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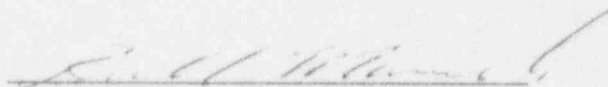
ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

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TECHNICAL REVIEW

PORC REVIEW DATE 3-30-94


PLANT SUPERINTENDENT

4-7-94
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

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A. PURPOSE - This procedure provides actions to continue plant cool-down and depressurization to cold shutdown, with no accident in progress, under conditions that allow for the potential formation of a void in the upper head region.

B. SYMPTOMS AND OR ENTRY CONDITIONS

1. ENTRY CONDITIONS - This procedure is entered from:

- A) ES-0.2, NATURAL CIRCULATION COOLDOWN, after completing the first 9 steps, if rapid cooldown or depressurization is required.
- B) ES-0.2, NATURAL CIRCULATION COOLDOWN, if depressurization is required which may result in upper head voiding.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION

- o IF SI ACTUATION OCCURS DURING THIS PROCEDURE, E-0, REACTOR TRIP OR SAFETY INJECTION, SHOULD BE PERFORMED.
- o THE FIRST 13 STEPS OF ES-0.2, NATURAL CIRCULATION COOLDOWN, SHOULD BE PERFORMED BEFORE CONTINUING WITH THIS PROCEDURE.
- o IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.

NOTE: Foldout page should be open and monitored periodically.

* 1 Monitor Conditions For RCP Restart:

- | | |
|--|--|
| <ul style="list-style-type: none"> a. Verify Bus 11A or Bus 11B - ENERGIZED b. Check RVLIS indication: <ul style="list-style-type: none"> o At least one train of RVLIS - AVAILABLE o Level (no RCPs) - GREATER THAN 95% c. Establish conditions for starting an RCP (Refer to Attachment RCP START) d. Start one RCP e. Any RCP - RUNNING f. Go to 0-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITION | <ul style="list-style-type: none"> a. Go to Step 2. b. Perform the following: <ul style="list-style-type: none"> 1) Increase PRZR level to 65% using charging and letdown. 2) Dump steam to establish subcooling based on core exit T/Cs greater than 20°F using Figure MIN SUBCOOLING. c. Go to Step 2. e. Go to Step 2. |
|--|--|

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: Saturated conditions in the PRZR should be established before trying to decrease PRZR level.

2 Establish PRZR Level To Accommodate Void Growth:

- a. Check PRZR level - BETWEEN 20% AND 30%
- a. Control charging and letdown as necessary.
- b. Place charging pump speed controllers in MANUAL

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION

- o BORON ADDITION TO ESTABLISH CSD CONCENTRATION SHOULD BE COMPLETE BEFORE DECREASING RCS TEMPERATURE LESS THAN 500°F.
- o THE ΔT BETWEEN PRZR LIQUID AND THE HOT LEG TEMPERATURE SHOULD NOT BE PERMITTED TO EXCEED 200°F. IF THIS LIMIT IS EXCEEDED, THEN NOTIFY TECHNICAL ENGINEERING OF THE MAXIMUM ΔT OBSERVED.

NOTE: RCS hot leg temperatures will decrease after cooldown is stopped due to decrease in loop delta Ts.

3 Decrease RCS Hot Leg
Temperatures To 500°F:

- a. Maintain cooldown rate in RCS cold legs - LESS THAN 50°F/HR
- b. Control RCS pressure between 1900 psig and 1950 psig
- c. Maintain RCS cold leg temperatures and pressure - WITHIN LIMITS OF FIGURE NC C/D WITH VOID IN UPPER HEAD
- d. Maintain stable PRZR level using charging
- e. Check RCS hot leg temperatures - LESS THAN 500°F
- e. Return to Step 3a.
- f. Stop RCS cooldown

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

SI ACTUATION CIRCUITS WILL AUTOMATICALLY UNBLOCK IF PRZR PRESSURE INCREASES TO GREATER THAN 1992 PSIG.

4 Verify SI Blocked:

Perform the following:

- o SI block switches in BLOCK
 - Train A
 - Train B
- o SAFETY INJECTION BLOCKED status light - LIT

- a. Verify PRZR pressure less than 1950 psig.
- b. Place SI block switches to BLOCK:
 - Train A
 - Train B
- c. Verify SAFETY INJECTION BLOCKED status light lit.
- d. Go to Step 5.

IF SI can NOT be blocked, THEN maintain PRZR pressure greater than 1750 psig and S/G pressure greater than 514 psig until SI blocked.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p style="text-align: center;">***** <u>CAUTION</u> *****</p>		
<p>VOIDING MAY OCCUR IN THE RCS DURING RCS DEPRESSURIZATION. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.</p>		
<p>*****</p>		
<u>NOTE:</u>	<ul style="list-style-type: none"> o If charging line to PRZR vapor ΔT exceeds 320°F, then plant staff should be consulted before using auxiliary spray. o WHEN using a PRZR PORV, THEN select one with an operable block valve. 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>5. Depressurize RCS To 1500 PSIG:</p>		
a. Check letdown - IN SERVICE	<p>a. Try to establish letdown (Refer to Attachment LETDOWN).</p> <p><u>IF</u> letdown can <u>NOT</u> be established, <u>THEN</u> depressurize RCS using one PRZR PORV and go to Step 5c.</p>	
b. Depressurize RCS using auxiliary spray valve (AOV-296)	<p>b. <u>IF</u> auxiliary spray valve <u>NOT</u> available, <u>THEN</u> use one PRZR PORV.</p>	
c. Check RCS pressure - APPROXIMATELY 1500 PSIG	<p>c. Return to Step 5a.</p>	
d. Stop RCS depressurization		

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

6 Isolate SI ACCUMs:

- a. 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

- b. Close SI ACCUM discharge valves

- ACCUM A, MOV-841
- ACCUM B, MOV-865

- b. Perform the following:

- 1) Dispatch personnel to locally close valves, as necessary.
- 2) Maintain RCS pressure greater than 1000 psig until both SI ACCUMs isolated.

IF any SI ACCUM can NOT be isolated AND RCS depressurization to less than 1000 psig is required, THEN:

- 1) Open vent valves for unisolated SI ACCUMs.
 - ACCUM A, AOV-834A
 - ACCUM B, AOV-834B
- 2) Open HCV-945.
- 3) Maintain RCS pressure greater than SI ACCUM pressure.

- c. Locally open breakers for MOV-841 and MOV-865

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

7 Continue RCS Cooldown And
Depressurization:

- | | |
|---|--|
| <p>a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR</p> <p>b. Maintain RCS pressure - WITHIN LIMITS OF FIGURE NAT CIRC C/D WITH VOID IN UPPER HEAD</p> <p>c. Check RCS cold leg temperature - GREATER THAN 335°F</p> <p>d. Check letdown - IN SERVICE</p> <p>e. Depressurize RCS using auxiliary spray valve (AOV-296)</p> | <p>c. Stabilize RCS temperature.</p> <p>d. Try to establish letdown (Refer to Attachment LETDOWN).

IF letdown can <u>NOT</u> be established, <u>THEN</u> depressurize RCS using one PRZR PORV and go to Step 8.</p> <p>e. IF auxiliary spray valve <u>NOT</u> available, <u>THEN</u> use one PRZR PORV.</p> |
|---|--|

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

8 Control PRZR Level:

a. Level - GREATER THAN 20%

a. Control charging and letdown to increase PRZR level to greater than 20%.

b. Level - LESS THAN 90%

b. Perform the following:

1) Turn on PRZR heaters to increase RCS pressure by 100 psi.

2) Decrease PRZR level to less than 30% by one of the following:

o Control charging as necessary.

-OR-

o Continue cooldown to shrink RCS inventory.

9 Check RVLIS Indication:

a. At least one train of RVLIS - AVAILABLE

a. Go to Step 10.

b. Check RVLIS level (no RCPs) - GREATER THAN 84%

b. Perform the following:

1) Repressurize RCS to maintain RVLIS level greater than 84%.

2) Return to Step 7.

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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

*10 Maintain Letdown Flow:

- a. Open letdown orifice isolation valves as necessary
- b. Adjust low pressure letdown pressure controller as necessary

*11 Maintain Required RCP Seal Injection Flow And Labyrinth Seal D/P:

- o Seal injection flow to each RCP - GREATER THAN 6 GPM
- o Labyrinth seal D/P to each RCP - GREATER THAN 15 INCHES OF WATER

IF RCP seal injection in service, THEN perform the following:

- o Adjust charging flow to REGEN Hx (HCV-142) as necessary.

-OR-

- o Dispatch AO to adjust seal injection needle valves if necessary.

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

IF RCP seal injection NOT in service, THEN go to Step 12.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Check If SI System Normal Shutdown Alignment Should Be Established:	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Return to Step 7.
	b. RCS pressure - LESS THAN 1500 PSIG	b. Stabilize RCS temperature and return to Step 7.
	c. Lock out SI system as follows:	
	1) Place all SI pump switches in PULL STOP	
	2) Locally close breakers for SI pump discharge valves to cold legs	
	<ul style="list-style-type: none"> • MOV-878B, MCC D position 8C • MOV-878D, MCC D position 8F 	
	3) Close SI pump discharge to cold legs	
	<ul style="list-style-type: none"> • MOV-878B • MOV-878D 	
	4) Locally open breakers for MOV-878B and MOV-878D	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13 Check If RHR Normal Cooling Can Be Established:		
a. RCS pressure - LESS THAN 400 PSIG		a. Stabilize RCS temperature and return to Step 7.
b. Verify all SI pump switches in PULL STOP		b. Return to Step 12.
c. Sample the RHR system to ensure adequate boron concentration (Refer to Attachment RHR SAMPLE)		
d. Place RCS overpressure protection system in service (Refer to O-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)		d. <u>IF</u> RCS overpressure protection system can <u>NOT</u> be placed in service, <u>THEN</u> consult Plant staff to determine if RHR normal cooling should be established and go to Step 14.
e. Establish RHR normal cooling (Refer to Attachment RHR COOL)		
14 Continue RCS Cooldown To Cold Shutdown		

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION

DEPRESSURIZING THE RCS BEFORE THE ENTIRE RCS IS LESS THAN 200°F MAY RESULT IN ADDITIONAL VOID FORMATION IN THE RCS.

15 Continue Cooldown Of Inactive Portion Of RCS:

- a. Cool upper head region using control rod shroud fans
- b. Cool S/G U-tubes by dumping steam from all S/Gs
- c. Check RVLIS indication:

- 1) At least one train of RVLIS - AVAILABLE
- 2) Level (no RCPs) - GREATER THAN 95%

- 1) Go to Step 16.
- 2) Stabilize RCS pressure and return to Step 14.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION

IF NO CONTROL ROD SHROUD FANS ARE RUNNING, THE UPPER HEAD REGION MAY REMAIN ABOVE 200°F FOR UP TO 29 HOURS AFTER REACHING CSD.

16 Determine If RCS
Depressurization Is Permitted:

- | | |
|---|---|
| <p>a. Check PRZR level - LESS THAN 30%</p> | <p>a. Perform the following:</p> <ol style="list-style-type: none"> 1) Turn on PRZR heaters to maintain PRZR pressure stable. 2) Decrease PRZR level to less than 30% by one of the following: <ul style="list-style-type: none"> o Control charging as necessary. <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o Continue cooldown to shrink RCS inventory. |
| <p>b. Entire RCS - LESS THAN 200°F</p> <ul style="list-style-type: none"> • Core exit T/Cs • Upper head T/Cs • RCS hot leg temperature • RCS cold leg temperature | <p>b. Do <u>NOT</u> depressurize RCS. Return to Step 14.</p> |
| <p>c. Check control rod shroud fan status - BOTH RUNNING DURING COOLDOWN</p> | <p>c. Consult Plant staff to determine wait period for upper head cooling.</p> |
| <p>d. Refer to 0-2.3, PLANT AT COLD SHUTDOWN</p> | |

-END-

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RED PATH SUMMARY

- a. SUBCRITICALITY - Nuclear power greater than 5%
- b. CORE COOLING - Core exit T/Cs greater than 1200°F
-OR-
Core exit T/Cs greater than 700°F AND
RVLIS level (no RCPs) less than 43% [46%
adverse CNMT]
- c. HEAT SINK - Narrow range level in all S/Gs less than 5%
[25% adverse CNMT] AND total feedwater flow
less than 200 gpm
- d. INTEGRITY - Cold leg temperatures decrease greater than
100°F in last 60 minutes AND RCS cold leg
temperature less than 285°F
- e. CONTAINMENT - CNMT pressure greater than 60 psig

FIGURE MIN SUBCOOLING

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

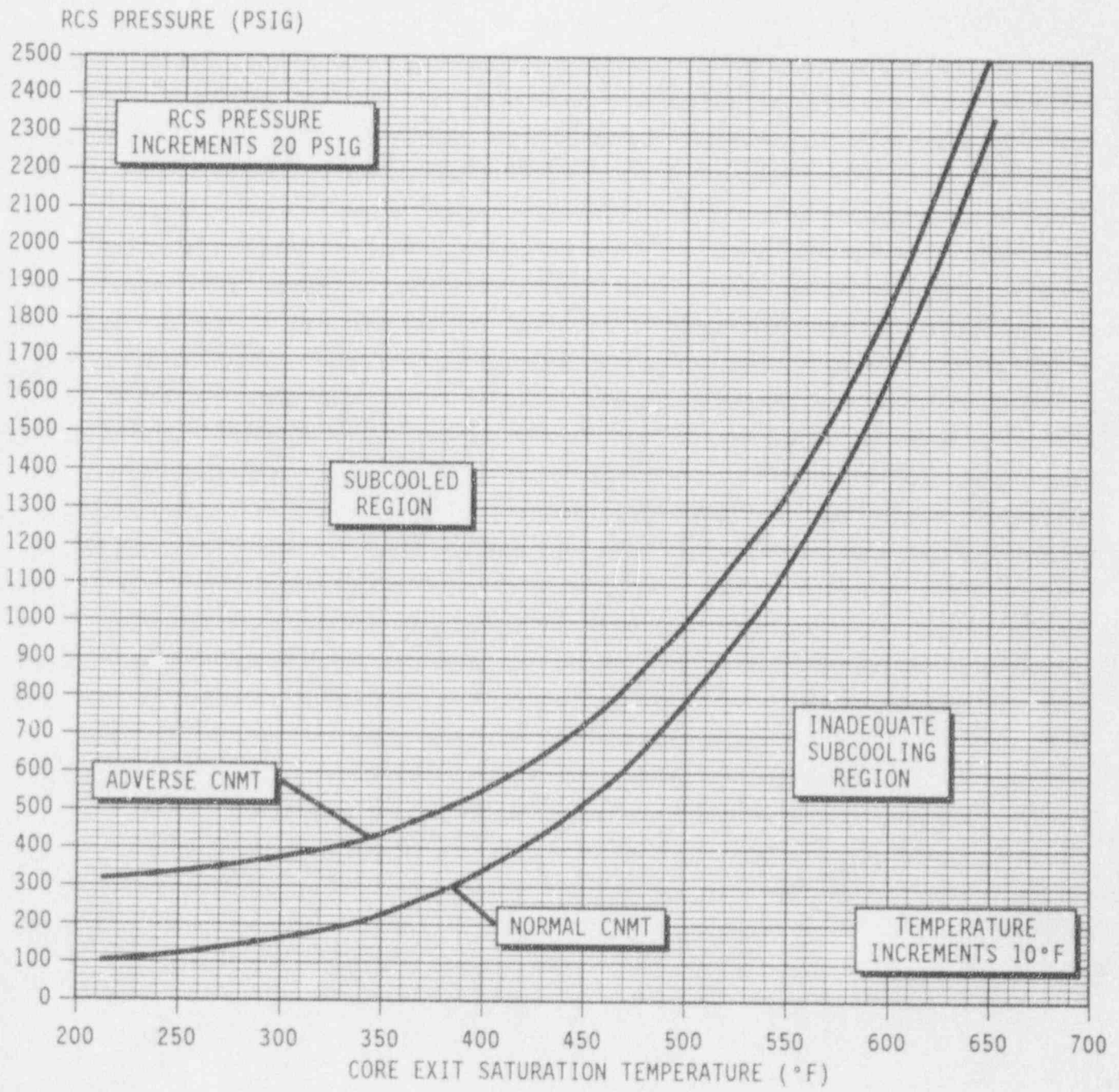
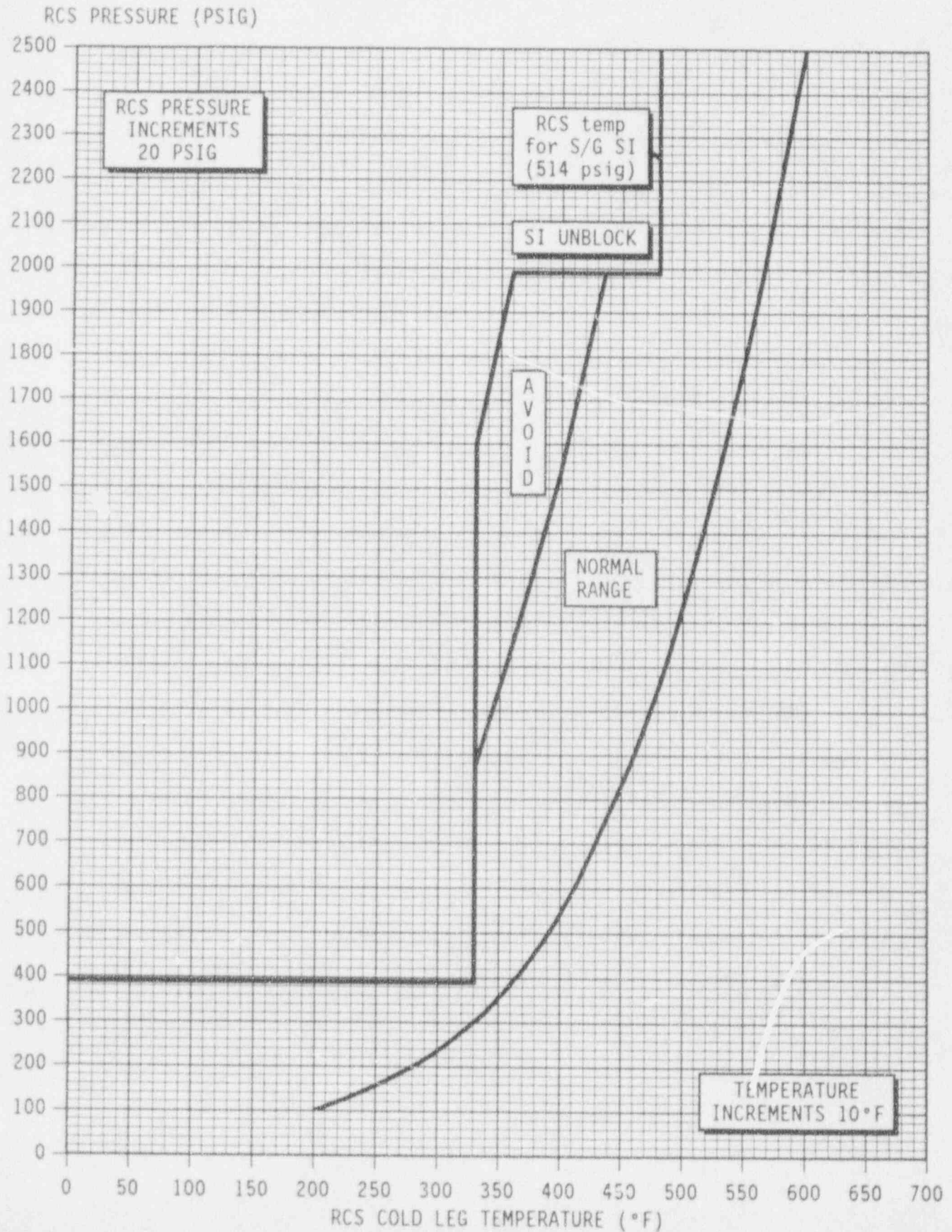


FIGURE NC C/D WITH VOID IN UPPER HEAD



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FOLDOUT PAGE

1. RCP TRIP CRITERIA

IF BOTH conditions listed below occur, THEN trip both RCPs:

- a. SI pumps - AT LEAST TWO RUNNING
- b. RCS pressure minus maximum S/G pressure - LESS THAN 175 PSIG

2. SI ACTUATION CRITERIA

IF EITHER 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 REQUIREMENTS OF FIGURE MIN SUBCOOLING

- OR -

- o PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN 5%

3. 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).