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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER

TECHNICAL REVIEW

PORC REVIEW DATE 4-21-93

SUPERINTENDENT PLANT

4-23-93 EFFECTIVE DATE

CATEGORY 1.0

9305140055 930505 PDR ADDCK 05000244

**REVIEWED BY:** 

PDR

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- A. PURPOSE This procedure provides actions to avoid, or limit, thermal shock or pressurized thermal shock to the reactor pressure vessel, or overpressure conditions at low temperature.
- B. ENTRY CONDITIONS/SYMPTOMS

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- 1. ENTRY CONDITIONS This procedure is entered from:
  - a. F-0.4, INTEGRITY Critical Safety Function Status Tree, on either a RED or ORANGE condition.

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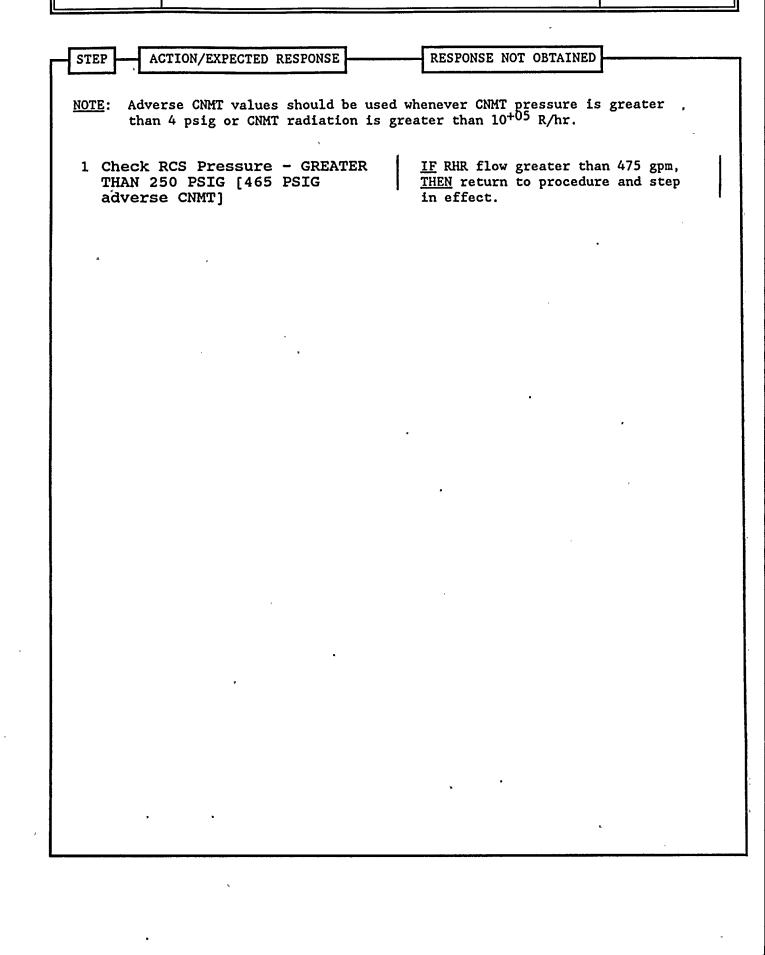
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE: A faulted S/G is any S/G that is manner or is completely depressur	depressurizing in an uncontrolled rized.
2 Check RCS Cold Leg Temperatures - STABLE OR	Try to stop RCS cooldown:
INCREASING	a. Ensure S/G ARVs closed.
	b. Close both S/G MSIVs.
·	c. Ensure MFW flow control valves closed.
	<ul> <li>MFW regulating valves</li> <li>MFW bypass valves</li> </ul>
•	d. Ensure MFW pumps tripped.
	e. Rotate reheater steam supply controller cam to close reheater steam supply valves.
τ,	f. <u>IF</u> S/G pressure less than condensate pressure, <u>THEN</u> stop all condensate pumps.
•	g. <u>IF</u> RHR system in service, <u>THEN</u> stop any cooldown from RHR system.
· · · · · · · · · · · · · · · · · · ·	<ul> <li>h. Control total feed flow to non-faulted S/G(s) greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in at least one non-faulted S/G. <u>WHEN</u> S/G level greater than 5% [25% adverse CNMT] in one non-faulted S/G, <u>THEN</u> limit feed flow to stop RCS cooldown.</li> </ul>
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This Step continued on the next page.

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TEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(Step 2 continued from previous page)	
-	i. Minimize cooldown fróm faulted S/G(s):
	<ol> <li>Close faulted S/G(s) TDAFW pump steam supply valve(s).</li> </ol>
· ·	• S/G A, MOV-3505A • S/G B, MOV-3504A
<b>、</b>	2) <u>IF</u> both S/G(s) faulted, <u>THEN</u> control feed flow at 50 gpm to each S/G.
	3) <u>IF</u> any S/G <u>NOT</u> faulted, <u>THEN</u> isolate all feedwater to faulted S/G unless necessary for RCS temperature control. <u>IF</u> a faulted S/G is necessary for RCS temperature control, <u>THEN</u> control feed flow at 50 gpm to that S/G.
3 Check PRZR PORV Block Valves:	
a. Power to PORV block valves - AVAILABLE	a. Restore power to block valves unless block valve was closed t isolate an open PORV:
	<ul> <li>MOV-515, MCC C position 6C</li> <li>MOV-516, MCC D position 6C</li> </ul>
b. Block valves - AT LEAST ONE OPEN	<ul> <li>b. Open one block valve unless it</li> <li>was closed to isolate an open</li> <li>PORV.</li> </ul>
	<u>IF</u> at least one block valve can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to locally check breaker.
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RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* * * * * * * * * * * * * * * * * * *	PRZR PRESSURE, THEN STEP 4 SHOULD BE
* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
4 Check PRZR PORV Status:	1
a. Check Reactor Vessel Overpressure Protection System - IN SERVICE	a. Go to Step 4d.
b. Check RCS pressure - LESS THAN 410 PSIG	<ul> <li>b. Perform the following:</li> <li>1) Ensure at least one PRZR PORV open.</li> </ul>
•	2) Continue with Step 5. <u>WHEN</u> pressure less than setpoint, <u>THEN</u> do Step 4e.
c. Go to Step 4e	
d. PRZR pressure - LESS THAN 2335 PSIG	<ul> <li>d. Perform the following:</li> <li>1) Ensure at least one PRZR PORV open.</li> </ul>
· .	2) Continue with Step 5. <u>WHEN</u> pressure less than setpoint, <u>THEN</u> do Step 4e.
e. Verify PRZR PORVs - CLOSED	e. Manually close valve. <u>IF</u> any valve can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve.
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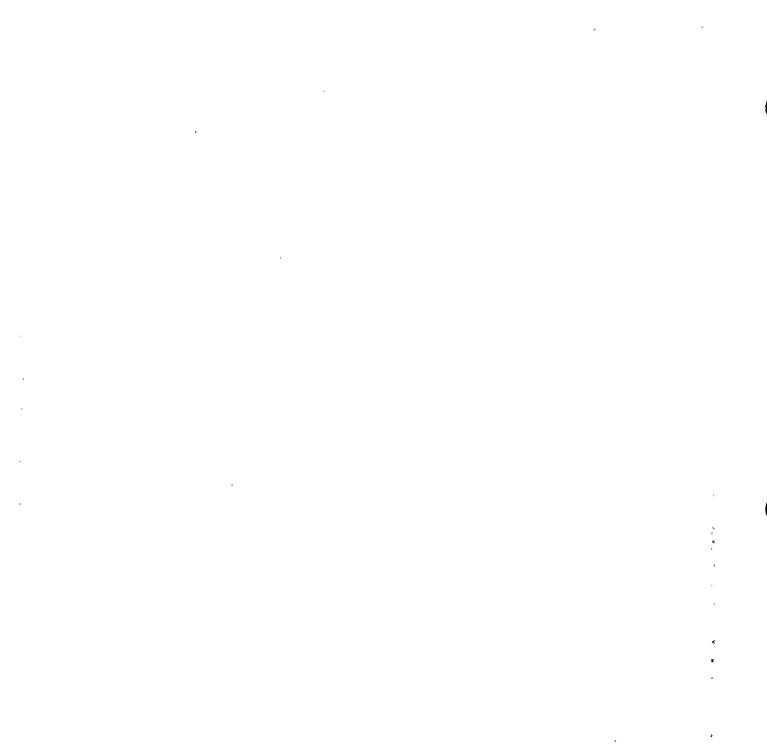
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5 Chec	k SI Pumps - ANY RUNNING	Go to Step 14.
6 Chec	k If SI Can Be Terminated:	Do <u>NOT</u> stop SI pumps. Perform the following:
o RC	S subcooling based on core	10110#116.
ex	it T/Cs - GREATER THAN 50°F ING FIGURE MIN SUBCOOLING	a. <u>IF</u> RCS subcooling based on core exit T/Cs greater than 0°F using
o Ch	eck RVLIS indication:	Figure MIN SUBCOOLING and no RCP running, <u>THEN</u> attempt to start an RCP:
0	Level (no RCPs) - GREATER	
-	THAN 68% [73% adverse CNMT]	<ol> <li>Establish conditions for starting an RCP:</li> </ol>
	-OR-	n 114 - 110
•	Fluid fraction (any RCP	o Bus 11A or 11B energized
Ū	running) - GREATER THAN 80%	o Refer to Attachment RCP START
		2) <u>IF</u> conditions established, <u>THEN</u> start one RCP.
		b. Go to Step 27.
* * * * *	* * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
	CAUT	
PUMP WIL	L AUTO START ON EMERGENCY D/G. SAFEGUARDS EQUIPMENT.	THEN SELECTED SW PUMPS AND ONE CCW MANUAL ACTION WILL BE REQUIRED TO
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8 Stop SI And RHR Pumps And Place In AUTO	•
9 Reset CI:	
a. Depress CI reset pushbutton	
<ul> <li>b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED</li> </ul>	b. Perform the following:
	1) Reset SI.
	2) Depress CI reset pushbutton.
10 Verify Adequate SW Flow:	
a. Check at least two SW pumps - RUNNING	a. Manually start SW pumps as power supply permits (258 kw each).
• •	IF 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 12. <u>WHEN</u> adequate SW available, <u>THEN</u> do Step 11
b. Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1)	×
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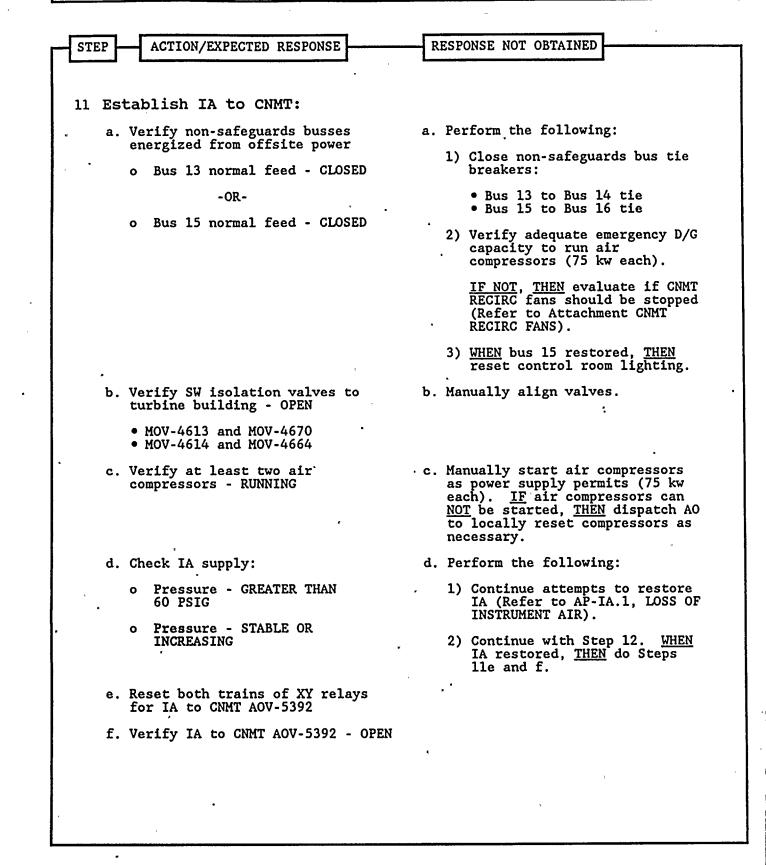
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STEP -	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5151	ROTION/ LATEOTED RESIGNED	
* * * *		* * * * * * * * * * * * * * * * * * * *
	<u> </u>	AUTION
ALIGN	ING SI PUMP SUCTION TO RWST BEF	ORE ISOLATING BAST MAY RESULT IN BACKFLOW
	RWST TO BASTS.	
* * * `	* * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
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	rify SI Pump Suction	
AL:	igned To RWST:	
a.	SI pump suction valves from	a. Ensure at least one valve in
	BASTS - CLOSED	each flow path closed.
	• MOV-826A	• MOV-826A or MOV-826B
	• MOV-826B	• MOV-826A or MOV-826B
	• MOV-826C	
	• MOV-826D	
b.		ST b. Ensure at least one valve is
	- OPEN	open.
	• MOV-825A	
	• MOV-825B	
	· · · · · · · · ·	
c.	Consult TSC to determine if SI flush is required (Refer to	
	Attachment SI FLUSH)	
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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13 Check If Charging Flow Has Been Established:	
a. Charging pumps - ANY RUNNING	a. Perform the following:
	<ol> <li><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:</li> </ol>
	• RCP A, V-300A • RCP B, V-300B
•	2) Ensure HCV-142 open, demand at '0%.
b. Align charging pump suction to RWST:	b. <u>IF</u> LCV-112B can <u>NOT</u> be opened, <u>THEN</u> perform the following:
<ul><li>o LCV-112B - OPEN</li><li>o LCV-112C - CLOSED</li></ul>	<ol> <li>Verify charging pump A <u>NOT</u> running and place in PULL STOP.</li> </ol>
•	<ol> <li>Dispatch AO to locally open manual charging pump suction from RWST (V-358 located in charging pump room).</li> </ol>
	3) <u>WHEN</u> V-358 open, <u>THEN</u> direct AO to close V-268 to isolate charging pumps B and C from VCT (V-268 located in charging pump room).
c. Start charging pumps as necessary and adjust charging flow to restore PRZR level	
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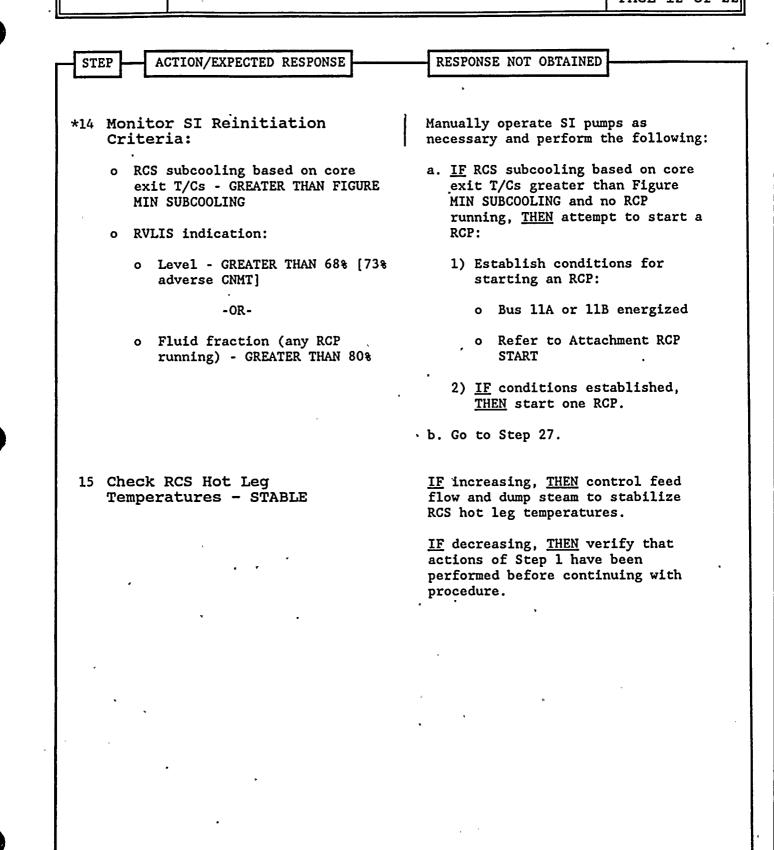
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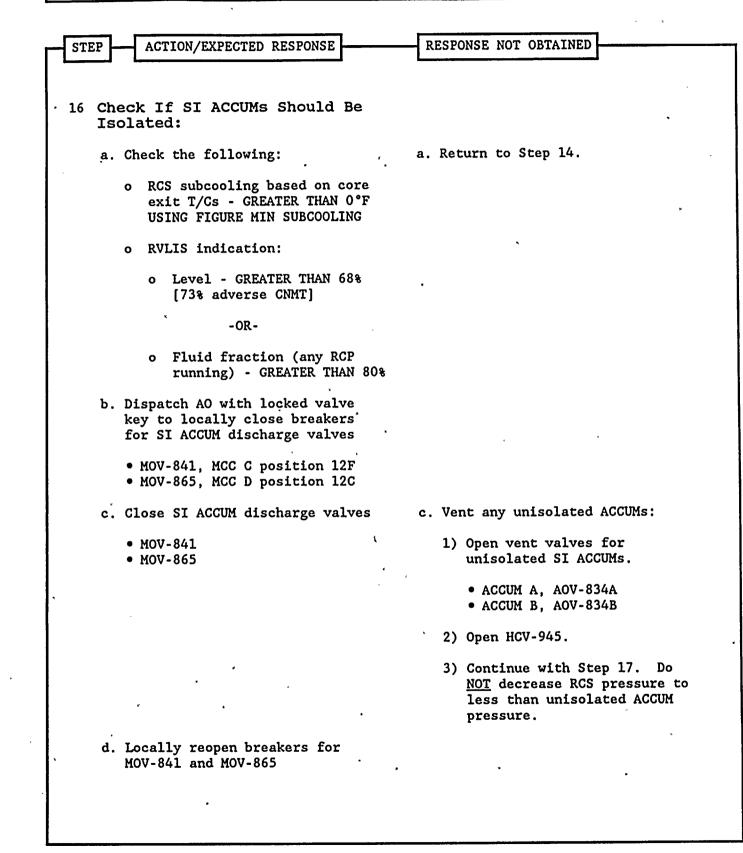
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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	S SHOULD NOT BE DEPRESSURIZED TO L ISOLATED.	ESS THAN SI ACCUM PRESSURE UNTIL SI
* * * *	* * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
<u>NOTE</u> : c	If auxiliary spray is in use, s closing normal charging valve A	pray flow may be increased by OV-294 and normal PRZR spray valves.
c	When using a PRZR PORV select o	one with an operable block valve.
	ressurize RCS To Decrease Subcooling:	× ·
	Depressurize using normal PRZR spray if available	a. <u>IF</u> normal spray <u>NOT</u> available, <u>THEN</u> use one PRZR PORV. <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to Attachment N2 PORVS.
	- 	<u>IF</u> no PRZR PORV available, <u>THEN</u> use auxiliary spray valve (AOV-296).
t	Depressurize RCS until either of the following conditions satisfied:	· · · · · · · · · · · · · · · · · · ·
c	RCS subcooling based on core exit T/Cs - LESS THAN 10°F USING FIGURE MIN SUBCOOLING	
	-OR-	
Ċ	PRZR level - GREATER THAN 87% [75% adverse CNMT]	· .
c. 5	Stop RCS depressurization	
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RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
· _	
18 Check If RCPs Must Be Stopped:	· ·
a. RCPs - ANY RUNNING	a. Go to Step 19.
b. Check the following:	b. Go to Step 19.
o RCP #1 seal D/P - LESS THAN 220 PSID	
-OR-	
o RCP #1 seal leakoff - LESS THAN 0.25 GPM	
c. Stop affected RCP(s)	
* * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * *
AN INCREASE IN RCS PRESSURE MAY RESULT I RCS PRESSURE AND TEMPERATURE SHOULD BE M SUBSEQUENT STEPS IN THIS PROCEDURE.	AINTAINED STABLE WHILE PERFORMING
AN INCREASE IN RCS PRESSURE MAY RESULT I RCS PRESSURE AND TEMPERATURE SHOULD BE M SUBSEQUENT STEPS IN THIS PROCEDURE.	
AN INCREASE IN RCS PRESSURE MAY RESULT I RCS PRESSURE AND TEMPERATURE SHOULD BE M SUBSEQUENT STEPS IN THIS PROCEDURE. * * * * * * * * * * * * * * * * * * *	AINTAINED STABLE WHILE PERFORMING * * * * * * * * * * * * * * * * * * *
AN INCREASE IN RCS PRESSURE MAY RESULT I RCS PRESSURE AND TEMPERATURE SHOULD BE M SUBSEQUENT STEPS IN THIS PROCEDURE. * * * * * * * * * * * * * * * * * * *	AINTAINED STABLE WHILE PERFORMING * * * * * * * * * * * * * * * * * * *
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AN INCREASE IN RCS PRESSURE MAY RESULT I RCS PRESSURE AND TEMPERATURE SHOULD BE M SUBSEQUENT STEPS IN THIS PROCEDURE. * * * * * * * * * * * * * * * * * * *	AINTAINED STABLE WHILE PERFORMING * * * * * * * * * * * * * * * * * * *

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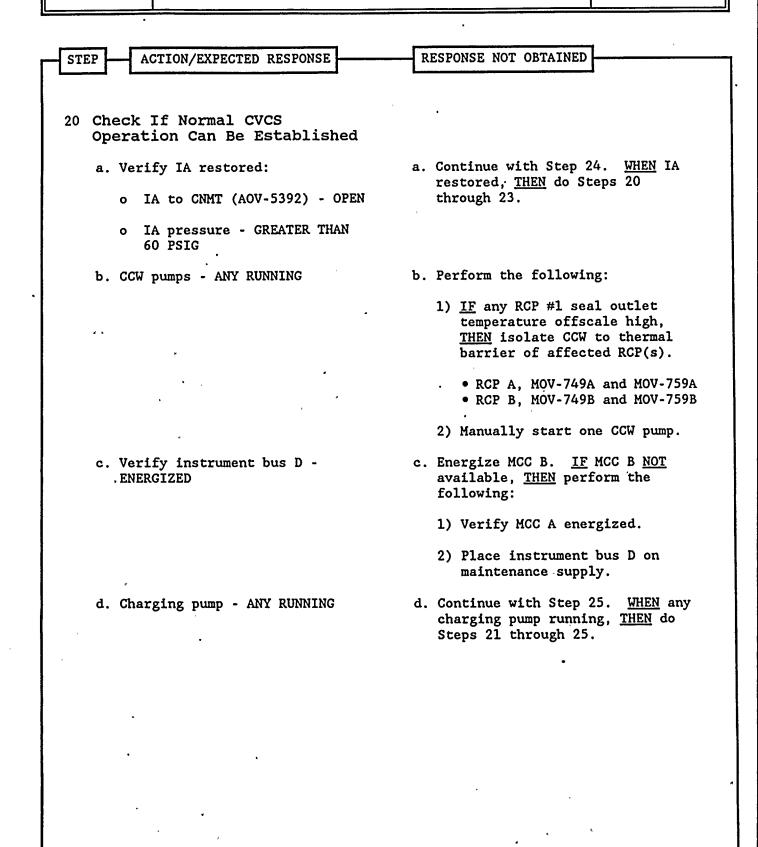
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	PRESSURE LESS THAN 250 PSIG, THEN I SH DESIRED LETDOWN FLOW, NOT TO IN	
* * * *	* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * *
	ablish Normal Letdown:	<u>IF</u> RCP seal return has been established, <u>THEN</u> establish excess
	stablish charging line flow to EGEN Hx - GREATER THAN 20 GPM	letdown as follows:
	lace the following switches to LOSE:	o Place excess letdown divert valve, AOV-312, to NORMAL.
. c. P M	<ul> <li>Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202)</li> <li>AOV-371, letdown isolation valve</li> <li>AOV-427, loop B cold leg to REGEN Hx</li> <li>Place letdown controllers in (ANUAL at 25% open</li> <li>TCV-130</li> <li>PCV-135</li> </ul>	<ul> <li>o Ensure CCW from excess letdown open, (AOV-745).</li> <li>o Open excess letdown isolation valve AOV-310.</li> <li>o Slowly open HCV-123 to maintain excess letdown temperature less than 195°F and pressure less than 100 psig.</li> <li>o Adjust charging pump speed as necessary.</li> <li>IF RCP seal return NOT established,</li> </ul>
f	eset both trains of XY relays for AOV-371 and AOV-427	<u>THEN</u> consult TSC to determine if excess letdown should be placed in service.
e. 0	pen AOV-371 and AOV-427	
	pen letdown orifice valves as necessary	
g. P	Place TCV-130 in AUTO at 105°F	
h. P	Place PCV-135 in AUTO at 250 psig	
	djust charging pump speed and ICV-142 as necessary	
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RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

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22 Check VCT Makeup System:	
a. BAST levels - ANY GREATER THAN 5%	a. Go to Step 23.
b. Check Annunicator B-23, BORIC ACID TANK LO LO LEVEL - EXTINGUISHED	<ul> <li>b. Perform the following:</li> <li>1) Adjust boric acid flow control valve to required flow from table.</li> </ul>
	BAST BORIC ACID LEVEL FLOW (GPM)
	<10%
	2) Go to Step 22d.
c. Adjust boric acid flow control valve in AUTO to 4.5 gpm	
d. Verify the following:	d. Adjust controls as necessary.
1) RMW mode selector`switch in AUTO	
2) RMW control armed - RED LIGHT LIT	
e. Check VCT level:	e. Manually increase VCT makeup flow as follows:
o Level - GREATER THAN 20% -OR- o Level - STABLE OR INCREASING	<ol> <li>Ensure BA transfer pumps and RMW pumps running. <u>IF NOT</u>, <u>THEN</u> reset MCC C and MCC D U lockouts as necessary.</li> </ol>
	2) Place RMW flow control valv HCV-111 in MANUAL and increase RMW flow.
	3) Increase boric acid flow as

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	eck Charging Pump Suction Igned To VCT:	
a.	VCT level - GREATER THAN 20%	a. <u>IF</u> VCT level can <u>NOT</u> be maintained greater than 5%, <u>THEN</u> perform the following:
•		1) Ensure charging pump suction aligned to RWST
		o LCV-112B open
		o` LCV-112C closed
		2) Continue with Step 24. <u>WHEN</u> VCT level greater than 40%, <u>THEN</u> do Step 23b.
	Verify charging pumps aligned to VCT	b. Manually align valves as necessary.
	o LCV-112C - OPEN	
	o LCV-112B - CLOSED	
	eck PRZR Level - LESS THAN 5 [75% adverse CNMT]	Control charging and letdown as necessary to reduce PRZR level to less than 87% [75% adverse CNMT]. If necessary establish excess letdown.
ĸ		<u>IF</u> no letdown available <u>AND</u> CCW to RCPs established, <u>THEN</u> cycle charging pumps as necessary to control PRZR level.
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ST	EP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>101</u>	TE: For optimum long term pressure cont be restored in the PRZR.	rol, saturated conditions should
25	Verify PRZR Liquid Temperature (TI-424) - AT SATURATION FOR DESIRED PRESSURE	<u>IF</u> PRZR liquid temperature low, <u>THEN</u> energize PRZR heaters as necessary to establish desired temperature.
	Check RCS Subcooling Based On Core Exit T/Cs - BETWEEN 0°F AND 10°F USING FIGURE MIN SUBCOOLING	<u>IF</u> RCS pressure less than 160 psig [200 psig adverse CNMT], <u>THEN</u> go to Step 27. <u>IF NOT, THEN</u> depressurize using normal spray.
		<u>IF</u> normal spray <u>NOT</u> available and letdown is in service, <u>THEN</u> use auxiliary spray for any further depressurization. Return to Step 17b.
		<u>IF</u> auxiliary spray <u>NOT</u> available, <u>THEN</u> return to Step 17a.
27	Check Cool Down Rate In RCS Cold Legs - GREATER THAN 100°F IN ANY 60 MINUTES PERIOD `	Return to procedure and step in effect.
28	Maintain RCS Pressure And Temperature Stable For At Least 1 Hour .	
	a. Control steam dump and feed flow as necessary	
я	b. Perform actions of other procedures in effect which do not cool down the RCS or increase RCS pressure until the RCS temperature soak has been completed	
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RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

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STEP ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
••••••••••••••••••••••••••••••••••••••	
29 <u>WHEN</u> 1 HOUR Soak Is Complete, <u>THEN</u> Continue RCS Cooldown And Depressurization As Necessary	•
a. Maintain RCS pressure and cold leg temperature within the limits of Figure SOAK LIMITS	
b. Establish and maintain cooldown rate in RCS cold legs - LESS THAN: 50°F IN ANY 60 MINUTES PERIOD	•
30 Verify SI Flow Not Required:	Manually operate SI pumps as necessary.
o RCS subcooling based on core exit T/Cs - GREATER THAN FIGURE MIN SUBCOOLING	<u>IF</u> RCS subcooling based on core exit T/Cs greater than Figure MIN SUBCOOLING and no RCP running, <u>THEN</u>
o RVLIS indication:	perform the following:
o Level - GREATER THAN 68% [73% adverse CNMT]	a. Establish conditions for starting an RCP:
-OR-	o Bus 11A or 11B energized
o Fluid fraction (any RCP running) - GREATER THAN 80%	o Refer to Attachment RCP START
•	b. <u>IF</u> conditions established, <u>THEN</u> start one RCP.
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31 Return To Proce In Effect	edure And Ste	p	 <b>-</b>
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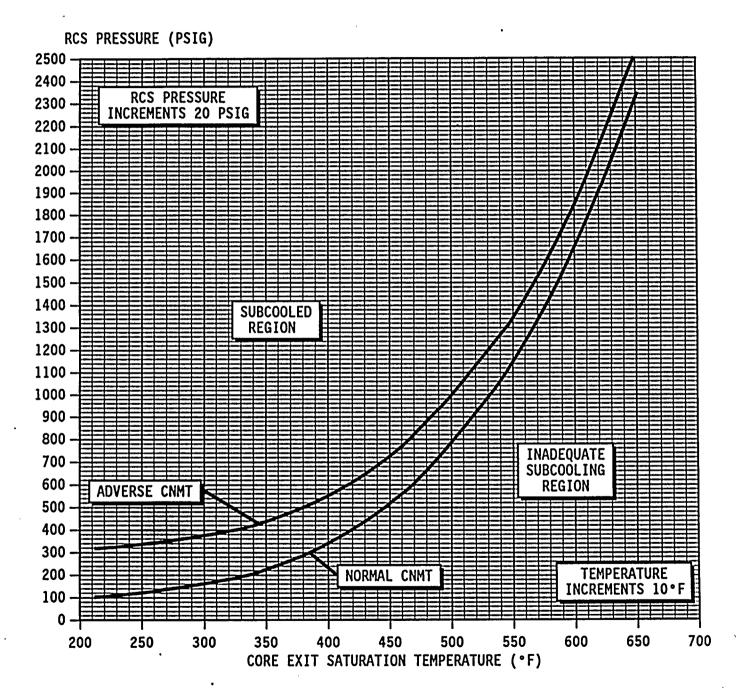
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RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION REV: 7

## FIGURE MIN SUBCOOLING

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





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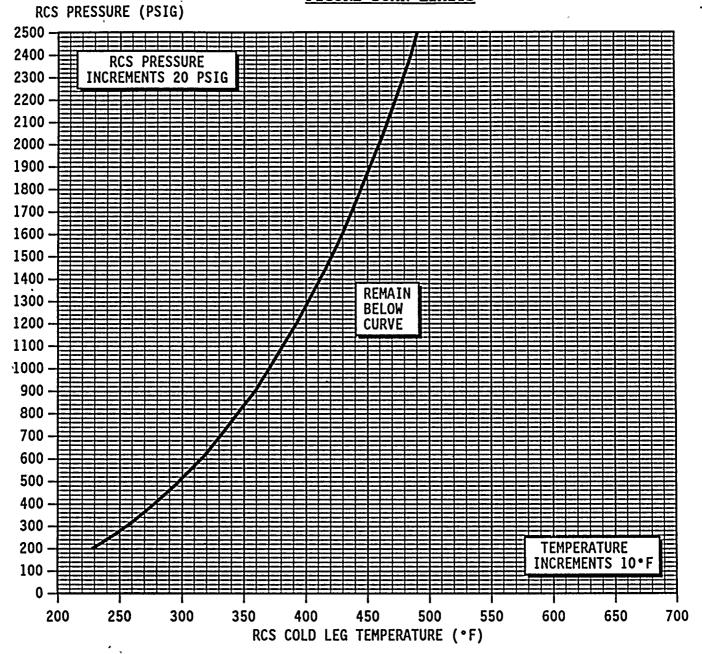
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RESPONSE TO IMMINENT PRESSURIZED THERMAL . SHOCK CONDITION

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## FIGURE SOAK LIMITS



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