

EOP: E-1	TITLE: LOSS OF REACTOR OR SECONDARY COOLANT	REV: 14 PAGE 1 of 16
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

Residman
RESPONSIBLE MANAGER

1-23-97
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

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A. PURPOSE - This procedure provides actions to recover from a loss of reactor or secondary coolant.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. E-0, REACTOR TRIP OR SAFETY INJECTION, and FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, when a PRZR PORV is stuck open and its block valve can not be closed.
- b. E-0, REACTOR TRIP OR SAFETY INJECTION, with any of the following symptoms: high containment radiation, high containment pressure, or high containment recirculation sump level.
- c. E-0, REACTOR TRIP OR SAFETY INJECTION, ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS, and FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, when RCS pressure is less than the shutoff head pressure of the RHR pumps or is decreasing.
- d. ES-1.1, SI TERMINATION, and FR-I.2, RESPONSE TO LOW PRESSURIZER LEVEL, if SI has to be reinitiated.
- e. E-2, FAULTED STEAM GENERATOR ISOLATION, after identification and isolation of a faulted S/G.
- f. ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, after normal injection mode conditions are established.
- g. ECA-1.2, LOCA OUTSIDE CONTAINMENT, when a LOCA outside containment is isolated.
- h. FR-C.1, RESPONSE TO INADEQUATE CORE COOLING, and FR-C.2, RESPONSE TO DEGRADED CORE COOLING, after core cooling has been reestablished.
- i. FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, if RCS pressure is less than all non-faulted S/G(s) pressure.
- j. FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, after secondary heat sink has been reestablished and all PRZR PORVs are close.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

<p><u>CAUTION</u> 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, STEP 1.</p>		

<p><u>NOTE:</u></p> <ul style="list-style-type: none"> 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.) o Conditions should be evaluated for Site Contingency Reporting (Refer to EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION). o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr. 		
<p>* 1 Monitor RCP Trip Criteria:</p>		
a. RCP status - ANY RCP RUNNING		a. Go to Step 2.
b. SI pumps - AT LEAST TWO RUNNING		b. Go to Step 2.
c. RCS pressure minus maximum S/G pressure - LESS THAN 175 psig [400 psig adverse CNMT]		c. Go to Step 2.
d. Stop both RCPs		

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	<p>Check If S/G Secondary Side Is Intact:</p> <ul style="list-style-type: none"> o Pressure in both S/Gs - STABLE OR INCREASING o Pressure in both S/Gs - GREATER THAN 100 PSIG 	<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"> • Steamlines • Feedlines <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>		
* 3	<p>Monitor Intact S/G Levels:</p>	
	<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 any S/G continues to increase in an uncontrolled manner, <u>THEN</u> go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	<p>Check Secondary Radiation Levels - NORMAL</p> <ul style="list-style-type: none"> Steamline radiation monitor (R-31 and R-32) Request HP sample S/Gs for activity 	<p>IF steamline radiation monitors <u>NOT</u> available, <u>THEN</u> dispatch AO to locally check steamline radiation.</p> <p>IF abnormal radiation levels detected in any S/G, <u>THEN</u> go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.</p>

<p><u>CAUTION</u> IF ANY PRZR PORV OPENS BECAUSE OF HIGH PRZR PRESSURE, IT SHOULD BE CLOSED AFTER PRESSURE DECREASES TO LESS THAN 2335 PSIG (REFER TO STEP 5B).</p>		

* 5	Monitor PRZR PORV Status:	
	<p>a. Power to PORV block valves - AVAILABLE</p> <p>b. PORVs - CLOSED</p> <p>c. Block valves - AT LEAST ONE OPEN</p>	<p>a. Restore power to block valves unless block valve was closed to isolate an open PORV:</p> <ul style="list-style-type: none"> MOV-515, MCC D position 6C MOV-516, MCC C position 6C <p>b. IF PRZR pressure less than 2335 psig, <u>THEN</u> manually close PORVs.</p> <p>IF any PORV can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve. IF block valve can <u>NOT</u> be closed, <u>THEN</u> dispatch AO to locally check breaker.</p> <ul style="list-style-type: none"> MOV-515, MCC D position 6C MOV-516, MCC C position 6C <p>c. Open one block valve unless it was closed to isolate an open PORV.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

<p><u>CAUTION</u> 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>		
6	Reset SI	
7	Reset CI:	
	<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>
8	Verify Adequate SW Flow:	
	<p>a. Check at least two SW pumps - RUNNING</p> <p>b. Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1)</p>	<p>a. Manually start SW pumps as power supply permits (258 kw each).</p> <p><u>IF</u> less than two SW pumps running, <u>THEN</u> perform the following:</p> <p>1) Ensure SW isolation.</p> <p>2) Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1)</p> <p>3) Go to Step 10.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Establish IA to CNMT:	
	<p>a. Verify non-safeguards busses energized from offsite power</p> <ul style="list-style-type: none"> o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED <p>b. Verify turbine building SW isolation valves - OPEN</p> <ul style="list-style-type: none"> • MOV-4613 and MOV-4670 • MOV-4614 and MOV-4664 <p>c. Verify at least two air compressors - RUNNING</p> <p>d. Check IA supply:</p> <ul style="list-style-type: none"> o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING <p>e. Reset both trains of XY relays for IA to CNMT AOV-5392</p> <p>f. Verify IA to CNMT AOV-5392 - OPEN</p>	<p>a. Perform the following:</p> <ol 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 tie 2) 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. <p>b. Manually align valves.</p> <p>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.</p> <p>d. Perform the following:</p> <ol style="list-style-type: none"> 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR). 2) Continue with Step 10. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 9e and f.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check Normal Power Available To Charging Pumps: <ul style="list-style-type: none">o Bus 14 normal feed breaker - CLOSEDo Bus 16 normal feed breaker - CLOSED	Verify adequate emergency D/G capacity to run charging pumps (75 kw each). <u>IF NOT, THEN</u> evaluate if CNMT RECIRC fans can be stopped (Refer to Attachment CNMT RECIRC FANS).

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	<p>Check If Charging Flow Has Been Established:</p> <p>a. Charging pumps - ANY RUNNING</p> <p>b. Charging pump suction aligned to RWST:</p> <ul style="list-style-type: none"> o LCV-112B - OPEN o LCV-112C - CLOSED <p>c. Start charging pumps as necessary and adjust charging flow to restore PRZR level</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 key to RWST gate to close seal injection needle valve(s) to affected RCP: <ul style="list-style-type: none"> • V-300A for RCP A • V-300B for RCP B 2) Ensure HCV-142 open, demand at 0%. <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"> 1) Verify charging pump A <u>NOT</u> 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) <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).

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Check If SI Should Be Terminated:	
a.	RCS pressure:	a. Do <u>NOT</u> stop SI pumps. Go to Step 14.
	o Pressure - GREATER THAN 1625 psig [1825 psig adverse CNMT]	
	o Pressure - STABLE OR INCREASING	
b.	RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING	b. Do <u>NOT</u> stop SI pumps. Go to Step 14.
c.	Secondary heat sink:	c. <u>IF</u> neither condition satisfied, <u>THEN</u> do <u>NOT</u> stop SI pumps. Go to Step 14.
	o Total feed flow to intact S/Gs - GREATER THAN 200 GPM	
	-OR-	
	o Narrow range level in at least one intact S/G - GREATER THAN 5% [25% adverse CNMT]	
d.	PRZR level - GREATER THAN 5% [30% adverse CNMT]	d. Do <u>NOT</u> stop SI pumps. Perform the following:
		1) <u>IF</u> normal PRZR spray available, <u>THEN</u> try to stabilize RCS pressure with PRZR spray.
		2) Go to Step 14.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	Go To ES-1.1, SI TERMINATION, Step 1	
*14	Monitor If CNMT Spray Should Be Stopped:	
	a. CNMT spray pumps - RUNNING	a. Go to Step 15.
	b. Check the following:	b. Continue with Step 15. <u>WHEN</u> BOTH conditions satisfied, <u>THEN</u> do Steps 14c through f.
	o CNMT pressure - LESS THAN 4 PSIG	
	o Sodium hydroxide tank level - LESS THAN 55%	
	c. Reset CNMT spray	
	d. Check NaOH tank outlet valves - CLOSED	d. Place NaOH tank outlet valve controllers to MANUAL and close valves.
	• AOV-836A	
	• AOV-836B	
	e. Stop CNMT spray pumps and place in AUTO	
	f. Close CNMT spray pump discharge valves	
	• MOV-860A	
	• MOV-860B	
	• MOV-860C	
	• MOV-860D	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p>CAUTION</p> <ul style="list-style-type: none"> 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. o 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. <p>*****</p>		
*15	<p>Monitor If RHR Pumps Should Be Stopped:</p> <p>a. Check RCS pressure:</p> <ul style="list-style-type: none"> 1) Pressure - GREATER THAN 250 psig [465 psig adverse CNMT] 2) RCS pressure - STABLE OR INCREASING <p>b. Stop RHR pumps and place in AUTO</p>	<p>1) Go to Step 17.</p> <p>2) Go to Step 16.</p>
16	<p>Check RCS And S/G Pressures</p> <p>a. Check pressures in both S/Gs - STABLE OR INCREASING</p> <p>b. Check pressures in both S/Gs - GREATER THAN 100 PSIG</p> <p>c. Check RCS pressure - STABLE OR DECREASING</p>	<p>a. Return to Step 1.</p> <p>b. Monitor RCS pressure. IF RCS pressure does <u>NOT</u> increase after faulted S/G dryout, <u>THEN</u> go to Step 17.</p> <p>c. Return to Step 1.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	<p>Check If Emergency D/Gs Should Be Stopped:</p> <p>a. Verify AC emergency busses energized by offsite power:</p> <ul style="list-style-type: none"> o Emergency D/G output breakers - OPEN o AC emergency bus voltage - GREATER THAN 420 VOLTS o AC emergency bus normal feed breakers - CLOSED <p>b. Stop any unloaded emergency D/G and place in standby (Refer to Attachment D/G STOP)</p>	<p>a. Perform the following:</p> <ol style="list-style-type: none"> 1) Close non-safeguards bus tie breakers as necessary: <ul style="list-style-type: none"> • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Place the following pumps in PULL STOP: <ul style="list-style-type: none"> • EH pumps • Turning gear oil pump • HP seal oil backup pump 3) Ensure condenser steam dump mode control in MANUAL. 4) Restore power to MCCs: <ul style="list-style-type: none"> • A from Bus 13 • B from Bus 15 • E from Bus 15 • F from Bus 15 5) <u>WHEN</u> bus 15 restored, <u>THEN</u> reset control room lighting breaker. 6) Refer to Attachment SI/UV for other equipment lost with loss of offsite power. 7) Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	<p>Verify CNMT Sump Recirculation Capability:</p> <p>a. Check RHR system:</p> <ol style="list-style-type: none"> 1) Power available to emergency AC busses and MCCs required for CNMT sump recirculation <ul style="list-style-type: none"> o Bus 14 and bus 18 - ENERGIZED o MCC C - ENERGIZED o Bus 16 and bus 17 - ENERGIZED o MCC D - ENERGIZED 2) RHR pumps and valves - OPERABLE <p>b. Check SW pumps - AT LEAST 2 PUMPS AVAILABLE</p> <p>c. Dispatch AO to check AUX BLDG sub-basement for RHR system leakage (AUX BLDG sub-basement key may be required)</p>	<p>a. Restore power to at least one train of emergency AC busses. <u>IF</u> at least one train of cold leg recirculation capability can <u>NOT</u> be verified, <u>THEN</u> go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.</p> <p>b. Attempt to restore at least 2 SW pumps to operable. <u>IF</u> only 1 SW pump available, <u>THEN</u> refer to Attachment MIN SW for additional guidance.</p> <p>c. <u>IF</u> any RHR pump seal leakage indicated, <u>THEN</u> leakage should be evaluated and isolated if necessary.</p>



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	<p>Evaluate Plant Status:</p> <p>a. Check auxiliary building radiation - NORMAL</p> <ul style="list-style-type: none"> • Plant vent iodine (R-10B) • Plant vent particulate (R-13) • Plant vent gas (R-14) • CCW liquid monitor (R-17) • LTDN line monitor (R-9) • CHG pump room (R-4) <p>b. Direct HP to obtain following samples:</p> <ul style="list-style-type: none"> • RCS boron • RCS activity • CNMT hydrogen • CNMT sump boron • BASTs boron <p>c. Verify adequate Rx head cooling:</p> <ol style="list-style-type: none"> 1) Verify at least one control rod shroud fan - RUNNING 2) Verify one Rx compartment cooling fan - RUNNING 	<p>a. Notify HP and refer to appropriate AR-RMS procedure.</p> <p><u>IF</u> the cause is a loss of RCS inventory outside CNMT, <u>THEN</u> go to ECA-1.2, LOCA OUTSIDE CONTAINMENT, Step 1.</p> <ol style="list-style-type: none"> 1) Manually start one fan as power supply permits (45 kw) 2) Perform the following: <ul style="list-style-type: none"> o Dispatch AO to reset UV relays at MCC C and MCC D. o Manually start one fan as power supply permits (23 kw)

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	<p>Check If RCS Cooldown And Depressurization Is Required:</p> <p>a. RCS pressure - GREATER THAN 250 psig [465 psig adverse CNMT]</p> <p>b. Go to ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION, Step 1</p>	<p>a. <u>IF</u> RHR pump flow greater than 475 gpm, <u>THEN</u> go to Step 21.</p>
21	<p>Check If Transfer To Cold Leg Recirculation Is Required:</p> <p>a. RWST level - LESS THAN 28%</p> <p>b. Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1</p>	<p>a. Return to Step 18.</p>
-END-		

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E-1 APPENDIX LIST

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8)	ATTACHMENT AUX BLDG SW	1
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10)	FOLDOUT	1



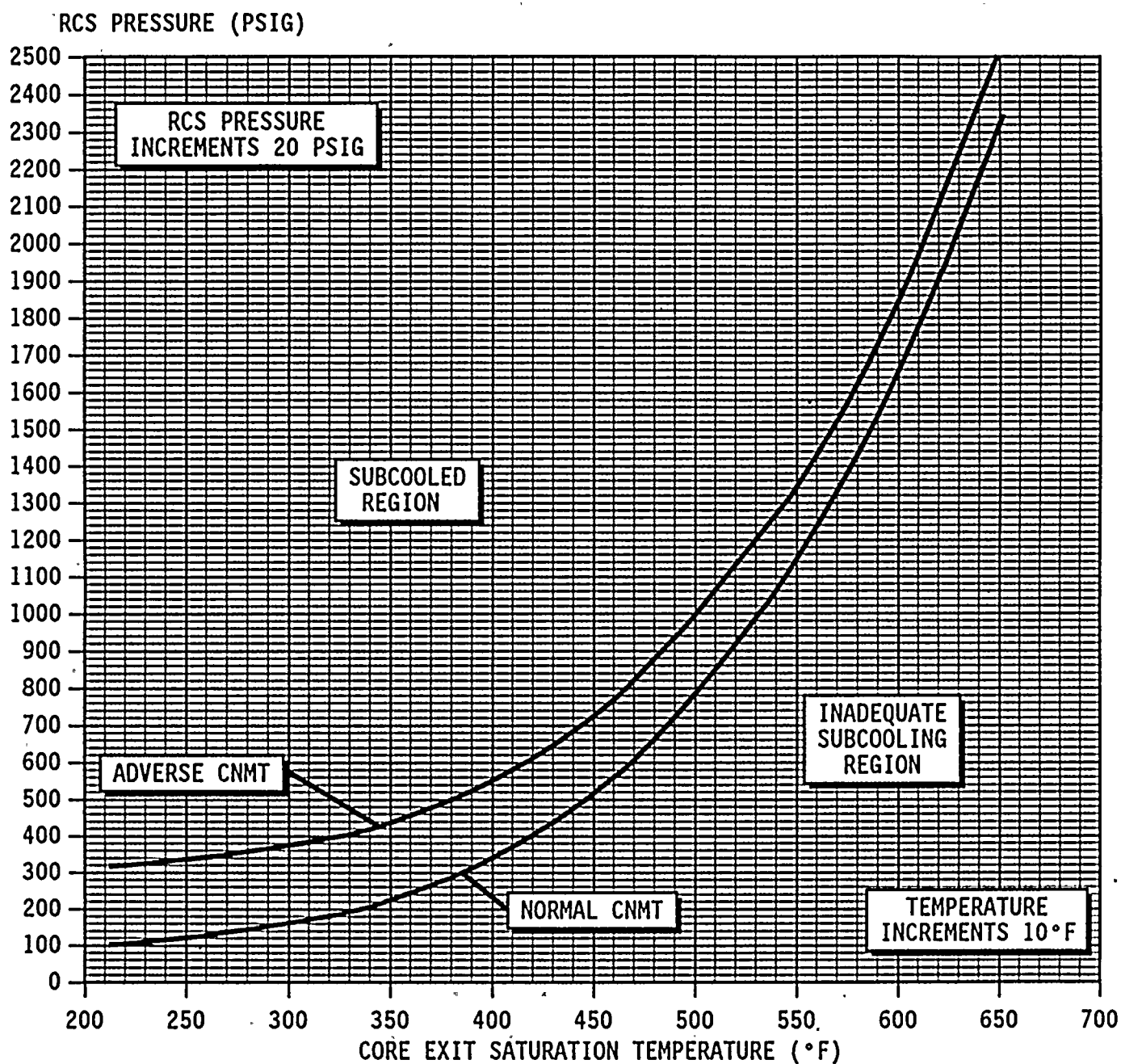
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RED PATH SUMMARY

- 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.



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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 T/Cs - LESS THAN 0°F USING FIGURE MIN SUBCOOLING
- OR -
- o PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN 5% [30% adverse CNMT]

2. SI TERMINATION CRITERIA

IF ALL conditions listed below occur, THEN go to ES-1.1, SI TERMINATION, Step 1:

- a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING
- b. Total feed flow to intact S/Gs - GREATER THAN 200 GPM
- OR -
- Narrow range level in at least one intact S/G - GREATER THAN 5% [25% adverse CNMT]
- c. RCS pressure:
 - o GREATER THAN 1625 PSIG [1825 psig adverse CNMT]
 - o STABLE OR INCREASING
- d. PRZR level - GREATER THAN 5% [30% adverse CNMT]

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.

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. 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).

6. E-3 TRANSITION CRITERIA

IF any S/G level increases in an uncontrolled manner or any S/G has abnormal radiation, THEN go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.



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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER

23

Residman

RESPONSIBLE MANAGER

4-24-97

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP:	TITLE:	REV: 12
ECA-1.1	LOSS OF EMERGENCY COOLANT RECIRCULATION	PAGE 2 of 28

- 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
<p>*****</p> <p>CAUTION</p> <ul style="list-style-type: none"> 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. <p>*****</p> <p>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.</p> <p>1 Verify CNMT Sump Recirculation Capability:</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>a. Check RHR system:</p> <ul style="list-style-type: none"> o RHR pumps - OPERABLE o RHR suction valves from sump B - OPERABLE <ul style="list-style-type: none"> • MOV-850A • MOV-850B o RHR pump discharge to Rx vessel deluge valves - OPERABLE <ul style="list-style-type: none"> • MOV-852A • MOV-852B o CCW pumps - OPERABLE o CCW to RHR Hx - OPERABLE <ul style="list-style-type: none"> • MOV-738A • MOV-738B <p>b. Check at least two SW pumps - RUNNING</p> </div> <div style="width: 48%;"> <p>a. Manually or locally try to restore at least one train (Refer to Attachment RHR SYSTEM to identify minimum components for one train).</p> <p>b. Manually start SW pumps as power supply permits (258 kw each).</p> </div> </div>		

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	<p>Add Makeup To RWST As Necessary</p> <ul style="list-style-type: none"> o Refer to S-9J, BLENDING TO RWST <p>-OR-</p> <ul style="list-style-type: none"> o Refer to S-3.2D, TRANSFERRING WATER FROM CVCS HUT(S) TO RWST OR SFP <p>-OR-</p> <ul style="list-style-type: none"> o Refer to Attachment SFP-RWST <p>*****</p> <p>CAUTION 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>*****</p> <p>NOTE: 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> <p>a. All fans - RUNNING</p> <p>b. Charcoal filter dampers green status lights - EXTINGUISHED</p>	<p>a. Manually start fans.</p> <p>b. Dispatch personnel with relay rack key to locally open dampers using trip relay pushbuttons in relay room racks.</p> <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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

<p><u>CAUTION</u> 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>		

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. <u>IF</u> two RHR pumps running, <u>THEN</u> stop one RHR pump. <u>IF</u> no RHR pumps running, <u>THEN</u> start one RHR pump.
10	Verify No Backflow From RWST To Sump:	
	a. Any RHR suction valve from sump B - OPEN	a. <u>IF</u> both RHR suction valves from sump B closed, <u>THEN</u> go to Step 11.
	<ul style="list-style-type: none"> • MOV-850A • MOV-850B 	
	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 <u>IF</u> valve can <u>NOT</u> be closed manually, <u>THEN</u> direct AO to locally close valve.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	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.
12	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 15.
	b. Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1)	

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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: <ol 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 tie 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each). <p><u>IF NOT</u>, <u>THEN</u> evaluate if CNMT RECIRC fans should be stopped (Refer to Attachment CNMT RECIRC FANS).</p> 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 PSIG o Pressure - STABLE OR INCREASING 	d. Perform the following: <ol 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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p><u>CAUTION</u> 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:	
	<p>a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING</p> <p>b. RCPs - AT LEAST ONE RUNNING</p> <p>c. Stop all but one RCP</p>	<p>a. Stop all RCPs and go to Step 16.</p> <p>b. 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>

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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> 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>		
<p>19 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> <ul style="list-style-type: none"> o RCS subcooling based on core exit T/Cs - LESS THAN 10°F USING FIGURE MIN SUBCOOLING <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o PRZR level - GREATER THAN 75% [65% adverse CNMT] 	
	<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 | d. Perform the following: |
| <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) | <ul 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	<p>Check If SI ACCUMs Should Be Isolated:</p> <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	<p>Monitor RCP Operation:</p> <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: 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	

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

28 Establish Maximum VCT Makeup:

- a. Check RMW control armed - RED LIGHT LIT
- b. Check VCT level - LESS THAN 20%
- c. Check VCT makeup system - OPERATING IN AUTO
- d. Increase VCT makeup flow
 - 1) Start both RMW pumps
 - 2) Start both boric acid pumps
 - 3) Adjust RMW controller (HC-111) to maximum flow from table

BAST CONC (PPM)	MAX RMW FLOW (GPM)
8750 (5%)	40
10500 (6%)	50
12250 (7%)	60
14000 (8%)	70
15750 (9%)	80
17500 (10%)	90
 - 4) Adjust boric acid flow controller (HC-110A) in MANUAL to 9.5 gpm
- e. Adjust charging pump speed to stabilize VCT level

- a. Place RMW mode switch in AUTO and place RMW control switch to START.
- b. Continue with Step 29. WHEN VCT level less than 20%, THEN do Steps 28c, d and e.
- c. Perform the following:
 - 1) Open makeup system valves.
 - AOV-110B
 - AOV-110C
 - AOV-111
 - 2) Start BA transfer pumps and RMW pumps.
 - 3) Open boric acid flow control valve (AOV-110A).

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29	<p>Try To Add Makeup To RCS From Alternate Source:</p> <ul style="list-style-type: none"> 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	<p>Verify SI ACCUM Isolation Valves - OPEN</p> <ul style="list-style-type: none"> • MOV-841 • MOV-865 	<p><u>IF</u> valves were closed to prevent SI ACCUM nitrogen injection, <u>THEN</u> go to Step 34.</p> <p><u>IF NOT</u>, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> a. Dispatch AO 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 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

b. Dump steam to condenser at
maximum rate

c. Check S/G pressures - LESS THAN
785 PSIG

d. Stop S/G depressurization

a. Go to Step 32.

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 A0 to perform the
following:

1) Open S/G MSIV bypass
valves.

2) Open priming air ejector
steam isolation valves

- V-3580
- V-3581

c. Return to Step 31b.



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p>NOTE: The intent of Step 32 is to depressurize S/Gs more slowly, but at a rate that will maintain required RVLIS level.</p>	
32	<p>Depressurize Intact S/Gs To 200 PSIG Slowly To Inject SI ACCUMs:</p>	
	<p>a. Dump steam to condenser as necessary to maintain appropriate RVLIS indication:</p> <ul style="list-style-type: none"> o Level (no RCPs) - BETWEEN 68% AND 73% [73% AND 76% adverse CNMT] <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o Fluid fraction (any RCP running) - BETWEEN 80% AND 90% 	<p>a. Manually or locally dump steam from intact S/G(s) to maintain appropriate RVLIS indication:</p> <ul style="list-style-type: none"> o Use S/G ARVs <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o Open steam supply valves to TDAFW pump <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o Dispatch AO to perform the following: <ul style="list-style-type: none"> 1) Open affected S/G MSIV bypass valve. 2) Open priming air ejector steam isolation valves <ul style="list-style-type: none"> • V-3580 • V-3581
	<p>b. Check S/G pressures - LESS THAN 200 PSIG</p>	<p>b. Return to Step 32a.</p>
	<p>c. Stop S/G depressurization</p>	

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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> <p>1) Open vent valves for unisolated SI ACCUMs.</p> <ul style="list-style-type: none"> • ACCUM A, AOV-834A • ACCUM B, AOV-834B <p>2) Open HCV-945.</p> |
|---|--|

***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> |
|--|--|

EOP:	TITLE:	REV: 12
ECA-1.1	LOSS OF EMERGENCY COOLANT RECIRCULATION	PAGE 25 of 28

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- o Open steam supply valves to TDAFW pump -OR- 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

EOP:

ECA-1.1

TITLE:

LOSS OF EMERGENCY COOLANT RECIRCULATION

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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

b. RCS pressure - LESS THAN
400 psig [300 psig adverse CNMT]

c. Place letdown pressure
controller in MANUAL CLOSED

d. Check following valves - OPEN

- 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)

e. Verify pressure on PI-135 - LESS
THAN 400 PSIG

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

a. Return to Step 35.

b. Return to Step 35.

d. Perform the following:

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. Return to Step 36.

EOP: ECA-1.1	TITLE: LOSS OF EMERGENCY COOLANT RECIRCULATION	REV: 12 PAGE 27 of 28
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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	b. Manually or locally dump steam from intact S/G(s): <ul style="list-style-type: none"> o Use S/G ARVs -OR- o Open steam supply valves to TDAFW pump -OR- 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>

EOP: ECA-1.1	TITLE: LOSS OF EMERGENCY COOLANT RECIRCULATION	REV: 12 PAGE 28 of 28
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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	<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>
40	<p>Consult TSC</p>	
<p>-END-</p>		

EOP:	TITLE:	REV: 12
ECA-1.1	LOSS OF EMERGENCY COOLANT RECIRCULATION	PAGE 1 of 1

ECA-1.1 APPENDIX LIST

	<u>TITLE</u>	<u>PAGES</u>
1)	FIGURE MIN SUBCOOLING	1
2)	FIGURE SDM	1
3)	FIGURE MIN RCS INJECTION	1
4)	FIGURE RCP SEAL LEAKOFF	1
5)	ATTACHMENT RHR COOL	2
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

EOP: ES-1.3	TITLE: TRANSFER TO COLD LEG RECIRCULATION	REV: 20 PAGE 1 of 19
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

R. S. Delmonico
RESPONSIBLE MANAGER

1-23-97
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP:	TITLE:	REV: 20
ES-1.3	TRANSFER TO COLD LEG RECIRCULATION	PAGE 2 of 19

A. PURPOSE - This procedure provides the necessary instructions for transferring the Safety Injection system and Containment Spray system to recirculation modes of operation.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure may be entered from:

- a. E-1, LOSS OF REACTOR OR SECONDARY COOLANT, or,
- b. ECA-0.2, LOSS OF ALL AC POWER WITH SI REQUIRED, or,
- c. ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS, or,
- d. FR-C.1, RESPONSE TO INADEQUATE CORE COOLING, or,
- e. FR-C.2, RESPONSE TO DEGRADED CORE COOLING, or,
- f. FR-C.3, RESPONSE TO SATURATED CORE COOLING, or,
- g. FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, or,
- h. FR-Z.1, RESPONSE TO HIGH CONTAINMENT PRESSURE, on low RWST level.
- i. Other procedures whenever RWST level reaches the switchover setpoint (28%).

EOP: ES-1.3	TITLE: TRANSFER TO COLD LEG RECIRCULATION	REV: 20 PAGE 3 of 19
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

<u>CAUTION</u>	<ul style="list-style-type: none"> o INJECTION FLOW TO THE RCS SHALL BE MAINTAINED AT ALL TIMES. 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. o CONSULT WITH RADIATION PROTECTION BEFORE DISPATCHING PERSONNEL TO AUXILIARY BUILDING. SWITCHOVER TO RECIRCULATION MAY CAUSE HIGH RADIATION LEVELS. 	

<u>NOTE:</u>	<ul style="list-style-type: none"> 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^{+05} R/hr. 	
1	Verify CNMT Sump B Level - GREATER THAN 113 INCHES	IF RWST level is less than 28% <u>AND</u> CNMT sump B level is less than 113 inches, <u>THEN</u> go to ECA-1.2, LOCA OUTSIDE CONTAINMENT, Step 1.
<u>NOTE:</u> Steps 2 through 12 should be performed without delay. FR procedures should not be implemented prior to completion of these steps.		
2	Reset SI	

EOP:	TITLE:	REV: 20
ES-1.3	TRANSFER TO COLD LEG RECIRCULATION	PAGE 4 of 19

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>NOTE: IF D/Gs supplying emergency AC busses, THEN non-essential loads may be shed as necessary to allow start of additional SW pumps.</p> <p>3 Establish Adequate SW Flow:</p> <div> <div> <p>a. Verify at least two SW pumps - RUNNING</p> <p>b. Verify AUX BLDG SW isolation valves - OPEN</p> <ul style="list-style-type: none"> • MOV-4615 and MOV-4734 • MOV-4616 and MOV-4735 <p>c. Dispatch AO to verify total SW flow to CCW Hxs - GREATER THAN 5000 GPM</p> </div> <div> <p>a. Start additional SW pumps as power supply permits (258 kw each). <u>IF</u> only 1 SW pump operable, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> 1) Ensure Attachment MIN SW is complete. 2) Go to Step 4. <p>b. Establish SW to AUX BLDG (Refer to Attachment AUX BLDG SW).</p> <p>c. Perform the following:</p> <ol style="list-style-type: none"> 1) Isolate SW to screenhouse and air conditioning headers. <ul style="list-style-type: none"> • MOV-4609 and MOV-4780 • MOV-4663 and MOV-4733 2) Direct AO to locally adjust total SW flow to the CCW Hxs to between 5000 gpm and 6000 gpm (V-4619 and V-4620). 3) Direct AO to locally isolate SW return from SFP Hxs: <ul style="list-style-type: none"> • SFP Hx A (V-4622) • SFP Hx B (V-8689) 4) Verify SW portions of Attachment SD-1 are complete. </div> </div>		

EOP: ES-1.3	TITLE: TRANSFER TO COLD LEG RECIRCULATION	REV: 20 PAGE 5 of 19
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Establish CCW flow to RHR Hxs:	
	<ul style="list-style-type: none"> a. Check both CCW pumps - RUNNING b. Manually open CCW valves to RHR Hxs <ul style="list-style-type: none"> • MOV-738A • MOV-738B 	<ul style="list-style-type: none"> a. Start CCW pumps as power supply permits (124 kw each). b. Dispatch AO to locally open valves.

	<p><u>CAUTION</u></p> <ul style="list-style-type: none"> o CONSULT WITH RADIATION PROTECTION BEFORE DISPATCHING PERSONNEL TO AUXILIARY BUILDING. SWITCHOVER TO RECIRCULATION MAY CAUSE HIGH RADIATION LEVELS. o THE RHR HX OUTLET VALVES (HCV-624 AND HCV-625) WILL FAIL OPEN ON LOSS OF INSTRUMENT AIR PRESSURE. 	

5	Check RHR Flow:	
	<ul style="list-style-type: none"> o Both RHR pumps - RUNNING o RHR flow (FI-626) - LESS THAN 1500 GPM PER OPERATING PUMP 	<p>Manually adjust RHR Hx outlet valves equally to reduce flow to less than 1500 gpm per operating pump.</p> <ul style="list-style-type: none"> • RHR Hx B, HCV-624 • RHR Hx A, HCV-625 <p><u>IF</u> flow can <u>NOT</u> be reduced manually, <u>THEN</u> dispatch an AO to locally adjust RHR Hx outlet manual valves equally to reduce flow.</p> <ul style="list-style-type: none"> • RHR Hx B, V-715 • RHR Hx A, V-717

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

<p><u>CAUTION</u> ANY PUMPS TAKING SUCTION FROM RWST SHOULD BE STOPPED UPON REACHING RWST LO-LO LEVEL ALARM.</p> <p>*****</p>		
<p>6 Check IF Unnecessary Pumps Can Be Stopped:</p>		
a.	Three SI pumps - RUNNING	a. Go to Step 6c.
b.	Stop SI pump C and place both switches in PULL STOP	
c.	Both CNMT spray pumps - RUNNING	c. Pull stop any idle CNMT spray pump and go to Step 6e.
d.	Pull stop one CNMT spray pump	
e.	Stop both RHR pumps and place in PULL STOP	

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

7 Verify RHR System Alignment:

- | | |
|--|--|
| <p>a. Verify the following valves - CLOSED</p> <ul style="list-style-type: none">o RHR suction valves from loop A hot leg<ul style="list-style-type: none">• MOV-700• MOV-701o RHR discharge valves to loop B cold leg<ul style="list-style-type: none">• MOV-720• MOV-721 <p>b. Verify RHR pump suction crosstie valves - OPEN</p> <ul style="list-style-type: none">• MOV-704A• MOV-704B <p>c. Verify the following valves - OPEN</p> <ul style="list-style-type: none">o RHR pump discharge to Rx vessel deluge valves<ul style="list-style-type: none">• MOV-852A• MOV-852Bo RHR suction from sump B (inside CNMT)<ul style="list-style-type: none">• MOV-851A• MOV-851B <p>d. Verify RCDT pump suction valves from sump B - CLOSED</p> <ul style="list-style-type: none">• MOV-1813A• MOV-1813B | <p>a. Ensure at least one suction valve and one discharge valve closed.</p> <p>b. Manually open valves. If valves can <u>NOT</u> be opened, <u>THEN</u> dispatch A0 to locally open valves.</p> <p>c. Ensure at least one valve in each set open.</p> <p>d. Manually close valves.</p> |
|--|--|

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
***** CAUTION RHR FLOW INDICATED ON FI-626 SHOULD BE LIMITED TO 1500 GPM PER OPERATING PUMP TO ENSURE OPTIMUM PUMP PERFORMANCE. *****		
8	Initiate RHR Sump Recirculation: a. Close RWST outlet valve to RHR pump suction, MOV-856 (turn on DC power key switch) b. Open both RHR suction valves from sump B (outside CNMT) <ul style="list-style-type: none"> o MOV-850A - OPEN o MOV-850B - OPEN c. Start both RHR pumps d. Verify at least one RHR pump - RUNNING	a. Dispatch AO to locally close valve and continue with Step 8b. b. <u>IF</u> only one valve will open, <u>THEN</u> perform the following: <ul style="list-style-type: none"> 1) Initiate only one train of RHR recirculation (Refer to Attachment RHR NPSH for further guidance). 2) Go to 8d. <u>IF</u> neither valve will open, <u>THEN</u> refer to Attachment RHR PRESS REDUCTION for further guidance. d. <u>IF</u> no RHR pump can be started, <u>THEN</u> go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>NOTE: The TSC should be requested to establish periodic monitoring of the AUX BLDG sub-basement, as radiological conditions permit, to monitor RHR pump operation.</p>		
9	Check RWST Level - LESS THAN 15%	DO <u>NOT</u> continue with this procedure until RWST level is less than 15%.
10	Stop All Pumps Supplied From RWST:	
	a. Stop all SI pumps and place in PULL STOP	
	b. Stop all charging pumps	
	c. Stop operating CNMT spray pump and place in PULL STOP	
	d. Check CNMT pressure - LESS THAN 28 PSIG	d. Go to Step 11.
	e. Reset CNMT spray if necessary	
	f. Close CNMT spray pump discharge valves	
	<ul style="list-style-type: none"> • MOV-860A • MOV-860B • MOV-860C • MOV-860D 	

EOP:	TITLE:	REV: 20
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

<p>CAUTION RHR FLOW MUST BE MAINTAINED LESS THAN 1500 GPM PER OPERATING RHR PUMP AS DETERMINED BY THE TOTAL OF FI-931A, FI-931B AND FI-626 INDICATIONS.</p> <p>*****</p>		
<p>11 Align SI And CNMT Spray For Sump Recirculation:</p>		
a.	Verify SI pump suction valves from BASTs - CLOSED	a. Ensure at least one valve in each flowpath closed.
	<ul style="list-style-type: none"> • MOV-826A and MOV-826B • MOV-826C and MOV-826D 	
b.	Close RWST outlet valves to SI and CNMT spray pumps (turn on DC power key switches)	b. Ensure at least one valve closed.
	<ul style="list-style-type: none"> • MOV-896A • MOV-896B 	
c.	Close SI pump RECIRC valves	c. Ensure at least one valve closed.
	<ul style="list-style-type: none"> • MOV-898 • MOV-897 	
d.	Verify SI pump suction valves from RWST - OPEN	d. Ensure at least one valve open.
	<ul style="list-style-type: none"> • MOV-825A • MOV-825B 	
e.	Align RHR Hx outlet flow paths to SI and CNMT spray pump suction	e. Ensure at least one flowpath aligned from RHR pump(s) to SI and CS pump suction header (Refer to Attachment RHR SYSTEM).
	<ul style="list-style-type: none"> o MOV-857A and MOV-857C - OPEN o MOV-857B - OPEN 	<p><u>IF</u> neither flow path can be aligned, <u>THEN</u> refer to Attachment RHR PRESS REDUCTION for further guidance.</p>

EOP: ES-1.3	TITLE: TRANSFER TO COLD LEG RECIRCULATION	REV: 20 PAGE 11 of 19
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p><u>CAUTION</u> SI PUMPS SHOULD BE STOPPED IF RCS PRESSURE IS GREATER THAN THEIR SHUTOFF HEAD PRESSURE.</p> <p>*****</p> <p><u>NOTE:</u> Operation of SI pump C is preferred since it delivers to both RCS loops.</p>		
12	<p>Verify Adequate RCS Makeup Flow:</p> <p>a. RCS pressure - LESS THAN 225 psig [425 psig adverse CNMT]</p> <p>b. RHR injection flow adequate:</p> <ul style="list-style-type: none"> o Core exit T/Cs - LESS THAN REQUIREMENTS OF FIGURE RHR INJECTION o Check RVLIS level (no RCPS) - GREATER THAN 43% [46% adverse CNMT] 	<p>a. Perform the following:</p> <p>1) Check RCS conditions:</p> <ul style="list-style-type: none"> o RCS subcooling based on core exit T/Cs greater than Figure MIN SUBCOOLING. o PRZR level greater than 5% [30% adverse CNMT]. <p><u>IF</u> either condition <u>NOT</u> met, <u>THEN</u> start one SI pump.</p> <p>2) Go to Step 13.</p> <p>b. Start one SI pump.</p>

EOP:	TITLE:	REV: 20
ES-1.3	TRANSFER TO COLD LEG RECIRCULATION	PAGE 12 of 19

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
***** <u>CAUTION</u> IF A CNMT SPRAY PUMP IS STARTED, THEN CNMT PRESSURE SHOULD BE CLOSELY MONITORED. CNMT PRESSURE SHOULD NOT BE REDUCED TO LESS THAN 32 PSIG. *****		
13	Check If CNMT Spray Is Required: a. CNMT pressure - GREATER THAN 37 PSIG b. Verify CNMT spray pump discharge valves - OPEN • MOV-860A • MOV-860B • MOV-860C • MOV-860D c. Start selected CNMT spray pump d. Adjust RHR flow to maintain less than 1500 gpm per operating RHR pump as indicated by the total of FI-931A, FI-931B and FI-626 indications. e. Open NaOH tank outlet valves for running pump • CS pump A, AOV-836A • CS pump B, AOV-836B f. <u>WHEN</u> CNMT pressure decreases to 32 psig, <u>THEN</u> pull stop CNMT spray pump	a. Perform the following: 1) <u>IF</u> CNMT spray previously actuated and NaOH tank level greater than 55%, <u>THEN</u> consult TSC to determine if CNMT spray should be restarted. 2) Go to Step 14. b. Manually open valve(s) for selected pump. • CS pump A, MOV-860A or MOV-860B • CS pump B, MOV-860C or MOV-860D c. <u>IF</u> the selected CNMT spray pump will not start, <u>THEN</u> align and start the other CNMT spray pump. <u>IF</u> neither pump will start, <u>THEN</u> continue with Step 14. <u>WHEN</u> a CNMT spray pump can be started, <u>THEN</u> do steps 13d, e and f.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Verify Adequate Core Cooling:	
	<ul style="list-style-type: none"> Core exit T/Cs - STABLE OR DECREASING RVLIS level (no RCPs) - STABLE OR INCREASING RVLIS level (no RCPs) - GREATER THAN 43% [46% adverse CNMT] 	<p><u>IF</u> both RHR pumps running, <u>THEN</u> ensure two SI pumps running.</p> <p><u>IF</u> only one RHR pump running, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> a. Ensure one SI pump running. b. <u>WHEN</u> CNMT spray pumps stopped, <u>THEN</u> start one additional SI pump.

<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>		
*15	Monitor Intact S/G Levels:	
	<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.

EOP:	TITLE:	REV: 20
ES-1.3	TRANSFER TO COLD LEG RECIRCULATION	PAGE 14 of 19

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	<p>Establish Normal Shutdown Alignment:</p> <p>a. Check condenser - AVAILABLE</p> <p>b. Perform the following:</p> <ul style="list-style-type: none"> o Open generator disconnects <ul style="list-style-type: none"> • 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 <p>c. Verify adequate Rx head cooling:</p> <ol style="list-style-type: none"> 1) Verify at least one control rod shroud fan - RUNNING 2) Verify one Rx compartment cooling fan - RUNNING <p>d. Verify Attachment SD-1 - COMPLETE</p>	<p>a. Dispatch AO to perform Attachment SD-2.</p> <p>1) Manually start one fan as power supply permits (45 kw)</p> <p>2) Perform the following:</p> <ul style="list-style-type: none"> o Dispatch AO to reset UV relays at MCC C and MCC D. o Manually start one fan as power supply permits (23 kw)

ECP:

ES-1.3

TITLE:

TRANSFER TO COLD LEG RECIRCULATION

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**17 Check If Emergency D/Gs
Should Be Stopped:**

- | | |
|--|--|
| <p>a. Verify AC emergency busses energized by offsite power:</p> <ul style="list-style-type: none">o Emergency D/G output breakers - OPENo AC emergency bus voltage - GREATER THAN 420 VOLTSo AC emergency bus normal feed breakers - CLOSED <p>b. Stop any unloaded emergency D/G and place in standby (Refer to Attachment D/G STOP)</p> | <p>a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).</p> |
|--|--|

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	<p>Check If SI ACCUMs Should Be Isolated:</p> <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"> • ACCUM A, MOV-841 • ACCUM B, MOV-865 <p>d. Locally reopen breakers for MOV-841 and MOV-865</p>	<p>a. Continue with Step 19. <u>WHEN</u> both RCS hot leg temperatures less than 400°F, <u>THEN</u> do Steps 18b through d.</p> <p>c. Vent any unisolated ACCUMs:</p> <p>1) Open vent valves for unisolated SI ACCUMs.</p> <ul style="list-style-type: none"> • ACCUM A, AOV-834A • ACCUM B, AOV-834B <p>2) Open HCV-945.</p>

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION IF FUEL DAMAGE IS SUSPECTED, MAINTAIN S/G PRESSURE SLIGHTLY GREATER THAN RCS PRESSURE.

19 Check If Intact S/Gs Should Be Depressurized To RCS Pressure:

- | | |
|---|--|
| a. RCS pressure - LESS THAN INTACT S/G PRESSURES | a. Go to Step 20. |
| b. Direct RP to sample S/Gs for activity | |
| c. Request TSC perform a dose projection on steaming S/Gs | |
| d. Dose projection for each S/G - ACCEPTABLE | d. Do <u>NOT</u> dump steam from a S/G with an unacceptable dose projection. |
| e. Dump steam to condenser from intact S/G(s) until S/G pressure less than RCS pressure | e. <u>IF</u> steam dump to condenser <u>NOT</u> available, <u>THEN</u> dump steam using intact S/G ARVs until S/G pressure less than RCS pressure. |

20 Consult TSC to Determine If Rx Vessel Head Should Be Vented

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: This procedure should be continued while obtaining CNMT hydrogen sample in Step 21.

21 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.

NOTE: The TSC should be consulted before changing recirculation lineups.

22 Check Event Duration - GREATER THAN 19 HOURS AFTER EVENT INITIATION

Consult TSC to evaluate long term plant status.

23 Place CNMT Spray Pumps In PULL STOP

24 Verify Two SI Pumps - RUNNING

Manually start pumps.

25 Check Core Exit T/Cs - LESS THAN REQUIREMENTS OF FIGURE RHR INJECTION

Perform the following:

a. Manually open both PRZR PORVs and block valves.

b. Verify core exit T/Cs decreasing to less than requirements of Figure RHR INJECTION. IF NOT, THEN dump steam from intact S/Gs until core exit T/Cs less than required.

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ES-1.3 APPENDIX LIST

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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

