>THEN</u> ensure at least one RHR pump running in injection mode and go to Step 13c. <u>IF</u> no RHR pump can be started in injection mode, <u>THEN</u> go to Step 19.</p> <p>c. Do <u>NOT</u> stop SI pump. Return to Step 10.</p>

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

14 Check If Last SI Pump Should  
Be Stopped:

a. One SI pump - RUNNING

a. IF any RHR pump running in  
injection mode, THEN go to  
Step 19. IF NOT, THEN go to  
Step 15.

b. Determine required RCS  
subcooling from table:

Charging Pump Availability	RCS Subcooling Criteria
NONE	Insufficient subcooling to stop SI pump.
ONE	215°F [215°F adverse CNMT]
TWO	150°F [150°F adverse CNMT]
THREE	80°F [80°F adverse CNMT]

c. RCS subcooling based on core  
exit T/Cs - GREATER THAN VALUE  
FROM TABLE ABOVE USING FIGURE  
MIN SUBCOOLING

c. IF RCS hot leg temperatures  
greater than 320°F [310°F  
adverse CNMT] OR IF RHR normal  
cooling in service, THEN go to  
Step 19.

IF RHR normal cooling NOT in  
service AND RCS hot leg  
temperatures less than 320°F  
[310°F adverse CNMT], THEN  
ensure at least one RHR pump  
running in injection mode and go  
to Step 14d. IF no RHR pump can  
be started in injection mode,  
THEN go to Step 19.

d. PRZR level - GREATER THAN 13%  
[40% adverse CNMT]

d. Do NOT stop SI pump. Return to  
Step 10.

e. Stop running SI pump

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

15 Check If Charging Flow Should  
Be Controlled To Maintain RCS  
Inventory:

a. Check RHR pumps - RUNNING IN  
INJECTION MODE

a. Perform the following:

1) Control charging flow to  
maintain RCS inventory:

- o RVLIS level (no RCPs) -  
BETWEEN 77% AND 82% [82%  
AND 85% adverse CNMT]

-OR-

- o RVLIS fluid fraction (any  
RCP running) - BETWEEN 84%  
AND 90%

2) Go to Step 16.

b. Go to Step 19

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

\*\*\*\*\*  
CAUTION

- o IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.
  - o INADVERTENT CRITICALITY MAY OCCUR FOLLOWING NATURAL CIRCULATION COOLDOWN IF THE RCP IN THE RUPTURED LOOP IS STARTED FIRST.
- \*\*\*\*\*

16 Check RCP Status:

a. RCPs - AT LEAST ONE RUNNING

a. Perform the following:

1) Try to start one RCP

a) IF RVLIS level (no RCPs) less than 95%, THEN perform the following:

- o Increase PRZR level to greater than 65% [80% adverse CNMT]
- o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using Figure MIN SUBCOOLING
- o Energize PRZR heaters as necessary to saturate PRZR water

b) Establish conditions for starting an RCP:

- o Verify bus 11A or 11B energized.
- o Refer to Attachment RCP START.

c) Start one RCP.

This Step continued on the next page.



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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 16 continued from previous page)

2) IF an RCP can NOT be started,  
THEN verify natural  
circulation (Refer to  
Attachment NC).

IF natural circulation NOT  
verified, THEN increase  
dumping steam.

b. Stop all but one RCP

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>o VOIDING MAY OCCUR IN THE RCS DURING RCS DEPRESSURIZATION. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.</p> <p>o IF SI HAS BEEN TERMINATED, THE ACCUMS SHOULD BE ISOLATED PRIOR TO DEPRESSURIZING THE RCS TO LESS THAN 1000 PSIG.</p> <p>*****</p> <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> <p>17 Depressurize RCS To Saturation At Core Exit:</p> <p>a. Determine saturation pressure for core exit T/Cs using Figure TSAT</p> <p>b. Use normal PRZR spray valves associated with running RCP</p> <ul style="list-style-type: none"> <li>• PCV-431A for A RCP</li> <li>• PCV-431B for B RCP</li> </ul> <p>c. Energize PRZR heaters as necessary</p> <p>d. Depressurize RCS until EITHER of the following conditions satisfied:</p> <ul style="list-style-type: none"> <li>o PRZR level - GREATER THAN 75% [65% adverse CNMT]</li> </ul> <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> <li>o RCS pressure - AT SATURATION FROM STEP 17a</li> </ul> <p>b. Use one PRZR PORV. <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to Attachment N2 PORVS.</p> <p><u>IF</u> PORV <u>NOT</u> available, <u>THEN</u> use auxiliary spray valve (AOV-296).</p>		



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Verify Adequate Shutdown Margin	
	<ul style="list-style-type: none"> <li>a. Direct RP to sample RCS and ruptured S/G for boron concentration</li> <li>b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIGURE SDM</li> </ul>	<ul style="list-style-type: none"> <li>b. Borate as necessary.</li> </ul>
*19	Monitor SI Reinitiation Criteria:	
	<ul style="list-style-type: none"> <li>a. Core exit T/Cs - DECREASING</li> <li>b. Check RVLIS indication: <ul style="list-style-type: none"> <li>o Level (no RCPs) - GREATER THAN 77% [82% adverse CNMT]</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>a. Manually start SI pumps as necessary.</li> <li>b. Manually start SI pumps as necessary.</li> </ul>
	-OR-	
	<ul style="list-style-type: none"> <li>o Fluid Fraction (any RCP running) - GREATER THAN 84%</li> </ul>	



EOP:

ECA-3.2

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SGTR WITH LOSS OF REACTOR COOLANT -  
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

## 20 Check If SI ACCUMs Should Be Isolated:

a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING

a. IF both RCS hot leg temperatures less than 400°F, THEN go to Step 20c.

IF NOT, THEN go to Step 21.

b. PRZR level - GREATER THAN 5% [30% adverse CNMT]

b. Return to Step 10.

c. 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

d. Close SI ACCUM discharge valves

- MOV-841
- MOV-865

d. Vent any unisolated ACCUMs:

1) Open vent valves for unisolated SI ACCUMs.

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

2) Open HCV-945.

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

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	<p>Check If Emergency D/Gs Should Be Stopped:</p> <ul style="list-style-type: none"> <li>a. Verify AC emergency busses energized by offsite power: <ul style="list-style-type: none"> <li>o Emergency D/G output breakers - OPEN</li> <li>o AC emergency bus voltage - GREATER THAN 420 VOLTS</li> <li>o AC emergency bus normal feed breakers - CLOSED</li> </ul> </li> <li>b. Stop any unloaded emergency D/G and place in standby (Refer to Attachment D/G STOP)</li> </ul>	<ul style="list-style-type: none"> <li>a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).</li> </ul>
22	<p>Minimize Secondary System Contamination:</p> <ul style="list-style-type: none"> <li>a. Isolate reject from hotwell to CST: <ul style="list-style-type: none"> <li>o Place hotwell level controller (HC-107) in MANUAL at 50%</li> <li>o Verify hotwell level - STABLE</li> </ul> </li> <li>b. Verify local actions to complete isolation of ruptured S/G (Refer to Attachment RUPTURED S/G)</li> </ul>	<ul style="list-style-type: none"> <li>a. <u>IF</u> hotwell level increasing, <u>THEN</u> direct RP to sample hotwells for activity.</li> </ul>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	<p>Verify Adequate SW Flow To CCW Hx:</p> <ul style="list-style-type: none"> <li>a. Verify at least two SW pumps - RUNNING</li> <li>b. Verify AUX BLDG SW isolation valves - OPEN <ul style="list-style-type: none"> <li>• MOV-4615 and MOV-4734</li> <li>• MOV-4616 and MOV-4735</li> </ul> </li> <li>c. Verify CNMT RECIRC fan annunciator C-2, HIGH TEMPERATURE ALARM - EXTINGUISHED</li> </ul>	<ul style="list-style-type: none"> <li>a. Manually start pumps as power supply permits (243 kw per pump). <u>IF</u> less than two SW pumps can be operated, <u>THEN</u> go to Step 24.</li> <li>b. Establish SW to AUX BLDG (Refer to Attachment AUX BLDG SW).</li> <li>c. Dispatch AO to locally throttle flow to CCW Hx to between 5000 gpm and 6000 gpm total flow.</li> </ul>
24	<p>Check RCP Cooling</p> <ul style="list-style-type: none"> <li>a. Check CCW to RCPs <ul style="list-style-type: none"> <li>o Annunciator A-7, RCP 1A CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED</li> <li>o Annunciator A-15, RCP 1B CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED</li> </ul> </li> <li>b. Check RCP seal injection <ul style="list-style-type: none"> <li>o Labyrinth seal D/Ps - GREATER THAN 15 INCHES OF WATER</li> </ul> <p style="text-align: center;">-OR-</p> <li>o RCP seal injection flow to each RCP - GREATER THAN 6 GPM</li> </li></ul>	<p>Establish normal cooling to RCPs (Refer to Attachment SEAL COOLING).</p>



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	Check If Seal Return Flow Should Be Established:	
a.	Verify instrument bus D - ENERGIZED	a. Perform the following: 1) Ensure steam dump mode control in MANUAL. 2) Restore power to instrument bus D from MCC B or MCC A (maintenance supply).
b.	Verify RCP #1 seal outlet temperature - LESS THAN 235°F	b. Go to Step 26.
c.	Verify RCP seal outlet valves - OPEN • AOV-270A • AOV-270B	c. Manually open valves as necessary.
d.	Reset both trains of XY relays for RCP seal return isolation valve MOV-313	
e.	Open RCP seal return isolation valve MOV-313	e. Perform the following: 1) Place MOV-313 switch to OPEN. 2) Dispatch AO with key to RWST gate to locally open MOV-313.
f.	Verify RCP #1 seal leakoff flow - LESS THAN 6.0 GPM	f. Perform the following: 1) Trip the affected RCP 2) Allow 4 minutes for pump coast down, <u>THEN</u> close the affected RCP seal discharge valve • RCP A, AOV-270A • RCP B, AOV-270B <u>IF</u> both RCP seal discharge valves are shut, <u>THEN</u> go to Step 26.
g.	Verify RCP #1 seal leakoff flow - GREATER THAN 0.8 GPM	g. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

26 Check If Source Range  
Detectors Should Be Energized:

a. Source range channels -  
DEENERGIZED

a. Go to Step 26e.

b. Check intermediate range flux -  
EITHER CHANNEL LESS THAN  
10<sup>-10</sup> AMPS

b. Perform the following:

1) IF neither intermediate range  
channel is decreasing, THEN  
initiate boration.

2) Continue with Step 27. WHEN  
flux is LESS THAN 10<sup>-10</sup> amps  
on any operable channel, THEN  
do Steps 26c, d and e.

c. Check the following:

c. Continue with Step 27. WHEN  
either condition met, THEN do  
Steps 26d and e.

o Both intermediate range  
channels - LESS THAN  
10<sup>-10</sup> AMPS

-OR-

o Greater than 20 minutes since  
reactor trip

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 27.

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

27 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) Verify at least one control  
rod shroud fan - RUNNING
- 2) Verify one Rx compartment  
cooling fan - RUNNING

1) Manually start one fan as  
power supply permits (45 kw)

2) 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

\*\*\*\*\*  
CAUTION

FEEED FLOW SHOULD NOT BE ESTABLISHED TO ANY RUPTURED S/G WHICH IS ALSO FAULTED  
UNLESS IT IS NEEDED FOR RCS COOLDOWN.

\*28 Monitor Ruptured S/G(s)  
Narrow Range Level - GREATER  
THAN 17% [25% adverse CNMT]

Refill ruptured S/G to 80% [60%  
adverse CNMT] using feed flow.

IF either of the following  
conditions occurs, THEN stop feed  
flow to ruptured S/G unless needed  
for RCS cooldown:

o Ruptured S/G pressure decreases  
in an uncontrolled manner.

-OR-

o Ruptured S/G pressure increases  
to 1020 psig.

\*29 Monitor RCP Operation:

a. RCPs - ANY RUNNING

a. Go to Step 30.

b. Check the following:

b. Stop the affected RCP(s).

- o RCP #1 seal D/P - GREATER  
THAN 220 PSID
- o Check RCP seal leakage -  
WITHIN THE NORMAL OPERATING  
RANGE OF FIGURE RCP SEAL  
LEAKOFF



EOP: ECA-3.2	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED	REV: 19 PAGE 25 of 26
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30	Check Condenser Steam Dump Available - CONDENSER VACUUM GREATER THAN 20 INCHES HG	Use intact S/G ARV for RCS temperature control.
31	Check If RHR Normal Cooling Can Be Established:	
a.	RCS cold leg temperature - LESS THAN 350°F	a. Go to Step 32.
b.	RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Go to Step 32.
c.	Place letdown pressure controller in MANUAL CLOSED	
d.	Check following valves - OPEN <ul style="list-style-type: none"> <li>• AOV-371, letdown isolation valve</li> <li>• AOV-427, loop B cold leg to REGEN Hx</li> <li>• At least one letdown orifice valve (AOV-200A, AOV-200B, or AOV-202)</li> </ul>	d. Perform the following: <ol style="list-style-type: none"> <li>1) Reset both trains of XY relays for AOV-371 and AOV-427.</li> <li>2) Open AOV-371 and AOV-427.</li> <li>3) Open one letdown orifice valve.</li> </ol>
e.	Verify pressure on PI-135 - LESS THAN 400 PSIG	e. Go to Step 32.
f.	Place RCS overpressure protection system in service (Refer to O-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	
g.	Consult TSC to determine if RHR normal cooling should be established using Attachment RHR COOL	

EOP: ECA-3.2	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED	REV: 19  PAGE 26 of 26
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p><u>NOTE:</u> This procedure should be continued while obtaining CNMT hydrogen sample in Step 32.</p>		
32	<p>Check CNMT Hydrogen Concentration:</p> <ul style="list-style-type: none"> <li>a. Direct RP to start CNMT hydrogen monitors as necessary</li> <li>b. Hydrogen concentration - LESS THAN 0.5%</li> </ul>	<ul style="list-style-type: none"> <li>b. Consult TSC to determine if hydrogen recombiners should be placed in service.</li> </ul>
33	<p>Check Core Exit T/Cs - LESS THAN 200° F</p>	<p>Return to Step 3.</p>
34	<p>Evaluate Long Term Plant Status:</p> <ul style="list-style-type: none"> <li>a. Maintain cold shutdown conditions</li> <li>b. Consult TSC</li> </ul>	
<p style="text-align: center;">-END-</p>		

EOP: ECA-3.2	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED	REV: 19  PAGE 1 of 1
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### ECA-3.2 APPENDIX LIST

#### TITLE

- 1) RED PATH SUMMARY
- 2) FIGURE MIN SUBCOOLING (FIG-1.0)
- 3) FIGURE SDM (FIG-2.0)
- 4) FIGURE TSAT (FIG-8.0)
- 5) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
- 6) ATTACHMENT SFP-RWST (ATT-18.0)
- 7) ATTACHMENT N2 PORVS (ATT-12.0)
- 8) ATTACHMENT NC (ATT-13.0)
- 9) ATTACHMENT SEAL COOLING (ATT-15.2)
- 10) ATTACHMENT RCP START (ATT-15.0)
- 11) ATTACHMENT D/G STOP (ATT-8.1)
- 12) ATTACHMENT AUX BLDG SW (ATT-2.0)
- 13) ATTACHMENT RUPTURED S/G (ATT-16.0)
- 14) ATTACHMENT SD-1 (ATT-17.0)
- 15) ATTACHMENT SD-2 (ATT-17.1)
- 16) ATTACHMENT RHR COOL (ATT-14.1)
- 17) FOLDOUT





EOP: ECA-3.2	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED	REV: 19  PAGE 1 of 1
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FOLDOUT PAGE

1. SI REINITIATION CRITERIA

IF EITHER condition listed below occurs, THEN manually start SI pumps as necessary:

- o Core exit T/Cs - INCREASING

-OR-

- o Check RVLIS indication:

Level (no RCPs) - LESS THAN 77% [82% adverse CNMT]

Fluid fraction (any RCP running) - LESS THAN 84%

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 faulted 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).



EOP: F-0.4	TITLE: INTEGRITY	REV: 1 PAGE 1 of 2
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

TECHNICAL REVIEW

PORC REVIEW DATE 7/16/89

Joseph A. Widay  
PLANT SUPERINTENDENT

7/21/89  
EFFECTIVE DATE

QA \_\_\_\_\_ NON-QA \_\_\_\_\_ CATEGORY 1.0

REVIEWED BY: \_\_\_\_\_

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

CSFST:

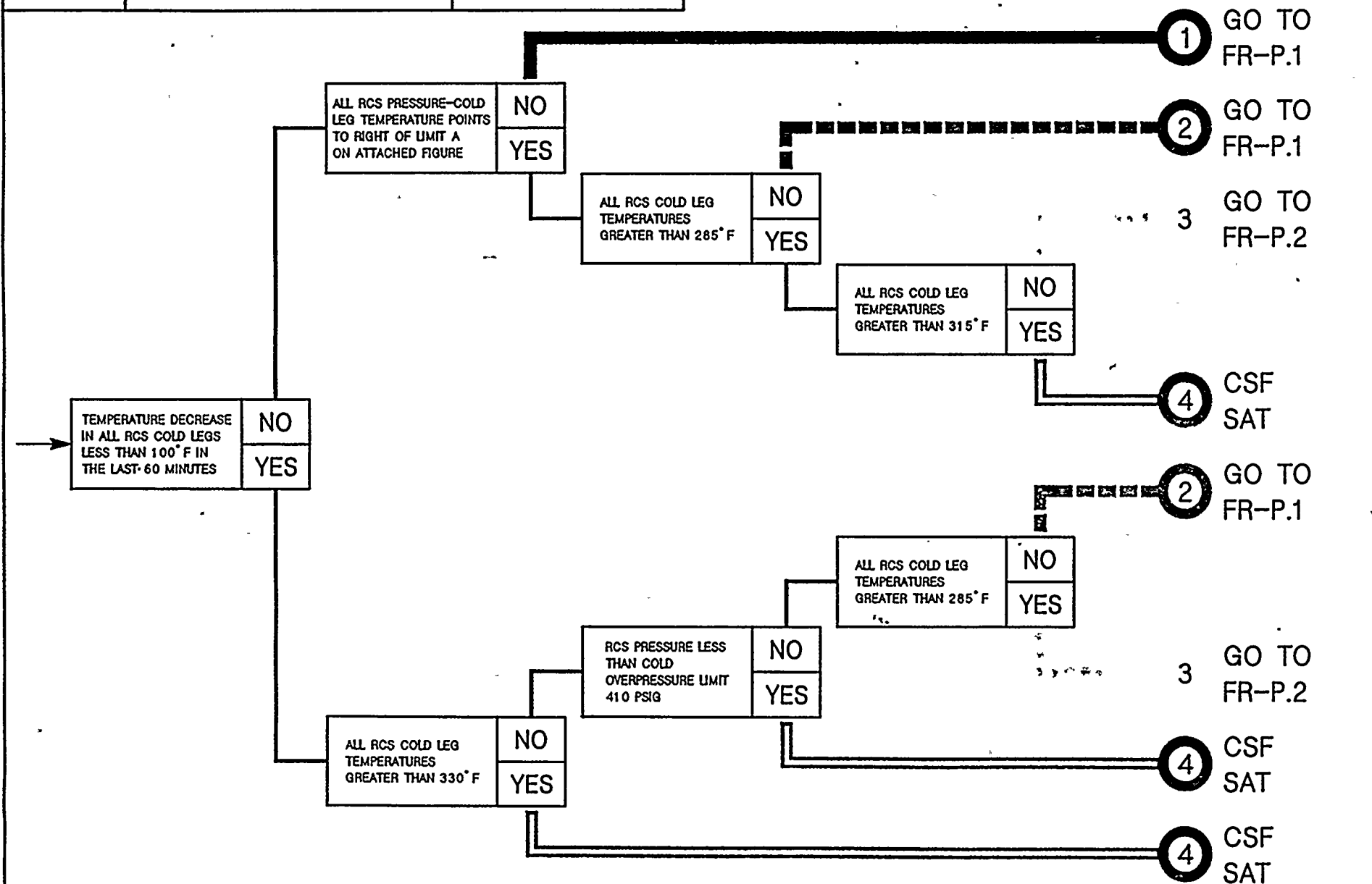
Title:

Rev: 1

F-0.4

INTEGRITY

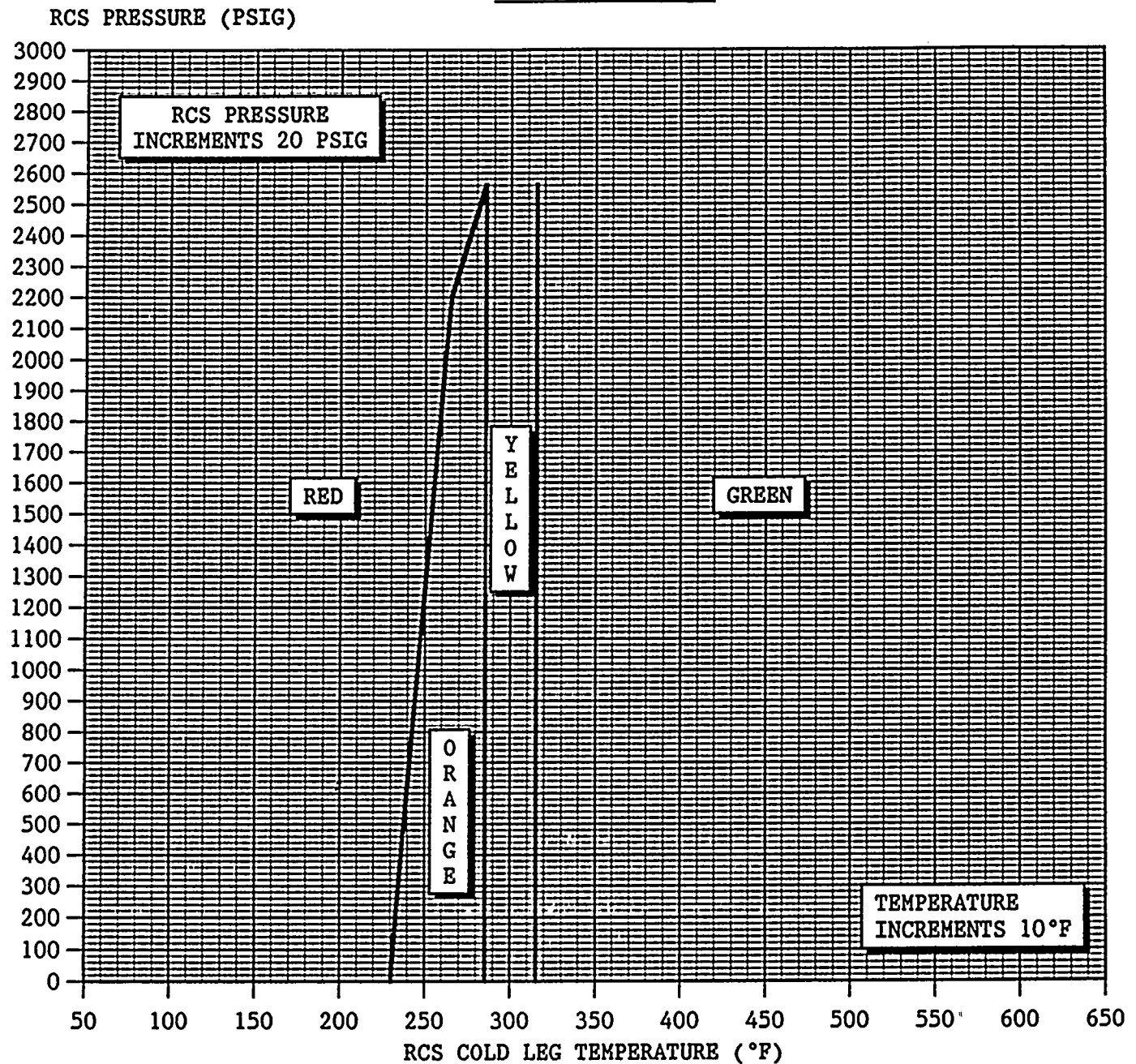
Page 1 of 2





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FIGURE LIMIT A



10

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EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 7 PAGE 1 of 12
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

*Terry White*  
RESPONSIBLE MANAGER

5-31-96  
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: \_\_\_\_\_



EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 7 PAGE 2 of 12
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A. PURPOSE - This procedure provides actions to respond to a high PRZR level.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. F-0.6, INVENTORY Critical Safety Function Status Tree on a YELLOW condition.

EOP:	TITLE:	REV: 7
FR-I.1	RESPONSE TO HIGH PRESSURIZER LEVEL	PAGE 3 of 12

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p><b>NOTE:</b> Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than <math>10^{+05}</math> R/hr.</p>		
1	Check RCS Hot Leg Temperature - STABLE OR DECREASING	Dump steam from intact S/G(s) to stabilize RCS temperature.
2	Verify Adequate SW Flow:	
	a. At least three SW pumps - RUNNING	a. Manually start pumps as power supply permits (258 kw each). <u>IF</u> less than two SW pumps can be operated, <u>THEN</u> perform the following:
		1) Ensure SW isolation
		2) Go to Step 7.
	b. Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1)	
	c. Verify AUX BLDG SW isolation valves - AT LEAST ONE SET OPEN	c. Establish SW to AUX BLDG. (Refer to Attachment AUX BLDG SW.)
	• MOV-4615 and MOV-4734	
	• MOV-4616 and MOV-4735	
	d. Verify CNMT RECIRC fans annunciator C-2, HIGH TEMPERATURE ALARM - EXTINGUISHED	d. Dispatch AO to locally throttle flow to CCW Hx to between 5000 gpm and 6000 gpm total flow.

EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 7 PAGE 4 of 12
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Establish IA to CNMT:	
a.	Verify non-safeguards busses energized from offsite power <ul style="list-style-type: none"> <li>o Bus 13 normal feed - CLOSED</li> <li>-OR-</li> <li>o Bus 15 normal feed - CLOSED</li> </ul>	a. Perform the following: <ol style="list-style-type: none"> <li>1) Close non-safeguards bus tie breakers: <ul style="list-style-type: none"> <li>• Bus 13 to Bus 14 tie</li> <li>• Bus 15 to Bus 16 tie</li> </ul> </li> <li>2) <u>WHEN</u> bus 15 restored, <u>THEN</u> reset control room lighting.</li> </ol>
b.	Verify SW isolation valves to turbine building - OPEN <ul style="list-style-type: none"> <li>• MOV-4613 and MOV-4670</li> <li>• MOV-4614 and MOV-4664</li> </ul>	b. Manually align valves.
c.	Verify at least two air compressors - RUNNING	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 AO to locally reset compressors as necessary.
d.	Check IA supply: <ul style="list-style-type: none"> <li>o Pressure - GREATER THAN 60 PSIG</li> <li>o Pressure - STABLE OR INCREASING</li> </ul>	d. Perform the following: <ol style="list-style-type: none"> <li>1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR).</li> <li>2) Continue with Step 7. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 3e and f.</li> </ol>
e.	Reset both trains of XY relays for IA to CNMT AOV-5392	
f.	Verify IA to CNMT AOV-5392 - OPEN	

EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 7 PAGE 5 of 12
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>CHARGING AND LETDOWN FLOW SHOULD BE CAREFULLY CONTROLLED TO AVOID SUDDEN RCS PRESSURE CHANGES SINCE THE PRZR MAY BE WATER SOLID.</p> <p>*****</p>		
4	<p>Check If Normal CVCS Operation Can Be Established</p> <p>a. Verify IA restored:</p> <ul style="list-style-type: none"> <li>o IA to CNMT (AOV-5392) - OPEN</li> <li>o IA pressure - GREATER THAN 60 PSIG</li> </ul> <p>b. CCW pumps - ANY RUNNING</p> <p>c. Verify instrument bus D - ENERGIZED</p>	<p>a. Continue with Step 7. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 4 through 6.</p> <p>b. Perform the following:</p> <ul style="list-style-type: none"> <li>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"> <li>• RCP A, MOV-749A and MOV-759A</li> <li>• RCP B, MOV-749B and MOV-759B</li> </ul> </li> <li>2) Manually start one CCW pump.</li> </ul> <p>c. Energize MCC B. <u>IF</u> MCC B <u>NOT</u> available, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> <li>1) Verify MCC A energized.</li> <li>2) Place instrument bus D on maintenance supply.</li> </ul>



EOP:	TITLE:	REV: 7
FR-I.1	RESPONSE TO HIGH PRESSURIZER LEVEL	PAGE 6 of 12

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Check If Seal Return Flow Should Be Established:	
	a. Verify RCP #1 seal outlet temperature - LESS THAN 235°F	a. Go to Step 7.
	b. Verify RCP seal outlet valves - OPEN <ul style="list-style-type: none"> <li>• AOV-270A</li> <li>• AOV-270B</li> </ul>	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"> <li>1) Place MOV-313 switch to OPEN.</li> <li>2) Dispatch AO with key to RWST gate to locally open MOV-313.</li> </ol>
	e. Verify RCP #1 seal leakoff flow - LESS THAN 6.0 GPM	e. Perform the following: <ol style="list-style-type: none"> <li>1) Trip the affected RCP</li> <li>2) Allow 4 minutes for pump coast down, <u>THEN</u> close the affected RCP seal discharge valve <ul style="list-style-type: none"> <li>• RCP A, AOV-270A</li> <li>• RCP B, AOV-270B</li> </ul> </li> </ol> <p><u>IF</u> both RCP seal discharge valves are shut, <u>THEN</u> go to Step 7.</p>
	f. Verify RCP #1 seal leakoff flow - GREATER THAN 0.8 GPM	f. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.



EOP:

FR-I.1

TITLE:

RESPONSE TO HIGH PRESSURIZER LEVEL

REV: 7

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

6 Check Normal Letdown - IN  
SERVICE

Establish excess letdown as follows:

- o Place AOV-312 to NORMAL
- o Ensure CCW from excess letdown,  
(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.



EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 7 PAGE 8 of 12
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Check If Charging Flow Has Been Established:	
	a. Charging pumps - ANY RUNNING	<p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>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 locally close seal injection needle valve(s) to affected RCP: <ul style="list-style-type: none"> <li>• RCP A, V-300A</li> <li>• RCP B, V-300B</li> </ul> </li> <li>2) Ensure HCV-142 open, demand at 0%.</li> </ol>
	b. Charging pump suction aligned to RWST: <ul style="list-style-type: none"> <li>o LCV-112B - OPEN</li> <li>o LCV-112C - CLOSED</li> </ul>	<p>b. Manually align valves as necessary.</p> <p><u>IF</u> LCV-112B can <u>NOT</u> be opened, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1) Verify charging pump A <u>NOT</u> running and place in PULL STOP.</li> <li>2) Dispatch AO to locally open manual charging pump suction from RWST (V-358 located in charging pump room).</li> <li>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).</li> </ol>
	c. Start charging pumps as necessary and adjust charging flow to restore PRZR level	

EOP:

FR-I.1

TITLE:

RESPONSE TO HIGH PRESSURIZER LEVEL

REV: 7

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8 Check Normal Letdown - IN SERVICE	<p>Establish Normal Letdown:</p> <ul style="list-style-type: none"><li>a. Establish charging flow to REGEN Hx greater than 20 gpm.</li><li>b. Place the following switches to CLOSE:<ul style="list-style-type: none"><li>• Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202)</li><li>• AOV-427, loop B cold leg to REGEN Hx</li><li>• AOV-371, letdown isolation valves</li></ul></li><li>c. Place letdown controllers TCV-130 and PCV-135 in MANUAL at 40% open<ul style="list-style-type: none"><li>• TCV-130</li><li>• PCV-135</li></ul></li><li>d. Reset both trains of XY relays for AOV-371 and AOV-427</li><li>e. Open AOV-371 and AOV-427</li><li>f. Open letdown orifice valves as necessary</li><li>g. Place TCV-130 in AUTO at 105°F</li><li>h. Place PCV-135 in AUTO at 250 psig</li><li>i. Adjust charging pump speed and HCV-142 as necessary</li><li>j. <u>WHEN</u> normal letdown in service, <u>THEN</u> secure excess letdown.<ul style="list-style-type: none"><li>o Close excess letdown flow control valve, HCV-123.</li><li>o Close excess letdown isolation valve, AOV-310.</li></ul></li></ul>	

EOP:

FR-I.1

TITLE:

RESPONSE TO HIGH PRESSURIZER LEVEL

REV: 7

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Check PRZR Pressure:	
	a. Pressure - LESS THAN 2335 PSIG	a. Verify at least one PRZR PORV and block valve open. <u>IF NOT</u> , <u>THEN</u> open one PORV and block valve as necessary until pressure less than 2335 psig. <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to Attachment N2 PORVS to operate PORVs.
	b. Pressure - LESS THAN 2260 PSIG	b. Control charging and letdown flow as necessary to decrease PRZR pressure to less than 2260 psig.
10	Verify PRZR PORVs - CLOSED	Manually close PORVs. <u>IF</u> any valve can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve.
11	Restore PRZR To Saturation Conditions:	
	a. Verify letdown - IN SERVICE	a. Do <u>NOT</u> energize PRZR heaters. Continue with Step 13. <u>WHEN</u> letdown established, <u>THEN</u> energize PRZR heaters.
	b. Energize PRZR heaters.	



EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 7 PAGE 11 of 12
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Check PRZR Spray Valves:	
	<p>a. Auxiliary spray valve (AOV-296) - CLOSED</p> <p>b. Verify normal PRZR spray valves - CLOSED</p> <ul style="list-style-type: none"> <li>• PCV-431A</li> <li>• PCV-431B</li> </ul>	<p>a. Manually close auxiliary spray valve. <u>IF</u> valve can <u>NOT</u> be closed, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1) Establish excess letdown (Refer to Step 6).</li> <li>2) Close loop B cold leg to REGEN Hx (AOV-427).</li> <li>3) Ensure HCV-142 demand at 0%.</li> </ol> <p>b. Place controllers in manual at 0% demand.</p>
	<p><u>NOTE:</u> PRZR temperature at which bubble should form may be determined from steam table.</p>	
13	Control Charging And Letdown Flow As Necessary To Maintain RCS Pressure Stable	
14	Check PRZR level - LESS THAN 87%	<p>Perform the following:</p> <ol style="list-style-type: none"> <li>a. Consult TSC to determine if RCPs should be stopped to isolated failed spray valve.</li> <li>b. Return to Step 13.</li> </ol>

EOP:

FR-I.1

TITLE:

RESPONSE TO HIGH PRESSURIZER LEVEL

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

15 Return To Procedure And Step  
In Effect

-END-



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FR-I.1 APPENDIX LIST

<u>TITLE</u>	<u>PAGES</u>
1) ATTACHMENT N2 PORVS	1
2) ATTACHMENT SD-1	1
3) ATTACHMENT AUX BLDG SW	1



EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 5 PAGE 1 of 15
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

TECHNICAL REVIEW

PORC REVIEW DATE 5/1/91

Joseph A. Widay  
PLANT SUPERINTENDENT

5/3/91  
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: \_\_\_\_\_

EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 5 PAGE 2 of 15
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A. PURPOSE - This procedure provides actions to respond to voids in the reactor vessel head.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. F-0.6, INVENTORY Critical Safety Function Status Tree on a YELLOW condition.

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EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 5 PAGE 3 of 15
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>IF A CONTROLLED NATURAL CIRCULATION COOLDOWN IS IN PROGRESS AND A VOID IN THE REACTOR VESSEL UPPER HEAD IS EXPECTED, THIS PROCEDURE SHOULD NOT BE PERFORMED.</p> <p>*****</p> <p><u>NOTE:</u> Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than <math>10^{+05}</math> R/hr.</p>		
1	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.

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EOP:

FR-I.3

TITLE:

RESPONSE TO VOIDS IN REACTOR VESSEL

REV: 5

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

2 Verify Adequate SW Flow To  
CCW Hx:

a. Verify at least two SW pumps -  
RUNNING

a. Perform the following:

1) Verify adequate power to  
operate two SW pumps (258 kw  
per pump).

IF NOT, THEN shed sufficient  
non-essential loads.

- CNMT RECIRC fans
- Charging pumps
- IA compressors
- PRZR heaters
- Rx compartment cooling fans
- Control rod shroud fans

2) Ensure two SW pumps running.

b. Verify AUX BLDG SW isolation  
valves - OPEN

b. Establish SW to AUX BLDG (Refer  
to Attachment AUX BLDG SW).

- MOV-4615 and MOV-4734
- MOV-4616 and MOV-4735

c. Verify CNMT RECIRC fans  
annunciator C-2, HIGH  
TEMPERATURE ALARM - EXTINGUISHED

c. Dispatch A0 to locally throttle  
flow to CCW Hx to between  
5000 gpm and 6000 gpm total flow.



EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 5 PAGE 5 of 15
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Establish IA to CNMT:	
a.	Verify non-safeguards busses energized from offsite power <ul style="list-style-type: none"> <li>o Bus 13 normal feed - CLOSED</li> <li>-OR-</li> <li>o Bus 15 normal feed - CLOSED</li> </ul>	a. Perform the following: <ol style="list-style-type: none"> <li>1) Close non-safeguards bus tie breakers: <ul style="list-style-type: none"> <li>• Bus 13 to Bus 14 tie</li> <li>• Bus 15 to Bus 16 tie</li> </ul> </li> <li>2) <u>WHEN</u> bus 15 restored, <u>THEN</u> reset control room lighting.</li> </ol>
b.	Verify SW isolation valves to turbine building - OPEN <ul style="list-style-type: none"> <li>• MOV-4613 and MOV-4670</li> <li>• MOV-4614 and MOV-4664</li> </ul>	b. Perform the following: <ol style="list-style-type: none"> <li>1) Manually open valves.</li> <li>2) Dispatch A0 to reset air compressors as required.</li> </ol>
c.	Verify at least two air compressors - RUNNING	c. Manually start air compressors as power supply permits (75 kw each).
d.	Check IA supply: <ul style="list-style-type: none"> <li>o Pressure - GREATER THAN 60 PSIG</li> <li>o Pressure - STABLE OR INCREASING</li> </ul>	d. Perform the following: <ol style="list-style-type: none"> <li>1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR).</li> <li>2) Continue with Step 4. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 3e and f.</li> </ol>
e.	Reset both trains of XY relays for IA to CI valve AOV-5392	
f.	Open IA AOV-5392	



EOP:

FR-I.3

TITLE:

RESPONSE TO VOIDS IN REACTOR VESSEL

REV: 5

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

4 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 A0 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:

b. Manually align valves as necessary.

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

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 A0 to locally open manual charging pump suction from RWST (V-358 located in charging pump room).
- 3) WHEN V-358 open, THEN direct A0 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 control PRZR level

c. Continue with Step 8. WHEN charging can be established, THEN do Steps 5, 6 and 7.

EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 5 PAGE 7 of 15
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Check If Normal CVCS Operation Can Be Established	
	a. Verify IA restored:	a. Continue with Step 8. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 5 through 7.
	o IA to CNMT (AOV-5392) - OPEN	
	o IA pressure - GREATER THAN 60 PSIG	
	b. CCW pumps - ANY RUNNING	b. Perform the following:
		1) <u>IF</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> isolate 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.
	c. Verify instrument bus D - ENERGIZED	c. Energize MCC B. <u>IF</u> MCC B <u>NOT</u> available, <u>THEN</u> perform the following:
		1) Verify MCC A energized.
		2) Place instrument bus D on maintenance supply.
6	Verify PRZR Level - GREATER THAN 13% [40% adverse CNMT]	Continue with Step 8. <u>WHEN</u> PRZR level increases to greater than 13% [40% adverse CNMT], <u>THEN</u> do Step 7.

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EOP:

FR-I.3

TITLE:

RESPONSE TO VOIDS IN REACTOR VESSEL

REV: 5

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

## 7 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 in MANUAL at 25% 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

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.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Establish Stable RCS Conditions:	
	a. PRZR level - STABLE AND BETWEEN 40% AND 60%	a. Control charging and letdown as necessary.
	b. RCS pressure - STABLE	b. Energize PRZR heaters and use normal PRZR spray as necessary. <u>IF</u> normal spray <u>NOT</u> available and letdown in service, <u>THEN</u> use auxiliary spray valve (AOV-296).
	c. RCS hot leg temperatures - STABLE	c. Control steam dump and total feed flow as necessary to stabilize RCS temperature.
9	Check RCPS - BOTH STOPPED	Go to Step 15.
10	Check If RCS Pressure Should Be Increased:	
	a. Pressure - AT LEAST 100 PSI BELOW LIMIT ON FIGURE TECH SPEC C/D (100°F/HR)	a. Go to Step 13.
	b. Energize PRZR heaters to increase RCS pressure by 50 psi	
11	Control Charging And Letdown As Necessary To Maintain PRZR Level Greater Than 13% [40% adverse CNMT]	

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EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 5 PAGE 10 of 15
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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12 Check RVLIS Indication:

- |  |                       |
|--|-----------------------|
| a. Level (no RCPs) - INCREASING                    | a. Go to Step 13.     |
| b. Level (no RCPs) - GREATER THAN 95%              | b. Return to Step 10. |
| c. Turn off PRZR heaters to stabilize RCS pressure |                       |
| d. Return to procedure and step in effect          |                       |

\*\*\*\*\*

CAUTION

IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.

\*\*\*\*\*

13 Try To Start One RCP:

- |  |   |
|--|---|
| a. Establish the following conditions prior to RCP start:                                | a. <u>IF</u> conditions can <u>NOT</u> be established, <u>THEN</u> go to Step 15. |
| o PRZR level - GREATER THAN 65% [80% adverse CNMT]                                       |   |
| o RCS subcooling based on core exit T/Cs - GREATER THAN 20°F USING FIGURE MIN SUBCOOLING |   |
| o Bus 11A or 11B - ENERGIZED   |   |
| o Refer to Attachment RCP START  |   |
| b. Start one RCP   |   |

14 Check RVLIS Fluid Fraction (any RCP running) - LESS THAN 97%

Go to Step 24.





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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Direct HP To Start CNMT Hydrogen Monitors	
	***** <u>CAUTION</u> FOLLOWING BLOCK OF AUTOMATIC SI ACTUATION, MANUAL SI ACTUATION MAY BE REQUIRED IF CONDITIONS DEGRADE. *****	
16	Check If SI Should Be Blocked:	
	a. PRZR pressure - GREATER THAN 1750 PSIG	a. Go to Step 17.
	b. PRZR pressure - LESS THAN 1950 PSIG	b. Decrease PRZR pressure to less than 1950 psig using normal PRZR spray.  IF normal spray <u>NOT</u> available and letdown in service, <u>THEN</u> use auxiliary spray (AOV-296). <u>IF NOT, THEN use one PRZR PORV.</u>
	c. Block SI	
17	Record RCS Pressure and CNMT Hydrogen Concentration on Attachment VENT TIME	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Establish Following RCS Conditions:	
	a. PRZR level - STABLE AND BETWEEN 40% AND 60%	a. Control charging and letdown as necessary.
	b. RCS pressure - STABLE	b. Energize PRZR heaters and use normal PRZR spray as necessary.  <u>IF</u> normal spray <u>NOT</u> available and letdown in service, <u>THEN</u> use auxiliary spray (AOV-296).
	c. RCS subcooling based on core exit T/Cs - GREATER THAN 50°F USING FIGURE MIN SUBCOOLING	c. Dump steam as necessary.
	d. RCS hot leg temperatures - STABLE	d. Control steam dump and total feed flow as necessary to stabilize RCS temperature.
19	Prepare CNMT For Reactor Vessel Venting:	
	a. Verify CNMT ventilation isolation valves - CLOSED	a. Manually close valves.
	<ul style="list-style-type: none"> <li>• CNMT MINI PURGE EXH VLVs (AOV-7970, AOV-7971)</li> <li>• CNMT MINI PURGE SPLY VLVs (AOV-7445, AOV-7448)</li> <li>• CNMT AIR SAMPLE ISO VLVs (AOV-1597, AOV-1598, AOV-1599)</li> </ul>	
	b. Verify the following CNMT ventilation equipment in service:	b. Manually start fans as power supply permits.
	<ul style="list-style-type: none"> <li>• All CNMT RECIRC fans</li> <li>• One reactor compartment cooling fan</li> <li>• One control rod shroud fan</li> </ul>	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	Determine Maximum Allowable Venting Time:	
	a. CNMT hydrogen concentration - LESS THAN 3%	a. Consult TSC to evaluate methods to reduce hydrogen concentration to less than 3%.
	b. Determine maximum venting time (Refer to Attachment VENT TIME)	
21	Review Reactor Vessel Venting Termination Criteria:	
	o RCS subcooling based on core exit T/Cs -LESS THAN 10°F USING FIGURE MIN SUBCOOLING	
	-OR-	
	o PRZR level - LESS THAN 13% [40% adverse CNMT]	
	-OR-	
	o RCS pressure - DECREASES BY 200 PSI	
	-OR-	
	o Venting time - GREATER THAN MAXIMUM TIME CALCULATED IN STEP 20	
	-OR-	
	o RVLIS level (no RCPs) - GREATER THAN 95%	
	-OR-	
	o RVLIS fluid fraction (any RCP running) - GREATER THAN 97%	

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EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 5 PAGE 14 of 15
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>VENTING SHOULD BE STOPPED IF ANY VENTING TERMINATION CRITERION IN STEP 21 IS EXCEEDED.</p> <p>*****</p> <p><u>NOTE:</u> The reactor vessel head vents should not be opened unless specifically directed by PORC.</p>		
22	Vent Reactor Vessel:	
	<p>a. Open train A Rx vessel head vent valves</p> <ul style="list-style-type: none"> <li>• SOV-590</li> <li>• SOV-592</li> </ul> <p>b. Any venting termination criterion - EXCEEDED</p> <p>c. Close all vent valves</p>	<p>a. <u>IF</u> either valve fails to open, <u>THEN</u> close both valves and open train B valves.</p> <ul style="list-style-type: none"> <li>• SOV-591</li> <li>• SOV-593</li> </ul> <p>b. Continue venting. <u>WHEN</u> any venting termination criterion is exceeded, <u>THEN</u> do Steps 22c, 23, 24 and 25.</p>
23	Check RVLIS Indication -	
	<p>o Level (no RCPs) - GREATER THAN 95%</p> <p style="text-align: center;">-OR-</p> <p>o Fluid fraction (any RCP running) - GREATER THAN 97%</p>	<p>Increase RCS pressure to value recorded in Step 17. Return to Step 15.</p>
24	Check PRZR Level - STABLE	<p>Control charging and letdown as necessary to stabilize PRZR level.</p>







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FR-I.3 APPENDIX LIST

<u>TITLE</u>	<u>PAGES</u>
1) FIGURE MIN SUBCOOLING	1
2) FIGURE TECH SPEC C/D	1
3) FIGURE HYDROGEN FLOW RATE	1
4) ATTACHMENT VENT TIME	1
5) ATTACHMENT RCP START	1
6) ATTACHMENT AUX BLDG	1

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EOP:

FR-I.3

TITLE:

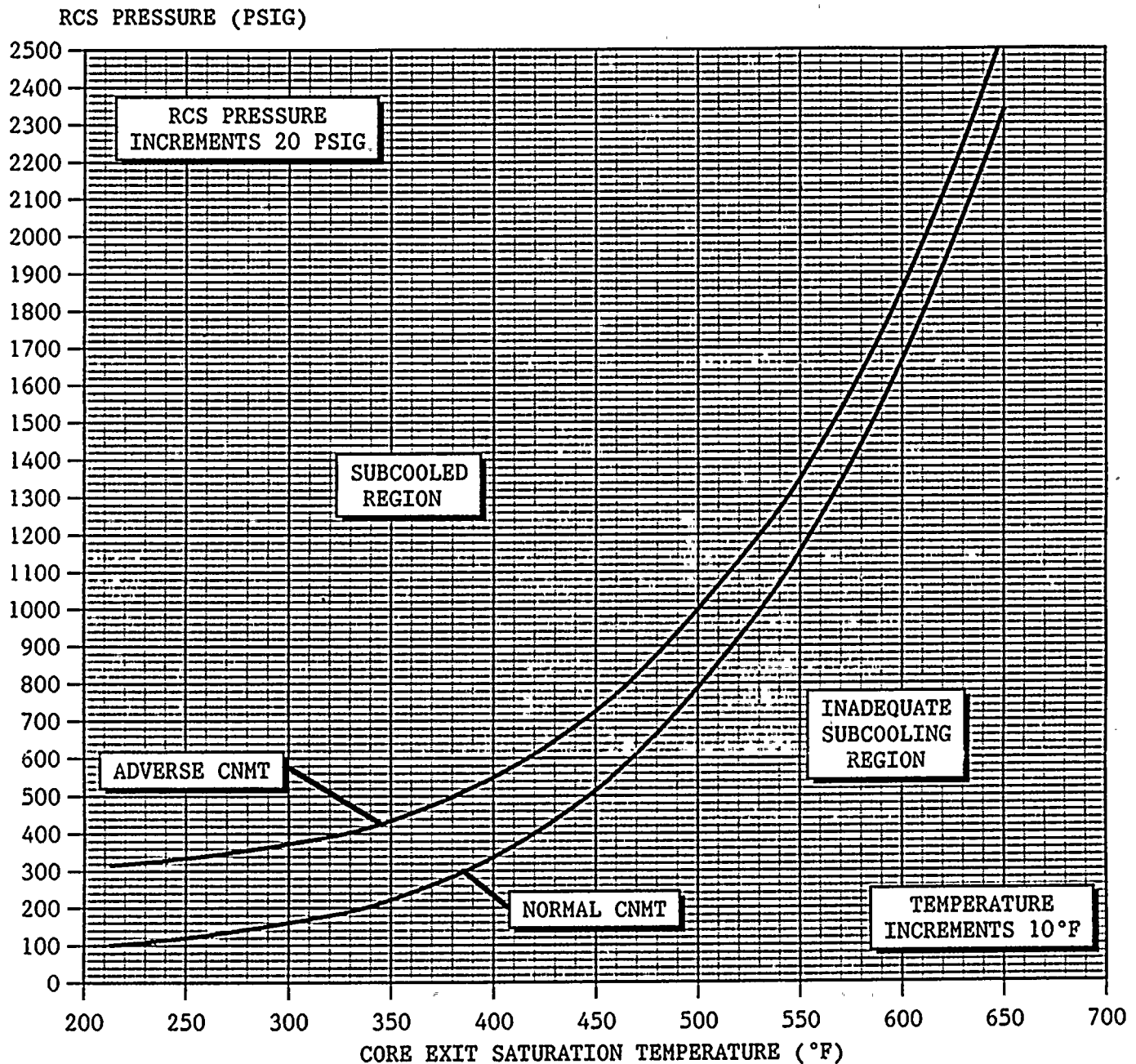
RESPONSE TO VOIDS IN REACTOR VESSEL

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FIGURE MIN SUBCOOLING

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





EOP:

FR-I.3

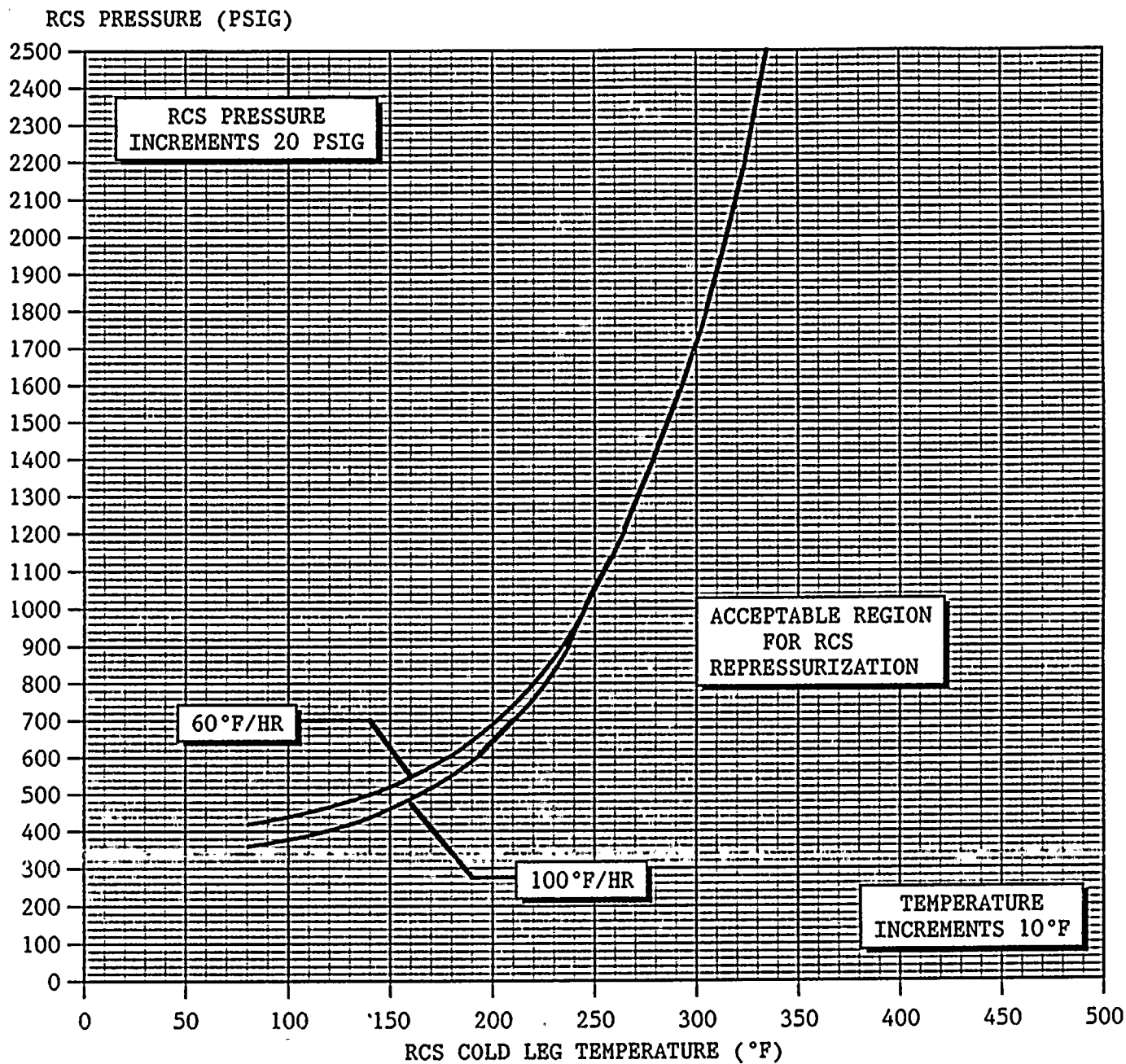
TITLE:

RESPONSE TO VOIDS IN REACTOR VESSEL

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FIGURE TECH SPEC C/D





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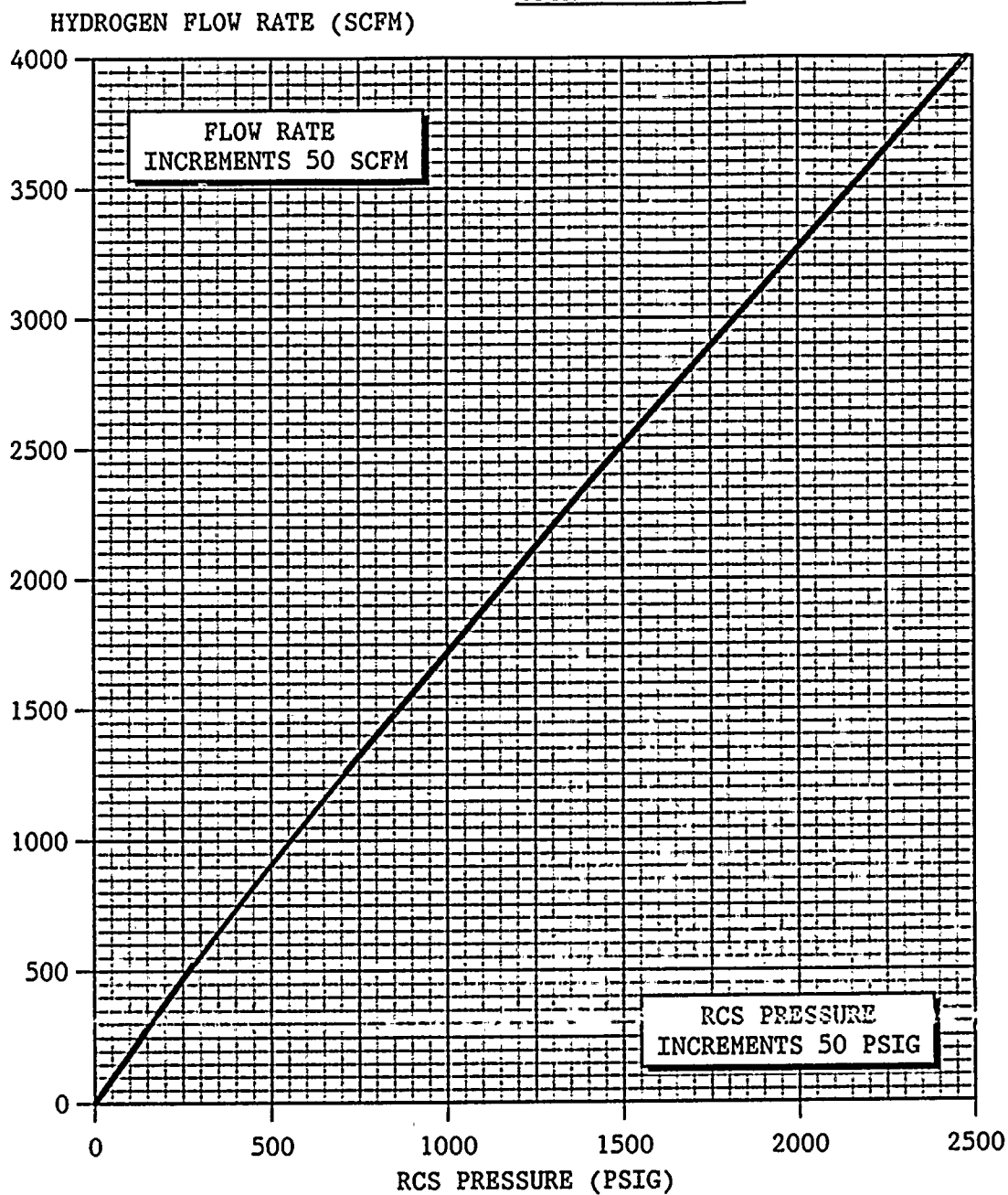
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RESPONSE TO VOIDS IN REACTOR VESSEL

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CNMT HYDROGEN

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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

*Terry White*  
RESPONSIBLE MANAGER

6-5-96  
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: \_\_\_\_\_





EOP: FR-I, 3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 8 PAGE 2 of 16
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A. PURPOSE - This procedure provides actions to respond to voids in the reactor vessel head.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. F-0.6, INVENTORY Critical Safety Function Status Tree on a YELLOW condition.

EOP: FR-I:3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 8 PAGE 3 of 16
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>IF A CONTROLLED NATURAL CIRCULATION COOLDOWN IS IN PROGRESS AND A VOID IN THE REACTOR VESSEL UPPER HEAD IS EXPECTED, THIS PROCEDURE SHOULD NOT BE PERFORMED.</p> <p>*****</p> <p><u>NOTE:</u> Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than <math>10^{+05}</math> R/hr.</p>		
1	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.

EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 8 PAGE 4 of 16
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Verify Adequate SW Flow To CCW Hx:	
a.	Verify at least two SW pumps - RUNNING	a. Perform the following:  1) Verify adequate power to operate two SW pumps (258 kw per pump).  <u>IF NOT, THEN</u> shed sufficient non-essential loads.  <ul style="list-style-type: none"> <li>• CNMT RECIRC fans</li> <li>• Charging pumps</li> <li>• IA compressors</li> <li>• PRZR heaters</li> <li>• Rx compartment cooling fans</li> <li>• Control rod shroud fans</li> </ul> 2) Ensure two SW pumps running.
b.	Verify AUX BLDG SW isolation valves - OPEN  <ul style="list-style-type: none"> <li>• MOV-4615 and MOV-4734</li> <li>• MOV-4616 and MOV-4735</li> </ul>	b. Establish SW to AUX BLDG (Refer to Attachment AUX BLDG SW).
c.	Verify CNMT RECIRC fans 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.



EOP:

FR-I.3

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RESPONSE TO VOIDS IN REACTOR VESSEL

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**3 Establish IA to CNMT:**

- a. Verify non-safeguards busses energized from offsite power

o Bus 13 normal feed - CLOSED

-OR-

o Bus 15 normal feed - CLOSED

- b. Verify SW isolation valves to turbine building - OPEN

- MOV-4613 and MOV-4670
- MOV-4614 and MOV-4664

- c. Verify at least two air compressors - RUNNING

- d. Check IA supply:

- o Pressure - GREATER THAN 60 PSIG
- o Pressure - STABLE OR INCREASING

- e. Reset both trains of XY relays for IA to CI valve AOV-5392

- f. Open IA AOV-5392

- a. Perform the following:

- 1) Close non-safeguards bus tie breakers:

- Bus 13 to Bus 14 tie
- Bus 15 to Bus 16 tie

- 2) WHEN bus 15 restored, THEN reset control room lighting.

- b. Perform the following:

- 1) Manually open valves.

- 2) Dispatch AO to reset air compressors as required.

- c. Manually start air compressors as power supply permits (75 kw each).

- d. Perform the following:

- 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR).

- 2) Continue with Step 4. WHEN IA restored, THEN do Steps 3e and f.

EOP:

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RESPONSE TO VOIDS IN REACTOR VESSEL

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**4 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:

b. Manually align valves as necessary.

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

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 control PRZR level

c. Continue with Step 8. WHEN charging can be established, THEN do Steps 5, 6 and 7.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	<p><b>Check If Normal CVCS Operation Can Be Established</b></p> <p>a. Verify IA restored:</p> <ul style="list-style-type: none"> <li>o IA to CNMT (AOV-5392) - OPEN</li> <li>o IA pressure - GREATER THAN 60 PSIG</li> </ul> <p>b. CCW pumps - ANY RUNNING</p> <p>c. Verify instrument bus D - ENERGIZED</p>	<p>a. Continue with Step 8. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 5 through 7.</p> <p>b. Perform the following:</p> <ol style="list-style-type: none"> <li>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"> <li>• RCP A, MOV-749A and MOV-759A</li> <li>• RCP B, MOV-749B and MOV-759B</li> </ul> </li> <li>2) Manually start one CCW pump.</li> </ol> <p>c. Energize MCC B. <u>IF</u> MCC B <u>NOT</u> available, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1) Verify MCC A energized.</li> <li>2) Place instrument bus D on maintenance supply.</li> </ol>
6	<p><b>Verify PRZR Level - GREATER THAN 13% [40% adverse CNMT]</b></p>	<p>Continue with Step 8. <u>WHEN</u> PRZR level increases to greater than 13% [40% adverse CNMT], <u>THEN</u> do Step 7.</p>



EOP:

FR-I:3

TITLE:

RESPONSE TO VOIDS IN REACTOR VESSEL

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

## 7 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 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

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.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Establish Stable RCS Conditions:	
	a. PRZR level - STABLE AND BETWEEN 40% AND 60%	a. Control charging and letdown as necessary.
	b. RCS pressure - STABLE	b. Energize PRZR heaters and use normal PRZR spray as necessary. IF normal spray NOT available and letdown in service, THEN use auxiliary spray valve (AOV-296).
	c. RCS hot leg temperatures - STABLE	c. Control steam dump and total feed flow as necessary to stabilize RCS temperature.
9	Check RCPS - BOTH STOPPED	Go to Step 15.
***** CAUTION IF RHR NORMAL COOLING IN SERVICE, THEN RCS PRESSURE SHOULD BE MAINTAINED LESS THAN THE RCS OVERPRESSURE PROTECTION SETPOINT (410 PSIG). *****		
10	Check If RCS Pressure Should Be Increased:	
	a. Pressure - AT LEAST 100 PSI BELOW LIMIT ON FIGURE TECH SPEC C/D (100°F/HR)	a. Go to Step 13.
	b. Energize PRZR heaters to increase RCS pressure by 50 psi	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Control Charging And Letdown As Necessary To Maintain PRZR Level Greater Than 13% [40% adverse CNMT]	
12	Check RVLIS Indication:	
	a. Level (no RCPs) - INCREASING	a. Go to Step 13.
	b. Level (no RCPs) - GREATER THAN 95%	b. Return to Step 10.
	c. Turn off PRZR heaters to stabilize RCS pressure	
	d. Return to procedure and step in effect	
***** CAUTION IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION. *****		
13	Try To Start One RCP:	
	a. Establish the following conditions prior to RCP start:	a. IF conditions can NOT be established, THEN go to Step 15.
	o PRZR level - GREATER THAN 65% [80% adverse CNMT]	
	o RCS subcooling based on core exit T/Cs - GREATER THAN 20°F USING FIGURE MIN SUBCOOLING	
	o Bus 11A or 11B - ENERGIZED	
	o Refer to Attachment RCP START	
	b. Start one RCP	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Check RVLIS Fluid Fraction (any RCP running) - LESS THAN 97%	Go to Step 24.
15	Direct RP To Start CNMT Hydrogen Monitors	
***** <u>CAUTION</u> FOLLOWING BLOCK OF AUTOMATIC SI ACTUATION, MANUAL SI ACTUATION MAY BE REQUIRED IF CONDITIONS DEGRADE. *****		
16	Check If SI Should Be Blocked:	
	a. PRZR pressure - GREATER THAN 1750 PSIG	a. Go to Step 17.
	b. PRZR pressure - LESS THAN 1950 PSIG	b. Decrease PRZR pressure to less than 1950 psig using normal PRZR spray.  IF normal spray <u>NOT</u> available and letdown in service, <u>THEN</u> use auxiliary spray (AOV-296). IF <u>NOT</u> , <u>THEN</u> use one PRZR PORV.
	c. Block SI	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Record RCS Pressure and CNMT Hydrogen Concentration on Attachment VENT TIME	
18	Establish Following RCS Conditions:	
	a. PRZR level - STABLE AND BETWEEN 40% AND 60%	a. Control charging and letdown as necessary.
	b. RCS pressure - STABLE	b. Energize PRZR heaters and use normal PRZR spray as necessary.  <u>IF</u> normal spray <u>NOT</u> available and letdown in service, <u>THEN</u> use auxiliary spray (AOV-296).
	c. RCS subcooling based on core exit T/Cs - GREATER THAN 50°F USING FIGURE MIN SUBCOOLING	c. Dump steam as necessary.
	d. RCS hot leg temperatures - STABLE	d. Control steam dump and total feed flow as necessary to stabilize RCS temperature.



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	<p><b>Prepare CNMT For Reactor Vessel Venting:</b></p> <p>a. Verify CNMT ventilation isolation valves - CLOSED</p> <ul style="list-style-type: none"> <li>• CNMT MINI PURGE EXH VLVs (AOV-7970, AOV-7971)</li> <li>• CNMT MINI PURGE SPLY VLVs (AOV-7445, AOV-7448)</li> <li>• CNMT AIR SAMPLE ISO VLVs (AOV-1597, AOV-1598, AOV-1599)</li> </ul> <p>b. Verify the following CNMT ventilation equipment in service:</p> <ul style="list-style-type: none"> <li>• All CNMT RECIRC fans</li> <li>• One reactor compartment cooling fan</li> <li>• One control rod shroud fan</li> </ul>	<p>a. Manually close valves.</p> <p>b. Manually start fans as power supply permits.</p>
20	<p><b>Determine Maximum Allowable Venting Time:</b></p> <p>a. CNMT hydrogen concentration - LESS THAN 3%</p> <p>b. Determine maximum venting time (Refer to Attachment VENT TIME)</p>	<p>a. Consult TSC to evaluate methods to reduce hydrogen concentration to less than 3%.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	<p>Review Reactor Vessel Venting Termination Criteria:</p> <ul style="list-style-type: none"> <li>o RCS subcooling based on core exit T/Cs -LESS THAN 10°F USING FIGURE MIN SUBCOOLING</li> <li>-OR-</li> <li>o PRZR level - LESS THAN 13% [40% adverse CNMT]</li> <li>-OR-</li> <li>o RCS pressure - DECREASES BY 200 PSI</li> <li>-OR-</li> <li>o Venting time - GREATER THAN MAXIMUM TIME CALCULATED IN STEP 20</li> <li>-OR-</li> <li>o RVLIS level (no RCPs) - GREATER THAN 95%</li> <li>-OR-</li> <li>o RVLIS fluid fraction (any RCP running) - GREATER THAN 97%</li> </ul>	





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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
***** CAUTION *****		
VENTING SHOULD BE STOPPED IF ANY VENTING TERMINATION CRITERION IN STEP 21 IS EXCEEDED.		
*****		
NOTE: The reactor vessel head vents should not be opened unless specifically directed by PORC.		
22 Vent Reactor Vessel:		
a. Open train A Rx vessel head vent valves	<ul style="list-style-type: none"> <li>• SOV-590</li> <li>• SOV-592</li> </ul>	a. <u>IF</u> either valve fails to open, <u>THEN</u> close both valves and open train B valves. <ul style="list-style-type: none"> <li>• SOV-591</li> <li>• SOV-593</li> </ul>
b. Any venting termination criterion - EXCEEDED		b. Continue venting. <u>WHEN</u> any venting termination criterion is exceeded, <u>THEN</u> do Steps 22c, 23, 24 and 25.
c. Close all vent valves		
23 Check RVLIS Indication -		Increase RCS pressure to value recorded in Step 17. Return to Step 15.
o Level (no RCPs) - GREATER THAN 95%		
-OR-		
o Fluid fraction (any RCP running) - GREATER THAN 97%		

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	Check PRZR Level - STABLE	Control charging and letdown as necessary to stabilize PRZR level.
25	Return To Procedure And Step In Effect	
		-END-

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FR-I.3 APPENDIX LIST

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1) FIGURE MIN SUBCOOLING	1
2) FIGURE TECH SPEC C/D	1
3) FIGURE HYDROGEN FLOW RATE	1
4) ATTACHMENT VENT TIME	1
5) ATTACHMENT RCP START	1
6) ATTACHMENT AUX BLDG SW	1

EOP:

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TITLE:

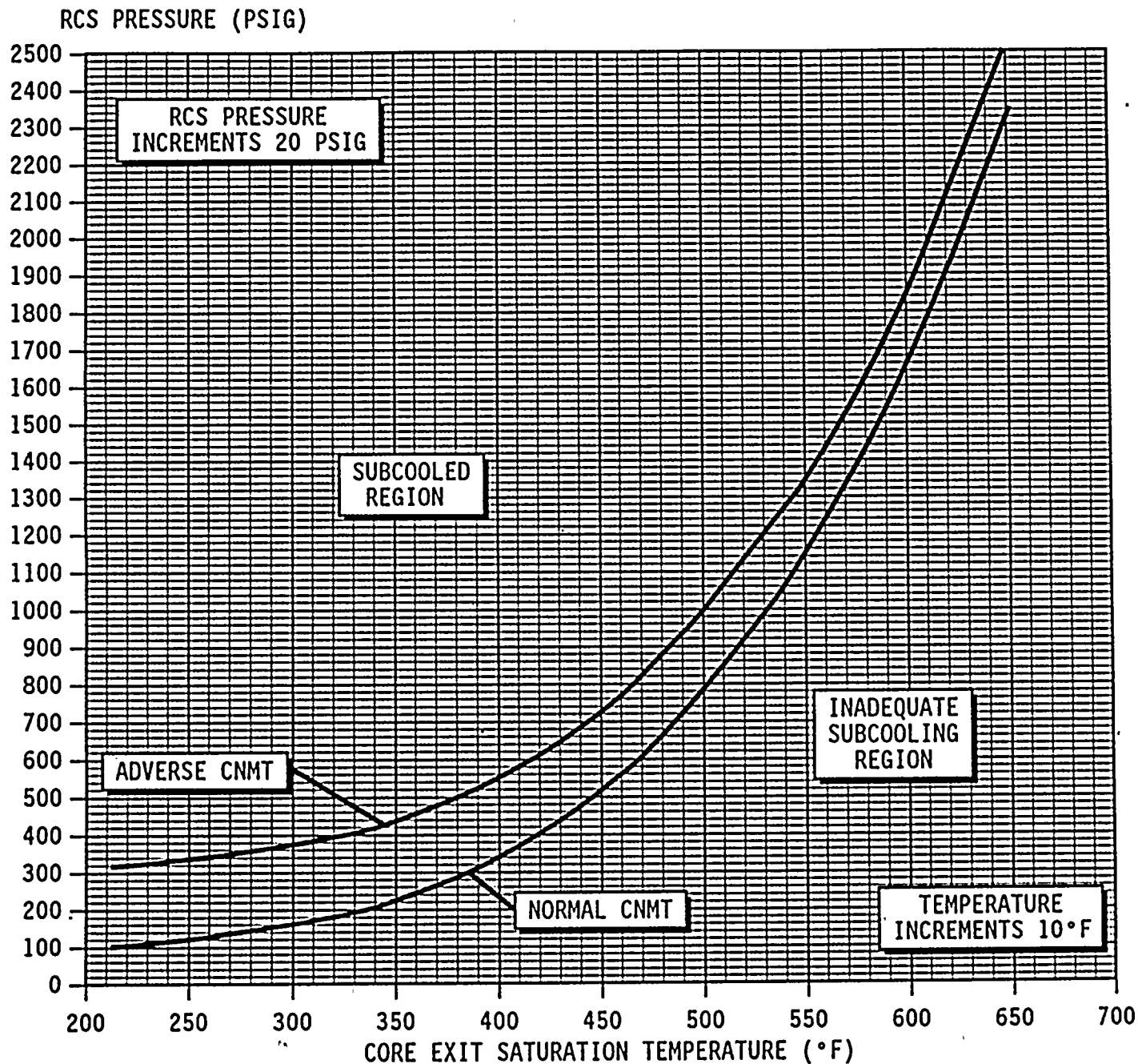
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FIGURE MIN SUBCOOLING

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





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## FIGURE TECH SPEC C/D

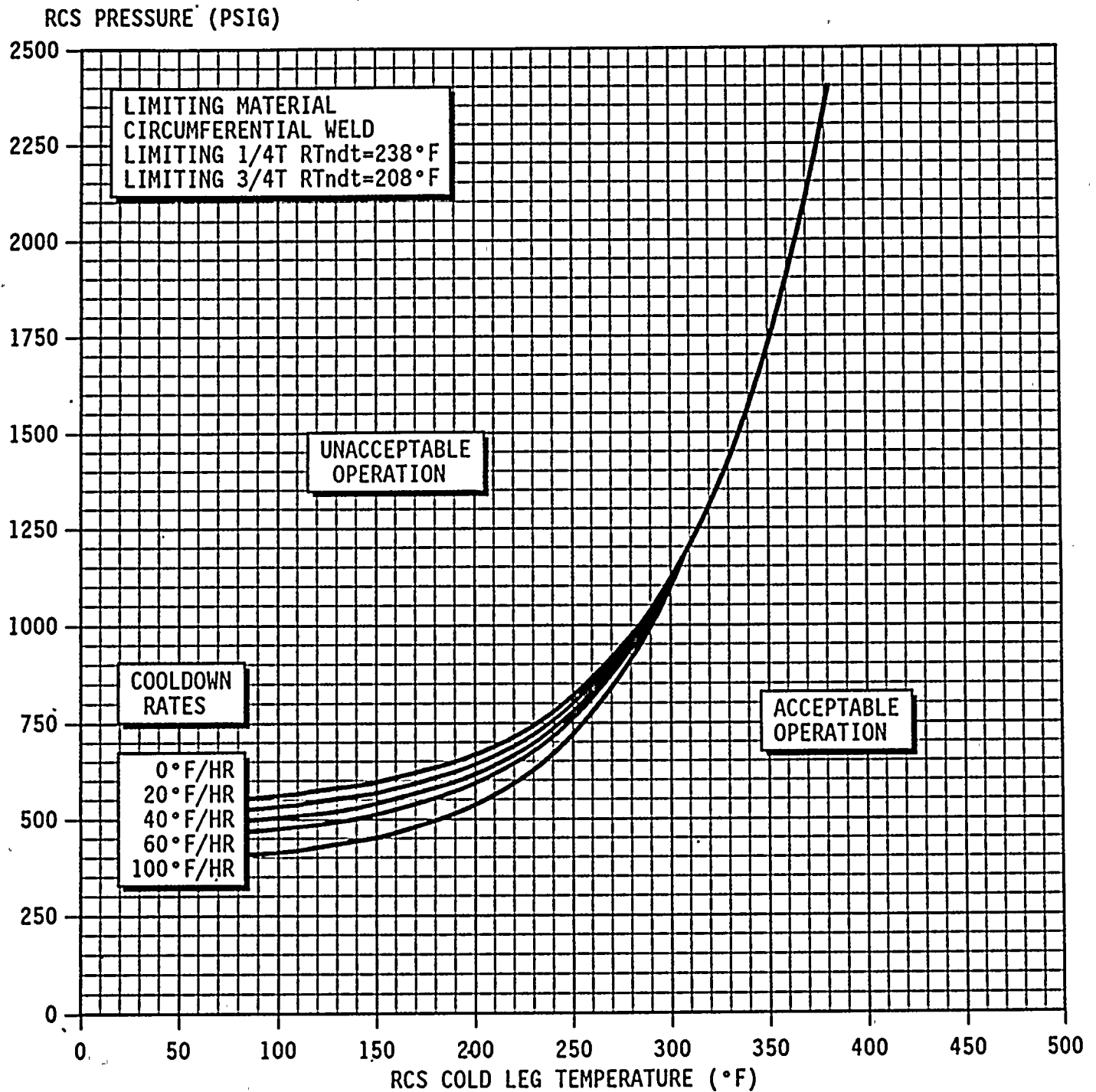


Figure 3.1-2: Ginna Reactor Vessel Cooldown Limitations Applicable for the first 21 EFPY using Reg Guide 1.99, Rev 2.

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CNMT HYDROGEN