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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

TECHNICAL REVIEW

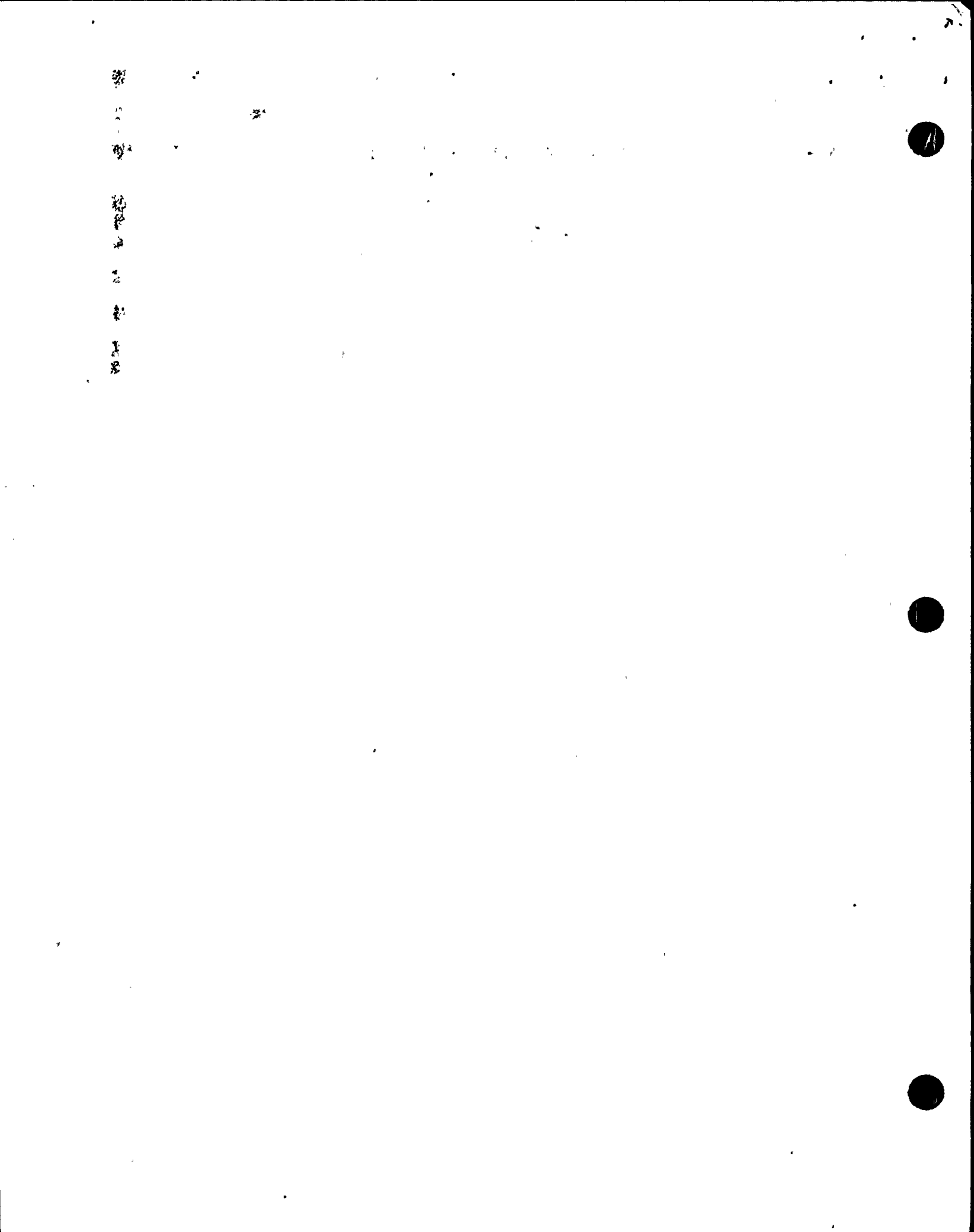
PORC REVIEW DATE 12/18/90

Thomas A. Markow  
PLANT SUPERINTENDENT

12/19/90  
EFFECTIVE DATE

CATEGORY 1.0

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



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A. PURPOSE - This procedure provides the necessary instructions to stabilize and control the plant following a reactor trip without a safety injection.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. E-0, REACTOR TRIP OR SAFETY INJECTION,  
when SI is neither actuated nor required.



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****  <u>CAUTION</u>            o IF SI ACTUATION OCCURS DURING THIS PROCEDURE, E-0, REACTOR TRIP OR SAFETY INJECTION, SHOULD BE PERFORMED.            o IF A MFW PUMP IS LEFT RUNNING ON RECIRC FOR EXTENDED PERIODS OF TIME, OVERHEATING MAY OCCUR.            *****</p>		
<p><u>NOTE:</u> o FOLDOUT page should be open and monitored periodically.            o Critical Safety Function Status Trees should be monitored.            (Refer to Appendix 1 for Red Path Summary.)</p>		
1	Check S/G Feed Flow Status:	
	a. Check RCS Tavg - LESS THAN 554°F	a. Continue with Step 2. <u>WHEN</u> temperature less than 554°F, <u>THEN</u> do Steps 1b, c, d and e.
	b. Verify MFW flow control valves - CLOSED	b. Place A and B MFW regulating valve and bypass valve controllers in MANUAL at 0% demand.
	<ul style="list-style-type: none"> <li>• MFW regulating valves</li> <li>• MFW bypass valves</li> </ul>	
	c. Verify total AFW flow - GREATER THAN 200 GPM	c. Manually start both MDAFW pumps.  <u>IF</u> total AFW flow greater than 200 gpm can <u>NOT</u> be established, <u>THEN</u> perform the following: o Manually start TDAFW pump. -OR- o Perform the following: 1) Establish MFW on bypass. 2) Go to step 2.
	d. Close MFW pump discharge valves	d. Manually stop MFW pumps.
	<ul style="list-style-type: none"> <li>• MOV-3977, A MFW pump</li> <li>• MOV-3976, B MFW pump</li> </ul>	
	e. Stop MFW pumps	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Check RCS Tavg - STABLE AT OR TRENDING TO 547°F	<p><u>IF</u> temperature less than 547°F and decreasing, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> <li>a. Stop dumping steam.</li> <li>b. <u>IF</u> MDAFW pumps supplying greater than 200 gpm, <u>THEN</u> ensure TDAFW pump steam supply valves in PULL STOP.</li> <li>c. <u>IF</u> cooldown continues, <u>THEN</u> control total feed flow greater than 200 gpm until narrow range level greater than 5% in at least one S/G. <u>WHEN</u> S/G level greater than 5% in one S/G, <u>THEN</u> limit feed flow to that required to maintain S/G level.</li> <li>d. <u>IF</u> cooldown continues, <u>THEN</u> close both MSIVs.</li> </ul> <p><u>IF</u> temperature greater than 547°F and increasing, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> <li>o Place condenser steam dump mode control to MANUAL</li> </ul> <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> <li>o Manually dump steam using S/G ARVs.</li> </ul>
3	Verify MRPI Indicates - ALL CONTROL AND SHUTDOWN RODS ON BOTTOM	<p><u>IF</u> one or more control rods <u>NOT</u> fully inserted, <u>THEN</u> borate 175 gallons for each control rod not fully inserted (Refer to AP-CVCS.2, IMMEDIATE BORATION).</p>





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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

4 Verify All AC Busses -  
ENERGIZED BY OFFSITE POWER

- o Normal feed breakers to all 480 volt busses - CLOSED
- o 480 volt bus voltage - GREATER THAN 420 VOLTS
- o Emergency D/G output breakers - OPEN

Perform the following:

- a. IF any AC emergency bus normal feed breaker open, THEN ensure associated D/G breaker closed.
- b. Perform the following as necessary:
  - 1) Ensure one CCW pump running.
  - 2) Close non-safeguards bus tie breakers:
    - Bus 13 to Bus 14 tie
    - Bus 15 to Bus 16 tie
  - 3) Reset Bus 13 and Bus 15 lighting breakers.
  - 4) Dispatch A0 to locally reset and start two IA compressors.
  - 5) Place the following pumps in PULL STOP:
    - EH pumps
    - Turning gear oil pump
    - HP seal oil backup pump
  - 6) Restore power to MCCs.
    - A from Bus 13
    - B from Bus 15
    - E from Bus 15
    - F from Bus 15
  - 7) Start CNMT RECIRC fans as necessary.
- c. Try to restore offsite power to all AC busses (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Verify At Least Two SW Pumps - RUNNING	Manually start SW pumps as necessary.
6	Verify IA Available: o At least 2 air compressors - RUNNING o IA pressure - GREATER THAN 60 PSIG	Dispatch A0 to locally reset and start air compressors as necessary.  <u>IF</u> IA pressure can <u>NOT</u> be maintained, <u>THEN</u> perform the following:  a. Refer to AP-IA.1, LOSS OF INSTRUMENT AIR.  b. Verify charging pump A <u>NOT</u> running and place in PULL STOP.  c. Dispatch A0 to locally open manual charging pump suction from RWST (V-358 in charging pump room).  d. <u>WHEN</u> V-358 open, <u>THEN</u> direct A0 to close V-268 to isolate charging pumps B and C from VCT (V-268 located in charging pump room).

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Check PRZR Level Control:	
a.	Verify charging pumps - ANY RUNNING	a. Manually start charging pumps as necessary.
b.	PRZR level - GREATER THAN 13%	b. Perform the following: <ul style="list-style-type: none"> <li>1) Place loop B cold leg isolation valve to REGEN Hx (AOV-427) switch to close.</li> <li>2) Verify excess letdown isolation valve (AOV-310) closed.</li> <li>3) Ensure PRZR heaters off.</li> <li>4) Control charging to restore PRZR level greater than 13%.</li> <li>5) Continue with Step 8. <u>WHEN</u> PRZR level greater than 13%, <u>THEN</u> do Steps 7c through e.</li> </ul>
c.	Verify letdown - IN SERVICE	c. Verify excess letdown in service. <u>IF NOT</u> , <u>THEN</u> manually place letdown in service (Refer to Attachment LETDOWN).
d.	PRZR level - TRENDING TO 20%	d. Control charging and letdown to maintain PRZR level at 20%.
e.	Check PRZR heaters - ENERGIZED AS NECESSARY <ul style="list-style-type: none"> <li>o PRZR heater control group</li> <li>o PRZR heater backup group</li> </ul>	e. Reset PRZR heaters and energize as necessary to restore PRZR pressure.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Check PRZR Pressure Control:	
a.	PRZR pressure - GREATER THAN 1750 PSIG	<p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Verify SI actuation. <u>IF NOT</u>, <u>THEN</u> manually actuate SI.</li> <li>2) Go to E-0, REACTOR TRIP OR SAFETY INJECTION, Step 5.</li> </ol>
b.	PRZR pressure - GREATER THAN 2210 PSIG	<p>b. <u>IF</u> pressure less than 2210 PSIG and decreasing, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1) Ensure PRZR PORVs closed.  <u>IF</u> any valve can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve. <ul style="list-style-type: none"> <li>• PCV-430, MOV-516</li> <li>• PCV-431C, MOV-515</li> </ul> </li> <li>2) Ensure normal PRZR spray valve controller, demand at 0%.</li> <li>3) <u>IF</u> PRZR pressure decreasing <u>AND</u> PRZR level increasing, <u>THEN</u> stop RCPs one at a time until PRZR pressure stabilizes.</li> <li>4) Ensure PRZR heaters energized.</li> </ol>
This Step continued on the next page.		

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 8 continued from previous page)	
c.	PRZR pressure - LESS THAN 2260 PSIG	<p>c. <u>IF</u> pressure greater than 2260 psig and increasing, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1) Verify demand on PRZR pressure controller PCV-431 greater than 50%. <u>IF NOT</u>, <u>THEN</u> place controller in MANUAL and increase as necessary.</li> <li>2) Ensure PRZR heaters off.</li> <li>3) Control pressure using normal PRZR spray.</li> </ol> <p><u>IF</u> normal PRZR spray <u>NOT</u> available and letdown is in service, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>a) Use auxiliary spray.</li> <li>b) Verify spray line fluid to PRZR <math>\Delta T</math> less than 320°F. <u>IF NOT</u>, <u>THEN</u> stop auxiliary spray.</li> </ol> <p><u>IF</u> PRZR spray <u>NOT</u> available, <u>THEN</u> use one PRZR PORV.</p>
9	Check S/G Levels:	
a.	Narrow range level - GREATER THAN 5%	a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% in at least one S/G.
b.	Control feed flow to maintain narrow range level between 17% and 39%.	b. <u>IF</u> narrow range level in any S/G continues to increase, <u>THEN</u> stop feed to that S/G.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check If TDAFW Pump Can Be Stopped:	
	a. Both MDAFW pumps - RUNNING	a. Go to Step 11.
	b. PULL STOP TDAFW pump steam supply valves	
	• MOV-3504A	
	• MOV-3505A	
11	Establish Condenser Steam Dump Pressure Control:	
	a. Verify condenser available:	a. Perform the following:
	o Any MSIV - OPEN	1) Place S/G ARV controller in AUTO at 1005 psig and verify proper operation. <u>IF</u> S/G ARV <u>NOT</u> controlling in AUTO, <u>THEN</u> control S/G ARV manually.
	o Annunciator G-15, STEAM DUMP - LIT	2) Go to Step 11d.
	b. Adjust condenser steam dump controller HC-484 to 1005 psig in AUTO	
	c. Place steam dump mode selector switch to MANUAL	
	d. Verify RCS Tavg - STABLE AT OR TRENDING TO 547°F	d. Return to Step 2.



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Check RCP Status - AT LEAST ONE RUNNING	<p>Perform the following:</p> <ul style="list-style-type: none"><li>a. Establish conditions for starting an RCP:<ul style="list-style-type: none"><li>o Verify bus 11A or 11B energized.</li><li>o Refer to Attachment RCP START.</li></ul></li><li>b. Start one RCP.</li></ul> <p><u>IF</u> an RCP can <u>NOT</u> be started, <u>THEN</u> verify natural circulation (Refer to Attachment NC).</p> <p><u>IF</u> natural circulation <u>NOT</u> verified, <u>THEN</u> increase dumping steam.</p>



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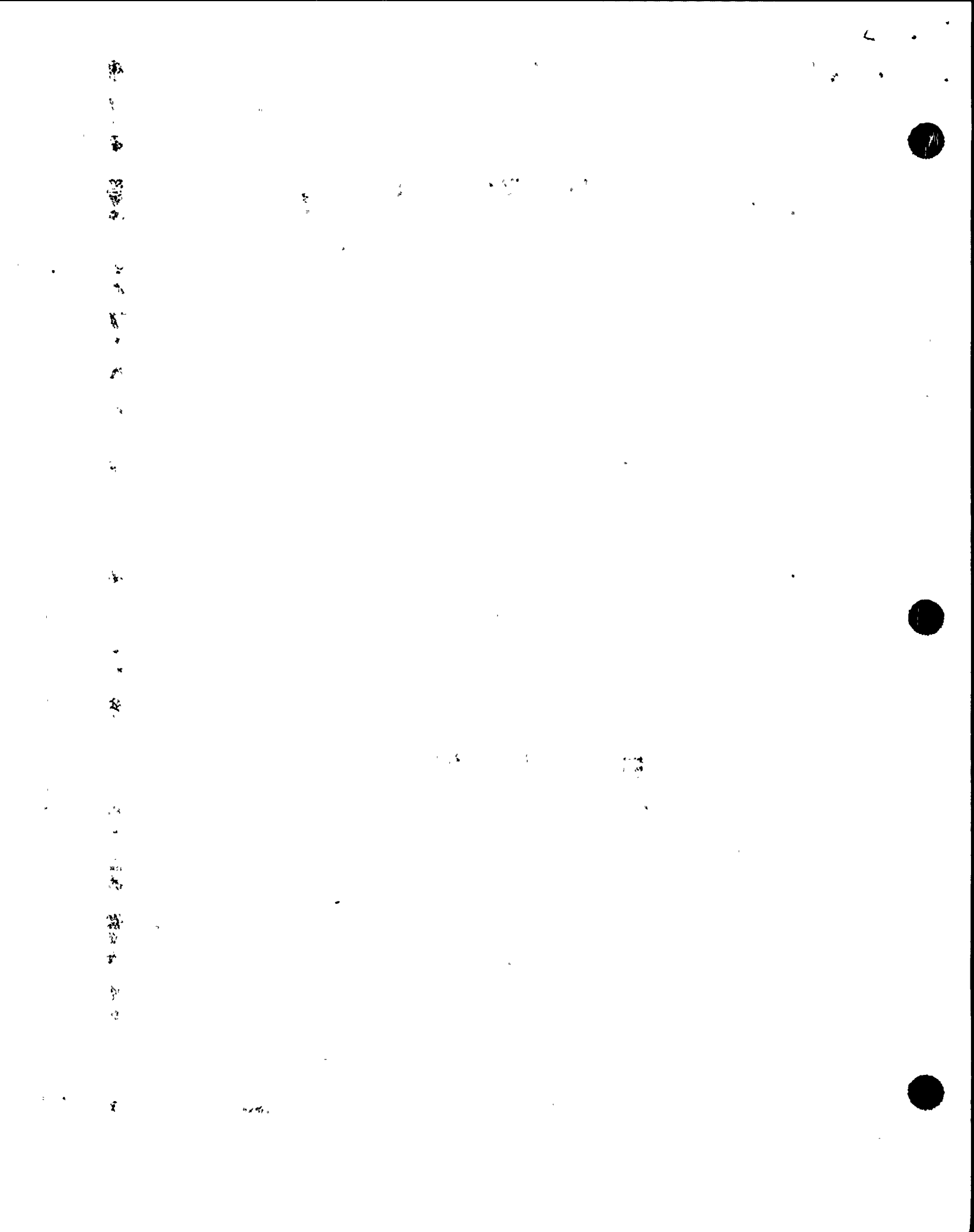
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p><u>NOTE:</u> Loss of forced air cooling may result in failure of NIS detectors.</p>		
13	Check If Source Range Detectors Should Be Energized:	
a.	Source range channels - DEENERGIZED	a. Go to Step 13e.
b.	Check intermediate range flux - EITHER CHANNEL LESS THAN $10^{-10}$ AMPS	b. Perform the following: <ul 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 14. <u>WHEN</u> flux is less than <math>10^{-10}</math> amps on any operable channel, <u>THEN</u> do Steps 13c, d and e.</li> </ul>
c.	Check the following: <ul style="list-style-type: none"> <li>o Both intermediate range channels - LESS THAN <math>10^{-10}</math> 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 14. <u>When</u> either condition met, <u>THEN</u> do Steps 13d 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 14.</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
14	<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 adequate Rx head cooling:</p> <ul style="list-style-type: none"> <li>1) Check IA to CNMT - AVAILABLE</li> <li>2) Verify at least one control rod shroud fan - RUNNING</li> <li>3) Verify one Rx compartment cooling fan - RUNNING</li> </ul> <p>d. Dispatch A0 to perform Attachment SD-1</p>	<p>a. Dispatch A0 to perform Attachment SD-2.</p> <p>1) Go to Step 15.</p> <p>2) Manually start one fan as power supply permits (45 kw).</p> <p>3) Manually start one fan as power supply permits (23 kw).</p>



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Maintain Stable Plant Conditions:	
	<ul style="list-style-type: none"> <li>a. PRZR pressure - BETWEEN 1800 PSIG AND 2260 PSIG</li> <li>b. PRZR level - BETWEEN 20% AND 30%</li> <li>c. S/G narrow range levels - BETWEEN 17% AND 39%</li> <li>d. RCS Tav<sub>g</sub> - GREATER THAN 540°F</li> </ul>	<ul style="list-style-type: none"> <li>a. Control PRZR heaters and spray as necessary.</li> <li>b. Control charging as necessary.</li> <li>c. Control S/G feed flow as necessary.</li> <li>d. Control dumping steam as necessary. <u>IF</u> cooldown continues, <u>THEN</u> close both MSIVs.</li> </ul>
16	Check VCT Makeup System:	
	<ul style="list-style-type: none"> <li>a. Verify the following: <ul style="list-style-type: none"> <li>1) Adjust boric acid flow control valve to 4.5 gpm</li> <li>2) RMW mode selector switch in AUTO</li> <li>3) RMW control armed - RED LIGHT LIT</li> </ul> </li> <li>b. Check VCT level <ul style="list-style-type: none"> <li>o Level - GREATER THAN 20% -OR-</li> <li>o Level - STABLE OR INCREASING</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>b. Manually increase VCT makeup flow as follows: <ul style="list-style-type: none"> <li>1) Ensure BA transfer pumps and RMW pumps running.</li> <li>2) Place RMW flow control valve HCV-111 in MANUAL and increase RMW flow.</li> <li>3) Increase boric acid flow as necessary.</li> </ul> </li> </ul>



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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

17 Check Charging Pump Suction  
Aligned To VCT:

a. VCT level - GREATER THAN 20%

a. IF VCT level can NOT be  
maintained greater than 5%,  
THEN perform the following:

1) Ensure charging pump suction  
aligned to RWST

o LCV-112B open

o LCV-112C closed

2) Continue with Step 18. WHEN  
VCT level greater than 40%,  
THEN do Step 17b.

b. Verify charging pumps aligned  
to VCT

o LCV-112C - OPEN

o LCV-112B - CLOSED

b. Manually align valves as  
necessary.



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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

18 Verify TDAFW Pump Aligned  
For AUTO Start:

- a. Any MDAFW pump - AVAILABLE
- b. Verify AMSAC TRIPPED status  
light - EXTINGUISHED
- c. Verify both S/G levels -  
GREATER THAN 17%
- d. Verify the following:
  - 1) TDAFW pump - OFF
  - 2) TDAFW pump steam supply  
valve switches in AUTO

- a. Verify TDAFW pump operating if  
necessary and go to Step 20.
- b. Reset AMSAC.
- c. Continue with Step 20 WHEN S/G  
level greater than 17%, THEN do  
Steps 18d and 19.
  - 1) IF TDAFW pump NOT required  
to maintain S/G level, THEN  
stop pump if desired.
  - 2) Place TDAFW pump steam  
supply valve switches in  
AUTO.





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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

## 19 Establish Normal AFW Pump Shutdown Alignment:

## a. Verify AFW bypass valves - OPERABLE

- AOV-4480
- AOV-4481

## b. Verify the following:

- o Both S/G levels - STABLE OR INCREASING
- o Total AFW flow - LESS THAN 200 GPM

## c. Close MDAFW pump discharge valves

- MOV-4007
- MOV-4008

## d. Place AFW bypass switches to DEF

## e. Stop all but one MDAFW pump

## f. Open AFW discharge crossover valves

- MOV-4000A
- MOV-4000B

## g. Open AFW bypass valves as necessary to control S/G levels

- AOV-4480
- AOV-4481

## a. Go to Step 20.

b. Continue with Step 20 WHEN conditions met, THEN do Steps 19c through g.



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	Determine If Cooldown Is Required:	
a.	Consult Plant staff to determine if RCS cooldown is necessary	a. <u>IF</u> cooldown <u>NOT</u> required, <u>THEN</u> go to 0-3, HOT SHUTDOWN WITH XENON PRESENT.
b.	At least one RCP - RUNNING	b. Perform the following: 1) Ensure 2 control rod shroud fans running. 2) Go to ES-0.2, NATURAL CIRCULATION COOLDOWN, Step 1.
c.	Go to 0-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD SHUTDOWN	
	-END-	

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2) FIGURE MIN SUBCOOLING	1
3) ATTACHMENT LETDOWN	1
4) ATTACHMENT RCP START	1
5) ATTACHMENT NC	1
6) ATTACHMENT SD-1	1
7) ATTACHMENT SD-2	1
8) FOLDOUT	1





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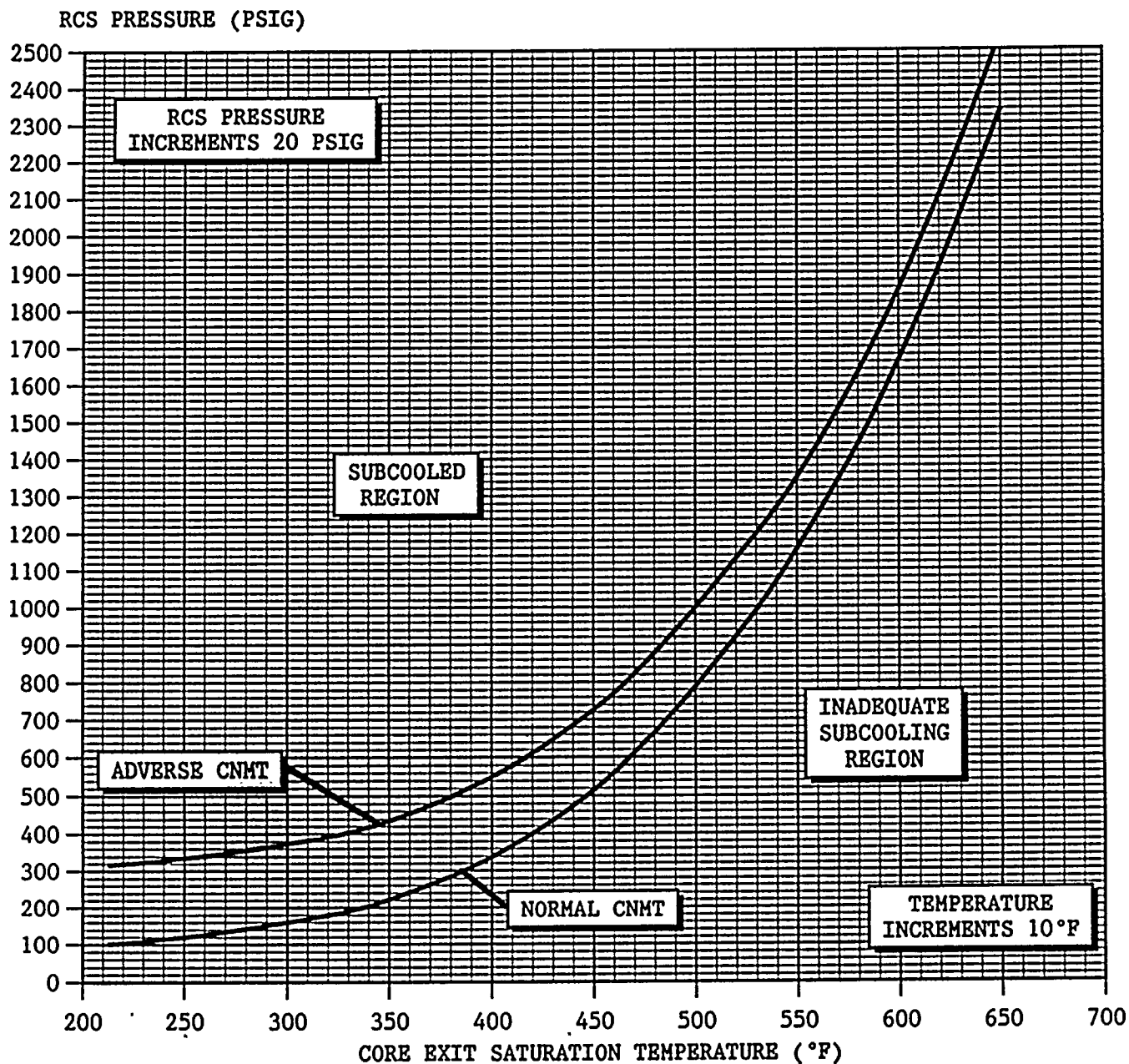
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FIGURE MIN SUBCOOLING

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



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FOLDOUT PAGE

NOTE The Critical Safety Function Red Path Summary is available in APPENDIX 1.

1. SI ACTUATION CRITERIA

IF ANY condition listed below occurs, THEN actuate SI and go to E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1:

- o RCS subcooling based on core exit T/Cs - LESS THAN 0°F  
USING FIGURE MIN SUBCOOLING

- OR -

- o PRZR level - LESS THAN 5% [30% adverse CNMT]  
AND RCS subcooling based on core exit T/Cs - LESS THAN  
20°F USING FIGURE MIN SUBCOOLING

- OR -

- o Any automatic SI setpoint is reached

2. 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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