

EOP: ECA-1.1 4 : 7 .	TITLE: LOSS OF EMERGENCY COOLANT RECIRCULATION	REV: 10 PAGE 1 of 28
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

TECHNICAL REVIEW

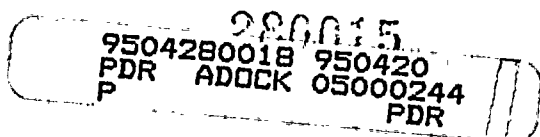
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Thomas A. Markiewicz
PLANT SUPERINTENDENT

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A. PURPOSE - This procedure provides actions to restore emergency coolant recirculation capability, to delay depletion of the RWST by adding makeup and reducing outflow, and to depressurize the RCS to minimize break flow.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. E-1, LOSS OF REACTOR OR SECONDARY COOLANT,
when cold leg recirculation capability cannot be verified.
- b. ES-1.3, TRANSFER TO COLD LEG RECIRCULATION,
when recirculation cannot be established or maintained.
- c. ECA-1.2, LOCA OUTSIDE CONTAINMENT,
when a LOCA outside containment cannot be isolated.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION

- o IF EMERGENCY COOLANT RECIRCULATION CAPABILITY IS RESTORED DURING THIS PROCEDURE, FURTHER RECOVERY ACTIONS SHOULD CONTINUE BY RETURNING TO PROCEDURE AND STEP IN EFFECT.
- o IF SUCTION SOURCE IS LOST TO ANY SI OR CNMT SPRAY PUMP, THE PUMP SHOULD BE STOPPED.

NOTE: Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr.

1 Verify CNMT Sump
Recirculation Capability:

a. Check RHR system:

- o RHR pumps - OPERABLE
- o RHR suction valves from sump
B - OPERABLE
 - MOV-850A
 - MOV-850B
- o RHR pump discharge to Rx
vessel deluge valves -
OPERABLE
 - MOV-852A
 - MOV-852B
- o CCW pumps - OPERABLE
- o CCW to RHR Hx - OPERABLE
 - MOV-738A
 - MOV-738B

a. Manually or locally try to
restore at least one train
(Refer to Attachment RHR SYSTEM
to identify minimum components
for one train).

b. Check at least two SW pumps -
RUNNING

b. Manually start SW pumps as power
supply permits (258 kw each).

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2	<p>Add Makeup To RWST As Necessary</p> <ul style="list-style-type: none"> o Refer to S-9J, BLENDING TO RWST -OR- o Refer to S-3.2D, TRANSFERRING WATER FROM CVCS HUT(S) TO RWST OR SFP -OR- o Refer to Attachment SFP-RWST <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>	
* 3	<p>Monitor Intact S/G Levels:</p> <ul style="list-style-type: none"> a. Narrow range level - GREATER THAN 5% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% 	<ul style="list-style-type: none"> 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. b. <u>IF</u> narrow range level in any S/G continues to increase, <u>THEN</u> stop feed flow to that S/G.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

4 Initiate RCS Cooldown To Cold Shutdown:

a. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR

b. Dump steam to condenser from intact S/G(s)

b. Manually or locally dump steam from intact S/G(s):

o Use S/G ARVs

-OR-

o Open TDAFW pump steam supply valves.

-OR-

o Dispatch AO to perform the following:

1) Open S/G MSIV bypass valves.

2) Open priming air ejector steam supply root valve, V-3578.

3) Open 1A and 1B priming air ejector isolation valves.

• V-3580

• V-3581

IF no intact S/G available, THEN use faulted S/G.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	<p>Verify CNMT RECIRC Fans Running:</p> <ul style="list-style-type: none"> a. All fans - RUNNING b. Charcoal filter dampers green status lights - EXTINGUISHED 	<ul style="list-style-type: none"> a. Manually start fans. b. Dispatch personnel with relay rack key to locally open dampers using trip relay pushbuttons in relay room racks. <ul style="list-style-type: none"> • AUX RELAY RACK RA-2 for fan A • AUX RELAY RACK RA-3 for fan C
* 6	<p>Monitor RWST Level - GREATER THAN 15%</p>	<p>Go to Step 25.</p>

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

7 Determine CNMT Spray Requirements:

- a. Determine number of CNMT spray pumps required from table:

RWST LEVEL	CNMT PRESSURE	CNMT RECIRC FANS RUNNING	CNMT SPRAY PUMPS REQUIRED
GREATER THAN 28%	GREATER THAN 60 PSIG	-	2
	BETWEEN 28 PSIG AND 60 PSIG	0 OR 1	2
		2 OR 3	1
		ALL	0
	LESS THAN 28 PSIG	-	0
BETWEEN 15% AND 28%	GREATER THAN 60 PSIG	-	2
	BETWEEN 28 PSIG AND 60 PSIG	0, 1, 2, OR 3	1
		ALL	0
	LESS THAN 28 PSIG	-	0
LESS THAN 15%	-	-	0

- b. CNMT spray pumps running - EQUAL TO MINIMUM NUMBER REQUIRED

- b. Manually operate CNMT spray pumps as necessary.

IF CNMT spray pump(s) must be stopped, THEN place switch in PULL STOP.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
***** CAUTION *****		
IF OFFSITE POWER IS LOST AFTER SI RESET, THEN SELECTED SW PUMPS AND ONE CCW PUMP WILL AUTO START ON EMERGENCY D/G. MANUAL ACTION WILL BE REQUIRED TO RESTART SAFEGUARDS EQUIPMENT. *****		
8	Reset SI If Necessary	
9	Establish One Train Of SI Flow	
	a. SI pumps - LESS THAN THREE RUNNING	a. Stop one SI pump.
	b. RCS pressure - LESS THAN 250 psig [465 psig adverse CNMT]	b. Stop RHR pumps and go to Step 10.
	c. RHR pump - ONLY ONE RUNNING	c. IF two RHR pumps running, THEN stop one RHR pump. IF no RHR pumps running, THEN start one RHR pump.
10	Verify No Backflow From RWST To Sump:	
	a. Any RHR suction valve from sump B - OPEN • MOV-850A • MOV-850B	a. IF both RHR suction valves from sump B closed, THEN go to Step 11.
	b. RWST outlet valve to RHR pump suction (MOV-856) - CLOSED	b. Perform the following: 1) Place MOV-856 key switch to ON 2) Manually close valve IF valve can NOT be closed manually, THEN direct AO to locally close valve.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Reset CI: <ul style="list-style-type: none"> a. Depress CI reset pushbutton b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED 	<ul style="list-style-type: none"> b. Perform the following: <ul style="list-style-type: none"> 1) Reset SI. 2) Depress CI reset pushbutton.
12	Verify Adequate SW Flow: <ul style="list-style-type: none"> a. Check at least two SW pumps - RUNNING b. Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1) 	<ul style="list-style-type: none"> a. Manually start SW pumps as power supply permits (258 kw each). <p><u>IF</u> less than two SW pumps running, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> 1) Ensure SW isolation. 2) Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1) 3) Go to Step 15.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	Establish IA to CNMT:	
a.	Verify non-safeguards busses energized from offsite power <ul style="list-style-type: none">o Bus 13 normal feed - CLOSED-OR-o Bus 15 normal feed - CLOSED	a. Perform the following: <ul style="list-style-type: none">1) Close non-safeguards bus tie breakers:<ul style="list-style-type: none">• Bus 13 to Bus 14 tie• Bus 15 to Bus 16 tie2) Verify adequate emergency D/G capacity to run air compressors (75 kw each). <u>IF NOT, THEN</u> evaluate if CNMT RECIRC fans should be stopped (Refer to Attachment CNMT RECIRC FANS).3) <u>WHEN</u> bus 15 restored, <u>THEN</u> reset control room lighting.
b.	Verify SW isolation valves to turbine building - OPEN <ul style="list-style-type: none">• MOV-4613 and MOV-4670• MOV-4614 and MOV-4664	b. Manually align valves.
c.	Verify at least two air compressors - RUNNING	c. Manually start air compressors as power supply permits (75 kw each). <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">o Pressure - GREATER THAN 60 PSIGo Pressure - STABLE OR INCREASING	d. Perform the following: <ul style="list-style-type: none">1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR).2) Continue with Step 14. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 13e and f.
e.	Reset both trains of XY relays for IA to CNMT AOV-5392	
f.	Verify IA to CNMT AOV-5392 - OPEN	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	<p>Establish Required Charging Line Flow:</p> <p>a. Charging pumps - ANY RUNNING</p> <p>b. Establish 20 gpm total charging flow</p>	<p>a. Perform the following:</p> <ol style="list-style-type: none"> 1) <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> dispatch AO with RWST area key to locally close seal injection needle valves to affected RCP: <ul style="list-style-type: none"> • RCP A, V-300A • RCP B, V-300B 2) Ensure HCV-142 demand at 0%. 3) Start one charging pump.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP(S) SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.</p> <p>*****</p>		
15	Check RCP Status:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING	a. Stop all RCPs and go to Step 16.
	b. RCPs - AT LEAST ONE RUNNING	b. Try to start an RCP: <ul style="list-style-type: none"> 1) Establish conditions for starting an RCP <ul style="list-style-type: none"> o Bus 11A or 11B energized o Refer to Attachment RCP START 2) Start one RCP.
	c. Stop all but one RCP	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*16	<p>Monitor SI Termination Criteria:</p> <ul style="list-style-type: none"> a. RCS subcooling based on core exit T/Cs - GREATER THAN 50°F USING FIGURE MIN SUBCOOLING b. Check RVLIS indication: <ul style="list-style-type: none"> o Level (no RCPs) - GREATER THAN 68% [73% adverse CNMT] <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o Fluid fraction (any RCP running) - GREATER THAN 80% 	<p>Limit RCS injection flow to that required to remove decay heat:</p> <ul style="list-style-type: none"> o Determine required injection flow using Figure MIN RCS INJECTION o Stop SI pumps as necessary to establish and maintain minimum required SI flow. o <u>IF</u> required injection flow is less than 100 gpm, <u>THEN</u> establish required charging flow and go to Step 17. <p><u>IF</u> required injection flow is greater than 100 gpm, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> a. Ensure one SI pump running b. Establish minimum charging flow for RCP seal injection. c. Consult TSC to determine if SI pump discharge valves should be locally throttled. (Locked valve key required.) d. Go to Step 18.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Stop SI And RHR Pumps And Place In Auto	
18	Verify Adequate RCS Makeup Flow:	
	<ul style="list-style-type: none"> a. Check RVLIS indication: <ul style="list-style-type: none"> o Level (no RCPs) - GREATER THAN 68% [73% adverse CNMT] -OR- o Fluid fraction (any RCP running) - GREATER THAN 80% 	<ul style="list-style-type: none"> a. Increase RCS injection flow as necessary to maintain RVLIS indication stable.
	<ul style="list-style-type: none"> b. Core exit T/Cs - STABLE OR DECREASING 	<ul style="list-style-type: none"> b. Increase RCS injection flow to maintain core exit T/Cs stable or decreasing.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p><u>NOTE:</u> If normal RCP support conditions can NOT be satisfied, then any running RCP(s) should be stopped.</p>	
19	<p>Depressurize RCS To Decrease RCS Subcooling:</p>	
	<p>a. Check RCS subcooling based on core exit T/Cs - GREATER THAN 20°F USING FIGURE MIN SUBCOOLING</p>	<p>a. Go to Step 20.</p>
	<p>b. Normal PRZR spray -AVAILABLE</p>	<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> no PRZR PORV available, <u>THEN</u> use auxiliary spray valve (AOV-296).</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 87% [75% adverse CNMT]</p>	
	<p>d. <u>WHEN</u> either condition met, <u>THEN</u> stop RCS depressurization</p>	
	<p>e. Check RCS subcooling - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING</p>	<p>e. Increase RCS makeup flow as necessary to restore subcooling.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	Check If RHR Normal Cooling Can Be Established:	
a.	RCS cold leg temperature - LESS THAN 350°F	a. Go to Step 21.
b.	RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Go to Step 21.
c.	Place letdown pressure controller (PCV-135) in MANUAL CLOSED	
d.	Check following valves - OPEN <ul style="list-style-type: none"> • AOV-371, letdown isolation valve • AOV-427, loop B cold leg to REGEN Hx • At least one letdown orifice valve (AOV-200A, AOV-200B, or AOV-202) 	d. Perform the following: <ol style="list-style-type: none"> 1) Reset both trains of XY relays for AOV-371 and AOV-427. 2) Open AOV-371. 3) Place AOV-427 switch to OPEN. 4) Open one letdown orifice valve.
e.	Verify pressure on PI-135 - LESS THAN 400 PSIG	e. Go to Step 21.
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
21	Check If SI ACCUMs Should Be Isolated:	
	<ul style="list-style-type: none"> a. Both RCS hot leg temperatures - LESS THAN 400°F b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves <ul style="list-style-type: none"> • MOV-841, MCC C position 12F • MOV-865, MCC D position 12C c. Close SI ACCUM discharge valves <ul style="list-style-type: none"> • MOV-841 • MOV-865 d. Locally reopen breakers for MOV-841 and MOV-865 	<ul style="list-style-type: none"> a. Continue with Step 22. <u>WHEN</u> both RCS hot leg temperatures less than 400°F, <u>THEN</u> do Steps 21b, c and d. c. Vent any unisolated ACCUMs: <ul style="list-style-type: none"> 1) Open vent valves for unisolated SI ACCUMs. <ul style="list-style-type: none"> • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945.
*22	Monitor RCP Operation:	
	<ul style="list-style-type: none"> a. RCPs - ANY RUNNING b. Check the following: <ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> a. Go to Step 23. b. Stop affected RCP(s).

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	Check Core Exit T/Cs - GREATER THAN 200°F	Go to Step 38.
24	Check RWST Level - LESS THAN 15%	Return to Step 1.
25	Minimize RWST Outflow:	
	a. Any SI pump(s) - RUNNING	a. <u>IF</u> charging pump suction aligned to RWST, <u>THEN</u> perform the following: <ul style="list-style-type: none"> 1) Verify SI pump suction aligned to RWST, MOV-825A or MOV-825B open. 2) Start one SI pump and verify flow. 3) Stop running charging pumps. 4) Go to Step 25e.
	b. Stop all but one SI pump	
	c. Check charging pump suction from RWST (AOV-112B) - OPEN	c. Go to Step 25e.
	d. Stop all charging pumps	
	e. Stop both CNMT spray pumps	
	f. Stop both RHR pumps	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26	Check SI pump flow - STABLE	<u>IF</u> SI flow zero or erratic, <u>THEN</u> stop running SI pump.
27	Try To Add Makeup To RCS From VCT:	
	a. Check VCT level - GREATER THAN 5%	a. Stop charging pumps taking suction from VCT and continue with Step 28. <u>WHEN</u> VCT level greater than 5%, <u>THEN</u> do Steps 27b and c.
	b. Verify charging pumps aligned to VCT	b. Manually align valves as necessary.
	o LCV-112C - OPEN	
	o LCV-112B - CLOSED	
	c. Start charging pumps as necessary to establish two pumps running	

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

28 Establish Maximum VCT Makeup:

- | | |
|--|---|
| <p>a. Check RMW control armed - RED LIGHT LIT</p> <p>b. Check VCT level - LESS THAN 20%</p> <p>c. Check VCT makeup system - OPERATING IN AUTO</p> <p>d. Increase VCT makeup flow</p> <ol style="list-style-type: none"> 1) Start both RMW pumps 2) Start both boric acid pumps 3) Adjust RMW controller (HC-111) in MANUAL to maximum flow from table | <p>a. Place RMW mode switch in AUTO and place RMW control switch to START.</p> <p>b. Continue with Step 29. <u>WHEN</u> VCT level less than 20%, <u>THEN</u> do Steps 28c, d and e.</p> <p>c. Perform the following:</p> <ol style="list-style-type: none"> 1) Open makeup system valves. <ul style="list-style-type: none"> • AOV-110B • AOV-110C • AOV-111 2) Start BA transfer pumps and RMW pumps. 3) Open boric acid flow control valve (AOV-110A). |
|--|---|

BAST CONC (PPM)	MAX RMW FLOW (GPM)
7000 (4%)	40
8750 (5%)	54
10500 (6%)	65
12250 (7%)	80
14000 (8%)	92

- 4) Adjust boric acid flow controller (HC-110A) in MANUAL to 9.5 gpm
- e. Adjust charging pump speed to stabilize VCT level

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

29 Try To Add Makeup To RCS From Alternate Source:

- a. Evaluate Use Of RCDT Pumps
(Refer to ER-RHR.1, RCDT PUMP OPERATION FOR CORE COOLING)
- b. Consult TSC to determine other means of makeup

30 Verify SI ACCUM Isolation Valves - OPEN

- MOV-841
- MOV-865

IF valves were closed to prevent SI ACCUM nitrogen injection, THEN go to Step 34.

IF NOT, THEN perform the following:

- a. Dispatch AO to locally close breakers for SI ACCUM discharge valves

- MOV-841, MCC C position 12F
- MOV-865, MCC D position 12C

- b. Open SI ACCUM discharge valves.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31	Depressurize All Intact S/Gs To 785 PSIG:	
	a. Check S/G pressures - GREATER THAN 785 PSIG	a. Go to Step 32.
	b. Dump steam to condenser at maximum rate	b. Manually or locally dump steam at maximum rate from intact S/G(s):
		o Use S/G ARVs
		-OR-
		o Open steam supply valves to TDAFW pump
		-OR-
		o Dispatch AO to perform the following:
		1) Open S/G MSIV bypass valves.
		2) Open priming air ejector steam isolation valves
		• V-3580
		• V-3581
	c. Check S/G pressures - LESS THAN 785 PSIG	c. Return to Step 31b.
	d. Stop S/G depressurization	

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: The intent of Step 32 is to depressurize S/Gs more slowly, but at a rate that will maintain required RVLIS level.

32 Depressurize Intact S/Gs To
200 PSIG Slowly To Inject SI
ACCUMs:

a. Dump steam to condenser as
necessary to maintain
appropriate RVLIS indication:

- o Level (no RCPs) - BETWEEN 68%
AND 73% [73% AND 76% adverse
CNMT]

-OR-

- o Fluid fraction (any RCP
running) - BETWEEN 80% AND 90%

a. Manually or locally dump steam
from intact S/G(s) to maintain
appropriate RVLIS indication:

- o Use S/G ARVs

-OR-

- o Open steam supply valves to
TDAFW pump

-OR-

- o Dispatch AO to perform the
following:

1) Open affected S/G MSIV
bypass valve.

2) Open priming air ejector
steam isolation valves

- V-3580
- V-3581

b. Check S/G pressures - LESS THAN
200 PSIG

b. Return to Step 32a.

c. Stop S/G depressurization

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
33	Check If SI ACCUMs Should Be Isolated:	
	<p>a. Both RCS hot leg temperatures - LESS THAN 400°F</p> <p>b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves</p> <ul style="list-style-type: none"> • MOV-841, MCC C position 12F • MOV-865, MCC D position 12C <p>c. Close SI ACCUM discharge valves</p> <ul style="list-style-type: none"> • MOV-841 • MOV-865 <p>d. Locally reopen breakers for MOV-841 and MOV-865</p>	<p>a. Continue with Step 34. <u>WHEN</u> both RCS hot leg temperatures less than 400°F, <u>THEN</u> do Steps 33b, c and d.</p> <p>c. Vent any unisolated ACCUMs:</p> <ol style="list-style-type: none"> 1) Open vent valves for unisolated SI ACCUMs. <ul style="list-style-type: none"> • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945.
*34	Monitor RCP Operation:	
	<p>a. RCPs - ANY RUNNING</p> <p>b. Check the following:</p> <ul style="list-style-type: none"> 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 	<p>a. Go to Step 36.</p> <p>b. Stop affected RCP(s).</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
35	Check SI Pump Flow - STABLE	<u>IF</u> SI flow zero or erratic, <u>THEN</u> stop running SI pump.
36	Depressurize All Intact S/Gs To Atmospheric Pressure:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Dump steam to condenser	b. Manually or locally dump steam from intact S/G(s): <ul style="list-style-type: none"> o Use S/G ARVs -OR- <ul style="list-style-type: none"> o Open steam supply valves to TDAFW pump -OR- <ul style="list-style-type: none"> o Dispatch AO to perform the following: <ul style="list-style-type: none"> 1) Open S/G MSIV bypass valves. 2) Open priming air ejector steam isolation valves <ul style="list-style-type: none"> • V-3580 • V-3581

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
37	Check If RHR Normal Cooling Can Be Established:	
a.	RCS cold leg temperature - LESS THAN 350°F	a. Return to Step 35.
b.	RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Return to Step 35.
c.	Place letdown pressure controller in MANUAL CLOSED	
d.	Check following valves - OPEN <ul style="list-style-type: none"> • AOV-371, letdown isolation valve • AOV-427, loop B cold leg to REGEN Hx • At least one letdown orifice valve (AOV-200A, AOV-200B, or AOV-202) 	d. Perform the following: <ol style="list-style-type: none"> 1) Reset both trains of XY relays for AOV-371 and AOV-427. 2) Open AOV-371 and AOV-427. 3) Open one letdown orifice valve.
e.	Verify pressure on PI-135 - LESS THAN 400 PSIG	e. Return to Step 36.
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
38	Maintain RCS Heat Removal:	
	a. Use RHR system if in service	
	b. Dump steam to condenser from intact S/Gs	<ul style="list-style-type: none"> b. Manually or locally dump steam from intact S/G(s): <ul style="list-style-type: none"> o Use S/G ARVs
		-OR-
		<ul style="list-style-type: none"> o Open steam supply valves to TDAFW pump
		-OR-
		<ul style="list-style-type: none"> o Dispatch AO to perform the following: <ul style="list-style-type: none"> 1) Open S/G MSIV bypass valves. 2) Open priming air ejector steam isolation valves <ul style="list-style-type: none"> • V-3580 • V-3581
		<p><u>IF</u> no intact S/G available and RHR system <u>NOT</u> in service, <u>THEN</u> use faulted S/G.</p>

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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 39.</p>	
39	Check CNMT Hydrogen Concentration:	
	a. Direct RP to start CNMT hydrogen monitors as necessary	
	b. Hydrogen concentration - LESS THAN 0.5%	b. Consult TSC to determine if hydrogen recombiners should be placed in service.
40	Consult TSC	
	-END-	

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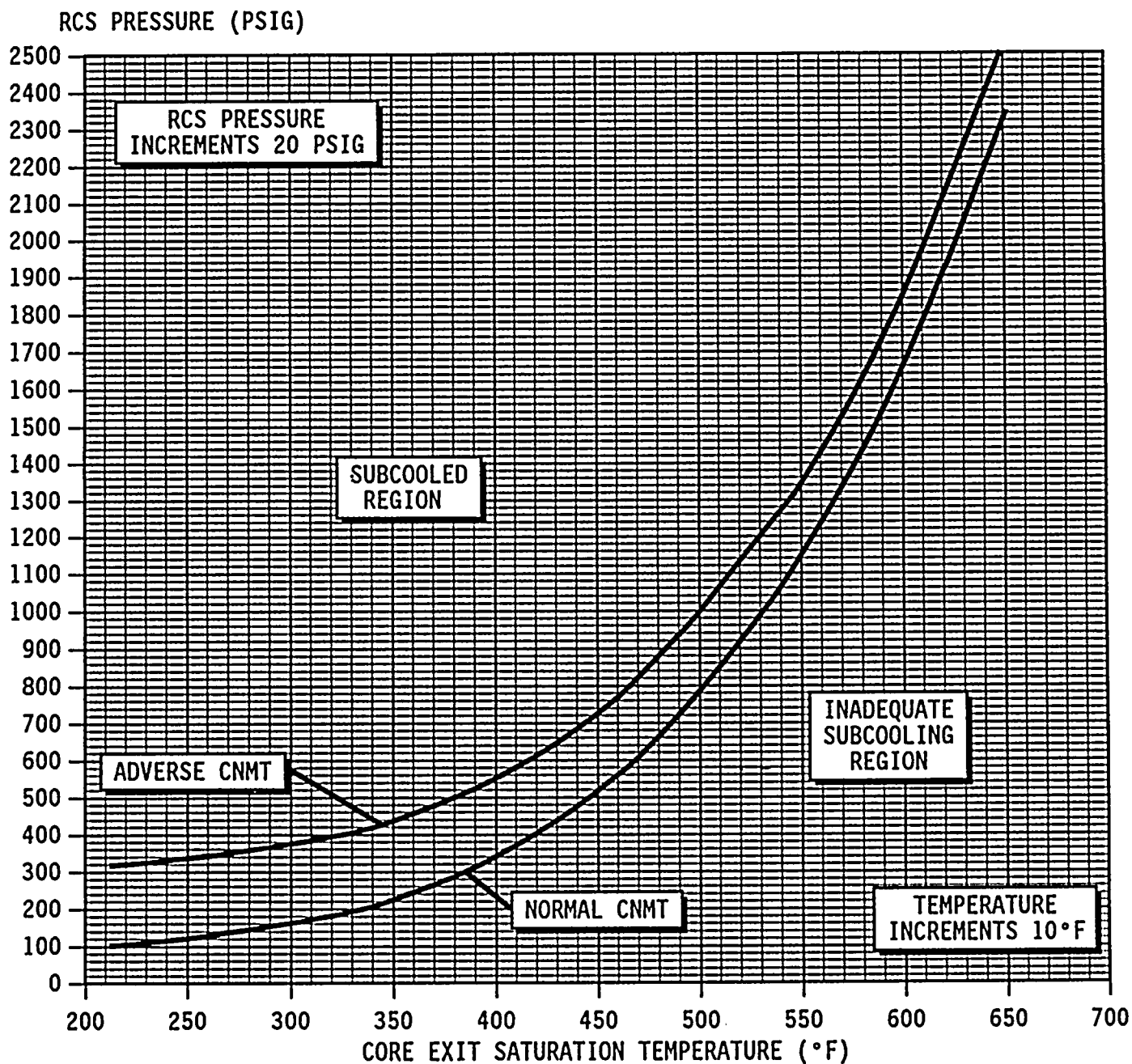
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6) ATTACHMENT SFP-RWST	1
7) ATTACHMENT RCP START	2
8) ATTACHMENT SD-1	1
9) ATTACHMENT CNMT RECIRC FANS	1
10) ATTACHMENT RHR SYSTEM	1
11) ATTACHMENT N2 PORVS	1

FIGURE MIN SUBCOOLING

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



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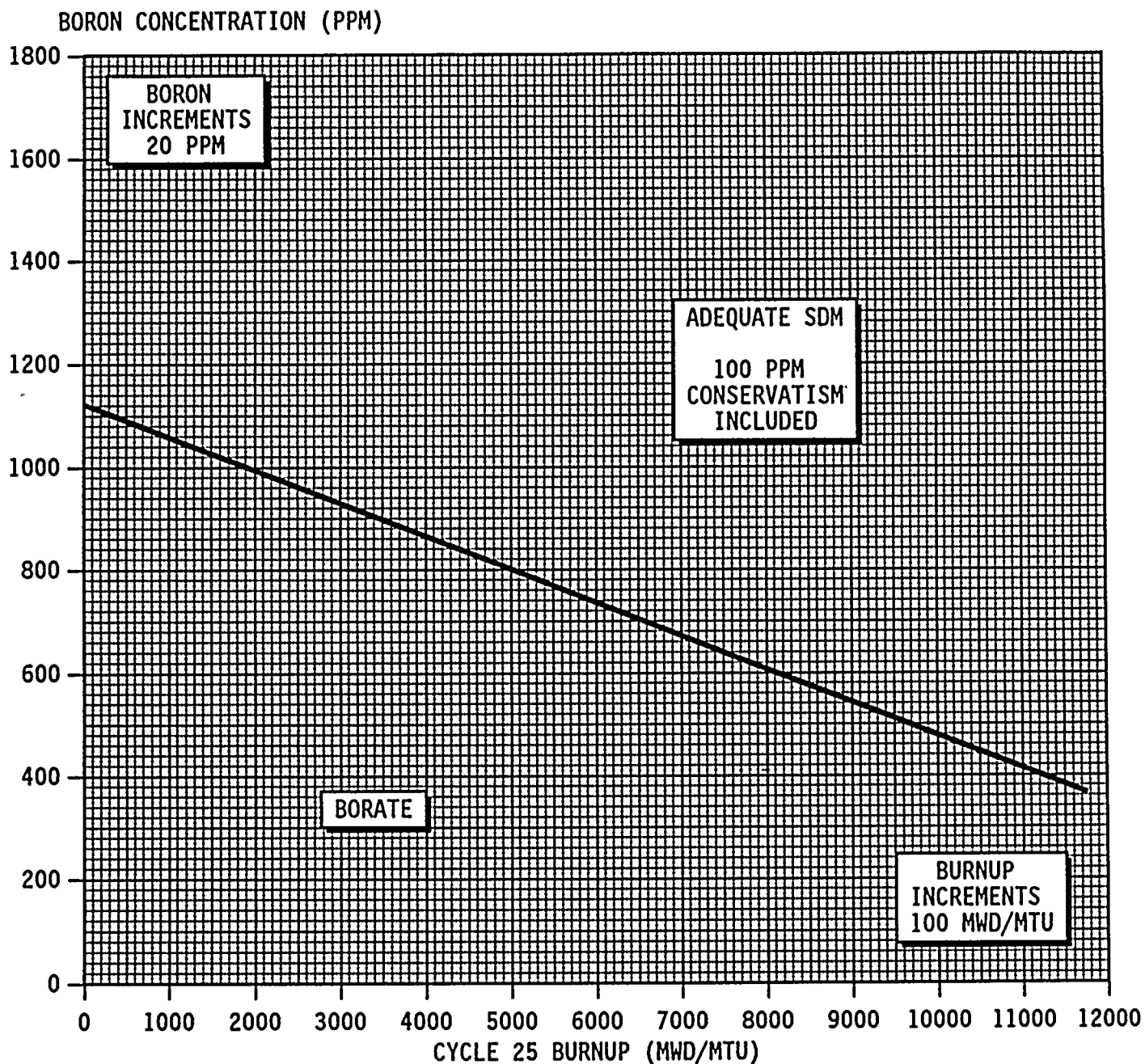
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FIGURE SDM

- 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.



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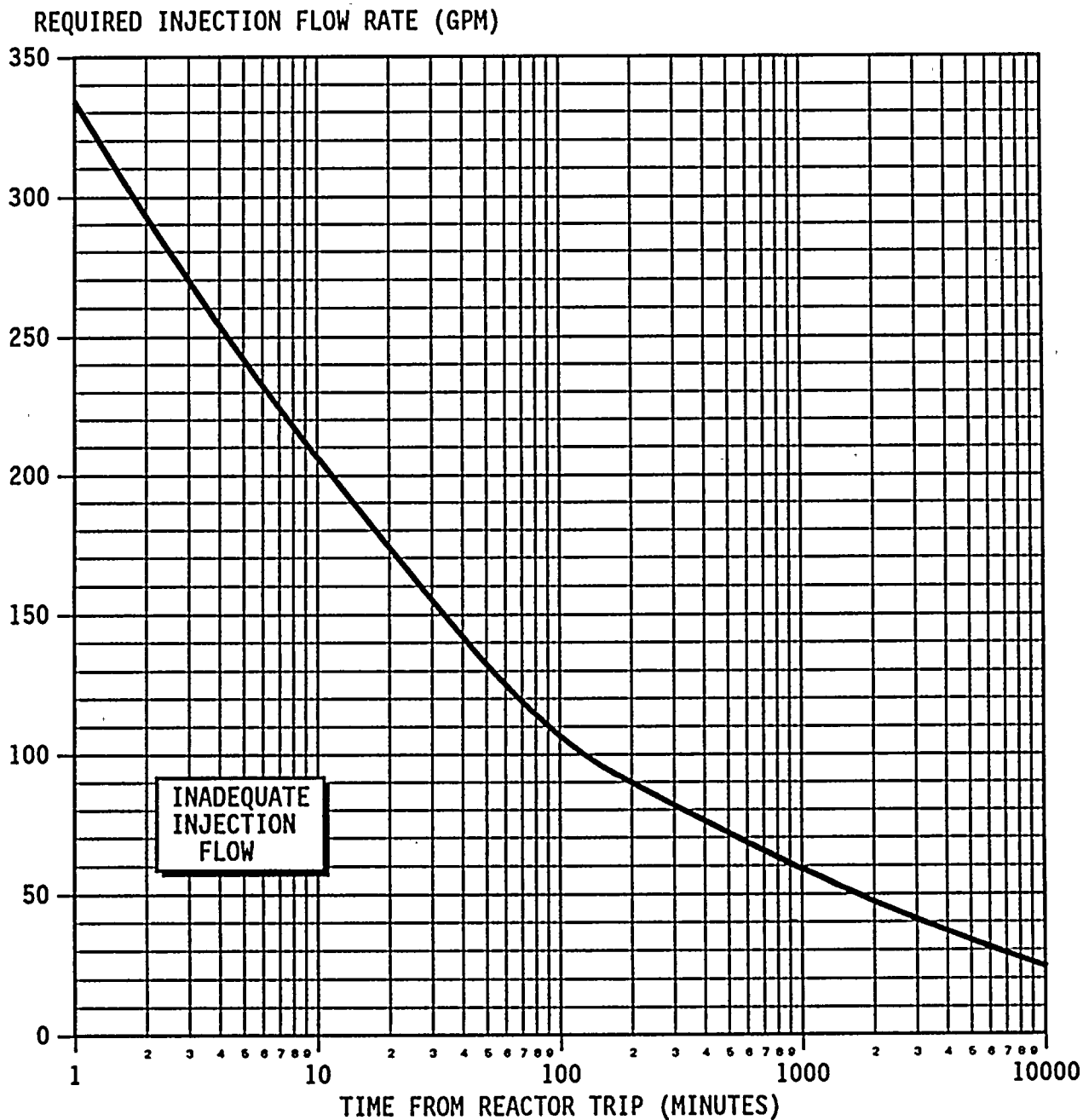
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FIGURE MIN RCS INJECTION

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FIGURE RCP SEAL LEAKOFF

#1 SEAL LEAK RATE (GPM)

