EOP:	TITLE:	REV: 2
ATT-2.4	ATTACHMENT NO SW PUMPS	PAGE 1 of 3

Responsible Manager _____ Date 5-30-2003

This attachment provides additional guidance if no service water pumps are available.

NOTE: Steps 1 through 5 should be performed promptly to avoid equipment damage.

1. Trip both RCPs.

2. IF any D/G is running without alternate cooling, THEN perform the following:

   a) Pull stop the affected D/G

   b) Immediately depress voltage shutdown pushbutton.

   c) Direct an AO to align alternate cooling to both D/Gs using ER-D/G.2

   d) IF Bus 17 has potentially been damaged (fire, flooding, etc), THEN locally open 1B3, B D/G ISOL BKR TO BUS 17 in B D/G room.

   e) WHEN cooling water has been restored to D/G(s), THEN place D/G control switch to AUTO, depress associated D/G RESET and D/G FIELD RESET pushbuttons.

3. Isolate the following flow paths:

   o Close letdown isol, AOV-427.

   o Close excess letdown, HCV-123.

   o Close both MSIVs (control RCS temperature using S/G ARVs)

4. Pull stop the following equipment. WHEN cooling water has been restored, THEN equipment may be started, if needed.

   - MDAFW Pumps (control S/G level using TDAFW pump)
   - CNMT Recirc Fans
   - MFW Pumps
   - Condensate Pumps

NOTE: Either CCW to thermal barrier or charging flow for seal injection should be maintained as long as possible.

5. Monitor CCW temperature. IF temperature increases to 125°F, THEN pull stop CCW pumps.

NOTE: The remaining steps should be performed as time and personnel availability permit.

6. Restore Instrument Air using one of the following:

   o Service Air Compressor

   o Diesel Air Compressor (Refer to ATT-11.2, DIESEL AIR COMPRESSOR)

7. Align charging pump suction to RWST

   a. Open LCV-112B

   b. Close LCV-112C

8. Unless otherwise directed by an EOP for accident mitigation, close HCV-142 and reduce charging flow to one charging pump at minimum flow to maintain RCP labyrinth seal ΔP above 15 inches. IF CCW supplied to both RCP thermal barriers or seal injection isolated to RCPs, THEN charging pumps may be started/stopped to control PRZR level.

9. Request pumper truck(s) from Ontario Fire Dept. for connection from discharge canal to a CCW Hx.

10. Direct an AO to align fire water cooling to the TDAFW pump using ATT-5.2, ATTACHMENT FIRE WATER COOLING TO TDAFW PUMP.

11. Refer to ER-AFW.1 for options for maintaining a source of feed flow to the SGs (consult Plant Staff if necessary).

12. IF the plant fire water header is required to supply TDAFW pump cooling or CST makeup, THEN consider crosstie of city water hydrant to the plant fire water header (refer to SC-3.16.4.1).

13. Request TSC determine how to supply SW cooling to CNMT Recirc Fan(s).

14. IF a MDAFW pump is required, THEN align alternate cooling using guidance provided in T-36.4, TEMPORARY COOLING WATER TO VARIOUS SERVICE WATER LOADS.

15. Align alternate cooling (or pumper truck) to one CCW Hx. (Refer to ER-CCW.1, FIRE WATER COOLING TO CCW HX). WHEN alternate CCW cooling established, THEN perform the following:

    a) Start one CCW pump.

    b) WHEN CCW temperature returns to normal, THEN letdown, excess letdown or RCP thermal barrier cooling may be restored as directed by procedure in effect.

16. Degas main generator and secure seal oil system.

    - T-31.2
    - T-34D

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

A. PURPOSE - This procedure provides actions to respond to a loss of 12A and/or 12B Busses from HSD or at power conditions.

B. ENTRY CONDITIONS/SYMPTOMS

2. SYMPTOMS - The symptoms of loss of #12A or 12B SS Transformer are:

a. Annunciator L-20, 12A XFMR OR 12A BUS TROUBLE, lit, or

b. Annunciator L-28, 12B XFMR OR 12B BUS TROUBLE, lit.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- IF ANY RADIOACTIVE RELEASE IN PROGRESS, THEN IT SHOULD BE TERMINATED UNTIL SUPPORT CONDITIONS ARE EVALUATED.
- OBSERVE D/G LOADING LIMITS OF 2300 KW FOR 1/2 HOUR, 2250 KW FOR 2 HOURS, AND 1950 KW FOR CONTINUOUS SERVICE.

* *

NOTE: Conditions should be evaluated for site contingency reporting (Refer to EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION).

1	Check RCS Temperature - GREATER THAN 350° F	Go to AP-ELEC.3, LOSS OF 12A AND/OR 12B TRANSFORMER (BELOW 350° F).
* 2	Monitor Tavg a. Place Rods in MANUAL b. Manually move control rods to control Tavg	
3	Verify RCPs - BOTH RUNNING	IF reactor trip breakers closed, THEN manually trip the reactor and go to E-0, REACTOR TRIP OR SAFETY INJECTION.
4	Verify Emergency D/G Associated With Deenergized Bus(es) - RUNNING o Bus 12A - D/G A o Bus 12B - D/G B	Manually start D/G(s) associated with affected bus.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Verify Both Trains Of AC Emergency Busses Energized To At Least 420 VOLTS: o Bus 14 and bus 18 o Bus 16 and bus 17	IF Bus 14 AND Bus 16 are deenergized, THEN go to ECA-0.0, LOSS OF ALL AC POWER, Step 1. IF one train deenergized, THEN perform the following: a. Ensure D/G aligned for unit operation o Mode switch in UNIT o Voltage control selector in AUTO b. Check D/G running. IF NOT, THEN perform the following: 1) Depress D/G FIELD RESET pushbutton 2) Depress D/G RESET pushbutton 3) Start D/G 4) IF D/G will NOT start, THEN dispatch AO to locally start D/G. (Refer to ER/D/G.1, RESTORING D/Gs) c. Adjust D/G voltage to approximately 480V d. Adjust D/G frequency to approximately 60 Hz. IF only ONE safeguards bus is deenergized, THEN refer to AP-ELEC.14/16, LOSS OF SAFEGUARDS BUS 14/16 or AP-ELEC.17/18, LOSS OF SAFEGUARDS BUS 17/18.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Verify Service Water System Operation:	
	a. Check at least one SW pump running in each loop • A or B Pump in Loop A • C or D Pump in Loop B	a. Perform the following: 1) Manually start pumps as necessary (257 kw each). 2) IF adequate cooling can NOT be supplied to a running D/G, THEN perform the following: a) Pull stop affected D/G(s) b) Immediately depress voltage shutdown pushbutton 3) IF no SW pumps can be operated, THEN perform the following: a) Trip the reactor b) WHEN all E-0 Immediate Actions done, THEN trip BOTH RCPs c) Close letdown isol, AOV-427 d) Close excess letdown, HCV-123 e) Go to E-0, REACTOR TRIP OR SAFETY INJECTION 4) IF only one SW pump can be operated, THEN refer to AP-SW.2, LOSS OF SERVICE WATER.
	b. SW header pressure - GREATER THAN 40 PSIG IN EACH LOOP	b. Refer to AP-SW.1, SERVICE WATER LEAK.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Check CCW Pump Status:	
	a. At least one CCW pump - RUNNING	a. Start one CCW pump (122 kw). IF neither CCW pump can be started, THEN perform the following: o IF reactor trip breakers closed, THEN: 1) Trip the reactor 2) WHEN all E-0 Immediate Actions done, THEN trip both RCPs 3) Close letdown isol, AOV-427 4) Close excess letdown, HCV-123 5) Pull stop BOTH CCW pumps 6) Go to E-0, REACTOR TRIP OR SAFETY INJECTION. o IF reactor trip breakers open, THEN: 1) Trip both RCPs 2) Close letdown isol, AOV-427 3) Close excess letdown, HCV-123 4) Pull stop BOTH CCW pumps 5) Go to step 8
	b. Annunciator A-22, CCW PUMP DISCHARGE LO PRESS 60 PSIG - EXTINGUISHED	b. Start second CCW pump (122 kw).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Verify charging pump status - AT LEAST ONE RUNNING	Isolate letdown flowpaths: a. Close letdown isol, AOV-427 b. Close excess letdown, HCV-123 c. Close Loop A cold leg to excess letdown Hx, AOV-310
9	Verify Annunciator H-16, INSTRUMENT AIR COMP - EXTINGUISHED	Dispatch AO to locally reset and start adequate air compressors. IF electric air compressor(s) can NOT be restored, THEN start diesel air compressor. (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR). IF IA can NOT be established, THEN refer to AP-IA.1, LOSS OF INSTRUMENT AIR.
10	Verify Bus 11A And 11B Normal Feed Breakers - CLOSED	Go to Step 22.
11	Check MFW Regulating Valves - RESTORING S/G LEVEL TO 52% IN AUTO	Perform the following: a. Place affected S/Gs MFW regulating valves in MANUAL b. Restore S/G level to 52% IF S/G level can NOT be controlled manually, THEN refer to AP-FW.1, ABNORMAL MAIN FEEDWATER FLOW.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: IF VCT level decreases to 5%, charging pump suction will swap to the RWST. This may require a load reduction.

12 Check VCT Makeup System:

a. Ensure the following:

1) RMW mode selector switch in AUTO

2) RMW control armed - RED LIGHT LIT

b. Check VCT level:

o Level GREATER THAN 20%

-OR-

o Level - STABLE OR INCREASING

b. Check letdown divert valve, LCV-112A, aligned to VCT.

Manually increase VCT makeup flow as follows:

1) Ensure BA transfer pumps and RMW pumps running.

2) Adjust RMW flow control valve, HCV-111, to increase RMW flow.

3) Increase boric acid flow as necessary to maintain required concentration.

IF VCT level can NOT be maintained, THEN refer to ER-CVCS.1, REACTOR MAKEUP CONTROL MALFUNCTION, if necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	Check Charging Pump Suction Aligned to VCT:	
	a. VCT level - GREATER THAN 20%	a. IF VCT level can NOT be maintained greater than 5%, THEN perform the following: 1) Ensure charging pump suction aligned to RWST o LCV-112B open o LCV-112C closed 2) Continue with Step 14. WHEN VCT level greater than 20%, THEN do Step 13b.
	b. Align charging pumps to VCT o LCV-112C open o LCV-112B closed	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: When restarting equipment for recovery, it is preferable to start equipment on busses being supplied from offsite power.

14 Check CVCS Operation:

a. Charging pumps - AT LEAST ONE RUNNING

a. Perform the following:

1) IF all seal cooling has been lost to any RCP, THEN close seal injection to affected RCP(s)

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

2) Start one charging pump (75 kw).

3) IF no charging pumps can be operated, THEN refer to AP-CVCS.3, LOSS OF ALL CHARGING FLOW.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 14 continued from previous page)

b. Check letdown indications:

- o Check PRZR level - GREATER THAN 13%
- o Letdown flow - APPROXIMATELY 40 gpm (60 gpm if AOV-202 OPEN)
- o Letdown flow - STABLE

b. Perform the following:

1) Close letdown isolation, AOV-427.

2) Close letdown orifice valves (AOV-200A, AOV-200B, and AOV-202)

3) Close letdown isolation, AOV-371

4) IF seal injection in service, THEN close charging flow control valve, HCV-142 WHILE adjusting charging pump speed to maintain:

- RCP labyrinth seal D/P between 15 inches and 80 inches
- PRZR level at program

5) IF PRZR level greater than 13%, THEN go to Step 15. IF NOT, THEN continue with Step 17. WHEN PRZR level greater than 13%, THEN do Steps 15 and 16.

c. Adjust charging pump speed and HCV-142 to restore PRZR level and labyrinth seal D/P

d. Go to Step 16

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	**Establish Normal Letdown:** (Refer to ATT-9.0, ATTACHMENT LETDOWN)	IF normal letdown can NOT be established, THEN establish excess letdown. (Refer to ATT-9.1, ATTACHMENT EXCESS L/D)
16	**Verify PRZR Heaters Restored:** o PRZR proportional heater breaker - CLOSED o PRZR backup heater breaker - RESET/IN AUTO	IF adequate D/G capacity available for PRZR heaters (400 kw each bank), THEN perform the following: a. Reset and close PRZR proportional heater breaker if necessary. b. Reset PRZR backup heater breaker and return to AUTO if necessary. IF adequate D/G capacity NOT available, THEN refer to ER-PRZR.1, RESTORATION OF PRZR HEATERS DURING BLACKOUT.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Verify Normal Rod Control Restored:	
	a. Annunciator C-5, PPCS ROD SEQUENCE OR ROD DEVIATION - EXTINGUISHED	a. IF alarm is due to a loss of power to MRPI, THEN maintain rods in manual AND minimize rod motion. IF alarm is due to actual rod misalignment, THEN refer to AP-RCC.2, RCC/RPI MALFUNCTION, while continuing with this procedure.
	b. Annunciator E-28, POWER RANGE ROD DROP ROD STOP - EXTINGUISHED	b. Perform the following: 1) Place rods in MANUAL. 2) Reset NIS rod drop rod stop signals (at NIS racks) as necessary.
	c. Annunciator F-15, RCS TAVG DEV 4°F - EXTINGUISHED	c. Go to step 18.
	d. Place rods in AUTO if desired	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: With PRZR pressure controller 431K in manual, PORV-431C will not operate in the automatic mode. (Refer to TR 3.4.3).

18 Establish Stable Plant Conditions:

a. Check Tavg - TRENDING TO TREF

a. IF Tavg greater than Tref, THEN restore Tavg to Tref by one or more of the following:

- Insert control rods
- RCS boration

IF Tavg less than Tref, THEN restore Tavg to Tref by one or more of the following:

- Withdraw control rods
- Reduce turbine load
- Dilution of RCS

b. Check PRZR pressure - TRENDING TO 2235 PSIG IN AUTO

b. Control PRZR pressure by one of the following:

- 431K in MANUAL
- Manual control of PRZR heaters and sprays

IF PRZR pressure can NOT be controlled manually, THEN refer to AP-PRZR.1, ABNORMAL PRESSURIZER PRESSURE.

c. Check PRZR level - TRENDING TO PROGRAM IN AUTO CONTROL

c. Perform the following:

1) Place affected charging pumps in MANUAL

2) Adjust charging pump speed to restore PRZR level to program

IF PRZR level can NOT be controlled manually, THEN refer to AP-RCS.1, REACTOR COOLANT LEAK.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

ANYTIME EMERGENCY D/GS ARE THE ONLY SOURCE OF AC POWER TO THE PLANT, PERSONNEL SHOULD BE ASSIGNED TO MAINTAIN SURVEILLANCE OF THE D/GS.

* *

19 Restore Normal Electric System Alignment:

a. Verify circuit 767 and/or 751 - AVAILABLE

a. Continue with Step 20. WHEN offsite power available, THEN do Steps 19b, c and d.

b. Restore power to non-faulted Buses 12A and/or 12B (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER)

c. Verify all AC bus normal feed breakers - CLOSED

- Bus 13
- Bus 14
- Bus 15
- Bus 16
- Bus 17
- Bus 18

c. Restore all AC busses and MCCs to normal power supply (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER)

d. Stop any unloaded emergency D/G and place in standby (Refer to T-27.4, DIESEL GENERATOR OPERATION)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	Check CNMT Recirc Fans - AT LEAST 2 RUNNING	Establish 2 CNMT recirc fans running

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	Establish Control Systems In Auto:	
	a. Verify 431K in AUTO	a. Place 431K in AUTO, if desired.
	b. Verify PRZR spray valves in AUTO	b. Place PRZR spray valves in AUTO, if desired.
	c. Verify PRZR heaters restored: o PRZR proportional heaters breaker - CLOSED o PRZR backup heaters breaker - RESET, IN AUTO	c. Restore PRZR heaters, if desired.
	d. Verify charging pumps o 2 charging pumps running o One charging pump in AUTO	d. Perform the following: 1) IF all seal cooling has been lost, THEN ensure seal injection isolated to affected RCPs • RCP A, V-300A • RCP B, V-300B 2) Establish 2 charging pumps running (75 kw each). 3) Place one charging pump in AUTO, if desired.
	e. Verify MFW regulating valves in AUTO	e. Place MFW regulating valves in AUTO, if desired.
	f. Restore EH controls 1) Place in OP PAN, IMP OUT 2) Select load rate to 10%/hour 3) Match setter and reference	
	g. Verify annunciator G-15, STEAM DUMP ARMED - EXTINGUISHED	g. WHEN Tavg within 5°F of Tref, THEN perform the following: 1) Ensure steam dump valves closed. 2) Reset steam dump.
	h. Verify Rods in AUTO	h. Place Rods in AUTO, if desired.
	i. Go to Step 38	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: o Temperatures in the loop with the stopped RCP will not be indicative of true Tavg and ΔT values.

o Attempts to restore offsite power should continue (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER.)

22 Check Secondary Heat Sink Status:

a. Any main feed pump - RUNNING

a. Perform the following:

1) Verify MDAFW pumps running as necessary.

2) Verify TDAFW pump running if necessary.

3) Adjust AFW pump flow to restore S/G level to 52%.

4) Go to Step 23.

b. Verify MFW regulating valves - RESTORING S/G LEVEL TO 52%

b. Perform the following:

1) Place affected S/G(s) MFW regulating valve in MANUAL.

2) Restore S/G level to 52%.

IF S/G level can NOT be controlled manually, THEN refer to AP-FW.1, ABNORMAL MAIN FEEDWATER FLOW.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

23 Check TDAFW Pump Status:

a. TDAFW pump - RUNNING

a. Go to Step 24.

b. Check S/G status

b. Go to Step 24.

o At least one S/G level - GREATER THAN 17%

-OR-

o Both MDAFW pumps - OPERABLE

c. Pull stop TDAFW pump steam supply valves

- MOV-3504A
- MOV-3505A

NOTE: Use of ARV associated with the running RCP is preferred.

24 Establish RCS Temperature Control:

a. Verify condenser available:

o Any MSIV - OPEN

o Annunciator G-15, STEAM DUMP ARMED - LIT

a. Perform the following:

1) Adjust S/G ARV controllers to stabilize RCS temperature.

2) Go to Step 25.

b. Adjust condenser steam dump controller HC-484 to stabilize RCS temperature

c. Place steam dump mode selector switch to MANUAL

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	Restore Non-Safeguards Busses As Follows:	
	a. Verify Bus 13 and 15 - ENERGIZED	a. IF offsite power available, THEN attempt to restore offsite power and normal feed to Bus 13/15 (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER). IF offsite power is NOT available, THEN perform the following: o Close Bus 13 to Bus 14 tie breaker o Close Bus 15 to Bus 16 tie breaker
	b. Verify MCC A - ENERGIZED	b. Perform the following: 1) Ensure the following pumps in PULL STOP: • EH pump A • Turning gear oil pump • HP seal oil backup pump 2) Close MCC A supply breaker from bus 13. 3) Start HP seal oil backup pump.
	c. Verify MCC B - ENERGIZED	c. Perform the following: 1) Ensure EH pump B in PULL STOP. 2) Close MCC B supply breaker from bus 15.
	d. Verify annunciator J-8, 480V MCC SUPPLY BREAKER TRIP - EXTINGUISHED	d. Restore power to other MCCs as D/G loading permits.
	e. Reset control room lighting	
	f. Reset MAIN XFMR AUX PWR SUPPLY breakers • Bus 13 • Bus 15	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: When restarting equipment for recovery, it is preferable to start equipment on busses being supplied from offsite power, if possible.

26	Verify Instrument Bus D - ENERGIZED	Energize MCC B. IF MCC B NOT available, THEN refer to ER-INST.3, INSTRUMENT BUS POWER RESTORATION.
27	Check VCT Makeup System:	
	a. Ensure the following: 1) RMW mode selector switch in AUTO 2) RMW control armed - RED LIGHT LIT	
	b. Check VCT level: o Level GREATER THAN 20% -OR- o Level - STABLE OR INCREASING	b. Check letdown divert valve, LCV-112A, aligned to VCT. Manually increase VCT makeup flow as follows: 1) Ensure BA transfer pumps and RMW pumps running. 2) Adjust RMW flow control valve, HCV-111, to increase RMW flow. 3) Adjust boric acid flow to maintain required concentration. IF VCT level can NOT be maintained, THEN refer to ER-CVCS.1, REACTOR MAKEUP CONTROL MALFUNCTION, if necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28	Check Charging Pump Suction Aligned to VCT:	
	a. VCT level - GREATER THAN 20%	a. IF VCT level can NOT be maintained greater than 5%, THEN perform the following: 1) Ensure charging pump suction aligned to RWST o LCV-112B open o LCV-112C closed 2) Continue with Step 29. WHEN VCT level greater than 20%, THEN do Step 28b.
	b. Align charging pumps to VCT o LCV-112C open o LCV-112B closed	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29	Check CVCS Operation:	
	a. Charging pumps - AT LEAST ONE RUNNING	a. Perform the following: 1) Close letdown isolation, AOV-427. 2) Start one charging pump (75 kw). 3) Establish greater than 20 gpm charging line flow.
	b. Check letdown indications: o Check PRZR level - GREATER THAN 13% o Letdown flow - APPROXIMATELY 40 GPM (60 GPM IF AOV-202 OPEN) o Letdown flow - STABLE	b. Perform the following: 1) Close letdown isolation, AOV-427. 2) Close letdown orifice valves (AOV-200A, AOV-200B, and AOV-202) 3) Close letdown isolation, AOV-371 4) IF seal injection in service, THEN close charging flow control valve, HCV-142 WHILE adjusting charging pump speed to maintain: • RCP labyrinth seal D/P between 15 inches and 80 inches • PRZR level at program 5) IF PRZR level greater than 13%, THEN go to Step 30. IF NOT, THEN continue with Step 32. WHEN PRZR level greater than 13%, THEN do Steps 30 and 31.
	c. Adjust charging pump speed and HCV-142 to restore PRZR level and labyrinth seal D/P	
	d. Go to Step 31	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30	**Establish Normal Letdown (Refer to ATT-9.0, ATTACHMENT LETDOWN)**	IF normal letdown can NOT be established, THEN establish excess letdown. (Refer to ATT-9.1, ATTACHMENT EXCESS L/D)
31	**Verify PRZR Heaters Restored:** o PRZR proportional heater breaker - CLOSED o PRZR backup heater breaker - RESET/IN AUTO	IF adequate D/G capacity available for PRZR heaters (400 kw each bank), THEN perform the following: a. Reset and close PRZR proportional heater breaker if necessary. b. Reset PRZR backup heater breaker and return to AUTO if necessary. IF adequate D/G capacity NOT available, THEN refer to ER-PRZR.1, RESTORATION OF PRZR HEATERS DURING BLACKOUT.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
32	Verify TDAFW Pump Aligned For Auto Start:	
	a. Any MDAFW pump - AVAILABLE	a. Verify TDAFW pump operating to maintain required S/G level and go to Step 34.
	b. Verify AMSAC TRIPPED status light - EXTINGUISHED	b. Reset AMSAC.
	c. Verify both S/G levels - GREATER THAN 17%	c. Continue with Step 34. <u>WHEN</u> S/G level greater than 17%, <u>THEN</u> do Steps 32d, e and 33.
	d. Verify Bus 11A and Bus 11B - AT LEAST ONE ENERGIZED	d. Perform the following: 1) <u>IF</u> TDAFW pump <u>NOT</u> required to maintain S/G level, <u>THEN</u> pull stop TDAFW pump steam supply valves: • MOV-3504A • MOV-3505A 2) Go to Step 33.
	e. Verify the following:	
	1) TDAFW pump - OFF	1) <u>IF</u> TDAFW pump <u>NOT</u> required to maintain S/G level, <u>THEN</u> stop pump if desired.
	2) TDAFW pump steam supply valve switches in AUTO	2) Place TDAFW pump steam supply valve switches in AUTO.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
33	**Establish Normal AFW Pump Shutdown Alignment:**	
	a. Verify the following: o Both S/G levels - GREATER THAN 17% AND STABLE OR INCREASING o Total AFW flow - LESS THAN 200 GPM	a. Continue with Step 34. WHEN conditions met, THEN do Steps 33b through f.
	b. Close MDAFW pump discharge valves • MOV-4007 • MOV-4008	
	c. Place AFW bypass switches to DEF	
	d. Stop all but one MDAFW pump	
	e. Open AFW discharge crossover valves • MOV-4000A • MOV-4000B	
	f. Adjust AFW bypass valves to control S/G levels at 52% • AOV-4480 • AOV-4481	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: With PRZR pressure controller 431K in manual, PORV-431C will not operate in the automatic mode. (Refer to TR 3.4.3)

34 Establish Stable Plant Conditions:

a. Check PRZR pressure - TRENDING TO 2235 PSIG IN AUTO

a. Control PRZR pressure at the desired value by one of the following:

- 431K in MANUAL
- Manual control of PRZR heaters and sprays

IF PRZR pressure can NOT be controlled manually, THEN refer to AP-PRZR.1, ABNORMAL PRESSURIZER PRESSURE.

b. Verify charging pumps

- o 2 charging pumps running
- o One charging pump in AUTO

b. Perform the following:

1) IF all seal cooling has been lost to any RCP, THEN isolate seal injection to affected RCP(s).

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

2) Establish 2 charging pumps running (75 kw each).

3) Place one charging pump in AUTO, if desired.

c. Check PRZR level - TRENDING TO PROGRAM IN AUTO CONTROL

c. Perform the following:

1) Place affected charging pumps in MANUAL

2) Adjust charging pump speed to restore PRZR level to program

IF PRZR level can NOT be controlled manually, THEN refer to AP-RCS.1, REACTOR COOLANT LEAK.

d. Check RCS Tavg - STABLE

d. Control dumping steam to stabilize RCS Tavg.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

ANYTIME EMERGENCY D/GS ARE THE ONLY SOURCE OF AC POWER TO THE PLANT, PERSONNEL SHOULD BE ASSIGNED TO MAINTAIN SURVEILLANCE OF THE D/GS.

* *

35 Restore Normal Electric System Alignment:

a. Verify circuit 767 and/or 751 - AVAILABLE

a. Continue with Step 36. WHEN offsite power available, THEN do Steps 35b, c and d.

b. Restore power to non-faulted Buses 12A and/or 12B if necessary (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER)

c. Verify all AC bus normal feed breakers - CLOSED

- Bus 13
- Bus 14
- Bus 15
- Bus 16
- Bus 17
- Bus 18

c. Restore all AC busses and MCCs to normal power supply (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER)

d. Stop any unloaded emergency D/G and place in standby (Refer to T-27.4, DIESEL GENERATOR OPERATION)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
36	Check CNMT Recirc Fans - AT LEAST 2 RUNNING	Establish 2 CNMT recirc fans running
	NOTE: Evaluate conditions to determine if turbine should be placed on turning gear.	
37	Verify Turning Gear Oil Pump - RUNNING	Perform the following: a. Manually start turning gear oil pump (42 kw). b. Break vacuum to accelerate turbine coastdown. c. Continue with Step 38. WHEN shaft stops, THEN dispatch AO to place turbine on turning gear (36 KW).
38	Check Status Of DC System Loads:	
	a. Verify TURB emergency DC lube oil pump - OFF	a. Manually stop emergency DC lube oil pump.
	b. Verify TDAFW pump DC oil pump - OFF IN AUTO	b. Perform the following: 1) Direct AO to locally check TDAFW AC oil pump running. IF not running, THEN start pump from MCB. 2) Stop TDAFW pump DC oil pump.
	c. Verify both MFW pump DC oil pumps - OFF	c. Perform the following: 1) Ensure associated MFW pump AC oil pump running. 2) Stop MFW pump DC oil pump and place in AUTO

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Inst Bus C provides power to all MCB manual controllers.

39	Check Status of Battery Chargers:	
	a. Battery Chargers 1A OR 1A1 - ENERGIZED (Annunciator J-15, BATTERY CHRGR FAILURE OR PA INVERTER TROUBLE, EXTINGUISHED)	a. IF BOTH battery chargers are deenergized, THEN direct the Electricians to crosstie TSC battery charger to main battery A (Refer to ATT-24.0, ATTACHMENT TRANSFER BATTERY TO TSC).
	b. Battery chargers 1B OR 1B1 - ENERGIZED (Annunciator J-15, BATTERY CHRGR FAILURE OR PA INVERTER TROUBLE, EXTINGUISHED)	b. IF BOTH battery chargers are deenergized, THEN direct the Electricians to crosstie TSC battery charger to main battery B (Refer to ATT-24.0, ATTACHMENT TRANSFER BATTERY TO TSC)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
40	Restore Equipment Alignment:	
	a. Check CCW pumps - ONLY ONE RUNNING	a. IF two CCW pumps running, THEN manually stop one pump.
	b. Check radiation monitoring systems: o CNMT vent sample pump - RUNNING o Plant vent sample pump - RUNNING o All area and process monitors operating as required	b. Restore sample pumps and radiation monitors.
	c. Dispatch AO to verify proper operation of seal oil system	
	d. Verify motor fire pump breaker - CLOSED	d. Close motor fire pump breaker.
	e. Verify annunciator L-1, AUX BLDG VENT SYSTEM CONTROL PANEL - EXTINGUISHED	e. IF bus 11A or 11B energized, THEN dispatch AO to restore AUX BLDG ventilation (Refer to T-35A, AUX AND INTERMEDIATE BUILDING VENTILATION STARTUP AND SHUTDOWN)
	f. Verify MCC G - ENERGIZED	f. Manually close breaker.
	g. Verify control board valve alignment - NORMAL (Refer to O-6.13, DAILY SURVEILLANCE LOG)	g. Manually align valves as necessary.
	h. Verify adequate Rx head cooling: 1) Verify at least one control rod shroud fan - RUNNING 2) Verify one Rx compartment cooling fan - RUNNING	1) Manually start one fan as power supply permits (45 kw). 2) Manually start one fan as power supply permits (23 kw).
	i. Dispatch AO to ensure one waste gas compressor in service	

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 40 continued from previous page)

j. Dispatch AO to restore SFP cooling

k. Verify adequate electric driven air compressors - RUNNING — k. Go to Step 41.

l. IF diesel air compressor supplying instrument air, THEN secure diesel air compressors. (Refer to T-2F, BACKUP AIR SUPPLY)

41 Reset UV Relay Targets On Undervoltage Cabinets

- Bus 14
- Bus 16
- Bus 17
- Bus 18

42 Evaluate MCB Annunciator Status (Refer to AR Procedures)

NOTE: Refer to O-9.3, NRC IMMEDIATE NOTIFICATION, for reporting requirements.

43 Notify Higher Supervision

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
44	Return To Procedure Or Guidance In Effect	

-END-

AP-ELEC. 1 APPENDIX LIST

TITLE

1) ATTACHMENT NC (ATT-13.0)
2) ATTACHMENT D/G STOP (ATT-8.1)
3) ATTACHMENT TRANSFER BATTERY TO TSC (ATT-24.0)
4) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
5) ATTACHMENT EXCESS L/D (ATT-9.1)
6) ATTACHMENT LETDOWN (ATT-9.0)

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

A. PURPOSE - This procedure provides actions to respond to a loss of 12A or 12B SS Transformer when RCS temperature is less than 350°F.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

   a. AP-ELEC.1, LOSS OF 12A AND/OR 12B BUSSES, when busses 12A and/or 12B are found to be deenergized and RCS temperature is less than 350°F.

2. SYMPTOMS - The symptoms of loss of #12A or 12B SS Transformer are:

   a. Annunciator L-20, 12A XFMR OR 12A BUS TROUBLE, lit, or

   b. Annunciator L-28, 12B XFMR OR 12B BUS TROUBLE, lit.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- OBSERVE D/G LOADING LIMITS OF 2300 KW FOR 1/2 HOUR, 2250 KW FOR 2 HOURS, AND 1950 KW FOR CONTINUOUS SERVICE.
- IF ANY RADIOACTIVE RELEASE IN PROGRESS, THEN IT SHOULD BE TERMINATED UNTIL SUPPORT CONDITIONS ARE EVALUATED.

* *

NOTE: Conditions should be evaluated for site contingency reporting (Refer to EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION).

1 Verify Emergency D/G Associated With Deenergized Bus - RUNNING AND LOADED o Bus 12A - D/G A o Bus 12B - D/G B	Attempt to start and load emergency D/G(s) manually. (Refer to ER-D/G.1, RESTORING D/G(s).)
2 Verify Both Trains Of AC Emergency Busses Energized To At Least 420 VOLTS: o Bus 14 and bus 18 o Bus 16 and bus 17	Try to restore power to all AC emergency busses. IF Bus 14 AND Bus 16 are deenergized, THEN refer to ECA-0.0, LOSS OF ALL AC POWER.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: When restarting equipment for recovery, it is preferable to start equipment on busses being supplied from offsite power, if possible.

3 Verify Service Water System Operation:

a. SW pumps - AT LEAST ONE RUNNING IN EACH LOOP

- A or B pump in Loop A
- C or D pump in Loop B

a. Manually start pumps as conditions permit (257 kw each).

IF adequate cooling can NOT be supplied to a running D/G, THEN perform the following:

1) Pull stop affected D/G

2) Immediately depress voltage shutdown pushbutton

3) Refer to ER-D/G.2, ALTERNATE COOLING FOR EMERGENCY D/Gs

IF no SW pumps can be operated, THEN stop both RCPs.

b. SW header pressure - GREATER THAN 40 PSIG IN EACH LOOP

b. Refer to AP-SW.1, SERVICE WATER LEAK.

4 Check CCW Pump Status:

a. At least one CCW pump - RUNNING

a. Start one CCW pump (122 kw).

b. Annunciator A-22, CCW PUMP DISCHARGE LO PRESS 60 PSIG - EXTINGUISHED

b. Start second CCW pump (122 kw).

IF NO CCW pumps can be operated, THEN stop both RCPs.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

IF THE RCS IS WATER SOLID, THEN ANY INCREASE IN RCS TEMPERATURE MAY RESULT IN A SIGNIFICANT RCS PRESSURE INCREASE. RCS HEATUP SHOULD BE PREVENTED.

* 5 Monitor RCS Temperature - STABLE

IF RCS temperature increasing, THEN stabilize temperature using available method.

- RHR normal cooling
- Dump steam and feed
- Blowdown and feed

IF RCS temperature decreasing, THEN perform the following:

a. Stop dumping steam or control RHR normal cooling.

b. IF cooldown continues AND is due to feeding S/G, THEN perform the following:

1) IF either MDAFW pump operable, THEN ensure TDAFW pump steam supply valves in PULL STOP.

2) WHEN S/G level greater than 17% in one S/G, THEN limit feed flow to that required to maintain S/G level.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 6	Monitor RCS Pressure:	
	a. Pressure - LESS THAN 390 PSIG	a. IF RCS is solid, THEN control charging and letdown pressure control valve (PCV-135) to decrease RCS pressure to less than 390 psig. IF PRZR bubble established, THEN operate normal or auxiliary spray to decrease pressure to less than 390 psig.
	b. Pressure - STABLE	b. Stabilize RCS pressure using appropriate means. • Charging • Letdown • PCV-135 (solid) • Normal spray • Auxiliary spray • PRZR heaters
7	Check If Refueling Should Be Stopped:	
	a. Refueling operations in progress	a. Go to Step 8.
	b. Notify Refueling Shift Supervisor to stop refueling operations	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Restore Non-Safeguards Busses As Follows:	
	a. Verify non-safeguards busses - ENERGIZED • Bus 13 • Bus 15	a. Close non-safeguards bus tie breaker for affected bus(ses) if possible: • Bus 13 to bus 14 tie • Bus 15 to bus 16 tie
	b. Verify MCC A - ENERGIZED	b. Perform the following: 1) Ensure the following pumps in PULL STOP: • EH pump A • Turning gear oil pump • HP seal oil backup pump 2) Close MCC A supply breaker from bus 13.
	c. Verify MCC B - ENERGIZED	c. Perform the following: 1) Ensure EH pump B in PULL STOP. 2) Close MCC B supply breaker from bus 15.
	d. Check CNMT vent sample pump - RUNNING	d. IF CNMT purge or mini-purge in progress, THEN secure purging.
	e. Verify annunciator J-8, 480V MCC SUPPLY BREAKER TRIP - EXTINGUISHED	e. Restore power to remaining MCCs as D/G loading permits.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 8 continued from previous page)	
	f. Verify main generator - DEPRESSURIZED	f. Perform the following: 1) Manually start the HP seal oil backup pump 2) Dispatch AO to locally perform the following: o Verify proper operation of the seal oil system (Refer to T-34B, GENERATOR SEAL OIL SYSTEM NORMAL OPERATION). o Ensure bearing drain vapor extractor running. o Ensure main lube oil reservoir vapor extractor running.
	g. Reset control room lighting if necessary	
9	Check IA System:	
	a. Verify adequate air compressor(s) - RUNNING	a. Manually start air compressors as necessary (75 kw each).
	b. Check IA supply o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING	b. Dispatch an AO to locally reset and start adequate air compressors (75 kw each). IF electric air compressor(s) can NOT be restored, THEN use diesel air compressor. (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) IF IA can NOT be established, THEN refer to AP-IA.1, LOSS OF INSTRUMENT AIR. -

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check RCS Cooling:	
	a. RHR system - PREVIOUSLY ALIGNED FOR RHR NORMAL COOLING	a. Go to Step 21.
	b. Check RHR pumps - ANY RUNNING	b. Go to Step 11.
	c. Go to Step 13	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Establish Conditions To Start RHR Pump:	
	a. Any RHR pump - AVAILABLE	a. IF RCS level greater than 64 inches, THEN go to AP-RHR.1, LOSS OF RHR. IF NOT, THEN go to AP-RHR.2, LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS.
	b. Verify CCW cooling to RHR system in service o CCW pumps - AT LEAST ONE RUNNING o CCW to RHR Hxs, MOV-738A AND MOV-738B - ADJUSTED TO OBTAIN DESIRED COOLING	b. Perform the following: 1) Ensure at least one CCW pump running. 2) Open MOV-738A and MOV-738B to obtain desired cooling. 3) IF > 4900 gpm CCW flow is required for desired RHR cooling, THEN notify the Shift Supervisor. IF CCW can NOT be restored, THEN continue attempts to restore CCW (Refer to AP-CCW.3, LOSS OF CCW - PLANT SHUTDOWN).
	c. Close RHR pump flow control valves (controllers at 100% demand) • HCV-624 • HCV-625	
	d. Place RHR Hx bypass valve, HCV-626, to MANUAL and close valve	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- STARTING AN RHR PUMP MAY RESULT IN AN RCS LEVEL OR PRESSURE DECREASE DUE TO SHRINK OR VOID COLLAPSE.
- THE RHR HX OUTLET VALVES (HCV-624 AND HCV-625) WILL FAIL OPEN ON LOSS OF INSTRUMENT AIR PRESSURE.

* *

12 Restore RHR Flow:

a. Start one RHR pump

b. At least one RHR pump - RUNNING — b. Go to Step 12d.

c. Establish RHR flow - WITHIN LIMITS OF TABLE BELOW AND < 1500 GPM — c. Manually adjust RHR flow as necessary.

B LOOP LEVEL	RHR FLOW
100 - 70 inches	< 3000 gpm
< 70 - 30 inches	≤ 1400 gpm
< 30 - 16 inches	≤ 1000 gpm
< 16 - 10 inches	≤ 800 gpm
< 10 - 6 inches	≤ 500 gpm

d. RHR flow - RESTORED — d. IF RCS level greater than 64 inches, THEN go to AP-RHR.1, LOSS OF RHR. IF NOT, THEN go to AP-RHR.2, LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS.

e. Place RHR Hx bypass valve, HCV-626, controller in AUTO at desired flowrate

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 12 continued from previous page)	
	f. Adjust RHR pump flow control valves to stabilize RCS temperature • HCV-624 • HCV-625	
	g. Check core exit T/Cs - STABLE OR DECREASING	g. Start another RHR pump or increase RHR flow to establish required RCS cooling. DO NOT exceed RHR flow limits from table above.
13	**Check AFW Pump Status:**	
	a. AFW pumps - ANY RUNNING	a. Go to Step 14.
	b. Both S/G levels - AT DESIRED LEVEL	b. Continue with Step 14. WHEN desired S/G levels established, THEN do Step 13c.
	c. Stop running AFW pumps and place switches in PULL STOP	
14	**Evaluate RCS Conditions:**	
	a. Check RCS status: o RCS - CLOSED o RCS pressure - GREATER THAN ATMOSPHERIC	a. IF RCS is open to atmosphere, THEN go to Step 20.
	b. Verify RCP #1 seal D/Ps - GREATER THAN 220 PSID	b. IF any RCP running with #1 seal D/P less than 220 psid, THEN stop affected RCP.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Check VCT Makeup System:	
	a. Ensure the following: 1) RMW mode selector switch in AUTO 2) RMW control armed - RED LIGHT LIT	
	b. Check VCT level: o Level GREATER THAN 20% -OR- o Level - STABLE OR INCREASING	b. Check letdown divert valve, LCV-112A, aligned to VCT. Manually increase VCT makeup flow as follows: 1) Ensure BA transfer pumps and RMW pumps running. 2) Adjust RMW flow control valve, HCV-111, to increase RMW flow. 3) Adjust boric acid flow to maintain required concentration. IF VCT level can NOT be maintained, THEN refer to ER-CVCS.1, REACTOR MAKEUP CONTROL MALFUNCTION, if necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Check Charging Pump Suction Aligned To VCT:	
	a. VCT level - GREATER THAN 20%	a. IF VCT level can NOT be maintained greater than 5%, THEN perform the following: 1) Ensure charging pump suction aligned to RWST o LCV-112B open o LCV-112C closed 2) Continue with Step 17. WHEN VCT level greater than 20%, THEN do Step 16b.
	b. Align charging pumps to VCT o LCV-112C open o LCV-112B closed	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	**Check Charging Pumps - ANY CHARGING PUMP RUNNING**	IF charging pumps required, THEN perform the following: a. Verify charging to loop B cold leg, AOV-294, open. b. Verify charging flow control valve, HCV-142, open as necessary. c. IF desired, THEN place letdown pressure controller, PCV-135, in MANUAL. d. Start one charging pump (75 kw). e. Adjust charging pump speed to: o Control PRZR level and labyrinth seal D/P. o IF RCS solid, THEN adjust PCV-135 to control PRZR pressure.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Monitor RCS Pressure:	
	a. Pressure - LESS THAN 390 PSIG	a. IF RCS is solid, THEN control charging and letdown pressure control valve (PCV-135) to decrease RCS pressure to less than 390 psig. IF PRZR bubble established, THEN operate normal or auxiliary spray to decrease pressure to less than 390 psig.
	b. Pressure - STABLE	b. Stabilize RCS pressure using appropriate means. • Charging • Letdown • PCV-135 (solid) • Normal spray • Auxiliary spray • PRZR heaters
19	Check PRZR Level:	
	a. Narrow range level - ON SCALE	a. IF RCS is solid, THEN go to Step 20.
	b. Level - TRENDING TO 35%	b. Adjust charging pump speed to stabilize PRZR level.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	Monitor RCS Temperature	
	a. Core exit T/Cs - STABLE OR DECREASING	a. Adjust RCS cooling to stabilize core exit T/Cs <u>AND</u> return to Step 3. • S/G steaming • S/G feeding • RHR cooling
	b. Go to Step 31	
21	Check AFW System Status:	
	a. Verify TDAFW pump steam supply valves in PULL STOP	a. <u>IF</u> S/Gs providing heat sink, <u>THEN</u> perform the following: 1) Verify adequate MDAFW flow. 2) Pull stop TDAFW pump. 3) Adjust AFW flow to stabilize S/G level and RCS temperature.
	b. Verify MDAFW pump crosstie valves closed • MOV-4000A • MOV-4000B	b. Ensure at least one MDAFW pump off. <u>IF</u> two pumps required, <u>THEN</u> close both MDAFW pump crosstie valves.
22	Check S/G Level	
	a. Any S/G level greater than 17%	a. Start MDAFW pumps as necessary to restore S/G level.
	b. Adjust MFW flow to maintain S/G level stable	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	Check RCS Pressure - GREATER THAN 300 PSIG	Increase RCS pressure to greater than 300 psig. IF RCP #1 seal D/P can NOT be maintained greater than 220 psid, THEN trip any running RCP.
24	Check RCP Status - ANY RCP RUNNING	Verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC). IF natural circulation NOT verified, THEN increase dumping steam.
25	Monitor RCS Temperature - STABLE OR DECREASING	Control S/G ARVs to stabilize RCS temperature. IF S/G ARVs do NOT provide adequate cooling, THEN perform the following: a. Initiate S/G blowdown from both S/Gs. b. Maintain both S/G levels stable by controlling AFW flow.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26	Check VCT Makeup System:	
	a. Ensure the following: 1) RMW mode selector switch in AUTO 2) RMW control armed - RED LIGHT LIT	
	b. Check VCT level: o Level GREATER THAN 20% -OR- o Level - STABLE OR INCREASING	b. Check letdown divert valve, LCV-112A, aligned to VCT. Manually increase VCT makeup flow as follows: 1) Ensure BA transfer pumps and RMW pumps running. 2) Adjust RMW flow control valve, HCV-111, to increase RMW flow. 3) Adjust boric acid flow to maintain required concentration. IF VCT level can NOT be maintained, THEN refer to ER-CVCS.1, REACTOR MAKEUP CONTROL MALFUNCTION, if necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
27	**Check Charging Pump Suction Aligned To VCT:**	
	a. VCT level - GREATER THAN 20%	a. IF VCT level can NOT be maintained greater than 5%, THEN perform the following: 1) Ensure charging pump suction aligned to RWST o LCV-112B open o LCV-112C closed 2) Continue with Step 28. WHEN VCT level greater than 20%, THEN do Step 27b.
	b. Align charging pumps to VCT o LCV-112C open o LCV-112B closed	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28	Check CVCS Operation:	
	a. Charging pumps - AT LEAST ONE RUNNING	a. Perform the following: 1) Start one charging pump (75 kw). 2) Establish greater than 20 gpm charging line flow.
	b. Check letdown indications: o Check PRZR level - GREATER THAN 13% o Letdown flow - AT EXPECTED FLOW FOR PLANT CONDITIONS o Letdown flow - STABLE	b. Perform the following: 1) Close letdown isolation, AOV-427. 2) Close letdown orifice valves (AOV-200A, AOV-200B, and AOV-202) 3) Close letdown isolation, AOV-371. 4) Close charging flow control valve, HCV-142 WHILE adjusting charging pump speed to maintain: o RCP labyrinth seal D/P between 15 inches and 80 inches o PRZR level at desired level 5) IF PRZR level greater than 13%, THEN go to Step 29. IF NOT, THEN continue with Step 31. WHEN PRZR level greater than 13%, THEN do Steps 29 and 30.
	c. Adjust charging pump speed and HCV-142 to restore PRZR level and labyrinth seal D/P	
	d. Go to Step 30	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29	Establish Normal Letdown (Refer to ATT-9.0, ATTACHMENT LETDOWN)	IF normal letdown can NOT be established, THEN establish excess letdown. (Refer to ATT-9.1, ATTACHMENT EXCESS L/D)
30	Verify PRZR Heaters Restored: o PRZR proportional heater breaker - CLOSED o PRZR backup heater breaker - RESET/IN AUTO	IF PRZR heaters required, THEN perform the following: a. Verify adequate D/G capacity available for PRZR heaters (400 kw each bank). b. Reset and close PRZR proportional heater breaker if necessary. c. Reset PRZR backup heater breaker and return to AUTO if necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

ANYTIME EMERGENCY D/GS ARE THE ONLY SOURCE OF AC POWER TO THE PLANT, PERSONNEL SHOULD BE ASSIGNED TO MAINTAIN SURVEILLANCE OF THE D/GS.

* *

NOTE: Check ITS section 3.8 for limiting conditions for operation.

31 Restore Normal Electric System Alignment:

a. Verify circuit 767 and/or 751 - AVAILABLE

a. Continue with Step 33. WHEN offsite power available, THEN do Steps 31b, c, d and 32.

b. Restore power to non-faulted buses 12A and/or 12B (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER)

c. Verify all AC bus normal feed breakers - CLOSED

- Bus 13
- Bus 14
- Bus 15
- Bus 16
- Bus 17
- Bus 18

c. Restore all AC busses and MCCs to normal power supply (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER)

d. Stop any unloaded emergency D/G and place in standby (Refer to T-27.4, DIESEL GENERATOR OPERATION)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
32	Check If An RCP Should Be Started:	
	a. Check the following: o Both RCPs - OFF o RCP operation - DESIRED	a. Go to Step 33.
	b. RCS pressure - APPROXIMATELY 325 PSIG	b. Control PRZR heaters and/or charging pump speed to restore RCS pressure to 325 psig.
	c. Check PRZR level - LESS THAN 38%	c. Verify S/G temperature (obtained locally in CNMT at S/G handhole) less than RCS cold leg temperature. IF NOT, THEN go to Step 33.
	d. Try to start an RCP 1) Establish conditions for starting an RCP a) Bus 11A or 11B energized b) Refer to ATT-15.0, ATTACHMENT RCP START 2) Start one RCP	d. IF an RCP can NOT be started, THEN continue to monitor natural circulation conditions (Refer to ATT-13.0, ATTACHMENT NC).
33	Check RCS Temperature - STABLE OR DECREASING	Adjust RCS cooling to stabilize RCS temperature. • S/G steaming • S/G feeding • RHR cooling

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34	Establish Normal Shutdown Alignment:	
	a. Verify turning gear oil pump - RUNNING	a. IF turbine oil system operation required, THEN perform the following: 1) Manually start turning gear oil pump (42 kw). 2) Dispatch AO to place turbine on turning gear if desired (36 KW).
	b. Verify main generator - DEPRESSURIZED	b. Perform the following: 1) Manually start the HP seal oil backup pump 2) Dispatch AO to locally perform the following: o Verify proper operation of the seal oil system (Refer to T-34B, GENERATOR SEAL OIL SYSTEM NORMAL OPERATION). o Ensure bearing drain vapor extractor running. o Ensure main lube oil reservoir vapor extractor running.
	c. Check RCS temperature - LESS THAN 135°F	c. Perform the following: 1) Ensure one Rx compartment cooling fan running (23 kw). 2) Ensure one control rod shroud fan running (45 kw).
	d. Dispatch AO to ensure one waste gas compressor in service	
	e. Dispatch AO to restore SFP cooling	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
35	Restore Equipment Alignment:	
	a. Verify at least 1 CNMT recirc fan - RUNNING	a. Start one CNMT recirc fan.
	b. Verify annunciator L-1, AUX BLDG VENT SYSTEM CONTROL PANEL - EXTINGUISHED	b. IF bus 11A or 11B energized, THEN dispatch AO to restore AUX BLDG ventilation (Refer to T-35A, AUX AND INTERMEDIATE BUILDING VENTILATION STARTUP AND SHUTDOWN)
	c. Check radiation monitoring systems: o CNMT vent sample pump - RUNNING o Plant vent sample pump - RUNNING o All area and process monitors operating as required	c. Perform the following: 1) Restore sample pumps and radiation monitors. 2) Restart CNMT purge or mini-purge if desired.
	d. Verify adequate electric driven air compressor(s) - RUNNING	d. Dispatch AO to locally start additional air compressors if desired.
	e. IF desired, THEN secure diesel air compressor (Refer to T-2F, BACKUP AIR SUPPLY)	
	f. Verify MCC G - ENERGIZED	f. Manually close breaker.
	g. Ensure motor fire pump breaker - CLOSED	
	h. Verify control board valve alignment - NORMAL (Refer to O-6.13, DAILY SURVEILLANCE LOG)	h. Manually align valves as necessary.
	i. Dispatch AO to restore SFP cooling	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
36	Check Status Of DC System Loads:	
	a. Verify emergency DC lube oil pump - OFF	a. Manually stop emergency DC lube oil pump.
	b. Verify TDAFW pump DC oil pump - OFF	b. Perform the following: 1) Direct AO to locally check TDAFW AC oil pump running. IF not running, THEN start pump from MCB. 2) Stop TDAFW pump DC oil pump.
	c. Verify both MFW pump DC oil pumps - OFF	c. Stop MFW pump DC oil pumps.
	NOTE: Inst Bus C provides power to all MCB manual controllers.	
37	Check Status Of Battery Chargers:	
	a. Battery Chargers 1A OR 1A1 - ENERGIZED (Annunciator J-15, BATTERY CHRGR FAILURE OR PA INVERTER TROUBLE, extinguished)	a. IF BOTH battery chargers are deenergized, THEN direct the Electricians to crosstie TSC battery charger to main battery A (Refer to ATT-24.0, ATTACHMENT TRANSFER BATTERY TO TSC)
	b. Battery Chargers 1B OR 1B1 - ENERGIZED (Annunciator J-15, BATTERY CHRGR FAILURE OR PA INVERTER TROUBLE, extinguished)	b. IF BOTH battery chargers are deenergized, THEN direct the Electricians to crosstie TSC battery charger to main battery B (Refer to ATT-24.0, ATTACHMENT TRANSFER BATTERY TO TSC).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38	Verify Offsite Power - RESTORED	Continue attempts to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
39	Reset UV relay targets on undervoltage cabinets • Bus 14 • Bus 16 • Bus 17 • Bus 18	
40	Evaluate MCB Annunciator Status (Refer to AR Procedures)	
41	Notify Higher Supervision	
	NOTE: Refer to O-9.3, NRC IMMEDIATE NOTIFICATION, for reporting requirements.	
42	Return To Procedure Or Guidance In Effect	

-END-

AP-ELEC.3 APPENDIX LIST

	TITLE	
1)	ATTACHMENT RCP START	(ATT-15.0)
2)	ATTACHMENT NC	(ATT-13.0)
3)	ATTACHMENT D/G STOP	(ATT-8.1)
4)	ATTACHMENT TRANSFER BATTERY TO TSC	(ATT-24.0)
5)	ATTACHMENT EXCESS L/D	(ATT-9.1)
6)	ATTACHMENT LETDOWN	(ATT-9.0)

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

A. PURPOSE - This procedure provides actions to respond to a loss of AC Emergency Bus 14 or Bus 16.

B. ENTRY CONDITIONS/SYMPTOMS

2. SYMPTOMS - The symptoms of a LOSS OF SAFEGUARDS BUS 14/16 are;

a. Annunciator J-7, 480V MAIN OR TIE BREAKER TRIP, lit, or

b. Annunciator J-29, 480V TRANSFORMER BREAKER TRIP, lit.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- IF A LOSS OF BUS 12A OR 12B HAS OCCURRED, THEN AP-ELEC.1, LOSS OF 12A AND/OR 12B BUSSES, SHOULD BE PERFORMED.
- OBSERVE D/G LOADING LIMITS OF 2300 KW FOR 1/2 HOUR, 2250 KW FOR 2 HOURS, AND 1950 KW FOR CONTINUOUS SERVICE.

* *

NOTE: Conditions should be evaluated for site contingency reporting (Refer to EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION).

*** 1 Monitor Tavg**

a. Place Rods in MANUAL

b. Manually move control rods to control Tavg

2 Verify Emergency D/G Associated With Affected Bus - RUNNING

Manually start D/G(s) associated with affected bus. (Refer to ER-D/G.1, RESTORING D/Gs)

- Bus 14 - D/G A
- Bus 16 - D/G B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	**Verify Both Trains Of AC Emergency Busses Energized To At Least 420 VOLTS:** o Bus 14 and Bus 18 o Bus 16 and Bus 17	IF Bus 14 AND Bus 16 are deenergized, THEN go to ECA-0.0, LOSS OF ALL AC POWER. IF one train deenergized, THEN perform the following: a. Ensure D/G aligned for unit operation o Mode switch in UNIT o Voltage control selector in AUTO b. Check D/G running. IF NOT, THEN perform the following: 1) Depress D/G FIELD RESET pushbutton 2) Depress D/G RESET pushbutton 3) Start D/G 4) IF D/G will NOT start, THEN dispatch AO to locally start D/G. (Refer to ER-D/G.1, RESTORING D/Gs) c. Adjust D/G voltage to approximately 480V. d. Adjust D/G frequency to approximately 60 Hz.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF CCW FLOW TO A RCP IS INTERRUPTED FOR GREATER THAN 2 MINUTES OR IF EITHER RCP MOTOR BEARING TEMPERATURE EXCEEDS 200°F, THEN TRIP THE AFFECTED RCP.

* *

4 Verify CCW Pump Status

a. At least one CCW Pump - RUNNING

a. Start one CCW pump (122 kw)

IF neither CCW pump can be started, THEN perform the following:

- o IF reactor trip breakers closed, THEN:
  1) Trip the reactor.
  2) WHEN all E-0 Immediate Actions done, THEN trip BOTH RCP's.
  3) Close letdown isolation, AOV-427.
  4) Close excess letdown, HCV-123.
  5) Pull stop BOTH CCW pumps.
  6) Go to E-0, REACTOR TRIP OR SAFETY INJECTION.
- o IF reactor trip breakers open, THEN:
  1) Trip both RCPs.
  2) Close letdown isolation, AOV-427.
  3) Close excess letdown, HCV-123.
  4) Pull stop BOTH CCW pumps.
  5) Go to Step 5.

b. Annunciator A-22, CCW PUMP DISCHARGE LO PRESS 60 PSIG - EXTINGUISHED

b. Start second CCW pump (122 kw).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Verify Charging Pump Status- AT LEAST ONE RUNNING	Isolate letdown flowpaths a. Close letdown isolation, AOV-427. b. Close EXCESS LETDOWN HCV-123. c. Close loop A cold leg to EXCESS LETDOWN Hx, AOV-310.
6	Check MFW Regulating Valves - RESTORING S/G LEVEL TO 52% IN AUTO	Perform the following: a. Place affected S/G MFW regulating valve in MANUAL. b. Restore S/G level to 52%. IF S/G level can NOT be controlled manually, THEN refer to AP-FW.1, ABNORMAL MAIN FEEDWATER FLOW.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Verify Bus 14 - ENERGIZED TO AT LEAST 420 VOLTS	Perform the following: a. Close letdown isolation, AOV-427. b. IF steam dump is armed, THEN place STEAM DUMP MODE SELECTOR Switch to MANUAL. c. Ensure only one charging pump operating (75 kw). d. Transfer Inst Bus B to maintenance supply. e. Return steam dump to AUTO, if desired. f. Ensure the following equipment operating as necessary: • CCW Pump B • PRZR Backup Heaters • CNMT Recirc Fans B and C • Boric Acid Pump B • RMW Pump B • Reactor Compartment Cooling Fan B • Penetration Cooling Fan B • SFP cooling g. IF Bus 14 can NOT be energized, THEN: o Provide alternate room cooling for D/G A. o Cross-connect D/G B fuel oil transfer pump to D/G A (Refer to ER-D/G.1, RESTORING D/Gs).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Verify Bus 16 - ENERGIZED TO AT LEAST 420 VOLTS	Perform the following: a. Ensure the following equipment operating as necessary: • CCW Pump A • Charging Pump A • PRZR Proportional Heaters • CNMT Recirc Fans A and D • Boric Acid Pump A • RMW Pump A • Reactor Compartment Cooling Fan A • Penetration Cooling Fan A • SFP cooling b. IF Bus 16 can NOT be energized, THEN: o Provide alternate room cooling for D/G B. o Cross-connect D/G A fuel oil transfer pump to D/G B (Refer to ER-D/G.1, RESTORING D/Gs).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: IF VCT level decreases to 5%, charging pump suction will swap to the RWST. This may required a load reduction.

9 Check VCT Makeup System:

a. Ensure the following:

1) RMW mode selector switch in AUTO

2) RMW control armed - RED LIGHT LIT

b. Check VCT level:

o Level GREATER THAN 20%

-OR-

o Level - STABLE OR INCREASING

b. Check letdown divert valve, LCV-112A, aligned to VCT.

Manually increase VCT makeup flow as follows:

1) Ensure BA transfer pumps and RMW pumps running.

2) Adjust RMW flow control valve, HCV-111, to increase RMW flow.

3) Adjust boric acid flow to maintain required concentration.

IF VCT level can NOT be maintained, THEN refer to ER-CVCS.1, REACTOR MAKEUP CONTROL MALFUNCTION, if necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check Charging Pump Suction Aligned To VCT:	
	a. VCT level - GREATER THAN 20%	a. IF VCT level can NOT be maintained greater than 5%, THEN perform the following: 1) Ensure charging pump suction aligned to RWST o LCV-112B open o LCV-112C closed 2) Continue with Step 11. WHEN VCT level greater than 20%, THEN do Step 10b.
	b. Align charging pumps to VCT o LCV-112C open o LCV-112B closed	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: When restarting equipment for recovery, it is preferable to start equipment on busses being supplied from offsite power.

11 Check CVCS Operation:

a. Charging pumps - AT LEAST ONE RUNNING

a. IF charging pump(s) available, THEN perform the following:

1) IF all seal cooling has been lost to any RCP, THEN isolate seal injection to affected RCP

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

2) Start one charging pump (75 kw).

3) Establish greater than 20 gpm charging line flow.

IF NO charging pumps available, THEN go to step 13

b. Charging line flow - GREATER THAN 20 GPM

b. Establish charging line flow to REGEN Hx - GREATER THAN 20 GPM

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 11 continued from previous page)

c. Check letdown indications:

- o Check PRZR level - GREATER THAN 13%
- o Letdown flow - APPROXIMATELY 40 GPM (60 GPM IF AOV-202 OPEN)
- o Letdown flow - STABLE

c. Perform the following:

1) Close letdown isolation, AOV-427.

2) Close letdown orifice valves (AOV-200A, AOV-200B, and AOV-202)

3) Close letdown isolation, AOV-371.

4) IF seal injection in service, THEN close charging flow control valve HCV-142 WHILE adjusting charging pump speed to maintain:

   - o RCP labyrinth seal D/P between 15 inches and 80 inches
   - o PRZR level at program

5) IF PRZR level greater than 13%, THEN go to Step 12. IF NOT, THEN continue with Step 14. WHEN PRZR level greater than 13%, THEN do Steps 12 and 13.

d. Adjust charging pump speed and HCV-142 to restore PRZR level and labyrinth seal D/P

e. Go to Step 13

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Establish Normal Letdown (Refer to ATT-9.0, ATTACHMENT LETDOWN)	IF normal letdown can NOT be established, THEN establish excess letdown. (Refer to ATT-9.1, ATTACHMENT EXCESS L/D)
13	Verify PRZR Heaters Restored: o PRZR proportional heater breaker - CLOSED o PRZR backup heater breaker - RESET, IN AUTO	IF adequate D/G capacity available for PRZR heaters (400 kw each bank), THEN perform the following: a. Reset and close PRZR proportional heater breaker if necessary. b. Reset PRZR backup heater breaker and return to AUTO if necessary. IF adequate D/G capacity NOT available, THEN refer to ER-PRZR.1, RESTORATION OF PRZR HEATERS DURING BLACKOUT.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Verify Normal Rod Control Restored:	
	a. Annunciator C-5, PPCS ROD SEQUENCE OR ROD DEVIATION - EXTINGUISHED	a. IF alarm is due to a loss of power to MRPI, THEN maintain rods in manual AND minimize rod motion. IF alarm is due to actual rod misalignment, THEN refer to AP-RCC.2, RCC/RPI MALFUNCTION, while continuing with this procedure.
	b. Annunciator E-28, POWER RANGE ROD DROP ROD STOP - EXTINGUISHED	b. Perform the following: 1) Place rods in MANUAL. 2) Reset NIS rod drop rod stop signals (at NIS racks) as necessary.
	c. Annunciator F-15, RCS TAVG DEV 4°F - EXTINGUISHED	c. Go to step 15
	d. Place rods in AUTO, if desired	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: With PRZR pressure controller 431K in manual, PORV-431C will not operate in the automatic mode. (Refer to TR 3.4.3)

15 Establish Stable Plant Conditions:

a. Check Tavg - TRENDING TO TREF

a. IF Tavg greater than Tref, THEN restore Tavg to Tref by one or more of the following:

- Insert control rods
- RCS boration

IF Tavg less than Tref, THEN restore Tavg to Tref by one or more of the following:

- Withdraw control rods
- Reduce turbine load
- Dilution of RCS

b. Check PRZR pressure - TRENDING TO 2235 PSIG IN AUTO

b. Control PRZR pressure by one of the following:

- 431K in MANUAL
- Manual control of PRZR heaters and sprays

IF PRZR pressure can NOT be controlled manually, THEN refer to AP-PRZR.1, ABNORMAL PRESSURIZER PRESSURE.

c. Check PRZR level - TRENDING TO PROGRAM IN AUTO CONTROL

c. Perform the following:

1) Place affected charging pumps in MANUAL

2) Adjust charging pump speed to restore PRZR level to program.

IF PRZR level can NOT be controlled manually, THEN refer to AP-RCS.1, REACTOR COOLANT LEAK.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	**Restore Normal Electric System Alignment:**	
	a. Verify all AC bus normal feed breakers - CLOSED • Bus 13 • Bus 14 • Bus 15 • Bus 16 • Bus 17 • Bus 18	a. Perform the following: 1) Refer to AR-L-5 to reset a safeguards bus over current condition. 2) Restore non-faulted AC busses and MCCs to normal power supply (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER) 3) IF normal power is restored to all AC emergency buses, THEN return to step 7. IF NOT, THEN go to step 17.
	b. Stop any unloaded emergency D/G and place in standby (Refer to T-27.4, DIESEL GENERATOR OPERATION)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Establish Normal Plant Conditions:	
	a. Verify 2 charging pumps - RUNNING	a. Perform the following: 1) Manually start charging pumps as necessary. 2) Place one charging pump in AUTO, if desired.
	b. Verify at least 2 CNMT recirc fans - RUNNING	b. Establish 2 CNMT recirc fans running.
	c. Check CCW pumps - ONLY ONE RUNNING	c. Locally verify two CCW pumps running, <u>THEN</u> manually stop one pump.
	d. Check radiation monitoring systems: o CNMT vent sample pump - RUNNING o Plant vent sample pump - RUNNING o All area and process monitors operating as required	d. Restore sample pumps and radiation monitors as necessary. (Refer to the ODCM).
18	Check Status Of DC System Loads:	
	a. Verify TDAFW pump DC oil pump - OFF IN AUTO	a. Perform the following: 1) Direct AO to locally check TDAFW AC oil pump running. <u>IF</u> not running, <u>THEN</u> start pump from MCB. 2) Stop TDAFW pump DC oil pump.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Inst Bus C provides power to all MCB manual controllers.

19 Check Status of Battery Chargers:

a. Battery Chargers 1A OR 1A1 - ENERGIZED (Annunciator J-15, BATTERY CHRGR FAILURE OR PA INVERTER TROUBLE, EXTINGUISHED)

a. IF BOTH battery chargers are deenergized, THEN direct the Electricians to crosstie TSC battery charger to main battery A (Refer to ATT-24.0, ATTACHMENT TRANSFER BATTERY TO TSC).

b. Battery Chargers 1B OR 1B1 - ENERGIZED (Annunciator J-15, BATTERY CHRGR FAILURE OR PA INVERTER TROUBLE, EXTINGUISHED)

b. IF BOTH battery chargers are deenergized, THEN direct the Electricians to crosstie TSC battery charger to main battery B (Refer to ATT-24.0, ATTACHMENT TRANSFER BATTERY TO TSC).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	Restore Equipment Alignment:	
	a. Verify annunciator L-1, AUX BLDG VENT SYSTEM CONTROL PANEL - EXTINGUISHED	a. Dispatch AO to restore AUX BLDG ventilation (Refer to T-35A, AUX AND INTERMEDIATE BUILDING VENTILATION STARTUP AND SHUTDOWN)
	b. Restore affected bus equipment as desired o SFP Cooling o Penetration cooling fans o Reactor compartment cooling fans o Hydrogen panel o PA system inverter (Battery Room A) o Auxiliary Bldg lighting (normal supply MCC D, manual throwover to MCC C)(located at MCC C) o Fire system (Refer to SC-3.16.2.3)	
	c. Evaluate MCB annunciator status (Refer to AR Procedures)	
	d. Verify control board valve alignment - NORMAL (Refer to O-6.13, DAILY SURVEILLANCE LOG)	d. Manually align valves as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	Establish Control System In Auto:	
	a. Verify 431K in AUTO	a. Place 431K in AUTO, if desired.
	b. Verify PRZR spray valves in AUTO	b. Place PRZR spray valves in AUTO, if desired.
	c. Verify PRZR heaters restored: o PRZR proportional heaters breaker - CLOSED o PRZR backup heaters breaker - RESET, IN AUTO	c. Restore PRZR heaters, if desired.
	d. Verify one charging pump in AUTO	d. Place one charging pump in AUTO, if desired.
	e. Verify MFW regulating valves in AUTO	e. Place MFW regulating valves in AUTO, if desired.
	f. Restore EH controls 1) Place in OP PAN, IMP OUT 2) Place load rate thumbwheel to 10%/hr 3) Match setter and reference	
	g. Verify annunciator G-15, STEAM DUMP ARMED - EXTINGUISHED	g. <u>WHEN</u> Tavg within 5°F of Tref, <u>THEN</u> perform the following: 1) Ensure steam dump valves closed 2) Reset steam dump
	h. Verify rods in AUTO	h. Place rods in AUTO, if desired.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	Evaluate MCB Annunciator Status (Refer to AR Procedures)	
	NOTE: Refer to O-9.3, NRC IMMEDIATE NOTIFICATION, for reporting requirements.	
23	Verify emergency AC bus normal feed breakers closed o Bus 14 o Bus 16	Return to Step 6
24	Verify Inst Bus B on normal supply	Place Inst Bus B on normal supply (Refer to ER-INST.3,INSTRUMENT BUS POWER RESTORATION).
25	Reset UV relay targets on undervoltage cabinets o Bus 14 o Bus 16	
26	Notify Higher Supervision	
27	Return To Procedure Or Guidance In Effect	

-END-

AP-ELEC.14/16 APPENDIX LIST

TITLE

1) ATTACHMENT TRANSFER BATTERY TO TSC (ATT-24.0)

2) ATTACHMENT EXCESS L/D (ATT-9.1)

3) ATTACHMENT LETDOWN (ATT-9.0)

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

A. PURPOSE - This procedure provides actions to respond to a loss of AC Emergency Bus 17 or Bus 18.

B. ENTRY CONDITIONS/SYMPTOMS

2. SYMPTOMS - The symptoms of a LOSS OF SAFEGUARDS BUS 17/18 are;

a. Annunciator J-7, 480V MAIN OR TIE BREAKER TRIP, lit, or

b. Annunciator J-29, 480V TRANSFORMER BREAKER TRIP, lit.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

o IF A LOSS OF BUS 12A OR 12B HAS OCCURRED, THEN AP-ELEC.1, LOSS OF 12A AND/OR 12B BUSSES, SHOULD BE PERFORMED.

o OBSERVE D/G LOADING LIMITS OF 2300 KW FOR 1/2 HOUR, 2250 KW FOR 2 HOURS, AND 1950 KW FOR CONTINUOUS SERVICE.

* *

NOTE: Conditions should be evaluated for site contingency reporting (Refer to EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Verify Emergency D/G Associated With Affected Bus - RUNNING o Bus 18 - D/G A o Bus 17 - D/G B	Manually start D/G(s) associated with affected Bus. (Refer to ER-D/G.1, RESTORING D/Gs)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	**Verify Both Trains Of AC Emergency Busses Energized To At Least 420 VOLTS:** o Bus 14 and Bus 18 o Bus 16 and Bus 17	IF Bus 14 AND Bus 16 are deenergized, THEN go to ECA-0.0, LOSS OF ALL AC POWER. IF one train deenergized, THEN perform the following: a. Ensure D/G aligned for unit operation o Mode switch in UNIT o Voltage control selector in AUTO b. Check D/G running. IF NOT, THEN perform the following: 1) Depress D/G FIELD RESET pushbutton 2) Depress D/G RESET pushbutton 3) Start D/G 4) IF D/G will NOT start, THEN dispatch AO to locally start D/G. (Refer to ER-D/G.1, RESTORING D/Gs) c. Adjust D/G voltage to approximately 480V. d. Adjust D/G frequency to approximately 60 Hz.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Verify Service Water System Operation:	
	a. SW pumps - AT LEAST ONE RUNNING IN EACH LOOP o A or B pump in Loop A o C or D pump in Loop B	a. Perform the following: 1) Manually start SW pumps as necessary (257 kw each). 2) IF adequate cooling can NOT be supplied to a running D/G THEN perform the following: a) Pull stop affected D/G. b) Immediately depress voltage shutdown pushbutton. c) Refer to ER-D/G.2, ALTERNATE COOLING FOR EMERGENCY D/Gs. 3) IF no SW pumps can be operated, THEN perform the following: a) Trip the reactor b) WHEN all E-0 Immediate Actions done, THEN trip BOTH RCPs c) Close letdown isol, AOV-427 d) Close excess letdown, HCV-123. e) Go to E-0, REACTOR TRIP OR SAFETY INJECTION 4) IF only one SW pump can be operated, THEN refer to AP-SW.2, LOSS OF SERVICE WATER.
	b. SW header pressure - GREATER THAN 40 PSIG IN EACH LOOP	b. Refer to AP-SW.1, SERVICE WATER LEAK.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Restore Normal Electric System Alignment:	
	a. Verify all AC bus normal feed breakers - CLOSED • Bus 13 • Bus 14 • Bus 15 • Bus 16 • Bus 17 • Bus 18	a. Perform the following: 1) Refer to AR-L-5 to reset safeguards bus overcurrent condition. 2) Restore all non-faulted AC busses and MCCs to normal power supply (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER) IF normal power to all AC emergency buses can NOT be restored, THEN go to step 5.
	b. Stop any unloaded emergency D/G and place in standby (Refer to T-27.4, DIESEL GENERATOR OPERATION)	
5	Restore Equipment Alignment:	
	a. Check SW Pumps - AT LEAST ONE PUMP RUNNING IN EACH LOOP o Pump A or B in Loop A o Pump C or D in Loop B	a. Start SW Pumps as necessary.
	b. Restore affected bus equipment as desired o MCC G o Intake Heaters o House Heating Boiler o Motor Fire Pump o Canal Sample Pump	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

6 Evaluate MCB Annunciator Status (Refer to AR Procedures)

NOTE: Refer to O-9.3, NRC IMMEDIATE NOTIFICATION, for reporting requirements.

7 Verify Emergency AC Bus Normal Feed Breakers Closed

Return to Step 3

- Bus 17
- Bus 18

8 Reset UV relay targets on undervoltage cabinets

- Bus 17
- Bus 18

9 Notify Higher Supervision

10 Return To Procedure Or Guidance In Effect

-END-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

A. PURPOSE - This procedure provides the necessary instructions to respond to a service water system leak.

B. ENTRY CONDITIONS/SYMPTOMS

1. SYMPTOMS - The symptoms of SERVICE WATER LEAK are:

   a. Service water header pressure low alarms on computer, or

   b. Sump pump activity increases in containment, the AUX BLDG, or INT BLDG, OR

   c. Unexplained increase in the waste hold-up tank, or

   d. Visual observation of a SW leak, or

   e. Annunciator C-2, CONTAINMENT RECIRC CLRS WATER OUTLET HI TEMP 217°F, lit, or

   f. Annunciator C-10, CONTAINMENT RECIRC CLRS WATER OUTLET LO FLOW 1050 GPM, lit, or

   g. Annunciator E-31, CONTAINMENT RECIRC FAN CONDENSATE HI-HI LEVEL alarm, exhibits an unexplained increase in frequency, or

   h. Annunciator H-6, CCW SERVICE WATER LO FLOW 1000 GPM, lit.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Verify 480V AC Emergency Busses 17 and 18 - ENERGIZED	Ensure associated D/G(s) running and attempt to manually load busses 17 and/or 18 onto the D/G(s) if necessary. IF neither bus 17 nor bus 18 can be energized, THEN perform the following: a. Trip the reactor b. WHEN all E-0 Immediate Actions done, THEN trip both RCPs c. Close letdown isol, AOV-427 d. Close excess letdown, HCV-123 e. Go to E-0, REACTOR TRIP OR SAFETY INJECTION IF either bus 17 OR bus 18 is deenergized, THEN refer to AP-ELEC.17/18, LOSS OF SAFEGUARDS BUS 17/18.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	**Verify At Least One SW Pump Running In Each Loop:** • A or B pump in loop A • C or D pump in loop B	Perform the following: a. Manually start SW pumps as necessary (257 kw each). b. IF adequate cooling can NOT be supplied to a running D/G, THEN perform the following: 1) Pull stop affected D/G 2) Immediately depress voltage shutdown pushbutton 3) Refer to ER-D/G.2, ALTERNATE COOLING FOR EMERGENCY D/Gs c. IF no SW pumps can be operated, THEN perform the following: 1) Trip the reactor 2) WHEN all E-0 Immediate Actions done, THEN trip BOTH RCPs 3) Close letdown isol, AOV-427 4) Close excess letdown, HCV-123. 5) Go to E-0, REACTOR TRIP OR SAFETY INJECTION d. IF only one SW pump can be operated, THEN refer to AP-SW.2, LOSS OF SERVICE WATER.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Abnormally low pressure in either SW loop may indicate that the idle pump check valve is open. This may be corrected by restarting or isolating the idle pump.

3 Check SW System Status:

a. Check SW loop header pressures:

- o Pressure in both loops - APPROXIMATELY EQUAL
- o PPCS SW low pressure alarm status - NOT LOW
  - PPCS point ID P2160
  - PPCS point ID P2161
- o Pressure in both loops - STABLE OR INCREASING

a. IF three SW pumps operating and either loop pressure less than 40 psig, THEN trip the reactor and go to E-0, REACTOR TRIP OR SAFETY INJECTION.

IF only two SW pumps operating and either loop pressure less than 45 psig, THEN start one additional SW pump (257 kw each pump).

b. Check SW loop header pressures - GREATER THAN 55 PSIG

b. IF either SW loop pressure is less than 55 PSIG with three SW pumps running AND cause can NOT be corrected, THEN initiate a controlled shutdown while continuing with this procedure (Refer to AP-TURB.5, RAPID LOAD REDUCTION).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: o If SW is lost to any safeguards equipment, the affected component should be declared inoperable and appropriate actions taken as required by ITS, Section 3.

o CNMT sump A level of 10 feet is approximately 6 feet 6 inches below the bottom of the reactor vessel.

4 Check For SW Leakage In CNMT:

a. Check Sump A indication

- o Sump A level - INCREASING

-OR-

- o Sump A pump start frequency - INCREASING (Refer to RCS Daily Leakage Log)

a. IF the SW leak is NOT in the CNMT, THEN go to Step 6.

b. Evaluate Sump A conditions:

1) Verify Leakage within capacity of one Sump A pump (50 gpm)

2) Check Sump A level - LESS THAN 10 FEET

b. Plant shutdown should be considered, consult plant staff.

c. Direct RP to establish conditions for CNMT entry

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: o One Reactor Compartment cooling fan should be running whenever RCS temperature is greater than 135°F.

o CNMT recirc fan condensate collector level indicators may be helpful in identifying a leaking fan cooler.

5	Check CNMT fan indications: o CNMT recirc fan collector dump frequency - NORMAL (Refer to RCS Daily Leakage Log) o CNMT recirc fan SW flows - APPROXIMATELY EQUAL (INTER BLDG basement by IBELIP) o Reactor compartment cooler SW outlet pressures - APPROXIMATELY EQUAL (INTER BLDG SAMPLE HOOD AREA) • Cooler A - PI 2232 • Cooler B - PI 2141	Dispatch AO with locked valve key to perform ATT-2.3, ATTACHMENT SW LOADS IN CNMT to determine leak location. WHEN CNMT SW leak location identified, THEN go to Step 9.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

6 Dispatch AO To Screenhouse To Perform The Following:

a. Verify idle SW pump check valve closed

- o Idle pump shaft stopped
- o Idle pump discharge pressure - ZERO (unisolate and check local pressure indicator)

a. Notify Control Room of any indication of check valve failure.

b. Investigate for SW leak in Screenhouse - NO EXCESSIVE LEAKAGE INDICATED

b. Perform the following:

1) Identify leak location.

<u>IF</u> increase in leakage from underground header indicated, <u>THEN</u> isolation of header should be considered (Refer to ATT-2.2, ATTACHMENT SW ISOLATION)

2) Notify Control Room of leak location.

<u>NOTE</u>: Refer to ATT-2.2, ATTACHMENT SW ISOLATION for a list of the major non-safeguards loads supplied by each service water header.

7 Check Indications For Leak Location:

- o AUX BLDG sump pump start frequency - NORMAL (Refer to RCS Daily Leakage Log)
- o Annunciator L-9, AUX BLDG SUMP HI LEVEL - EXTINGUISHED
- o Annunciator L-17, INTER BLDG SUMP HI LEVEL - EXTINGUISHED

Dispatch AO to the specific area to investigate for leakage.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

8 Dispatch AO To Locally Investigate For SW Leakage And To Monitor Operating Equipment

- Turbine BLDG
- SAFW pump room

NOTE: If SW is lost to either D/G, refer to ER-D/G.2, ALTERNATE COOLING FOR EMERGENCY D/Gs, if cooling is required.

9 Evaluate SW Leak Concerns

a. Check SW pump status - AT LEAST THREE PUMPS RUNNING	a. IF either SW header pressure less than 45 psig, THEN start third SW pump.
b. Check SW loop header pressure - BOTH LOOPS GREATER THAN 45 PSIG	b. Perform the following: 1) Dispatch AO to split A and B SW headers (refer to ATT-2.5, ATTACHMENT SPLIT SW HEADERS) 2) IF plant at power, THEN initiate a controlled shutdown (Refer to AP-TURB.5, RAPID LOAD REDUCTION). 3) Go to Step 10.
c. Verify leak location - IDENTIFIED	c. Return to Step 3.
d. Verify plant operating at power	d. Verify SW system conditions appropriate for plant mode (Refer to ITS Section 3.7.8) and go to Step 10.
e. Leak isolation at power - ACCEPTABLE	e. IF plant shutdown required, THEN refer to O-2.1, NORMAL SHUTDOWN TO HOT SHUTDOWN or AP-TURB.5, RAPID LOAD REDUCTION.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Dispatch AO(s) To Locally Isolate SW Leak As Necessary	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	**Verify SW Leak Isolated**	
	a. Monitor SW System Operation o SW loop header pressure - RESTORED TO PRE-EVENT VALUE Archive PPCS point ID loop A P2160 OR loop B P2161) o Both SW loop header pressures - STABLE	a. IF SW leak can NOT be isolated within the affected loop, THEN stop SW pumps in the affected loop.
	b. Verify At Least One SW Pump Running In Each Loop: • A or B pump in loop A • C or D pump in loop B	b. Perform the following: 1) Ensure two SW pumps running (257 kw each). 2) IF adequate cooling can NOT be supplied to a running D/G, THEN perform the following: a) Pull stop affected D/G b) Immediately depress voltage shutdown pushbutton c) Refer to ER-D/G.2, ALTERNATE COOLING FOR EMERGENCY D/Gs. 3) IF no SW pumps can be operated, THEN perform the following: a) Trip the reactor b) WHEN all E-0 Immediate Actions done, THEN trip BOTH RCPs c) Close letdown isol, AOV-427 d) Go to E-0, REACTOR TRIP OR SAFETY INJECTION 4) IF only one SW pump can be operated, THEN refer to AP-SW.2, LOSS OF SERVICE WATER.
	c. Restore to normal position all valves repositioned during leak investigation EXCEPT leak isolation boundary.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

12 Evaluate MCB Annunciator Status (Refer to AR procedures)

NOTE: Refer to O-9.3, NRC IMMEDIATE NOTIFICATION, for reporting requirements.

13 Notify Higher Supervision

-END-

AP-SW.1 APPENDIX LIST

	TITLE	
1)	ATTACHMENT SW ISOLATION	(ATT-2.2)
2)	ATTACHMENT SW LOADS IN CNMT	(ATT-2.3)
3)	ATTACHMENT SPLIT SW HEADERS	(ATT-2.5)

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

A. PURPOSE - This procedure provides the necessary instructions to respond to a loss of service water pumps.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

   a. AP-ELEC.17/18, LOSS OF SAFEGUARDS BUS 17/18.

   b. Any of several EOPs, when only one SW pump can be operated.

2. SYMPTOMS - The symptoms of LOSS OF SERVICE WATER PUMPS are:

   a. Service water header pressure low alarms on computer, or

   b. Annunciator C-2, CONTAINMENT RECIRC CLRS WATER OUTLET HI TEMP 217°F, lit, or

   c. Annunciator C-10, CONTAINMENT RECIRC CLRS WATER OUTLET LO FLOW 1050 GPM, lit, or

   d. Annunciator H-6, CCW SERVICE WATER LOW FLOW 1000 GPM, lit, or

   e. Annunciator H-9, AUXILIARY FEED PUMP CLG WTR FLTR HI DIFF PRESS, lit, or

   f. Annunciator I-10, CW PUMP SEAL WATER LO FLOW, lit, or

   g. Annunciator J-4, GENERATOR ISOPHASE BUS COOLING SYSTEM, lit, or

   h. Annunciator J-9, SAFEGUARD BREAKER TRIP, lit, or

   i. Annunciator K-30, TURBINE PLANT SAMPLING RACK TROUBLE, lit.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Verify 480V AC Emergency Busses 17 and 18 - ENERGIZED	Ensure associated D/G(s) running and attempt to manually load busses 17 and/or 18 onto their respective D/G(s). IF neither bus 17 nor bus 18 can be energized, THEN perform the following: a. Trip the reactor b. WHEN all E-0 Immediate Actions done, THEN trip both RCPs c. Close letdown isol, AOV-427 d. Close excess letdown, HCV-123 e. Go to E-0, REACTOR TRIP OR SAFETY INJECTION

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 2	**Verify SW Pump Alignment:**	
	a. Check at least one SW pump running in each loop • A or B pump in loop A • C or D pump in loop B	a. Perform the following: 1) Manually start SW pumps as necessary (257 kw each). 2) IF adequate cooling can NOT be supplied to a running D/G, THEN perform the following: a) Pull stop affected D/G b) Immediately depress voltage shutdown pushbutton 3) IF no SW pumps can be operated, THEN perform the following: a) Trip the reactor b) WHEN all E-0 Immediate Actions done, THEN trip BOTH RCPs c) Close letdown isol, AOV-427 d) Close excess letdown, HCV-123 e) Go to E-0, REACTOR TRIP OR SAFETY INJECTION 4) IF only one SW pump can be operated, THEN go to step 3. 5) IF at least two SW pumps can be operated, THEN go to step 8.
	b. Return to procedure or guidance in effect	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

3 Align Alternate Cooling To One D/G (Refer to ER-D/G.2, ALTERNATE COOLING EMERGENCY D/Gs):

- o IF A or C SW Pump is operating, THEN align alternate cooling to D/G B

-OR-

- o IF B or D SW Pump is operating, THEN align alternate cooling to D/G A

4 Isolate SW To Non-Essential Loads

a. Close screenhouse SW isolation valves

- MOV-4609
- MOV-4780

b. Close air conditioning SW isolation valves

- MOV-4663
- MOV-4733

c. Direct AO to perform Part C of ATT-2.2, ATTACHMENT SW ISOLATION

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	**Monitor Plant Equipment Cooled By SW - TEMPERATURES STABLE** • Exciter • MFP oil coolers • Instrument air compressors • Bus duct coolers • Seal Oil unit • Turbine lube oil cooler • CCW Hx • SFP Hx • AFPs • Condensate Pumps • Secondary sample coolers	IF required, THEN reduce load as necessary to stabilize equipment temperatures (Refer to O-5.1, LOAD REDUCTIONS, or AP-TURB.5, RAPID LOAD REDUCTION)
6	**Notify Higher Supervision**	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	**Check SW System Status:**	
	a. Check SW loop header pressures: o PPCS SW low pressure alarm status - NOT LOW • PPCS point ID P2160 • PPCS point ID P2161 o Pressure in both loops - STABLE OR INCREASING o Check SW loop header pressures - GREATER THAN 40 PSIG	a. Locally isolate selected SW loads as desired (Refer to ATT-2.2, ATTACHMENT SW ISOLATION)
	b. Check at least one SW pump running in each loop: • A or B pump in loop A • C or D pump in loop B	b. Perform the following: 1) Continue efforts to start at least one SW pump in each loop. 2) IF at least two SW pumps can be operated, THEN go to Step 8. IF NOT, THEN return to step 3.
8	**Notify Higher Supervision**	
9	**Select Operable SW Pumps For Auto Start**	Refer to ITS LCO 3.7.8

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Evaluate MCB Annunciator Status (Refer to AR Procedures)	
11	Return To Procedure or Guidance In Effect	

-END-

AP-SW.2 APPENDIX LIST

	TITLE	
1)	ATTACHMENT SW ISOLATION	(ATT-2.2)

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to verify proper response of the automatic protection systems following manual or automatic actuation of a reactor trip or safety injection and to assess plant conditions, and identify the appropriate recovery procedure.

B. ENTRY CONDITIONS/SYMPTOMS

1. The following are symptoms that require a reactor trip, if one has not occurred:

   - o Any plant parameter reaches a reactor trip setpoint and logic as listed in procedure P-1, REACTOR CONTROL AND PROTECTION SYSTEM.
   - o Operator discretion.

2. The following are symptoms of a reactor trip:

   - o Any First Out reactor trip annunciator lit.
   - o A rapid decrease in core neutron level as indicated by nuclear instrumentation.
   - o MRPI indicates all control and shutdown rods on bottom.
   - o Reactor trip breakers indicate open.

3. The following are symptoms that require a reactor trip and safety injection, if one has not occurred:

   - o Any plant parameter reaches the Safety Injection setpoint and logic listed in procedure P-1, REACTOR CONTROL AND PROTECTION SYSTEM.
   - o Operator discretion.

4. The following are symptoms of a reactor trip and safety injection:

   - o Any SI annunciator lit.
   - o Safeguards sequencing started.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	**Verify Reactor Trip:** o At least one train of reactor trip breakers - OPEN o Neutron flux - DECREASING o MRPI indicates - ALL CONTROL AND SHUTDOWN RODS ON BOTTOM	Manually trip reactor. IF reactor trip breakers NOT open, THEN perform the following: a. Open Bus 13 and Bus 15 normal feed breakers. b. Verify rod drive MG sets tripped. c. Close Bus 13 and Bus 15 normal feed breakers. d. Reset lighting breakers. IF the reactor will NOT trip OR IF power range NIS indicates greater than 5%, THEN go to FR-S.1, RESPONSE TO REACTOR RESTART/ATWS, Step 1
2	**Verify Turbine Stop Valves - CLOSED**	Manually trip turbine. IF turbine trip can NOT be verified, THEN close both MSIVs.
3	**Verify Both Trains Of AC Emergency Busses Energized To At Least 420 VOLTS:** • Bus 14 and Bus 18 • Bus 16 and Bus 17	Attempt to start any failed emergency D/G to restore power to all AC emergency busses. IF Bus 14 AND Bus 16 are deenergized, THEN go to ECA-0.0, LOSS OF ALL AC POWER, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	**Check if SI is Actuated:**	
	a. Any SI Annunciator - LIT	a. IF any of the following conditions are met, THEN manually actuate SI and CI: o PRZR pressure less than 1750 psig -OR- o Steamline pressure less than 514 psig -OR- o CNMT pressure greater than 4 psig -OR- o SI sequencing started -OR- o Operator determines SI required IF SI is NOT required, THEN go to ES-0.1, REACTOR TRIP RESPONSE, Step 1.
	b. SI sequencing - BOTH TRAINS STARTED.	b. Manually actuate SI and CI.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: 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.

5 Verify SI and RHR Pumps Running:

a. All SI pumps - RUNNING

a. Perform the following:

1) Ensure SI pump suction supply open from RWST.

2) Manually start pumps.

b. Both RHR pumps - RUNNING

b. Manually start pumps.

6 Verify CNMT RECIRC Fans Running:

a. All fans - RUNNING

a. Manually start fans.

b. Charcoal filter dampers green status lights - EXTINGUISHED

b. Dispatch personnel to relay room with relay rack key to locally open dampers by pushing in trip relay plungers.

- AUX RELAY RACK RA-2 for fan A
- AUX RELAY RACK RA-3 for fan C

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 7	**Verify CNMT Spray Not Required:** o Annunciator A-27, CNMT SPRAY - EXTINGUISHED o CNMT pressure - LESS THAN 28 PSIG	Verify CNMT spray initiated. IF CNMT spray NOT initiated, THEN perform the following: a. Depress manual CNMT spray pushbuttons (2 of 2). b. Ensure CNMT spray pumps running. IF no CNMT spray pump available, THEN go to Step 8. c. Ensure CNMT spray pump discharge valves open for operating pump(s). o CNMT spray pump A: • MOV-860A • MOV-860B o CNMT spray pump B: • MOV-860C • MOV-860D d. Verify NaOH flow (FI-930) IF NaOH flow NOT indicated, THEN place switches for NaOH tank outlet valves to OPEN. • AOV-836A • AOV-836B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	**Check If Main Steamlines Should Be Isolated:**	
	a. Any MSIV - OPEN	a. Go to Step 9.
	b. Check CNMT pressure - LESS THAN 18 PSIG	b. Ensure BOTH MSIVs closed and go to Step 9.
	c. Check if ANY main steamlines should be isolated: o Low Tavg (545°F) AND high steam flow (0.4×10^6 lb/hr) from either S/G -OR- o High-High steam flow (3.6×10^6 lb/hr) from either S/G	c. Go to Step 9.
	d. Verify MSIV closed on the affected S/G(s)	d. Manually close valves.
9	**Verify MFW Isolation:**	
	a. MFW pumps - TRIPPED	a. Perform the following:. 1) Manually close MFW pump discharge valves and trip MFW pumps. 2) Continue with Step 9c. <u>WHEN</u> both MFPs are tripped, <u>THEN</u> perform Step 9b.
	b. Place A and B S/G MFW regulating valve and bypass valve controllers in MANUAL at 0% demand.	
	c. S/G blowdown and sample valves - CLOSED	c. Place S/G blowdown and sample valve isolation switch to CLOSE.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Verify Both MDAFW Pumps Running	Manually start both MDAFW pumps. IF less than 2 MDAFW pumps are running, THEN manually open TDAFW pump steam supply valves. • MOV-3505A • MOV-3504A
11	Verify At Least Two SW Pumps - RUNNING	Perform the following: a. Ensure one SW pump running on each energized screenhouse AC emergency bus: • Bus 17 • Bus 18 b. IF offsite power NOT available, THEN ensure SW isolation. c. IF NO SW pumps running, THEN perform the following: 1) Pull stop any D/G that is NOT supplied by alternate cooling AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. 2) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	**Verify CI And CVI:**	
	a. CI and CVI annunciators - LIT • Annunciator A-26, CNMT ISOLATION • Annunciator A-25, CNMT VENTILATION ISOLATION	a. Depress manual CI pushbutton.
	b. Verify CI and CVI valve status lights - BRIGHT	b. Manually close CI and CVI valves as required. IF valves can NOT be verified closed by MCB indication, THEN dispatch AO to locally close valves (Refer to ATT-3.0, ATTACHMENT CI/CVI for alternate isolation valves).
	c. CNMT RECIRC fan coolers SW outlet valve status lights - BRIGHT • FCV-4561 • FCV-4562	c. Dispatch AO to locally fail open valves.
	d. Letdown orifice valves - CLOSED • AOV-200A • AOV-200B • AOV-202	d. Place affected valve switch to CLOSE. IF valves can NOT be verified closed by MCB indication, THEN close alternate isolations. (Refer to ATT-3.0, ATTACHMENT CI/CVI)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

RCP TRIP CRITERIA LISTED ON FOLDOUT PAGE SHOULD BE MONITORED PERIODICALLY.

* *

13 Check CCW System Status:

a. Verify CCW pump - AT LEAST ONE RUNNING

a. IF offsite power available, THEN manually start one CCW pump.

b. Place switch for excess letdown AOV-310 to CLOSE

c. Place switch for CCW from excess letdown, AOV-745 to CLOSE

14 Verify SI And RHR Pump Flow:

a. SI flow indicators - CHECK FOR FLOW

a. IF RCS pressure less than 1400 psig, THEN manually start pumps and align valves. IF NOT, THEN go to Step 15.

b. RHR flow indicator - CHECK FOR FLOW

b. IF RCS pressure less than 140 psig, THEN manually start pumps and align valves. IF NOT, THEN go to Step 15.

15 Verify AFW Valve Alignment:

Manually align valves as necessary.

a. AFW flow - INDICATED TO BOTH S/G(s)

b. AFW flow from each MDAFW pump - LESS THAN 230 GPM

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*16	Monitor Heat Sink:	
	a. Check S/G narrow range level - GREATER THAN 5% [25% adverse CNMT] in any S/G	a. Perform the following: 1) Verify total AFW flow - GREATER THAN 200 GPM IF total AFW is less than 200 gpm, THEN manually start pumps and align valves to establish greater than 200 gpm AFW flow. IF AFW flow greater than 200 gpm can NOT be established, THEN go to FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 1. 2) Go to Step 17.
	b. Check S/G narrow range level - BOTH S/G LESS THAN 50%	b. Secure AFW flow to any S/G with level above 50%.
	c. Control feed flow to maintain S/G narrow range level between 5% [25% adverse CNMT] and 50%.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	**Verify SI Pump And RHR Pump Emergency Alignment:**	
	a. RHR pump discharge to Rx vessel deluge - OPEN • MOV-852A • MOV-852B	a. Ensure at least one valve open.
	b. Verify SI pump C - RUNNING	b. Manually start pump on available bus.
	c. Verify SI pump A - RUNNING	c. Perform the following: 1) Ensure SI pumps B and C running. IF either pump NOT running, THEN go to Step 17e. 2) Ensure SI pump C aligned to discharge line A: o MOV-871A open o MOV-871B closed 3) Go to Step 18.
	d. Verify SI pump B - RUNNING	d. Perform the following: 1) Ensure SI pumps A and C running. IF either pump NOT running, THEN go to Step 17e. 2) Ensure SI pump C aligned to discharge line B: o MOV-871B open o MOV-871A closed 3) Go to Step 18.
	e. Verify SI pump C discharge valves - OPEN • MOV-871A • MOV-871B	e. Manually open valves as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF OFFSITE POWER IS LOST AFTER SI RESET, THEN MANUAL ACTION MAY BE REQUIRED TO RESTART SAFEGUARDS EQUIPMENT. (REFER TO ATT-8.5, ATTACHMENT LOSS OF OFFSITE POWER)

* *

18 Check CCW Flow to RCP Thermal Barriers:

- o Annunciator A-7, RCP 1A CCW RETURN HI TEMP OR LO FLOW - EXTINGUISHED
- o Annunciator A-15, RCP 1B CCW RETURN HI TEMP OR LO FLOW - EXTINGUISHED

IF CCW to a RCP is lost, THEN perform the following:

a. Stop affected RCPs.

b. Reset SI.

c. Verify adequate power available to run one charging pump (75 kw).

d. Start one charging pump at minimum speed for seal injection.

e. Adjust HCV-142 to establish either of the following:

   - o Labyrinth seal D/P to each RCP greater than 15 inches of water.

   -OR-

   - o RCP seal injection flow to each RCP greater than 6 gpm.

f. IF large imbalance in seal injection flow exists, THEN consider local adjustment of V-300A and V-300B.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	Check If TDAFW Pump Can Be Stopped: a. Both MDAFW pumps - RUNNING b. PULL STOP TDAFW pump steam supply valves • MOV-3504A • MOV-3505A	a. Go to Step 20.
*20	Monitor RCS Tavg - STABLE AT OR TRENDING TO 547°F	IF temperature less than 547°F and decreasing, THEN perform the following: a. Stop dumping steam. b. Ensure reheater steam supply valves are closed. c. IF cooldown continues, THEN control total feed flow greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in at least one S/G. d. WHEN S/G level greater than 5% [25% adverse CNMT] in one S/G, THEN limit feed flow to that required to maintain level in at least one S/G. e. IF cooldown continues, THEN close both MSIVs. IF temperature greater than 547°F and increasing, THEN dump steam to stabilize and slowly decrease temperature to 547°F.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	Check PRZR PORVs And Spray Valves:	
	a. PORVs - CLOSED	a. IF PRZR pressure less than 2335 psig, THEN manually close PORVs. IF any valve can NOT be closed, THEN manually close its block valve. • MOV-516 for PCV-430 • MOV-515 for PCV-431C IF block valve can NOT be closed, THEN go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	b. Auxiliary spray valve (AOV-296) - CLOSED	b. Manually close auxiliary spray valve. IF valve can NOT be closed, THEN perform the following: 1) Decrease charging pump flow to minimum. 2) Ensure charging valve to loop B cold leg open (AOV-294).
	c. Check PRZR pressure - LESS THAN 2260 PSIG	c. Continue with Step 22. WHEN pressure less than 2260 psig, THEN do Step 21d.
	d. Normal PRZR spray valves - CLOSED • PCV-431A • PCV-431B	d. Place controllers in MANUAL at 0% demand. IF valves can NOT be closed, THEN stop associated RCP(s).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	Monitor RCP Trip Criteria:	
	a. RCP status - ANY RCP RUNNING	a. Go to Step 23.
	b. SI pumps - AT LEAST TWO RUNNING	b. Go to Step 23.
	c. RCS pressure minus maximum S/G pressure - LESS THAN 175 psig [400 psig adverse CNMT]	c. Go to Step 23.
	d. Stop both RCPs	
23	Check If S/G Secondary Side Is Intact: o Pressure in both S/Gs - STABLE OR INCREASING o Pressure in both S/Gs - GREATER THAN 110 PSIG	IF any S/G pressure decreasing in an uncontrolled manner OR completely depressurized, THEN go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.
24	Check If S/G Tubes Are Intact: o Air ejector radiation monitors (R-15 or R-15A) - NORMAL o S/G blowdown radiation monitor (R-19) - NORMAL o Steamline radiation monitors (R-31 and R-32) - NORMAL	Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	**Check If RCS Is Intact:** a. CNMT area radiation monitors - NORMAL • R-2 • R-7 • R-29 • R-30 b. CNMT pressure - LESS THAN 0.5 PSIG c. CNMT sump B level - LESS THAN 8 INCHES d. CNMT sump A level o Level - STABLE o Annunciator C-19, CONTAINMENT SUMP A HI LEVEL - EXTINGUISHED	Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26	Check If SI Should Be Terminated:	
	a. RCS pressure: o Pressure - GREATER THAN 1625 PSIG o Pressure - STABLE OR INCREASING	a. Do NOT stop SI pumps. Go to Step 27.
	b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	b. Do NOT stop SI pumps. Go to Step 27.
	c. Secondary heat sink: o Total feed flow to S/Gs - GREATER THAN 200 GPM -OR- o Narrow range level in at least one S/G - GREATER THAN 5%	c. IF neither condition met, THEN do NOT stop SI pumps. Go to Step 27.
	d. PRZR level - GREATER THAN 5%	d. Do NOT stop SI pumps. Perform the following: 1) IF normal PRZR spray available, THEN try to stabilize RCS pressure with PRZR spray. 2) Go to Step 27.
	e. Go to ES-1.1, SI TERMINATION, Step 1.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: o Conditions should be evaluated for Site Contingency Reporting (Refer to EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION).

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

27 Initiate Monitoring of Critical Safety Function Status Trees

*28 Monitor S/G Levels:

a. Narrow range level - GREATER THAN 5%

a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% in at least one S/G.

b. Control feed flow to maintain narrow range level between 17% and 50%

b. IF narrow range level in any S/G continues to increase in an uncontrolled manner, THEN go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

29 Check Secondary Radiation Levels - NORMAL

Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

o Steamline radiation monitor (R-31 and R-32)

o Dispatch AO to locally check steamline radiation

o Request RP sample S/Gs for activity

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

IF OFFSITE POWER IS LOST AFTER SI RESET, THEN MANUAL ACTION MAY BE REQUIRED TO RESTART SAFEGUARDS EQUIPMENT. (REFER TO ATT-8.5, ATTACHMENT LOSS OF OFFSITE POWER)

30 Reset SI

31 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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
32	Verify Adequate SW Flow:	
	a. At least three SW pumps - RUNNING	a. Manually start SW pumps as power supply permits (257 kw each). IF less than three pumps running, THEN ensure SW isolation. IF NO SW pumps running, THEN perform the following: 1) Pull stop any D/G that is NOT supplied by alternate cooling AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. 2) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. IF only one SW pump running, THEN refer to AP-SW.2, LOSS OF SERVICE WATER.
	b. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
33	Establish IA to CNMT:	
	a. Verify non-safeguards busses energized from offsite power o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED	a. Perform the following: 1) Close non-safeguards bus tie breakers: • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Verify adequate emergency D/G capacity to run air compressor(s) (75 kw each). IF NOT, THEN perform the following: o Start diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR -OR- o Evaluate if CNMT RECIRC fans should be stopped. (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS 3) WHEN bus 15 is restored, THEN reset control room lighting.
	b. Check SW Pumps - AT LEAST TWO PUMPS RUNNING	b. Perform the following: 1) Restore IA using service air compressor OR diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) 2) Go to step 33d.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 33 continued from previous page)	
c.	Verify SW isolation valves to turbine building - OPEN • MOV-4613 and MOV-4670 • MOV-4614 and MOV-4664	c. Perform the following: 1) Manually align valves. 2) Dispatch AO to locally reset compressors as necessary.
d.	Verify adequate air compressor(s) - RUNNING	d. Manually start electric air compressor(s) as power supply permits (75 kw each). IF electric air compressor can NOT be started, THEN start diesel air compressor. (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR)
e.	Check IA supply: o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING	e. Perform the following: 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR). 2) Continue with Step 34. WHEN IA restored, THEN do Steps 33f and g.
f.	Reset both trains of XY relays for IA to CNMT AOV-5392	
g.	Verify IA to CNMT AOV-5392 - OPEN	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34	Check Auxiliary Building Radiation - NORMAL • Plant vent iodine (R-10B) • Plant vent particulate (R-13) • Plant vent gas (R-14) • CCW liquid monitor (R-17) • LTD line monitor (R-9) • CHG pump room (R-4)	Evaluate cause of abnormal conditions. IF the cause is a loss of RCS inventory outside CNMT, THEN go to ECA-1.2, LOCA OUTSIDE CONTAINMENT, Step 1.
35	Check PRT Conditions o PRT level (LI-442) - LESS THAN 84% o PRT temperature (TI-439) - LESS THAN 120°F o PRT pressure (PI-440A) - LESS THAN 3 PSIG	Evaluate the following flowpaths for cause of abnormal conditions: • RCP seal return relief • PRZR PORVs • PRZR safeties • Letdown line relief IF excess letdown previously in service, THEN close AOV-310, excess letdown isolation valve from loop A cold.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

RCS PRESSURE SHOULD BE MONITORED. IF RCS PRESSURE DECREASES IN AN UNCONTROLLED MANNER TO LESS THAN 250 PSIG, THEN THE RHR PUMPS MUST BE MANUALLY RESTARTED TO SUPPLY WATER TO THE RCS.

* *

*36	**Monitor If RHR Pumps Should Be Stopped:**	
	a. Check RCS pressure:	
	1) Pressure - GREATER THAN 250 PSIG	1) Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	2) Pressure - STABLE OR INCREASING	2) Go to Step 37.
	b. Stop both RHR pumps and place in AUTO	
37	**Check Normal Power Available To Charging Pumps:**	Verify adequate emergency D/G capacity to run charging pumps (75 kw each).
	o Bus 14 normal feed breaker - CLOSED	<u>IF NOT</u>, <u>THEN</u> evaluate if CNMT RECIRC fans can be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS).
	o Bus 16 normal feed breaker - CLOSED	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38	Check If Charging Flow Has Been Established:	
	a. Charging pumps - ANY RUNNING.	a. Perform the following: 1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN dispatch AO to close seal injection needle valve(s) to affected RCP: • V-300A for RCP A • V-300B for RCP B 2) Ensure HCV-142 open, demand at 0%.
	b. Charging pump suction aligned to RWST: o LCV-112B - OPEN o LCV-112C - CLOSED	b. Manually align valves. IF LCV-112B can NOT be opened, THEN dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room). IF LCV-112C can NOT be closed, THEN perform the following: 1) Direct AO to locally open V-358, manual charging pump suction from RWST (Charging Pump Room). 2) Verify charging pump A NOT running and place in PULL STOP. 3) WHEN V-358 open, THEN direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
	c. Start charging pumps as necessary and adjust charging flow to restore PRZR level	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

39 Maintain PRZR Pressure Between 1800 PSIG And 2235 PSIG

- o Reset PRZR heaters
- o Use normal PRZR spray

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

40 Check If Emergency D/Gs Should Be Stopped:

a. Verify AC emergency busses energized by offsite power:

- o Emergency D/G output breakers - OPEN
- o AC emergency bus voltage - GREATER THAN 420 VOLTS
- o AC emergency bus normal feed breakers - CLOSED

a. Perform the following:

1) Verify non-safeguards bus tie breakers closed:

- Bus 13 to Bus 14 tie
- Bus 15 to Bus 16 tie

2) Place the following pumps in PULL STOP:

- 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:

- A from Bus 13
- B from Bus 15
- E from Bus 15
- F from Bus 15

5) Start HP seal oil backup pump.

6) Ensure D/G load within limits.

7) Refer to ATT-8.4, ATTACHMENT SI/UV for other equipment lost with loss of offsite power.

8) Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).

b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

41 Return to Step 20

-END-

E-0 APPENDIX LIST

TITLE

1) RED PATH SUMMARY
2) FIGURE MIN SUBCOOLING (FIG-1.0)
3) ATTACHMENT CI/CVI (ATT-3.0)
4) ATTACHMENT SD-1 (ATT-17.0)
5) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
6) ATTACHMENT D/G STOP (ATT-8.1)
7) ATTACHMENT SI/UV (ATT-8.4)
8) ATTACHMENT NO SW PUMPS (ATT-2.4)
9) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
10) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
11) FOLDOUT

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 52% [55% 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

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 [400 psig adverse CNMT]

2. LOSS OF SW CRITERIA

   IF no SW pumps are available, THEN perform the following:

   a. Pull stop any D/G that is NOT supplied by alternate cooling AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

   b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

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).

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

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, after secondary heat sink has been reestablished and all PRZR PORVs are closed.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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.

* *

NOTE: 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.

1 Monitor RCP Trip Criteria:

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	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Check If S/G Secondary Side Is Intact: o Pressure in both S/Gs - STABLE OR INCREASING o Pressure in both S/Gs - GREATER THAN 110 PSIG	IF any S/G pressure decreasing in an uncontrolled manner OR completely depressurized, THEN verify faulted S/G isolated unless needed for RCS cooldown: • Steamlines • Feedlines IF NOT, THEN go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.

NOTE: TDAFW pump flow control AOVs may drift open on loss of IA.

* 3	Monitor Intact S/G Levels:	
	a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]	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. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	b. IF narrow range level in any S/G continues to increase in an uncontrolled manner, THEN go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.
* 4	Monitor If Secondary Radiation Levels Are Normal o Steamline radiation monitor (R-31 and R-32) o Request RP sample S/Gs for activity	IF steamline radiation monitors NOT available, THEN dispatch AO to locally check steamline radiation. IF abnormal radiation levels detected in any S/G, THEN go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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).

* *

* 5	Monitor PRZR PORV Status:	
	a. Power to PORV block valves - AVAILABLE	a. Restore power to block valves unless block valve was closed to isolate an open PORV: • MOV-515, MCC D position 6C • MOV-516, MCC C position 6C
	b. PORVs - CLOSED	b. IF PRZR pressure less than 2335 psig, THEN manually close PORVs. IF any PORV can NOT be closed, THEN manually close its block valve. IF block valve can NOT be closed, THEN dispatch AO to locally check breaker. • MOV-515, MCC D position 6C • MOV-516, MCC C position 6C
	c. Block valves - AT LEAST ONE OPEN	c. Open one block valve unless it was closed to isolate an open PORV.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF OFFSITE POWER IS LOST AFTER SI RESET, THEN MANUAL ACTION MAY BE REQUIRED TO RESTART SAFEGUARDS EQUIPMENT. (REFER TO ATT-8.5, ATTACHMENT LOSS OF OFFSITE POWER)

* *

6 Reset SI

7 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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	**Verify Adequate SW Flow:**	
	a. Check at least two SW pumps - RUNNING	a. Manually start SW pumps as power supply permits (257 kw each). IF less than two SW pumps running, THEN perform the following: 1) Ensure SW isolation. 2) IF NO SW pumps running, THEN perform the following: a) Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. b) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. 3) IF only one SW pump running, THEN refer to AP-SW.2, LOSS OF SERVICE WATER.
	b. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Establish IA to CNMT:	
	a. Verify non-safeguards busses energized from offsite power o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED	a. Perform the following: 1) Close non-safeguards bus tie breakers: • 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). IF NOT, THEN perform the following: o Start diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR -OR- o Evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS). 3) WHEN bus 15 restored, THEN reset control room lighting.
	b. Check SW pumps - AT LEAST TWO PUMPS RUNNING	b. Perform the following: 1) Restore IA using service air compressor OR diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) 2) Go to step 9d.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 9 continued from previous page)	
c.	Verify turbine building SW isolation valves - OPEN • MOV-4613 and MOV-4670 • MOV-4614 and MOV-4664	c. Perform the following: 1) Manually align valves. 2) Dispatch AO to locally reset compressors as necessary.
d.	Verify adequate air compressors - RUNNING	d. Manually start electric air compressors as power supply permits (75 kw each). IF electric air compressors can NOT be started, THEN start diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).
e.	Check IA supply: o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING	e. Perform the following: 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR). 2) Continue with Step 10. WHEN IA restored, THEN do Steps 9f and g.
f.	Reset both trains of XY relays for IA to CNMT AOV-5392	
g.	Verify IA to CNMT AOV-5392 - OPEN	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	**Check Normal Power Available To Charging Pumps:** o Bus 14 normal feed breaker - CLOSED o Bus 16 normal feed breaker - CLOSED	Verify adequate emergency D/G capacity to run charging pumps (75 kw each). IF NOT, THEN evaluate if CNMT RECIRC fans can be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Check If Charging Flow Has Been Established:	
	a. Charging pumps - ANY RUNNING	a. Perform the following: 1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN dispatch AO to close seal injection needle valve(s) to affected RCP: • V-300A for RCP A • V-300B for RCP B 2) Ensure HCV-142 open, demand at 0%.
	b. Charging pump suction aligned to RWST: o LCV-112B - OPEN o LCV-112C - CLOSED	b. Manually align valves as necessary. IF LCV-112B can NOT be opened, THEN dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room). IF LCV-112C can NOT be closed, THEN perform the following: 1) Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room). 2) Verify charging pump A NOT running and place in PULL STOP. 3) WHEN V-358 open, THEN direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
	c. Start charging pumps as necessary and adjust charging flow to restore PRZR level	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Check If SI Should Be Terminated:	
	a. RCS pressure: o Pressure - GREATER THAN 1625 psig [1825 psig adverse CNMT] o Pressure - STABLE OR INCREASING	a. Do NOT stop SI pumps. Go to Step 13.
	b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	b. Do NOT stop SI pumps. Go to Step 13.
	c. Secondary heat sink: 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]	c. IF neither condition satisfied, THEN do NOT stop SI pumps. Go to Step 13.
	d. PRZR level - GREATER THAN 5% [30% adverse CNMT]	d. Do NOT stop SI pumps. Perform the following: 1) IF normal PRZR spray available, THEN try to stabilize RCS pressure with PRZR spray. 2) Go to Step 13.
	e. Go to ES-1.1, SI TERMINATION, Step 1.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*13	Monitor If CNMT Spray Should Be Stopped:	
	a. CNMT spray pumps - RUNNING	a. Go to Step 14.
	b. Check the following: o CNMT pressure - LESS THAN 4 PSIG o Sodium hydroxide tank level - LESS THAN 55%	b. Continue with Step 14. WHEN BOTH conditions satisfied, THEN do Steps 13c through f.
	c. Reset CNMT spray	
	d. Check NaOH flow (FI-930) - NO FLOW	d. Place NaOH tank outlet valve switches to CLOSE. • 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	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- IF OFFSITE POWER IS LOST AFTER SI RESET, THEN MANUAL ACTION MAY BE REQUIRED TO RESTART SAFEGUARDS EQUIPMENT. (REFER TO ATT-8.5, ATTACHMENT LOSS OF OFFSITE POWER)
- RCS PRESSURE SHOULD BE MONITORED. IF RCS PRESSURE DECREASES IN AN UNCONTROLLED MANNER TO LESS THAN 250 PSIG [465 PSIG ADVERSE CNMT], THEN THE RHR PUMPS MUST BE MANUALLY RESTARTED TO SUPPLY WATER TO THE RCS.

* *

*14 Monitor If RHR Pumps Should Be Stopped:		
a. RHR pumps - ANY RUNNING IN INJECTION MODE		a. Go to Step 15.
b. Check RCS pressure:		
1) Pressure - GREATER THAN 250 psig [465 psig adverse CNMT]		1) Go to Step 16.
2) RCS pressure - STABLE OR INCREASING		2) Go to Step 15.
c. Stop RHR pumps and place in AUTO		
15 Check RCS And S/G Pressures		
a. Check pressures in both S/Gs - STABLE OR INCREASING		a. Return to Step 1.
b. Check pressures in both S/Gs - GREATER THAN 110 PSIG		b. Monitor RCS pressure. IF RCS pressure does NOT increase after faulted S/G dryout, THEN go to Step 16.
c. Check RCS pressure - STABLE OR DECREASING		c. Return to Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Check If Emergency D/Gs Should Be Stopped:	
	a. Verify AC emergency busses energized by offsite power: o Emergency D/G output breakers - OPEN o AC emergency bus voltage - GREATER THAN 420 VOLTS o AC emergency bus normal feed breakers - CLOSED	a. Perform the following: 1) Close non-safeguards bus tie breakers as necessary: • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Place the following pumps in PULL STOP: • 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: • A from Bus 13 • B from Bus 15 • E from Bus 15 • F from Bus 15 5) Start HP seal oil backup pump. 6) Ensure D/G load within limits. 7) WHEN bus 15 restored, THEN reset control room lighting breaker. 8) Refer to ATT-8.4, ATTACHMENT SI/UV for other equipment lost with loss of offsite power. 9) Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
	b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	**Check If RHR Should Be Throttled:**	
	a. Check RHR Pumps - ANY RUNNING	a. Go to step 18.
	b. Check RWST level - LESS THAN 70%	b. Continue with Step 18. <u>WHEN</u> RWST level less than 70%, <u>THEN</u> perform step 17b.
	c. RHR flow - LESS THAN 1500 GPM PER OPERATING PUMP	c. Manually adjust RHR Hx outlet valves equally to reduce flow to less than 1500 gpm per operating pump • RHR Hx A, HCV-625 • RHR Hx B, HCV-624 <u>IF</u> flow can <u>NOT</u> be reduced manually, <u>THEN</u> dispatch an AO with locked valve key to locally adjust RHR Hx outlet valve handwheels equally to reduce flow. • RHR Hx A, HCV-625 handwheel • RHR Hx B, HCV-624 handwheel

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Verify CNMT Sump Recirculation Capability:	
	a. Check RHR and CCW systems:	a. IF at least one flowpath of cold leg recirculation capability can NOT be verified, THEN go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.
	1) At least one recirculation flowpath, including required power supplies, from Sump B and back to RCS available per ATT-14.5, ATTACHMENT RHR SYSTEM	
	2) At least one CCW pump available.	
	3) At least one CCW Hx available.	
	b. Check SW pumps - AT LEAST 2 PUMPS AVAILABLE	b. Attempt to restore at least 2 SW pumps to operable. IF only 1 SW pump available, THEN refer to ATT-2.1, ATTACHMENT MIN SW for additional guidance. IF no SW pumps are available, THEN perform the following: 1) Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. 2) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. 3) Go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION.
	c. Dispatch AO to check AUX BLDG sub-basement for RHR system leakage (AUX BLDG sub-basement key may be required)	c. IF any RHR pump seal leakage indicated, THEN leakage should be evaluated and isolated if necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	**Evaluate Plant Status:**	
	a. Check auxiliary building radiation - NORMAL • 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)	a. Notify RP and refer to appropriate AR-RMS procedure. <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.
	b. Direct RP to obtain following samples: • RCS boron • RCS activity • CNMT hydrogen • CNMT sump boron • CNMT Sump pH	
	c. Verify adequate Rx head cooling:	
	1) Verify at least one control rod shroud fan - RUNNING	1) Manually start one fan as power supply permits (45 kw)
	2) Verify one Rx compartment cooling fan - RUNNING	2) Perform the following: o Dispatch AO to reset UV relays at MCC C and MCC D. o Manually start one fan as power supply permits (23 kw)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	Check If RCS Cooldown And Depressurization Is Required:	
	a. RCS pressure - GREATER THAN 250 psig [465 psig adverse CNMT]	a. IF RHR pump flow greater than 475 gpm, THEN go to Step 21.
	b. Go to ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION, Step 1	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: IF D/Gs supplying emergency AC busses, THEN non-essential loads may be shed as necessary to allow start of additional SW pumps.

21 Establish Adequate SW Flow:

a. Verify at least two SW pumps - RUNNING

a. Start additional SW pumps as power supply permits (257 kw each). IF only 1 SW pump operable, THEN perform the following:

1) Ensure ATT-2.1, ATTACHMENT MIN SW is in progress.

2) Go to Step 22.

IF no SW pumps are available, THEN perform the following:

1) Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

2) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

3) Go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION.

b. Verify AUX BLDG SW isolation valves - OPEN

- MOV-4615 and MOV-4734
- MOV-4616 and MOV-4735

b. Manually align valves.

c. Dispatch AO to check BOTH CCW Hx - IN SERVICE

c. Locally place BOTH CCW Hxs in service

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 21 continued from previous page)

d. Determine required SW flow to CCW HXs per table:

SW DISCHARGE ALIGNMENT	CCW HXs IN SERVICE	REQUIRED SW FLOW
Normal	2	Total of 5000 - 6000 gpm equally divided to both HXs
Normal	1	5000 - 6000 gpm to in-service HX
Alternate	2	30-33" d/p across each HX
Alternate	1	95-100" d/p across in-service HX

e. Direct AO to adjust SW flow to required value

o IF on normal SW discharge:

- V-4619, CCW HX A
- V-4620, CCW HX B

-OR-

o IF on alternate SW discharge:

- V-4619C, CCW HX A
- V-4620B, CCW HX B

e. IF the required SW flow can NOT be obtained, THEN perform the following:

1) Isolate SW to screenhouse and air conditioning headers.

- MOV-4609/MOV-4780 - AT LEAST ONE CLOSED
- MOV-4663/MOV-4733 - AT LEAST ONE CLOSED

2) Direct AO to locally adjust SW flow to required value.

3) Direct AO to locally isolate SW return from SFP Hxs:

- SFP Hx A (V-4622) (for alternate SW discharge use V-4622A)
- SFP Hx B (V-8689)

4) Verify SW portions of ATT-17.0, ATTACHMENT SD-1 are complete.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	**Establish CCW flow to RHR Hxs:**	
	a. Check both CCW pumps - RUNNING	a. Perform the following: 1) Start CCW pumps as power supply permits (122 kw each) 2) IF both CCW pumps are running, THEN go to step 22b. 3) IF only one CCW pump is running, THEN perform the following: a) Direct AO to isolate CCW to boric acid evaporator o Close V-760A b) Manually open CCW MOV to only one operable RHR Loop o Open MOV-738A -OR- o Open MOV-738B c) Go to step 23.
	b. Manually open CCW valves to RHR Hxs • MOV-738A • MOV-738B	b. Dispatch AO to locally open valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	**Check If Transfer To Cold Leg Recirculation Is Required:**	
	a. RWST level - LESS THAN 28%	a. Return to Step 17.
	b. Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1	

-END-

E-1 APPENDIX LIST

TITLE

1) RED PATH SUMMARY
2) FIGURE MIN SUBCOOLING (FIG-1.0)
3) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
4) ATTACHMENT D/G STOP (ATT-8.1)
5) ATTACHMENT SD-1 (ATT-17.0)
6) ATTACHMENT SI/UV (ATT-8.4)
7) ATTACHMENT MIN SW (ATT-2.1)
8) ATTACHMENT NO SW PUMPS (ATT-2.4)
9) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
10) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
11) ATTACHMENT RHR SYSTEM (ATT-14.5)
12) FOLDOUT

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 52% [55% 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

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 [400 psig adverse CNMT]

2. LOSS OF SW CRITERIA

   IF no SW pumps are available, THEN perform the following:

   a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

   b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

3. SI REINITIATION CRITERIA

   IF EITHER condition listed below occurs, THEN manually start SI pumps as necessary:
   - RCS subcooling based on core exit T/Cs - LESS THAN 0° F USING FIGURE MIN SUBCOOLING
   - OR -
   - PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN 5% [30% adverse CNMT]

4. 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:
      - GREATER THAN 1625 PSIG [1825 psig adverse CNMT]
      - STABLE OR INCREASING

   d. PRZR level - GREATER THAN 5% [30% adverse CNMT]

5. 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.

6. E-3 TRANSITION CRITERIA

   IF any S/G level increased in an uncontrolled manner or any S/G has abnormal radiation, THEN manually start SI pumps as necessary AND go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

7. 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.

8. 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).

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to identify and isolate a faulted steam generator.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

a. E-0, REACTOR TRIP OR SAFETY INJECTION, with the following symptoms:

1) Any S/G pressure decreasing in an uncontrolled manner.

2) Any S/G completely depressurized.

b. E-1, LOSS OF REACTOR OR SECONDARY COOLANT,
E-3, STEAM GENERATOR TUBE RUPTURE,
ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, and
ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED, with the following symptoms and/or conditions:

1) Any S/G pressure decreasing in an uncontrolled manner.

2) Any S/G complete depressurized.

3) Faulted S/G isolation not verified.

c. FR-H.5, RESPONSE TO STEAM GENERATOR LOW LEVEL, when the affected S/G is identified as faulted.

d. Other procedures whenever a faulted S/G is identified.

e. ECA-2.1 Foldout Page if any S/G pressure increases.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- o AT LEAST ONE S/G SHALL BE MAINTAINED AVAILABLE FOR RCS COOLDOWN.
- o ANY FAULTED S/G OR SECONDARY BREAK SHOULD REMAIN ISOLATED DURING SUBSEQUENT RECOVERY ACTIONS UNLESS NEEDED FOR RCS COOLDOWN.

* *

NOTE: o Critical Safety Function Status Trees should be monitored.

- 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.
- o Foldout page should be open and monitored periodically.

1 Check MSIV Of Faulted S/G(s) - CLOSED

Manually close valve.

IF valve will NOT close from MCB, THEN dispatch AO with locked valve key to locally closed faulted S/G(s) MSIV as follows:

- o S/G A
  - close IA to MSIV, V-5408A
  - open vent valves V-5471 AND V-5473
- o S/G B
  - close IA to MSIV, V-5409B
  - open vent valves V-5472 AND V-5474

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	**Check If Any S/G Secondary Side Is Intact:** o Check pressure in S/G A - STABLE OR INCREASING -OR- o Check pressure in S/G B - STABLE OR INCREASING	IF both S/G pressures decreasing in an uncontrolled manner, THEN go to ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS, Step 1.
3	**Check Faulted S/G Status:** o Faulted S/G pressure - DECREASING IN AN UNCONTROLLED MANNER -OR- o Faulted S/G - COMPLETELY DEPRESSURIZED	IF both S/G pressures stable or increasing, THEN search for initiating break and go to Step 6. • Main steamlines • Main feedlines • S/G blowdown system • Sample system

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Isolate Feed Flow To Faulted S/G: o Close faulted S/G MDAFW pump discharge valve • S/G A, MOV-4007 • S/G B, MOV-4008 o Pull stop faulted S/G MDAFW pump o Close faulted S/G TDAFW flow control valve • S/G A, AOV-4297 • S/G B, AOV-4298 o Verify faulted S/G MFW regulating valve and bypass valve - CLOSED • S/G A, HCV-466 and HCV-480 • S/G B, HCV-476 and HCV-481 o Verify MDAFW pump crosstie valves - BOTH CLOSED • MOV-4000A • MOV-4000B o Close faulted S/G SAFW pump discharge valve • S/G A, MOV-9701A • S/G B, MOV-9701B	Manually close valves. IF valves can NOT be closed, THEN dispatch AO to locally isolate flowpaths as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF THE TDAFW PUMP IS THE ONLY AVAILABLE SOURCE OF FEED FLOW, THEN STEAM SUPPLY TO THE TDAFW PUMP MUST BE MAINTAINED FROM ONE S/G.

* *

5 Isolate Steam Flow From Faulted S/G:

Manually close valves.

IF valves can NOT be closed, THEN dispatch AO to locally isolate flowpaths as necessary.

- o Verify faulted S/G ARV - CLOSED
  - S/G A, AOV-3411
  - S/G B, AOV-3410
- o Close faulted S/G TDAFW pump steam supply valve and place in PULL STOP
  - S/G A, MOV-3505A
  - S/G B, MOV-3504A
- o Verify faulted S/G blowdown and sample valves - CLOSED
  - S/G A, AOV-5738 and AOV-5735
  - S/G B, AOV-5737 and AOV-5736
- o Dispatch AO to complete faulted S/G isolation (Refer to ATT-10.0, ATTACHMENT FAULTED S/G)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

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).

* *

NOTE: TDAFW pump flow control AOVs may drift open on loss of IA.

* 6 Monitor Intact S/G Levels:

a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]

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. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%

b. IF narrow range level in any S/G continues to increase in an uncontrolled manner, THEN go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

7 Check Secondary Radiation Levels - NORMAL

- o Steamline radiation monitor (R-31 and R-32)
- o Air ejector radiation monitor (R-15)
- o S/G blowdown radiation monitor (R-19)
- o Request RP sample S/Gs for activity

IF steamline radiation monitors NOT available, THEN dispatch AO to locally check steamline radiation.

IF abnormal radiation levels detected in any S/G, THEN go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Adjust Steam Dump To Minimize RCS Heatup:	
	a. Determine allowable intact S/G pressure using maximum hot leg temperature (Refer to FIG-7.0, FIGURE INTACT S/G PRESSURE)	
	b. Check condenser steam dump available: o Verify intact S/G MSIV - OPEN o Annunciator G-15, STEAM DUMP ARMED- LIT	b. Perform the following: 1) Adjust intact S/G ARV to pressure determined from FIG-7.0, FIGURE INTACT S/G PRESSURE. 2) Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	c. Verify steam dump mode selector switch in MANUAL	
	d. Adjust condenser steam dump controller in AUTO to pressure determined from FIG-7.0, FIGURE INTACT S/G PRESSURE	
9	Go To E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1	

-END-

E-2 APPENDIX LIST

TITLE

1) FIGURE INTACT S/G PRESSURE (FIG-7.0)
2) ATTACHMENT FAULTED S/G (ATT-10.0)
3) ATTACHMENT NO SW PUMPS (ATT-2.4)
4) FOLDOUT

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

   IF no SW pumps are available, THEN perform the following:

   a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

   b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to terminate leakage of reactor coolant into the secondary system following a steam generator tube rupture (SGTR), this procedure should also be used for a SGTR in one S/G and a fault in the other S/G.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

a. E-0, REACTOR TRIP OR SAFETY INJECTION, when condenser air ejector radiation or blowdown radiation is abnormal, or

b. E-0, REACTOR TRIP OR SAFETY INJECTION,
E-1, LOSS OF REACTOR OR SECONDARY COOLANT,
E-2, FAULTED STEAM GENERATOR ISOLATION, and
FR-H.3, RESPONSE TO STEAM GENERATOR HIGH LEVEL,
when secondary radiation is abnormal, or

c. E-0, REACTOR TRIP OR SAFETY INJECTION,
E-1, LOSS OF REACTOR OR SECONDARY COOLANT,
E-2, FAULTED STEAM GENERATOR ISOLATION,
ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION,
ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL,
when an intact S/G narrow range level increases in an uncontrolled manner.

d. ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, when pressurizer pressure control is restored.

e. Any FOLDOUT page that has E-3 transition criteria whenever either S/G level increases in an uncontrolled manner or either S/G has abnormal radiation.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: 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 Personnel should be available for sampling during this procedure.

o Conditions should be evaluated for Site Contingency Reporting (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.

* 1	Monitor RCP Trip Criteria:	
	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	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF OFFSITE POWER IS LOST AFTER SI RESET, THEN MANUAL ACTION MAY BE REQUIRED TO RESTART SAFEGUARDS EQUIPMENT. (REFER TO ATT-8.5, ATTACHMENT LOSS OF OFFSITE POWER)

* *

2 Identify Ruptured S/G(s):

- o Unexpected increase in either S/G narrow range level

  -OR-

- o High radiation indication on main steamline radiation monitor
  - R-31 for S/G A
  - R-32 for S/G B

  -OR-

- o AO reports local indication of high steamline radiation

  -OR-

- o RP reports high radiation from S/G activity sample

Perform the following:

a. Reset SI

b. Continue with Steps 10 through 16. WHEN ruptured S/G(s) identified, THEN do Steps 3 through 9.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- IF THE TDAFW PUMP IS THE ONLY AVAILABLE SOURCE OF FEED FLOW, STEAM SUPPLY TO THE TDAFW PUMP MUST BE MAINTAINED FROM ONE S/G.
- AT LEAST ONE S/G SHALL BE MAINTAINED AVAILABLE FOR RCS COOLDOWN.

* *

3 Isolate Flow From Ruptured S/G(s):

a. Adjust ruptured S/G ARV controller to 1050 psig in AUTO

b. Check ruptured S/G ARV - CLOSED

b. WHEN ruptured S/G pressure less than 1050 psig, THEN verify S/G ARV closed. IF NOT closed, THEN place controller in MANUAL and close S/G ARV.

IF S/G ARV can NOT be closed, THEN dispatch AO to locally isolate.

c. Close ruptured S/G TDAFW pump steam supply valve and place in PULL STOP

- S/G A, MOV-3505A
- S/G B, MOV-3504A

c. Dispatch AO with locked valve key to locally isolate steam from ruptured S/G to TDAFW pump.

- S/G A, V-3505
- S/G B, V-3504

d. Verify ruptured S/G blowdown valve - CLOSED

- S/G A, AOV-5738
- S/G B, AOV-5737

d. Place S/G blowdown and sample valve isolation switch to CLOSE.

IF blowdown can NOT be isolated manually, THEN dispatch AO to locally isolate blowdown.

- S/G A, V-5701
- S/G B, V-5702

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Complete Ruptured S/G Isolation:	
	a. Close ruptured S/G MSIV - RUPTURED S/G MSIV CLOSED	a. Perform the following: 1) Close intact S/G MSIV. 2) Place intact S/G ARV controller at 1005 psig in AUTO. 3) Adjust condenser steam dump controller to 1050 psig in AUTO. 4) Place condenser steam dump mode selector switch to MANUAL. 5) Adjust reheat steam supply controller cam to close reheat steam supply valves. 6) Ensure turbine stop valves - CLOSED. 7) Dispatch AO to complete ruptured S/G isolation (Refer to ATT-16.0, ATTACHMENT RUPTURED S/G, parts A and B). 8) Go to step 5.
	b. Dispatch AO to complete ruptured S/G isolation (Refer to ATT-16.0, ATTACHMENT RUPTURED S/G part A)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF ANY RUPTURED S/G IS FAULTED, FEED FLOW TO THAT S/G SHOULD REMAIN ISOLATED DURING SUBSEQUENT RECOVERY ACTIONS UNLESS NEEDED FOR RCS COOLDOWN.

* *

5 Check Ruptured S/G Level:

a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]

a. IF ruptured S/G NOT faulted, THEN perform the following:

1) Maintain feed flow to ruptured S/G until level greater than 5% [25% adverse CNMT].

2) Continue with Step 6. WHEN ruptured S/G level greater than 5% [25% adverse CNMT], THEN do Steps 5b through e.

b. Close MDAFW pump discharge valve to ruptured S/G

- S/G A, MOV-4007
- S/G B, MOV-4008

b. Dispatch AO to locally close valve.

c. Pull stop MDAFW pump for ruptured S/G

d. Close TDAFW pump flow control valve to ruptured S/G

- S/G A, AOV-4297
- S/G B, AOV-4298

d. Dispatch AO with locked valve key to locally close TDAFW pump manual feedwater isolation valve to ruptured S/G.

- S/G A, V-4005
- S/G B, V-4006

e. Verify MDAFW pump crosstie valves - CLOSED

- MOV-4000A
- MOV-4000B

e. Manually close valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	**Verify Ruptured S/G Isolated:**	
	a. Check ruptured MSIV - CLOSED	a. Ensure air ejector/gland steam supply and flange heating steam isolated. (Refer to ATT-16.0, ATTACHMENT RUPTURED S/G, part B).
	b. Check TDAFW pump steam supply from ruptured S/G - ISOLATED	b. Continue efforts to isolate steam supply from ruptured S/G: • S/G A, MOV-3505A OR V-3505 • S/G B, MOV-3504A OR V-3504
	c. Ruptured S/G pressure - GREATER THAN 300 PSIG	c. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
7	**Establish Condenser Steam Dump Pressure Control:**	
	a. Verify condenser available: o Intact S/G MSIV - OPEN o Annunciator G-15, STEAM DUMP ARMED - LIT	a. Adjust S/G ARV controllers to maintain intact S/G pressure in AUTO and go to Step 8.
	b. Adjust condenser steam dump controller HC-484 to maintain intact S/G pressure and verify in AUTO	
	c. Place steam dump mode selector switch to MANUAL	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF OFFSITE POWER IS LOST AFTER SI RESET, THEN MANUAL ACTION MAY BE REQUIRED TO RESTART SAFEGUARDS EQUIPMENT. (REFER TO ATT-8.5, ATTACHMENT LOSS OF OFFSITE POWER)

* *

8 Reset SI

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

RUPTURED S/G LEVEL SHALL BE MAINTAINED GREATER THAN 5% [25% ADVERSE CNMT] DURING THE RCS COOLDOWN, UNLESS THE RUPTURED S/G IS ALSO FAULTED.

* *

NOTE: Following initiation of controlled cooldown or depressurization, RCP trip criteria is no longer applicable.

9 Initiate RCS Cooldown:

a. Determine required core exit temperature from below table

RUPTURED SG PRESSURE	REQUIRED CORE EXIT TEMPERATURE (°F)
1100 PSIG	525 [505 adverse CNMT]
1000 PSIG	510 [490 adverse CNMT]
900 PSIG	500 [475 adverse CNMT]
800 PSIG	485 [460 adverse CNMT]
700 PSIG	465 [440 adverse CNMT]
600 PSIG	450 [420 adverse CNMT]
500 PSIG	425 [395 adverse CNMT]
400 PSIG	405 [370 adverse CNMT]
300 PSIG	375 [330 adverse CNMT]

b. IF ruptured S/G MSIV closed, THEN initiate dumping steam to condenser from intact S/G at maximum rate

b. Manually or locally initiate steam dump from intact S/G at maximum rate using S/G ARV.

IF no intact S/G available, THEN perform the following:

- Use faulted S/G.

-OR-

- IF a ruptured S/G must be used, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

c. Core exit T/Cs - LESS THAN REQUIRED TEMPERATURE

c. Continue with Step 10. WHEN core exit T/Cs less than required, THEN do Step 9d.

d. Stop RCS cooldown and stabilize core exit T/Cs less than required temperature

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: TDAFW pump flow control AOVs may drift open on loss of IA.

10 Monitor Intact S/G Level:

a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]	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. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	b. IF narrow range level in the intact S/G continues to increase in an uncontrolled manner, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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 11B).

* *

11 Monitor PRZR PORVs And Block Valves:

a. Power to PORV block valves - AVAILABLE

a. Restore power to block valves unless block valve was closed to isolate an open PORV:

- MOV-515, MCC D position 6C
- MOV-516, MCC C position 6C

b. PORVs - CLOSED

b. IF PRZR pressure less than 2335 psig, THEN manually close PORVs.

IF any PORV can NOT be closed, THEN manually close its block valve. IF block valve can NOT be closed, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

c. Block valves - AT LEAST ONE OPEN

c. Open one block valve unless it was closed to isolate an open PORV.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	**Monitor All AC Busses - BUSSES ENERGIZED BY OFFSITE POWER** o Normal feed breakers to all 480 volt busses - CLOSED o 480 volt bus voltage - GREATER THAN 420 VOLTS o Emergency D/G output breakers - OPEN	Perform the following: a. IF any AC emergency bus normal feed breaker open, THEN ensure associated D/G breaker closed. b. Perform the following as necessary: 1) Close non-safeguards bus tie breakers: • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Place the following pumps in PULL STOP: • EH pumps • Turning gear oil pump • HP seal oil backup pump 3) Restore power to MCCs. • A from Bus 13 • B from Bus 15 • E from Bus 15 • F from Bus 15 4) Start HP seal oil backup pump. 5) Start CNMT RECIRC fans as necessary. 6) Ensure D/G load within limits. 7) WHEN bus 15 restored, THEN reset control room lighting. c. Try to restore offsite power to all AC busses (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Verify Adequate SW Flow:	
	a. Check at least two SW pumps - RUNNING	a. Manually start SW pumps as power supply permits (257 kw each). IF less than two SW pumps running, THEN: 1) Ensure SW isolation. 2) IF NO SW pumps running, THEN perform the following: a) Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress VOLTAGE SHUTDOWN pushbutton. b) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. 3) IF only one SW pump running, THEN refer to AP-SW.2, LOSS OF SERVICE WATER.
	b. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	**Establish IA to CNMT:**	
	a. Verify non-safeguards busses energized o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED	a. Perform the following: 1) Close non-safeguards bus tie breakers: • 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). IF NOT, THEN perform the following: o Start diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) -OR- o Evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS)
	b. Check SW pumps - AT LEAST TWO PUMPS RUNNING	b. Perform the following: 1) Restore IA using service air compressor OR diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) 2) Go to step 15d.
	c. Verify turbine building SW isolation valves - OPEN • MOV-4613 and MOV-4670 • MOV-4614 and MOV-4664	c. Manually align valves.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 15 continued from previous page)

	d. Verify adequate air compressors - RUNNING	d. Manually start air compressors as power supply permits (75 kw each). IF air compressors can NOT be started, THEN dispatch AO to locally reset compressors as necessary.
	e. Check IA supply: o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING	e. Perform the following: 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR). 2) Continue with Step 16. WHEN IA restored, THEN do Steps 15f and g.
	f. Reset both trains of XY relays for IA to CNMT AOV-5392	
	g. Verify IA to CNMT AOV-5392 - OPEN	

* *

CAUTION

RCS PRESSURE SHOULD BE MONITORED. IF RCS PRESSURE DECREASES IN AN UNCONTROLLED MANNER TO LESS THAN 250 PSIG [465 PSIG ADVERSE CNMT], THEN THE RHR PUMPS MUST BE MANUALLY RESTARTED TO SUPPLY WATER TO THE RCS.

* *

16	Check If RHR Pumps Should Be Stopped:	
	a. Check RCS pressure - GREATER THAN 250 psig [465 psig adverse CNMT]	a. Go to Step 17.
	b. Stop RHR pumps and place both in AUTO	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	**Establish Charging Flow:**	
	a. Charging pumps - ANY RUNNING	a. Perform the following: 1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN dispatch AO to locally close seal injection needle valves to affected RCP. • V-300A for RCP A • V-300B for RCP B 2) Ensure HCV-142 demand at 0%.
	b. Align charging pump suction to RWST: o LCV-112B - OPEN o LCV-112C - CLOSED	b. IF LCV-112B can NOT be opened, THEN dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room). IF LCV-112C can NOT be closed, THEN perform the following: 1) Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room). 2) Verify charging pump A NOT running and place in PULL STOP. 3) WHEN V-358 open, THEN direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
	c. Start charging pumps as necessary and establish 75 gpm total charging flow • Charging line flow • Seal injection	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Check If RCS Cooldown Should Be Stopped:	
	a. Core exit T/Cs - LESS THAN REQUIRED TEMPERATURE	a. Do NOT proceed until core exit T/Cs less than required temperature.
	b. Stop RCS cooldown	
	c. Stabilize core exit T/Cs - LESS THAN REQUIRED TEMPERATURE	
19	Check Ruptured S/G Pressure - STABLE OR INCREASING	IF pressure continues to decrease to less than 250 psi above the pressure of the intact S/G, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
20	Check RCS Subcooling Based On Core Exit T/Cs - GREATER THAN 20°F USING FIG-1.0, FIGURE MIN SUBCOOLING	Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1 .

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: SI ACCUMs may inject during RCS depressurization.

21 Depressurize RCS To Minimize Break Flow And Refill PRZR:

a. Check the following:

- Ruptured S/G level - LESS THAN 90% [80% adverse CNMT]
- Any RCP - RUNNING
- IA to CNMT - AVAILABLE

a. Go to Step 22.

b. Spray PRZR with maximum available spray until ANY of the following conditions satisfied:

- PRZR level - GREATER THAN 75% [65% adverse CNMT]

-OR-

- RCS pressure - LESS THAN SATURATION USING FIG-1.0, FIGURE MIN SUBCOOLING

-OR-

- BOTH of the following:
  1) RCS pressure - LESS THAN RUPTURED S/G PRESSURE
  2) PRZR level - GREATER THAN 5% [30% adverse CNMT]

c. Close normal PRZR spray valves:

1) Adjust normal spray valve controller to 0% DEMAND

2) Verify PRZR spray valves - CLOSED

- PCV-431A
- PCV-431B

c. Stop associated RCP(s).

d. Verify auxiliary spray valve (AOV-296) - CLOSED

d. Decrease charging speed to minimum and ensure charging valve to loop B cold leg open (AOV-294).

e. Go to Step 24

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- THE PRT MAY RUPTURE IF A PRZR PORV IS USED TO DEPRESSURIZE THE RCS. THIS MAY RESULT IN ABNORMAL CNMT CONDITIONS.
- CYCLING OF THE PRZR PORV SHOULD BE MINIMIZED.
- THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION IF RCPS ARE NOT RUNNING. THIS MAY RESULT IN A RAPIDLY INCREASING PRZR LEVEL.

* *

NOTE: o If auxiliary spray is in use, spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves.

o When using a PRZR PORV select one with an operable block valve.

22 Depressurize RCS Using PRZR PORV To Minimize Break Flow And Refill PRZR:

a. Verify IA to CNMT - AVAILABLE

a. Refer to ATT-12.0, ATTACHMENT N2 PORVS to operate PORVs.

b. PRZR PORVs - AT LEAST ONE AVAILABLE

b. IF auxiliary spray available, THEN return to Step 21b.

IF auxiliary spray can NOT be established, THEN go to ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, Step 1.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 22 continued from previous page)

c. Open one PRZR PORV until ANY of the following conditions satisfied:

- PRZR level - GREATER THAN 75% [65% adverse CNMT]

-OR-

- RCS pressure - LESS THAN SATURATION USING FIG-1.0, FIGURE MIN SUBCOOLING

-OR-

- BOTH of the following:

  1) RCS pressure - LESS THAN RUPTURED S/G PRESSURE

  2) PRZR level - GREATER THAN 5% [30% adverse CNMT]

c. IF auxiliary spray available, THEN return to step 21b.

1) IF auxiliary spray can NOT be established, THEN go to ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, Step 1.

d. Close PRZR PORVs

d. IF either PRZR PORV can NOT be closed, THEN close associated block valve.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	Check RCS Pressure - INCREASING	Close block valve for the PRZR PORV that was opened. IF pressure continues to decrease, THEN perform the following: a. Monitor the following conditions for indication of leakage from PRZR PORV: o PORV outlet temp (TI-438) NOT decreasing. o PRT pressure, level or temperature continue to increase. b. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

SI MUST BE TERMINATED WHEN TERMINATION CRITERIA ARE SATISFIED TO PREVENT OVERFILLING OF THE RUPTURED S/G.

24 Check If SI Flow Should Be Terminated:

a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING

a. Do NOT stop SI pumps. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

b. Secondary heat sink:

- o Total feed flow to S/G(s) - GREATER THAN 200 GPM AVAILABLE

-OR-

- o Narrow range level in at least one intact S/G - GREATER THAN 5% [25% adverse CNMT]

b. IF neither condition satisfied, THEN do NOT stop SI pumps. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

c. RCS pressure - STABLE OR INCREASING

c. Do NOT stop SI pumps. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

d. PRZR level - GREATER THAN 5% [30% adverse CNMT]

d. Do NOT stop SI pumps. Return to Step 6.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	Stop SI Pumps And Place In AUTO	
26	Establish Required Charging Line Flow:	
	a. Charging pumps - ANY RUNNING	a. Perform the following: 1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN dispatch AO to locally isolate seal injection to affected RCP: • RCP A, V-300A • RCP B, V-300B 2) Ensure HCV-142 open. 3) Start one charging pump.
	b. Establish 20 gpm charging line flow	
27	Monitor SI Reinitiation Criteria:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	a. Manually start SI pumps as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level. IF PRZR level can NOT be maintained, THEN manually start SI pumps as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28	Check If SI ACCUMs Should Be Isolated:	
	a. Check the following: o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING o PRZR level - GREATER THAN 5% [30% adverse CNMT]	a. Manually operate SI pumps as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	b. 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	
	c. Close SI ACCUM discharge valves • MOV-841 • MOV-865	c. Vent any unisolated ACCUMs: 1) Open vent valves for unisolated SI ACCUMs. • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945. IF an accumulator can NOT be isolated or vented, THEN consult TSC to determine contingency actions.
	d. Locally reopen breakers for MOV-841 and MOV-865	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29	**Verify Adequate SW Flow To CCW Hx:**	
	a. Verify at least three SW pumps - RUNNING	a. Manually start pumps as power supply permits (257 kw each). IF less than two SW pumps can be operated, THEN perform the following: 1) IF NO SW pumps running, THEN perform the following: a) Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress VOLTAGE SHUTDOWN pushbutton. b) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. 2) IF only one SW pump running, THEN refer to AP-SW.2, LOSS OF SERVICE WATER. 3) Go to Step 36.
	b. Verify AUX BLDG SW isolation valves - AT LEAST ONE SET OPEN • MOV-4615 and MOV-4734 • MOV-4616 and MOV-4735	b. Manually align valves.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 29 continued from previous page)

c. Verify CNMT RECIRC fan annunciator C-2, HIGH TEMPERATURE ALARM - EXTINGUISHED

c. Perform the following:

1) Determine required SW flow to CCW HXs per table:

SW DISCHARGE ALIGNMENT	CCW HXs IN SERVICE	REQUIRED SW FLOW
Normal	2	Total of 5000 - 6000 gpm equally divided to both HXs
Normal	1	5000 - 6000 gpm to in-service HX
Alternate	2	30-33" d/p across each HX
Alternate	1	95-100" d/p across in-service HX

2) Direct AO to adjust SW flow to required value.

- o IF on normal SW discharge:
  - V-4619, CCW Hx A
  - V-4620, CCW Hx B

-OR-

- o IF on alternate SW discharge:
  - V-4619C, CCW Hx A
  - V-4620B, CCW Hx B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30	Check If Normal CVCS Operation Can Be Established	
	a. Verify IA restored: o IA to CNMT (AOV-5392) - OPEN o IA pressure - GREATER THAN 60 PSIG	a. Continue with Step 36. WHEN IA restored, THEN do Steps 30 through 35.
	b. Verify instrument bus D - ENERGIZED	b. Energize MCC B. IF MCC B NOT available, THEN perform the following: 1) Verify MCC A energized. 2) Place instrument bus D on maintenance supply.
	c. CCW pumps - ANY RUNNING	c. Perform the following: 1) IF any RCP #1 seal outlet temperature offscale high, THEN isolate CCW to thermal barrier of affected RCP(s). • RCP A, MOV-749A and MOV-759A • RCP B, MOV-749B and MOV-759B 2) Manually start one CCW pump.
	d. Charging pump - ANY RUNNING	d. Continue with Step 36. WHEN any charging pump running, THEN do Steps 31 through 35.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31	Check If Seal Return Flow Should Be Established:	
	a. Verify RCP #1 seal outlet temperature - LESS THAN 235°F	a. Go to Step 32.
	b. Verify RCP seal outlet valves - OPEN • AOV-270A • AOV-270B	b. Manually open valves as necessary.
	c. Reset both trains of XY relays for RCP seal return isolation valve MOV-313	
	d. Open RCP seal return isolation valve MOV-313	d. Perform the following: 1) Place MOV-313 switch to OPEN. 2) Dispatch AO to locally open MOV-313.
	e. Verify RCP #1 seal leakoff flow - LESS THAN 6.0 GPM	e. Perform the following: 1) Trip the affected RCP 2) Allow 4 minutes for pump coast down, THEN close the affected RCP seal discharge valve • RCP A, AOV-270A • RCP B, AOV-270B IF both RCP seal discharge valves are shut, THEN go to Step 32.
	f. Verify RCP #1 seal leakoff flow - GREATER THAN 0.8 GPM	f. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
32	Verify PRZR Level - GREATER THAN 13% [40% adverse CNMT]	Continue with Step 34. WHEN PRZR level increases to greater than 13% [40% adverse CNMT], THEN do Step 33.
33	Establish Normal Letdown: a. Establish charging line flow to REGEN Hx - GREATER THAN 20 GPM b. Place the following switches to CLOSE: • Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202) • Letdown isolation valve AOV-371 • Loop B cold leg to REGEN Hx AOV-427 c. Place letdown controllers in MANUAL at 40% open • TCV-130 • PCV-135 d. Reset both trains of XY relays for AOV-371 and AOV-427 e. Open AOV-371 and AOV-427 f. Open letdown orifice valves as necessary g. Place TCV-130 in AUTO at 105°F h. Place PCV-135 in AUTO at 250 psig i. Adjust charging pump speed and HCV-142 as necessary	IF RCP seal return has been established, THEN establish excess letdown as follows: o Place excess letdown divert valve, AOV-312, to NORMAL. o Ensure CCW from excess letdown open, (AOV-745). o Open excess letdown isolation valve AOV-310. o Slowly open HCV-123 to maintain excess letdown temperature less than 195°F and pressure less than 100 psig. o Adjust charging pump speed as necessary. IF RCP seal return NOT established, THEN consult TSC to determine if excess letdown should be placed in service.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34	Check VCT Makeup System:	
	a. Adjust boric acid flow control valve in AUTO to 9.5 gpm	
	b. Adjust RMW flow control valve in AUTO to 40 gpm	
	c. Verify the following: 1) RMW mode selector switch in AUTO 2) RMW control armed - RED LIGHT LIT	c. Adjust controls as necessary.
	d. Check VCT level: o Level - GREATER THAN 20% -OR- o Level - STABLE OR INCREASING	d. Manually increase VCT makeup flow as follows: 1) Ensure BA transfer pumps and RMW pumps running. IF NOT, THEN reset MCC C and MCC D UV lockouts as necessary. 2) Place RMW flow control valve HCV-111 in MANUAL and increase RMW flow. 3) Increase boric acid flow as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
35	Check Charging Pump Suction Aligned To VCT:	
	a. VCT level - GREATER THAN 20%	a. IF VCT level can NOT be maintained greater than 5%, THEN perform the following: 1) Ensure charging pump suction aligned to RWST o LCV-112B open o LCV-112C closed 2) Continue with Step 36. WHEN VCT level greater than 40%, THEN do Step 35b.
	b. Verify charging pumps aligned to VCT o LCV-112C - OPEN o LCV-112B - CLOSED	b. Manually align valves as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

RCS AND RUPTURED S/G PRESSURES MUST BE MAINTAINED LESS THAN 1050 PSIG.

* *

***36 Control RCS Pressure And Charging Flow To Minimize RCS-To-Secondary Leakage:**

a. Perform appropriate action(s) from table:

PRZR LEVEL	RUPTURED S/G NARROW RANGE LEVEL		
	INCREASING	DECREASING	OFFSCALE HIGH
LESS THAN 13% [40% ADVERSE CNMT]	o Increase charging flow o Depressurize RCS using Step 36b	Increase charging flow	o Increase charging flow o Maintain RCS and ruptured S/G pressure equal
BETWEEN 13% [40% ADVERSE CNMT] AND 50%	Depressurize RCS using Step 36b	Energize PRZR heaters	Maintain RCS and ruptured S/G pressure equal
BETWEEN 50% AND 75% [65% ADVERSE CNMT]	o Depressurize RCS using Step 36b o Decrease charging flow	Energize PRZR heaters	Maintain RCS and ruptured S/G pressure equal
GREATER THAN 75% [65% ADVERSE CNMT]	o Decrease charging flow	Energize PRZR heaters	Maintain RCS and ruptured S/G pressure equal

b. Control pressure using normal PRZR spray, if available, to obtain desired results for Step 36a

b. IF letdown is in service, THEN use auxiliary spray (AOV-296). IF NOT, THEN use one PRZR PORV.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
37	Monitor If CNMT Spray Should Be Stopped:	
	a. CNMT spray pumps - ANY RUNNING	a. Go to Step 38.
	b. Verify CNMT pressure - LESS THAN 4 PSIG	b. Continue with Step 38. <u>WHEN</u> CNMT pressure less than 4 psig. <u>THEN</u> do Steps 37c through f.
	c. Reset CNMT spray	
	d. Check NaOH flow (FI-930) - NO FLOW	d. Place NaOH tank outlet valve switches to CLOSE. • 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	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38	Check If Emergency D/Gs Should Be Stopped:	
	a. Verify AC emergency busses energized by offsite power: o Emergency D/G output breakers - OPEN o AC emergency bus voltage - GREATER THAN 420 VOLTS o AC emergency bus normal feed breakers - CLOSED	a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
	b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)	
39	Minimize Secondary System Contamination:	
	a. Isolate reject from hotwell to CST: o Place hotwell level controller (LC-107) in MANUAL at 50% o Verify hotwell level - STABLE	a. IF hotwell level increasing, THEN direct RP to sample hotwells for activity.
	b. Check status of local actions to complete ruptured S/G isolation (Refer to ATT-16.0, ATTACHMENT RUPTURED S/G)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

40 Energize PRZR Heaters As Necessary To Saturate PRZR Water At Ruptured S/G Pressure

41 Check RCP Cooling:

Establish normal cooling to RCPs (Refer to ATT-15.2, ATTACHMENT SEAL COOLING).

a. Check CCW to RCPs:

- o Annunciator A-7, RCP 1A CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED
- o Annunciator A-15, RCP 1B CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED

b. Check RCP seal injection:

- o Labyrinth seal D/Ps - GREATER THAN 15 INCHES OF WATER

-OR-

- o RCP seal injection flow to each RCP - GREATER THAN 6 GPM

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.

42	Check RCP Status	
	a. Both RCPs - STOPPED	a. Stop all but one RCP and go to step 43.
	b. Ensure conditions for starting an RCP. o Bus 11A or 11B energized. o Refer to ATT-15.0, ATTACHMENT RCP START.	b. IF conditions can NOT be met, THEN perform the following: 1) Verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC). IF natural circulation can NOT be verified, THEN increase dumping steam. 2) Go to step 43.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 42 continued from previous page)	
	c. Check RVLIS level (no RCPs) - ≥ 95%	c. IF RVLIS level (no RCPs) less than 95%, THEN perform the following: o Increase PRZR level to greater than 65% [82% adverse CNMT]. o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING. o Energize PRZR heaters as necessary to saturate PRZR water IF conditions NOT met, THEN continue with step 43. WHEN conditions met, THEN do step 42d.
	d. Start one RCP	d. IF an RCP can NOT be started, THEN verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC). IF natural circulation can NOT be verified, THEN increase dumping steam.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Adverse CNMT conditions or loss of forced air cooling may result in failure of NIS detectors.

43 Check If Source Range Detectors Should Be Energized:

a. Source range channels - DEENERGIZED

a. Go to Step 43e.

b. Check intermediate range flux - EITHER CHANNEL LESS THAN 10^{-10} AMPS

b. Perform the following:

1) IF neither intermediate range channel is decreasing, THEN initiate boration.

2) Continue with Step 44. WHEN flux is LESS THAN 10^{-10} amps on any operable channel, THEN do Steps 43c through e.

c. Check the following:

- Both intermediate range channels - LESS THAN 10^{-10} AMPS

-OR-

- Greater than 20 minutes since reactor trip

c. Continue with Step 44. WHEN either condition met, THEN do Steps 43d and e.

d. Verify source range detectors - ENERGIZED

d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2).

IF source ranges can NOT be restored, THEN refer to ER-NIS.1, SR MALFUNCTION and go to Step 44.

e. Transfer Rk-45 recorder to one source range and one intermediate range channel

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
44	**Establish Normal Shutdown Alignment:**	
	a. Check condenser - AVAILABLE	a. Dispatch AO to perform ATT-17.1, ATTACHMENT SD-2.
	b. Perform the following: o Open generator disconnects • 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	
	c. Verify adequate Rx head cooling: 1) Verify at least one control rod shroud fan - RUNNING 2) Verify one Rx compartment cooling fan - RUNNING	1) Manually start one fan as power supply permits (45 kw) 2) Perform the following: o Dispatch AO to reset UV relays at MCC C and MCC D. o Manually start one fan as power supply permits (23 kw)
	d. Verify ATT-17.0, ATTACHMENT SD-1 - COMPLETE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

45 Consult TSC To Determine Appropriate Post-SGTR Cooldown Procedure:

- Go to ES-3.1, POST-SGTR COOLDOWN USING BACKFILL, Step 1

-OR-

- Go to ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, Step 1

-OR-

- Go to ES-3.3, POST-SGTR COOLDOWN USING STEAM DUMP, Step 1

-END-

E-3 APPENDIX LIST

TITLE

1) RED PATH SUMMARY
2) FIGURE MIN SUBCOOLING (FIG-1.0)
3) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
4) ATTACHMENT D/G STOP (ATT-8.1)
5) ATTACHMENT N2 PORVS (ATT-12.0)
6) ATTACHMENT NC (ATT-13.0)
7) ATTACHMENT SEAL COOLING (ATT-15.2)
8) ATTACHMENT RCP START (ATT-15.0)
9) ATTACHMENT RUPTURED S/G (ATT-16.0)
10) ATTACHMENT SD-1 (ATT-17.0)
11) ATTACHMENT SD-2 (ATT-17.1)
12) ATTACHMENT NO SW PUMPS (ATT-2.4)
13) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
14) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
15) FOLDOUT

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 52% [55% 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

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

IF no SW pumps are available, THEN perform the following:

a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. SI REINITIATION CRITERIA

Following SI termination, IF either condition listed below occurs, THEN start SI pumps manually as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1:

- RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING REQUIREMENTS OF FIG-1.0, FIGURE MIN SUBCOOLING.

OR

- PRZR level - CHARGING CAN NOT CONTROL 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, UNLESS faulted S/G needed for RCS cooldown.

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. MULTIPLE S/G TUBE RUPTURE CRITERIA

IF any intact S/G level increases in in an uncontrolled manner OR IF any intact S/G has abnormal radiation, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

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

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF SI ACTUATION OCCURS DURING THIS PROCEDURE, THEN E-0, REACTOR TRIP OR SAFETY INJECTION, SHOULD BE PERFORMED.

* *

NOTE: 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 Refer to AP(s) that were in effect prior to the reactor trip.

* 1 Monitor RCS Tavg - STABLE AT OR TRENDING TO 547°F

IF temperature less than 547°F and decreasing, THEN perform the following:

a. Stop dumping steam.

b. Ensure S/G blowdown and sample valves closed.

c. Ensure reheater steam supply valves are closed.

d. IF MDAFW pumps supplying greater than 200 gpm, THEN ensure TDAFW pump steam supply valves in PULL STOP.

e. IF cooldown continues, THEN control total feed flow greater than 200 gpm until narrow range level greater than 5% in at least one S/G. WHEN S/G level greater than 5% in one S/G, THEN limit feed flow to that required to maintain S/G level.

f. IF cooldown continues below 540°F, THEN close both MSIVs.

IF temperature greater than 547°F and increasing, THEN dump steam to stabilize and slowly decrease temperature to 547°F.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Check S/G Feed Flow Status:	
	a. Check RCS Tavg - LESS THAN 554°F	a. Continue with Step 3. WHEN temperature less than 554°F, THEN do Steps 2b through f.
	b. Verify MFW flow control valves - CLOSED • MFW regulating valves • MFW bypass valves	b. Place A and B MFW regulating valve and bypass valve controllers in MANUAL at 0% demand.
	c. Verify total AFW flow - GREATER THAN 200 GPM	c. Manually start both MDAFW pumps. IF total AFW flow greater than 200 gpm can NOT be established, THEN perform the following: o Manually start TDAFW pump. -OR- o Perform the following: 1) Establish MFW on bypass valves. 2) Go to step 3.
	d. Close MFW pump discharge valves • MOV-3977, A MFW pump • MOV-3976, B MFW pump	
	e. Stop MFW pumps and place in PULL STOP	
	f. WHEN both MFP pumps are stopped, THEN place A and B MFW regulating valve and bypass valve controllers in MANUAL at 0% demand.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 3	Monitor S/G Levels:	
	a. Narrow range level - GREATER THAN 5%	a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% in at least one S/G.
	b. Control feed flow to maintain narrow range level between 17% and 52%.	b. IF narrow range level in any S/G continues to increase, THEN stop feed to that S/G.
4	Verify MRPI Indicates - ALL CONTROL AND SHUTDOWN RODS ON BOTTOM	IF one or more control rods NOT fully inserted, THEN perform the following: a. Place RMW mode selector switch to BORATE. b. Adjust boric acid flow control valve, FCV-110A, for desired flowrate. c. Set boric acid integrator to desired amount (650 gallons for each control rod not fully inserted). d. Place RMW control to start and verify flow. IF flow can NOT be established, THEN refer to ER-CVCS.1, REACTOR MAKEUP CONTROL MALFUNCTION.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	**Verify All AC Busses - ENERGIZED BY OFFSITE POWER** o Normal feed breakers to all 480 volt busses - CLOSED o 480 volt bus voltage - GREATER THAN 420 VOLTS o Emergency D/G output breakers - OPEN	Perform the following: a. IF any AC emergency bus normal feed breaker open, THEN ensure associated D/G breaker closed. b. Perform the following as necessary: 1) Ensure one CCW pump running. 2) Close non-safeguards bus tie breakers: • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 3) Reset Bus 13 and Bus 15 lighting breakers. 4) Dispatch AO to locally reset and start adequate air compressors. 5) Place the following pumps in PULL STOP: • EH pumps • Turning gear oil pump • HP seal oil backup pump 6) Restore power to MCCs. • A from Bus 13 • B from Bus 15 • E from Bus 15 • F from Bus 15 7) Start HP seal oil backup pump 8) Establish 2 CNMT RECIRC fans in service (205 kw each). 9) Ensure D/G load within limits. c. Try to restore offsite power to all AC busses (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Verify At Least Two SW Pumps - RUNNING	Manually start SW pumps as necessary. IF NO SW pumps running, THEN perform the following: a. Pull stop D/G that is NOT supplied by alternate cooling AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS IF only one SW pump running, THEN refer to AP-SW.2, LOSS OF SERVICE WATER.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	**Verify IA Available:** o Adequate air compressor(s) - RUNNING o IA pressure - GREATER THAN 60 PSIG	Dispatch AO to locally reset and start adequate air compressors. IF adequate electric air compressor(s) can NOT be operated, THEN use diesel air compressor. (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) IF IA pressure can NOT be maintained, THEN perform the following: a. Refer to AP-IA.1, LOSS OF INSTRUMENT AIR. b. Verify charging pump A NOT running and place in PULL STOP. c. Dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room). d. WHEN V-358 open, THEN direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Check PRZR Level Control:	
	a. Verify charging pumps - ANY RUNNING	a. Perform the following: 1) Close letdown isolation, AOV-427. 2) Manually start one charging pump.
	b. PRZR level - GREATER THAN 13%	b. Perform the following: 1) Place letdown isolation AOV-427 switch to close. 2) Verify excess letdown isolation valve AOV-310 closed. 3) Ensure PRZR heaters off. 4) Control charging to restore PRZR level greater than 13%. 5) Continue with Step 9. <u>WHEN</u> PRZR level greater than 13%, <u>THEN</u> do Steps 8c through e.
	c. Verify letdown - IN SERVICE	c. Verify excess letdown in service. <u>IF NOT</u>, <u>THEN</u> manually place letdown in service (Refer to ATT-9.0, ATTACHMENT LETDOWN).
	d. PRZR level - TRENDING TO 35%	d. Control charging and letdown to maintain PRZR level at 35%.
	e. Check PRZR heaters - ENERGIZED o PRZR proportional heaters o PRZR heater backup group	e. Reset PRZR heaters and energize to restore PRZR pressure.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	**Check PRZR Pressure Control:**	
	a. PRZR pressure - GREATER THAN 1750 PSIG	a. Perform the following: 1) Verify SI actuation. IF NOT, THEN manually actuate SI and CI. 2) Go to E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1.
	b. PRZR pressure - GREATER THAN 2210 PSIG	b. IF pressure less than 2210 PSIG and decreasing, THEN perform the following: 1) Ensure PRZR PORVs closed. IF any valve can NOT be closed, THEN manually close its block valve. • PCV-430, MOV-516 • PCV-431C, MOV-515 2) Ensure normal PRZR spray valves closed. • PCV-431A • PCV-431B IF valves can NOT be closed, THEN stop associated RCP(s). 3) Ensure PRZR heaters energized.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 9 continued from previous page)

c. PRZR pressure - LESS THAN 2260 PSIG

c. IF pressure greater than 2260 psig and increasing, THEN perform the following:

1) Verify demand on PRZR pressure controller 431K greater than 50%. IF NOT, THEN place controller in MANUAL and adjust to restore PRZR pressure to approximately 2235 psig.

2) Ensure PRZR heaters off.

3) Control pressure using normal PRZR spray.

IF normal PRZR spray NOT available and letdown is in service, THEN perform the following:

a) Verify spray line fluid to PRZR ΔT less than 320°F. IF NOT, THEN use one PORV.

b) Use auxiliary spray.

IF PRZR spray NOT available, THEN use one PRZR PORV.

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Check RCP Status - AT LEAST ONE RUNNING	Perform the following: a. Establish conditions for starting an RCP: o Ensure bus 11A or 11B energized. o Refer to ATT-15.0, ATTACHMENT RCP START. b. Start one RCP. IF an RCP can NOT be started, THEN verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC). IF natural circulation NOT verified, THEN increase dumping steam.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Loss of forced air cooling may result in failure of NIS detectors.

13 Check If Source Range Detectors Should Be Energized:

a. Source range channels - DEENERGIZED

a. Go to Step 13e.

b. Check intermediate range flux - EITHER CHANNEL LESS THAN 10^{-10} AMPS

b. Perform the following:

1) IF neither intermediate range channel is decreasing THEN initiate boration.

2) Continue with Step 14. WHEN flux is less than 10^{-10} amps on any operable channel, THEN do Steps 13c, d and e.

c. Check the following:

- Both intermediate range channels - LESS THAN 10^{-10} AMPS

-OR-

- Greater than 20 minutes since reactor trip

c. Continue with Step 14. When either condition met, THEN do Steps 13d and e.

d. Verify source range detectors - ENERGIZED

d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2).

IF source ranges can NOT be restored, THEN refer to ER-NIS.1, SR MALFUNCTION, and go to Step 14.

e. Transfer Rk-45 recorder to one source range and one intermediate range channel

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	**Establish Normal Shutdown Alignment:**	
	a. Check condenser - AVAILABLE	a. Dispatch AO to perform ATT-17.1, ATTACHMENT SD-2.
	b. Perform the following: o Open generator disconnects • 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 (Refer to T-5F, STARTING OR STOPPING THE CONDENSATE PUMPS)	
	c. Verify adequate Rx head cooling: 1) Verify at least one control rod shroud fan - RUNNING 2) Verify one Rx compartment cooling fan - RUNNING	1) Manually start one fan as power supply permits (45 kw). 2) Manually start one fan as power supply permits (23 kw).
	d. Dispatch AO to perform ATT-17.0, ATTACHMENT SD-1	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	**Maintain Stable Plant Conditions:**	
	a. PRZR pressure - BETWEEN 1800 PSIG AND 2260 PSIG	a. Control PRZR heaters and spray as necessary.
	b. PRZR level - BETWEEN 35% AND 40%	b. Control charging as necessary.
	c. S/G narrow range levels - BETWEEN 17% AND 52%	c. Control S/G feed flow as necessary.
	d. RCS Tavg - GREATER THAN 540°F	d. Close both MSIVs.
16	**Check VCT Makeup System:**	
	a. Verify the following: 1) Adjust boric acid flow control valve to 9.5 gpm 2) Adjust RMW flow control valve to 40 gpm 3) RMW mode selector switch in AUTO 4) RMW control armed - RED LIGHT LIT	
	b. Check VCT level o Level - GREATER THAN 20% -OR- o Level - STABLE OR INCREASING	b. Manually increase VCT makeup flow as follows: 1) Ensure BA transfer pumps and RMW pumps running. 2) Place RMW flow control valve HCV-111 in MANUAL and increase RMW flow.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	**Check Charging Pump Suction Aligned To VCT:**	
	a. VCT level - GREATER THAN 20%	a. IF VCT level can NOT be maintained greater than 5%, THEN perform the following: 1) Ensure charging pump suction aligned to RWST o LCV-112B open o LCV-112C closed 2) Continue with Step 18. WHEN VCT level greater than 40%, THEN do Step 17b.
	b. Align charging pumps to VCT o LCV-112C - OPEN o LCV-112B - CLOSED	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Verify TDAFW Pump Aligned For AUTO Start:	
	a. Any MDAFW pump - AVAILABLE	a. Verify TDAFW pump operating to maintain required S/G level and go to Step 20.
	b. Verify AMSAC TRIPPED status light - EXTINGUISHED	b. Reset AMSAC.
	c. Verify both S/G levels - GREATER THAN 17%	c. Continue with Step 20. <u>WHEN</u> S/G level greater than 17%, <u>THEN</u> do Steps 18d, e and 19.
	d. Verify Bus 11A and Bus 11B - AT LEAST ONE ENERGIZED	d. Perform the following: 1) <u>IF</u> TDAFW pump <u>NOT</u> required to maintain S/G level, <u>THEN</u> pull stop TDAFW pump steam supply valves: • MOV-3504A • MOV-3505A 2) Go to Step 19.
	e. Verify the following: 1) TDAFW pump - OFF	1) Perform the following: a) <u>IF</u> TDAFW pump required to maintain S/G level, <u>THEN</u> go to Step 20. b) Stop TDAFW pump.
	2) TDAFW pump steam supply valve switches in AUTO	2) Place TDAFW pump steam supply valve switches in AUTO.
	3) Verify TDAFW flow control valves - OPEN, DEMAND AT 0 • AOV-4297 • AOV-4298	3) Open TDAFW flow control valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	**Establish Normal AFW Pump Shutdown Alignment:**	
	a. Verify the following: o Both S/G levels - GREATER THAN 17% AND STABLE OR INCREASING o Total AFW flow - LESS THAN 200 GPM	a. Continue with Step 20. WHEN conditions met, THEN do Steps 19b through f.
	b. Close MDAFW pump discharge valves • MOV-4007 • MOV-4008	
	c. Place AFW bypass switches to DEF	
	d. Stop all but one MDAFW pump	
	e. Open AFW discharge crossover valves • MOV-4000A • MOV-4000B	
	f. Adjust AFW bypass valves to control S/G levels • AOV-4480 • AOV-4481	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	Determine If Cooldown Is Required:	
	a. Consult Plant Staff - COOLDOWN REQUIRED	a. Go to O-3, HOT SHUTDOWN WITH XENON PRESENT.
	b. At least one RCP - RUNNING	b. Perform the following: 1) Ensure 2 control rod shroud fans running. 2) Go to ES-0.2, NATURAL CIRCULATION COOLDOWN, Step 1.
	c. Go to O-2.1, NORMAL SHUTDOWN TO HOT SHUTDOWN	

-END-

ES-0.1 APPENDIX LIST

TITLE

1) RED PATH SUMMARY
2) FIGURE MIN SUBCOOLING (FIG-1.0)
3) ATTACHMENT LETDOWN (ATT-9.0)
4) ATTACHMENT RCP START (ATT-15.0)
5) ATTACHMENT NC (ATT-13.0)
6) ATTACHMENT SD-1 (ATT-17.0)
7) ATTACHMENT SD-2 (ATT-17.1)
8) ATTACHMENT NO SW PUMPS (ATT-2.4)
9) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
10) FOLDOUT

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 52% [55% 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

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

   IF no SW pumps are available, THEN perform the following:

   a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

   b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. SI ACTUATION CRITERIA

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

   - RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING

   - OR -

   - PRZR level - LESS THAN 5% [30% adverse CNMT] AND RCS subcooling based on core exit T/Cs - LESS THAN 20°F USING FIG-1.0, FIGURE MIN SUBCOOLING

   - OR -

   - Any automatic SI setpoint is reached

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).

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to perform a natural circulation RCS cooldown and depressurization to cold shutdown, with no accident in progress, under requirements that will preclude any upper head void formation.

B. SYMPTOMS AND/OR ENTRY CONDITIONS

This procedure is entered from:

1) ES-0.1, REACTOR TRIP RESPONSE, when it has been determined that a natural circulation cooldown is required.

2) ECA-0.1, LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED, when it has been determined that a natural circulation cooldown is required.

3) Other normal operating procedures when a natural circulation cooldown is required.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- IF SI ACTUATION OCCURS DURING THIS PROCEDURE, E-0, REACTOR TRIP OR SAFETY INJECTION, SHOULD BE PERFORMED.
- 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:

a. Establish conditions for starting an RCP:
   - o Bus 11A or 11B energized
   - o Refer to ATT-15.0, ATTACHMENT RCP START

   — a. Go to Step 2.

b. Start one RCP

c. Any RCP - RUNNING — c. Go to Step 2.

d. Go to O-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITION

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

2 Check VCT Makeup System:

a. Verify the following:

1) Boric acid flow control valve - SET FOR REQUIRED CSD CONCENTRATION (Refer to FIG-2.0, FIGURE SDM)

2) RMW flow control valve - SET FOR REQUIRED CSD CONCENTRATION

3) RMW mode selector switch in AUTO

4) RMW control armed - RED LIGHT LIT

b. Check VCT level

- Level - GREATER THAN 20%

-OR-

- Level - STABLE OR INCREASING

b. Manually increase VCT makeup flow as follows:

1) Ensure BA transfer pumps and RMW pumps running.

2) Place RMW flow control valve HCV-111 in MANUAL and increase RMW flow.

3) Increase boric acid flow as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Check Charging Pump Suction Aligned To VCT:	
	a. Check VCT level: o Level - GREATER THAN 20% o VCT makeup system - AVAILABLE	a. IF VCT level can NOT be maintained greater than 5%, THEN perform the following: 1) Ensure charging pump suction aligned to RWST o LCV-112B open o LCV-112C closed 2) Continue with Step 4. WHEN VCT level greater than 40%, THEN do Step 3b.
	b. Verify the following: o LCV-112C - OPEN o LCV-112B - CLOSED	b. Manually align valves as necessary.
4	Borate RCS To Cold Shutdown Boron Concentration (Refer to FIG-2.0, FIGURE SDM)	
* 5	Establish Maximum Rx Vessel Head Cooling:	
	a. Check control rod shroud fans - BOTH RUNNING	a. Establish 2 control rod shroud fans running (45 kw each)
	b. Check one Rx compartment cooling fan - RUNNING	b. Start one Rx compartment cooling fan (23 kw)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Verify Adequate Shutdown Margin	
	a. Direct RP to sample the RCS for boron concentration • RCS loop A • RCS loop B • PRZR	
	b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0, FIGURE SDM	b. Perform the following: 1) Maintain RCS average temperature greater than 500°F until adequate SDM established. 2) Continue to borate as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- SI MUST BE BLOCKED BEFORE S/G PRESSURE DECREASES TO 514 PSIG.
- 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.

* *

7	**Initiate RCS Cooldown To Cold Shutdown:**	
	a. Dump steam to condenser	a. Manually or locally dump steam using S/G ARVs.
	b. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 25°F/HR	
	c. Maintain S/G narrow range level - BETWEEN 17% AND 52%	c. Control feed flow as necessary.
	d. Plot RCS cold leg temperatures and PRZR temperature twice per hour (Refer to O-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD SHUTDOWN)	
8	**Check RCS Hot Leg Temperatures - LESS THAN 550°F**	Return to Step 7.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: 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.

9 Depressurize RCS To 1950 PSIG:

a. Check letdown - IN SERVICE

a. Try to establish letdown (Refer to ATT-9.0, ATTACHMENT LETDOWN).

IF letdown can NOT be established, THEN depressurize RCS using one PRZR PORV and go to Step 10.

b. Depressurize RCS using auxiliary spray valve (AOV-296)

b. IF auxiliary spray valve NOT available, THEN use one PRZR PORV.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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

* *

***10 Monitor SI Block Criteria:**

a. Check the following:

- o PRZR pressure - LESS THAN 1950 PSIG

-OR-

- o LOW PRZR PRESS BLOCK SAF INJEC status light - LIT

a. Return to Step 9.

b. Place SI block switches to BLOCK

- Train A
- Train B

c. Verify SAFETY INJECTION BLOCKED status light - LIT

c. Maintain PRZR pressure greater than 1750 psig and S/G pressure greater than 514 psig until SI blocked.

11 Determine RCS Pressure And Temperature Limits:

a. Check control rod shroud fans - BOTH RUNNING

a. Perform the following:

1) Maintain RCS pressure within limits of FIG-3.1, FIGURE NAT CIRC C/D WITHOUT SHROUD FANS.

2) Go to Step 12.

b. Maintain RCS pressure - WITHIN LIMITS OF FIG-3.0, FIGURE NAT CIRC C/D WITH SHROUD FANS

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

*12 Maintain PRZR Level Between 35% And 40%

*13 Monitor RCS Cooldown:

- o Core exit T/Cs - DECREASING
- o RCS hot leg temperatures - DECREASING
- o RCS subcooling based on core exit T/Cs - INCREASING
- o Cooldown rate in RCS cold legs - LESS THAN 25°F/HR

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.

NOTE:
- o If at any time it is determined that a natural circulation cooldown and depressurization must be performed at a rate that may form a steam void in the vessel, then procedure ES-0.3, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL, should be used.
- 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.

14 Initiate RCS Depressurization:

a. Check letdown - IN SERVICE	a. Try to establish letdown (Refer to ATT-9.0, ATTACHMENT LETDOWN). IF letdown can NOT be established, THEN depressurize RCS using one PRZR PORV and go to Step 15.
b. Depressurize RCS using auxiliary spray valve (AOV-296)	b. IF auxiliary spray valve NOT available, THEN use one PRZR PORV.
c. Plot RCS temperature and pressure on curve selected in Step 11 hourly	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	**Continue Cooldown And Depressurization:**	
	a. Check RCS cold leg temperature - GREATER THAN 335°F	a. Stabilize RCS temperature and go to Step 15c.
	b. Maintain cooldown rate in RCS cold legs - LESS THAN 25°F/HR	
	c. Maintain RCS temperature and pressure within limits of Figure determined previously	c. Control RCS pressure as necessary to restore pressure/ temperature relationship to within limits of appropriate Figure.
16	**Establish Required RCS Hydrogen Concentration (Refer to S-3.3C, H2 OR O2 REMOVAL FROM PRIMARY SYSTEM BY BURPING VCT)**	
17	**Check For Steam Void In Reactor Vessel:**	Repressurize RCS within allowable limits and continue cooldown.
	o PRZR level - NO UNEXPECTED LARGE VARIATIONS	IF RCS depressurization must continue, THEN go to ES-0.3, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL.
	o RVLIS level (no RCPs) - GREATER THAN 95%	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Check If SI ACCUMs Should Be Isolated:	
	a. RCS pressure - LESS THAN 1500 PSIG	a. Continue with Step 19. WHEN RCS pressure is less than 1500 psig, THEN do Steps 18b through d.
	b. 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	
	c. Close SI ACCUM discharge valves • ACCUM A, MOV-841 • ACCUM B, MOV-865	c. IF any valve can NOT be closed, THEN 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.
	d. Locally open breakers for MOV-841 and MOV-865	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*19	Maintain Letdown Flow: a. Open letdown orifice valves as necessary b. Adjust low pressure letdown control valve setpoint as necessary	
*20	Maintain Required RCP Seal Injection Flow And Labyrinth Seal D/P: o Labyrinth seal D/P to each RCP - GREATER THAN 15 INCHES OF WATER o Seal injection flow to each RCP - GREATER THAN 6 GPM	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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

21 Check If SI System Normal Shutdown Alignment Should Be Established:

a. RCS cold leg temperature - LESS THAN 350°F

a. Return to Step 15.

b. 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

- MOV-878B, MCC D position 8C
- MOV-878D, MCC D position 8F

3) Close SI pump discharge to cold legs

- MOV-878B
- MOV-878D

4) Locally open breakers for MOV-878B and MOV-878D

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	**Check If RHR Normal Cooling Can Be Established:**	
	a. RCS pressure - LESS THAN 400 PSIG	a. Stabilize RCS temperature and return to Step 15.
	b. Verify all SI pump switches in PULL STOP	b. Return to Step 21.
	c. Place RCS overpressure protection system in service (Refer to O-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	c. <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 23.
	d. Establish RHR normal cooling (Refer to ATT-14.1, ATTACHMENT RHR COOL)	
23	**Continue RCS Cooldown To Cold Shutdown**	

* *

CAUTION

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

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	**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 both S/Gs	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

IF LESS THAN TWO CONTROL ROD SHROUD FANS ARE RUNNING, THE UPPER HEAD REGION MAY REMAIN ABOVE 200°F FOR UP TO 29 HOURS AFTER REACHING CSD.

25 Determine If RCS Depressurization Is Permitted:

a. Entire RCS - LESS THAN 200°F

- Core exit T/Cs
- Upper head T/Cs
- RCS hot leg temperature
- RCS cold leg temperature

a. Do NOT depressurize RCS.

Return to Step 23.

b. Check control rod shroud fan status - BOTH RUNNING DURING COOLDOWN

b. Consult Plant staff to determine wait period for upper head cooling.

c. Maintain cold shutdown conditions (Refer to O-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS)

-END-

ES-0.2 APPENDIX LIST

TITLE

1) FIGURE MIN SUBCOOLING (FIG-1.0)
2) FIGURE SDM (FIG-2.0)
3) FIGURE NAT CIRC C/D WITHOUT SHROUD FANS (FIG-3.1)
4) FIGURE NAT CIRC C/D WITH SHROUD FANS (FIG-3.0)
5) ATTACHMENT RCP START (ATT-15.0)
6) ATTACHMENT LETDOWN (ATT-9.0)
7) ATTACHMENT RHR COOL (ATT-14.1)
8) ATTACHMENT NO SW PUMPS (ATT-2.4)
9) FOLDOUT

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

IF no SW pumps are available, THEN perform the following:

a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. SI ACTUATION CRITERIA

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

- RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING REQUIREMENTS OF FIG-1.0, FIGURE MIN SUBCOOLING

- OR -

- 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).

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to continue plant cooldown 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 13 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

CAUTION

- IF SI ACTUATION OCCURS DURING THIS PROCEDURE, E-0, REACTOR TRIP OR SAFETY INJECTION, SHOULD BE PERFORMED.
- THE FIRST 13 STEPS OF ES-0.2, NATURAL CIRCULATION COOLDOWN, SHOULD BE PERFORMED BEFORE CONTINUING WITH THIS PROCEDURE.
- 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:	
	a. Verify Bus 11A or Bus 11B - ENERGIZED	a. Go to Step 2.
	b. Establish conditions for starting an RCP (Refer to ATT-15.0, ATTACHMENT RCP START)	b. Go to Step 2.
	c. Check RVLIS indication: o At least one train of RVLIS - AVAILABLE o Level (no RCPs) - GREATER THAN 95%	c. Perform the following: 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 FIG-1.0, FIGURE MIN SUBCOOLING. 3) Energize PRZR heaters as necessary to saturate PRZR water.
	d. Start one RCP	
	e. Any RCP - RUNNING	e. Go to Step 2.
	f. Go to O-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITION	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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	

* *

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.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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 - LESS THAN 1900 PSIG	
	c. Maintain RCS cold leg temperatures and pressure - WITHIN LIMITS OF FIG-3.2, 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:

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

Perform the following:

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

CAUTION

THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.

NOTE: 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.

5	**Depressurize RCS To 1500 PSIG:**	
	a. Check letdown - IN SERVICE	a. Try to establish letdown (Refer to ATT-9.0, ATTACHMENT LETDOWN). IF letdown can NOT be established, THEN depressurize RCS using one PRZR PORV and go to Step 5c.
	b. Depressurize RCS using auxiliary spray valve (AOV-296)	b. IF auxiliary spray valve NOT available, THEN use one PRZR PORV.
	c. Check RCS pressure - APPROXIMATELY 1500 PSIG	c. Return to Step 5a.
	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

* *

CAUTION

IF RCP SEAL COOLING TO ANY RCP IS LOST, THEN THE RCS COOLDOWN RATE SHALL NOT EXCEED 60°F/HR.

* *

7	**Continue RCS Cooldown And Depressurization:**	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Maintain RCS pressure - WITHIN LIMITS OF FIG-3.2, FIGURE NC C/D WITH VOID IN UPPER HEAD	
	c. Check RCS cold leg temperature - GREATER THAN 335°F	c. Stabilize RCS temperature.
	d. Check letdown - IN SERVICE	d. Try to establish letdown (Refer to ATT-9.0, ATTACHMENT LETDOWN). IF letdown can NOT be established, THEN depressurize RCS using one PRZR PORV and go to Step 8.
	e. Depressurize RCS using auxiliary spray valve (AOV-296)	e. IF auxiliary spray valve NOT available, THEN use one PRZR PORV.

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 93%	b. Perform the following: 1) Repressurize RCS to maintain RVLIS level greater than 93%. 2) Return to Step 7.

STEP	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. 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

- MOV-878B, MCC D position 8C
- MOV-878D, MCC D position 8F

3) Close SI pump discharge to cold legs

- 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. Place RCS overpressure protection system in service (Refer to O-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	c. IF RCS overpressure protection system can NOT be placed in service, THEN consult Plant staff to determine if RHR normal cooling should be established and go to Step 14.
	d. Establish RHR normal cooling (Refer to ATT-14.1, ATTACHMENT RHR COOL)	
14	**Continue RCS Cooldown To Cold Shutdown**	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

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	1) Go to Step 16.
2) Level (no RCPs) - GREATER THAN 95%	2) Stabilize RCS pressure and return to Step 14.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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:

a. Check PRZR level - LESS THAN 30%

a. Perform the following:

1) Turn on PRZR heaters to maintain PRZR pressure stable.

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.

b. Entire RCS - LESS THAN 200°F

- Core exit T/Cs
- Upper head T/Cs
- RCS hot leg temperature
- RCS cold leg temperature

b. Do NOT depressurize RCS. Return to Step 14.

c. Check control rod shroud fan status - BOTH RUNNING DURING COOLDOWN

c. Consult Plant staff to determine wait period for upper head cooling.

d. Refer to O-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS

-END-

ES-0.3 APPENDIX LIST

TITLE

1) FIGURE MIN SUBCOOLING (FIG-1.0)
2) FIGURE NC C/D WITH VOID IN UPPER HEAD (FIG-3.2)
3) ATTACHMENT RCP START (ATT-15.0)
4) ATTACHMENT RHR COOL (ATT-14.1)
5) ATTACHMENT LETDOWN (ATT-9.0)
6) ATTACHMENT NO SW PUMPS (ATT-2.4)
7) FOLDOUT

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

IF no SW pumps are available, THEN perform the following:

a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. SI ACTUATION CRITERIA

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

- RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING REQUIREMENTS OF FIG-1.0, FIGURE MIN SUBCOOLING

- OR -

- 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).

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides the necessary instructions to terminate safety injection and stabilize plant conditions.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

a. E-0, REACTOR TRIP OR SAFETY INJECTION, and E-1, LOSS OF REACTOR OR SECONDARY COOLANT, when specified termination criteria are satisfied.

b. FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, after secondary heat sink has been reestablished and SI has been terminated.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

IF OFFSITE POWER IS LOST AFTER SI RESET, THEN MANUAL ACTION MAY BE REQUIRED TO RESTART SAFEGUARDS EQUIPMENT. (REFER TO ATT-8.5, ATTACHMENT LOSS OF OFFSITE POWER)

NOTE: o FOLDOUT page should be open AND monitored periodically.

o Critical Safety Function Status Trees should be monitored (Refer to Appendix I for Red Path Summary).

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 Reset SI

2 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.

3 Maintain PRZR Pressure Between 1800 PSIG And 2235 PSIG

o Reset PRZR heaters

o Use normal PRZR spray

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	**Verify Adequate SW Flow:**	
	a. Check at least two SW pumps - RUNNING	a. Manually start SW pumps as power supply permits (257 kw each). IF less than two SW pumps running, THEN perform the following: 1) Ensure SW isolation. 2) IF NO SW pumps running, THEN perform the following: a) Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress VOLTAGE SHUTDOWN pushbutton. b) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. 3) IF only one SW pump running, THEN refer to AP-SW.2, LOSS OF SERVICE WATER.
	b. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	**Establish IA to CNMT:**	
	a. Verify non-safeguards busses energized from offsite power o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED	a. Perform the following: 1) Close non-safeguards bus tie breakers: • 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). IF NOT, THEN perform the following: o Start diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) -OR- o Evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS) 3) WHEN bus 15 restored, THEN reset control room lighting.
	b. Check SW pumps - AT LEAST TWO PUMPS RUNNING	b. Perform the following: 1) Restore IA using service air compressor OR diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) 2) Go to step 5d.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 5 continued from previous page)

c. Verify SW isolation valves to turbine building - OPEN

- MOV-4613 and MOV-4670
- MOV-4614 and MOV-4664

c. Perform the following:

1) Manually align valves.

2) Dispatch AO to locally reset compressors as necessary.

d. Verify adequate air compressor(s) - RUNNING

d. Manually start electric air compressors as power supply permits (75 kw each). IF electric air compressors can NOT be started, THEN start diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).

e. Check IA supply:

- o Pressure - GREATER THAN 60 PSIG
- o Pressure - STABLE OR INCREASING

e. Perform the following:

1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR).

2) Continue with Step 6. WHEN IA restored, THEN do Steps 5f and g.

f. Reset both trains of XY relays for IA to CNMT AOV-5392

g. Verify IA to CNMT AOV-5392 - OPEN

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Check If Charging Flow Has Been Established:	
	a. Charging pumps - ANY RUNNING	a. Perform the following: 1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN dispatch AO to close seal injection needle valve(s) to affected RCP: • RCP A, V-300A • RCP B, V-300B 2) Ensure HCV-142 open, demand at 0%.
	b. Charging pump suction aligned to RWST: o LCV-112B - OPEN o LCV-112C - CLOSED	b. Manually align valves as necessary. IF LCV-112B can NOT be opened, THEN dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room). IF LCV-112C can NOT be closed, THEN perform the following: 1) Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room). 2) Verify charging pump A NOT running and place in PULL STOP. 3) WHEN V-358 open, THEN direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
	c. Start charging pumps as necessary and adjust charging flow to restore PRZR level	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Stop SI And RHR Pumps And Place In AUTO	
8	Monitor SI Reinitiation Criteria:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	a. Manually start SI pumps as necessary and go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level. IF PRZR level can NOT be maintained, THEN manually start SI pumps as necessary and go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 9	Monitor If CNMT Spray Should Be Stopped:	
	a. CNMT spray pumps - RUNNING	a. Go to Step 10.
	b. Check CNMT pressure - LESS THAN 4 PSIG	b. Continue with Step 10. WHEN CNMT pressure less than 4 psig, THEN do Steps 9c through f.
	c. Reset CNMT spray	
	d. Check NaOH flow (FI-930) - NO FLOW	d. Place NaOH tank outlet valve switches to CLOSE. • 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	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Verify MRPI Indicates - ALL CONTROL AND SHUTDOWN RODS ON BOTTOM	IF one or more control rods NOT fully inserted, THEN perform the following: a. Place RMW mode selector switch to BORATE. b. Adjust boric acid flow control valve, FCV-110A, for desired flowrate. c. Set boric acid integrator to desired amount (650 gallons for each control rod not fully inserted). d. Place RMW control to start and verify flow. IF flow can NOT be established, THEN refer to ER-CVCS.1, REACTOR MAKEUP CONTROL MALFUNCTION.
11	Establish Condenser Steam Dump Pressure Control: a. Verify condenser available: o Any MSIV - OPEN o Annunciator G-15, STEAM DUMP ARMED - LIT b. Adjust condenser steam dump controller HC-484 to desired pressure and verify in AUTO. c. Place steam dump mode selector switch to MANUAL.	a. Place S/G ARV controllers in AUTO at desired pressure and go to Step 12.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Check RCS Hot Leg Temperatures - STABLE	Control steam dump and total feed flow to stabilize RCS temperature.
13	Verify Adequate SW Flow To CCW Hx:	
	a. Verify at least two SW pumps - RUNNING	a. Manually start pumps as power supply permits (257 kw each). IF less than two SW pumps can be operated, THEN perform the following: 1) IF NO SW pumps running, THEN perform the following: a) Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress VOLTAGE SHUTDOWN pushbutton. b) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. 2) IF only one SW pump running, THEN refer to AP-SW.2, LOSS OF SERVICE WATER. 3) Go to Step 19.
	b. Verify AUX BLDG SW isolation valves - OPEN • MOV-4615 and MOV-4734 • MOV-4616 and MOV-4735	b. Manually align valves.
	c. Verify CNMT RECIRC fan annunciator C-2, HIGH TEMPERATURE ALARM - EXTINGUISHED	c. Manually start an additional SW pump as power supply permits (257 kw each).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	**Check If Normal CVCS Operation Can Be Established**	
	a. Verify IA restored: o IA to CNMT (AOV-5392) - OPEN o IA pressure - GREATER THAN 60 PSIG	a. Continue with Step 19. WHEN IA can be restored, THEN do Steps 14 through 18.
	b. Verify instrument bus D - ENERGIZED	b. Energize MCC B. IF MCC B NOT available, THEN perform the following: 1) Verify MCC A energized. 2) Place instrument bus D on maintenance supply.
	c. CCW pumps - ANY RUNNING	c. Perform the following: 1) IF any RCP #1 seal outlet temperature offscale high, THEN isolate CCW to thermal barrier of affected RCP(s). • RCP A, MOV-749A and MOV-759A • RCP B, MOV-749B and MOV-759B 2) Manually start one CCW pump.
	d. Charging pump - ANY RUNNING	d. Continue with Step 19. WHEN any charging pump running, THEN do Steps 15 through 18.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Verify PRZR Level - GREATER THAN 13% [40% adverse CNMT]	Continue with Step 17. WHEN PRZR level increases to greater than 13% [40% adverse CNMT], THEN do Step 16.
16	Establish Normal Letdown: a. Establish charging line flow to REGEN Hx - GREATER THAN 20 GPM b. Place the following switches to CLOSE: • Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202) • AOV-371, letdown isolation valve • AOV-427, loop B cold leg to REGEN Hx c. Place letdown controllers in MANUAL at 40% open • TCV-130 • PCV-135 d. Reset both trains of XY relays for AOV-371 and AOV-427 e. Open AOV-371 and AOV-427 f. Open letdown orifice valves as necessary g. Place TCV-130 in AUTO at 105°F h. Place PCV-135 in AUTO at 250 psig i. Adjust charging pump speed and HCV-142 as necessary to control PRZR level	IF RCP seal return has been established, THEN establish excess letdown as follows: o Place excess letdown divert valve, AOV-312, to NORMAL. o Ensure CCW from excess letdown open, (AOV-745). o Open excess letdown isolation valve AOV-310. o Slowly open HCV-123 to maintain excess letdown temperature less than 195°F and pressure less than 100 psig. o Adjust charging pump speed as necessary. IF RCP seal return NOT established, THEN consult Plant Staff to determine if excess letdown should be placed in service.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Check VCT Makeup System:	
	a. Adjust boric acid flow control valve in AUTO to 9.5 gpm	
	b. Adjust RMW flow control valve in AUTO to 40 gpm	
	c. Verify the following: 1) RMW mode selector switch in AUTO 2) RMW control armed - RED LIGHT LIT	c. Adjust controls as necessary.
	d. Check VCT level: o Level - GREATER THAN 20% -OR- o Level - STABLE OR INCREASING	d. Manually increase VCT makeup flow as follows: 1) Ensure BA transfer pumps and RMW pumps running. IF NOT, THEN dispatch AO to locally reset MCC C and MCC D UV lockouts as necessary. 2) Place RMW flow control valve HCV-111 in MANUAL and increase RMW flow. 3) Increase boric acid flow as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	**Check Charging Pump Suction Aligned To VCT:**	
	a. VCT level - GREATER THAN 20%	a. IF VCT level can NOT be maintained greater than 5%, THEN perform the following: 1) Ensure charging pump suction aligned to RWST o LCV-112B open o LCV-112C closed 2) Continue with Step 19. WHEN VCT level greater than 40%, THEN do Step 18b.
	b. Verify charging pumps aligned to VCT o LCV-112C - OPEN o LCV-112B - CLOSED	b. Manually align valves as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: 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.

19 Control PRZR Heaters And Operate Normal Spray To Stabilize RCS Pressure

IF normal spray NOT available and letdown is in service, THEN perform the following:

a. Verify Regen Hx Chg outlet temp to PRZR Vapor temp ΔT less than 320°F. IF NOT, THEN control pressure using one PRZR PORV and go to Step 20.

b. Control pressure using auxiliary spray.

IF auxiliary spray NOT available, THEN use one PRZR PORV.

NOTE: TDAFW pump flow control AOVs may drift open on loss of IA.

***20 Monitor Intact S/G Levels:**

a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]

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. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%

b. IF narrow range level in any S/G continues to increase, THEN stop feed flow to that S/G.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: SW should be aligned to CCW Hxs before restoring RCP seal cooling.

21 Check RCP Cooling:

Establish normal cooling to RCPs (Refer to ATT-15.2, ATTACHMENT SEAL COOLING).

a. Check CCW to RCPs:

- o Annunciator A-7, RCP 1A CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED
- o Annunciator A-15, RCP 1B CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED

b. Check RCP seal injection:

- o Labyrinth seal D/Ps - GREATER THAN 15 INCHES WATER

-OR-

- o RCP seal injection flow to each RCP - GREATER THAN 6 GPM

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	**Check If Seal Return Flow Should Be Established:**	
	a. Verify RCP #1 seal outlet temperature - LESS THAN 235°F	a. Go to Step 23.
	b. Verify RCP seal outlet valves - OPEN • AOV-270A • AOV-270B	b. Manually open valves as necessary.
	c. Reset both trains of XY relays for RCP seal return isolation valve MOV-313	
	d. Open RCP seal return isolation valve MOV-313	d. Perform the following: 1) Place MOV-313 switch to OPEN. 2) Dispatch AO to locally open MOV-313.
	e. Verify RCP #1 seal leakoff flow - LESS THAN 6.0 GPM	e. Perform the following: 1) Trip the affected RCP 2) Allow 4 minutes for pump coast down, <u>THEN</u> close the affected RCP seal discharge valve. • RCP A, AOV-270A • RCP B, AOV-270B <u>IF</u> both RCP seal discharge valves are shut, <u>THEN</u> go to Step 23.
	f. Verify RCP #1 seal leakoff flow - GREATER THAN 0.8 GPM	f. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	**Verify All AC Busses - ENERGIZED BY OFFSITE POWER** o Normal feed breakers to all 480 volt busses - CLOSED o 480 volt bus voltage - GREATER THAN 420 VOLTS o Emergency D/G output breakers - OPEN	Perform the following: a. IF any AC emergency bus normal feed breaker open, THEN ensure associated D/G breaker closed. b. Perform the following as necessary: 1) Close non-safeguards bus tie breakers: • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Reset Bus 13 and Bus 15 lighting breakers. 3) Dispatch AO to locally reset and start two IA compressors. 4) Place the following pumps in PULL STOP: • EH pumps • Turning gear oil pump • HP seal oil backup pump 5) Restore power to MCCs. • A from Bus 13 • B from Bus 15 • E from Bus 15 • F from Bus 15 6) Start HP seal oil backup pump. 7) Start CNMT RECIRC fans as necessary. 8) Ensure D/G load within limits. 9) Refer to ATT-8.4, ATTACHMENT SI/UV for other equipment lost with loss of offsite power. c. Try to restore offsite power to all AC busses (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Adverse CNMT conditions or loss of forced air cooling may result in failure of NIS detectors.

24 Check If Source Range Channels Should Be Energized:

a. Source range channels - DEENERGIZED

a. Go to Step 24e.

b. Check intermediate range flux - EITHER CHANNEL LESS THAN 10^{-10} AMPS

b. Perform the following:

1) IF neither intermediate range channel is decreasing, THEN initiate boration.

2) Continue with Step 25. WHEN flux is LESS THAN 10^{-10} amps on any operable channel, THEN do Steps 24c, d and e.

c. Check the following:

- Both intermediate range channels - LESS THAN 10^{-10} AMPS

-OR-

- Greater than 20 minutes since reactor trip

c. Continue with step 25. WHEN either condition met, THEN do Steps 24d and e.

d. Verify source range detectors - ENERGIZED

d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2).

IF source ranges can NOT be restored, THEN refer to ER-NIS.1, SR MALFUNCTION, and go to Step 25.

e. Transfer Rk-45 recorder to one source range and one intermediate range channel

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	Check If Emergency D/Gs Should Be Stopped: a. Verify AC emergency busses energized by offsite power: o Emergency D/G output breakers - OPEN o AC emergency bus voltage - GREATER THAN 420 VOLTS o AC emergency bus normal feed breakers - CLOSED b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)	a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.

26 Check RCP Status

a. Both RCPs - STOPPED

a. Go to step 27.

b. Ensure conditions for starting an RCP:

- o Ensure bus 11A or 11B energized.
- o Refer to ATT-15.0, ATTACHMENT RCP START.

b. IF conditions can NOT be met, THEN perform the following:

1) Verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC).

IF natural circulation can NOT be verified, THEN increase dumping steam from intact S/Gs.

2) Go to step 27.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 26 continued from previous page)

c.	Check RVLIS level (no RCPs) ≥ 95%	c. IF RVLIS level (no RCPs) less than 95%, THEN perform the following: o Increase PRZR level to greater than 65% (82% adverse CNMT). o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING. o Energize PRZR heaters as necessary to saturate PRZR water. IF conditions NOT met, THEN continue with Step 27. WHEN conditions met, THEN do Step 26d.
d.	Start one RCP	d. IF an RCP can NOT be started, THEN verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC). IF natural circulation NOT verified, THEN increase dumping steam from intact S/Gs.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
27	**Establish Normal Shutdown Alignment:**	
	a. Check condenser - AVAILABLE	a. Dispatch AO to perform ATT-17.1, ATTACHMENT SD-2.
	b. Perform the following: o Open generator disconnects • 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 (Refer to T-5F, STARTING OR STOPPING THE CONDENSATE PUMPS	
	c. Verify adequate Rx head cooling: 1) Verify at least one control rod shroud fan - RUNNING 2) Verify one Rx compartment cooling fan - RUNNING	1) Manually start one fan as power supply permits (45 kw) 2) Perform the following: o Dispatch AO to reset UV relays at MCC C and MCC D. o Manually start one fan as power supply permits (23 kw)
	d. Verify ATT-17.0, ATTACHMENT SD-1 - COMPLETE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28	Maintain Plant Conditions Stable:	
	a. RCS pressure - BETWEEN 1800 PSIG AND 2235 PSIG	a. Control PRZR heaters and spray as necessary.
	b. PRZR level - BETWEEN 35% AND 40%	b. Control charging as necessary.
	c. Intact S/G narrow range levels - BETWEEN 17% AND 52%	c. Control S/G feed flow as necessary.
	d. RCS cold leg temperature - STABLE	d. Control dumping steam as necessary. IF cooldown continues, THEN close both MSIVs.
29	Monitor SI Reinitiation Criteria:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	a. Manually start SI pumps as necessary and go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level. IF PRZR level can NOT be maintained, THEN manually start SI pumps as necessary and go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

30 Implement Plant Recovery Procedures:

a. Review plant systems for realignment to normal conditions (Refer to ATT-26.0, ATTACHMENT RETURN TO NORMAL OPERATIONS)

b. Go to O-2.1, NORMAL SHUTDOWN TO HOT SHUTDOWN

-END-

ES-1.1 APPENDIX LIST

TITLE

1) RED PATH SUMMARY
2) FIGURE MIN SUBCOOLING (FIG-1.0)
3) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
4) ATTACHMENT D/G STOP (ATT-8.1)
5) ATTACHMENT NC (ATT-13.0)
6) ATTACHMENT SEAL COOLING (ATT-15.2)
7) ATTACHMENT RCP START (ATT-15.0)
8) ATTACHMENT SD-1 (ATT-17.0)
9) ATTACHMENT SD-2 (ATT-17.1)
10) ATTACHMENT SI/UV (ATT-8.4)
11) ATTACHMENT NO SW PUMPS (ATT-2.4)
12) ATTACHMENT RETURN TO NORMAL OPERATIONS (ATT-26.0)
13) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
14) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
15) FOLDOUT

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 52% [55% 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

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

   IF no SW pumps are available, THEN perform the following:

   a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

   b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. SI REINITIATION CRITERIA

   Following SI termination, IF EITHER condition listed below occurs, THEN manually start SI pumps as necessary and go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1:
   - RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING

   - OR -

   - PRZR level - CHARGING CAN NOT CONTROL 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. 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).

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to cool down and depressurize the RCS to cold shutdown conditions following a loss of reactor coolant inventory.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

E-1, LOSS OF REACTOR OR SECONDARY COOLANT, when RCS pressure is greater than the shutoff head pressure of the RHR pumps.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

RCS PRESSURE SHOULD BE MONITORED. IF RCS PRESSURE DECREASES IN AN UNCONTROLLED MANNER TO LESS THAN 250 PSIG [465 PSIG ADVERSE CNMT], THEN THE RHR PUMPS MUST BE MANUALLY RESTARTED TO SUPPLY WATER TO THE RCS.

* *

NOTE: 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 Monitor If RHR Pumps Should Be Stopped:

a. RHR pumps - ANY RUNNING IN INJECTION MODE — a. Go to Step 2.

b. Check RCS pressure: — b. Go to Step 2.

1) Pressure - GREATER THAN 250 psig [465 psig adverse CNMT]

2) Pressure - STABLE OR INCREASING

c. Stop RHR pumps and place AUTO

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 2	Monitor All AC Busses - BUSSES ENERGIZED BY OFFSITE POWER o Normal feed breakers to all 480 volt busses - CLOSED o 480 bus voltage - GREATER THAN 420 VOLTS o Emergency D/G output breakers - OPEN	Perform the following: a. IF any AC emergency bus normal feed breaker open, THEN ensure associated D/G breaker closed. b. Perform the following, as necessary: 1) Close non-safeguards bus tie breakers: • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Place the following pumps in PULL STOP: • EH pumps • Turning gear oil pump • HP seal oil backup pump 3) Restore power to MCCs. • A from Bus 13 • B from Bus 15 • E from Bus 15 • F from Bus 15 4) Start HP seal oil backup pump. 5) Ensure D/G load within limits. 6) WHEN bus 15 restored, THEN reset control room lighting. 7) Refer to ATT-8.4, ATTACHMENT SI/UV for other equipment lost with loss of offsite power. c. Try to restore offsite power to all AC busses (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Establish 75 GPM Charging Flow:	
	a. Charging pumps - ANY RUNNING	a. Perform the following: 1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN dispatch AO to locally isolate seal injection to affected RCP: • V-300A for RCP A • V-300B for RCP B 2) Ensure HCV-142 open, demand at 0%.
	b. Align charging pump suction to RWST: o LCV-112B - OPEN o LCV-112C - CLOSED	b. IF LCV-112B can NOT be opened, THEN dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room). IF LCV-112C can NOT be closed, THEN perform the following: 1) Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room). 2) Verify charging pump A NOT running and place in PULL STOP. 3) WHEN V-358 open, THEN direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
	c. Start charging pumps as necessary (75 kw each) and establish 75 gpm total charging flow • Charging line flow • Seal injection flow	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	**Establish Condenser Steam Dump Pressure Control:**	
	a. Verify condenser available: o Any MSIV - OPEN o Annunciator G-15, STEAM DUMP ARMED - LIT	a. Place S/G ARV controllers in AUTO at desired pressure and go to Step 5.
	b. Adjust condenser steam dump controller HC-484 to desired pressure and verify in AUTO	
	c. Place steam dump mode selector switch to MANUAL	
	NOTE: TDAFW pump flow control AOVs may drift open on loss of IA.	
* 5	**Monitor Intact S/G Levels:**	
	a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]	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. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	b. IF narrow range level in any S/G continues to increase in an uncontrolled manner, THEN stop RCS cooldown and go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

PRZR HEATERS SHOULD NOT BE ENERGIZED UNTIL PRZR LEVEL INDICATES GREATER THAN MINIMUM RECOMMENDED BY TSC TO ENSURE HEATERS ARE COVERED.

6 Deenergize PRZR Heaters

a. Place PRZR proportional heaters in PULL STOP

b. Place PRZR backup heaters in OFF

c. Consult TSC for a recommended minimum indicated PRZR water level that will ensure heaters are covered

NOTE: Shutdown margin should be monitored during RCS cooldown (Refer to FIG-2.0, FIGURE SDM).

7 Initiate RCS Cooldown To Cold Shutdown:

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

b. Use RHR system if in service

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

c. Manually or locally dump steam using intact S/Gs ARV.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	**Check RCS Subcooling Based On Core Exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING**	Manually start SI pumps as necessary and go to Step 19.
9	**Check SI and RHR Pump Status:** o SI pumps - ANY RUNNING -OR- o RHR pumps - ANY RUNNING IN INJECTION MODE	Go to Step 15.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION IF RCPS ARE NOT RUNNING. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.

* *

NOTE: 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.

10 Depressurize RCS To Refill PRZR:

a. Depressurize using normal PRZR spray if available

a. Depressurize using one PRZR PORV. IF IA NOT available, THEN refer to ATT-12.0, ATTACHMENT N2 PORVS.

IF no PORV available, THEN use auxiliary spray valve (AOV-296).

b. PRZR level - GREATER THAN 13% [40% adverse CNMT]

b. Continue with Step 11. WHEN level greater than 13% [40% adverse CNMT], THEN stop RCS depressurization.

c. Stop RCS depressurization

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.

11 Check If An RCP Should Be Started:

a. Both RCPs - STOPPED

a. Stop all but one RCP and go to Step 12.

b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING

b. Go to Step 19.

c. PRZR level - GREATER THAN 13% [40% adverse CNMT]

c. Return to Step 10.

d. Try to start an RCP

1) Establish conditions for starting an RCP

- o Bus 11A or 11B energized
- o Refer to ATT-15.0, ATTACHMENT RCP START

2) Start one RCP

d. Ensure at least one control rod shroud fan running (45 kw each).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Check If One Of Three SI Pumps Should Be Stopped:	
	a. Three SI pumps - RUNNING	a. Go to Step 13.
	b. RCS subcooling based on core exit T/Cs - GREATER THAN 35°F [90°F adverse CNMT] USING FIG-1.0, FIGURE MIN SUBCOOLING	b. IF RCS hot leg temperatures greater than 320°F [310°F adverse CNMT] OR IF RHR normal cooling in service, THEN go to Step 19. IF RHR normal cooling NOT in service AND RCS hot leg temperatures less than 320°F [310°F adverse CNMT], THEN ensure at least one RHR pump running in injection mode and go to Step 12c. IF no RHR pump can be started in injection mode, THEN go to Step 19.
	c. Check PRZR level - GREATER THAN 13% [40% adverse CNMT]	c. Do NOT stop SI pump. Return to Step 10.
	d. Stop one SI pump	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

13 Check If One Of Two SI Pumps Should Be Stopped:

a. Two SI pumps - RUNNING

a. Go to Step 14.

b. Determine required RCS subcooling from table:

Charging Pump Availability	RCS Subcooling Criteria
NONE	120°F [200°F adverse CNMT]
ONE	115°F [190°F adverse CNMT]
TWO	105°F [180°F adverse CNMT]
THREE	100°F [175°F adverse CNMT]

c. RCS subcooling based on core exit T/Cs - GREATER THAN VALUE FROM TABLE ABOVE USING FIG-1.0, FIGURE MIN SUBCOOLING

c. IF RCS hot leg temperatures greater than 320°F [310°F adverse CNMT] OR IF RHR normal cooling in service, THEN go to Step 19.

IF RHR normal cooling NOT in service AND RCS hot leg temperatures less than 320°F [310°F adverse CNMT], THEN ensure at least one RHR pump running in injection mode and go to Step 13d. IF no RHR pump can be started in injection mode, THEN go to Step 19.

d. PRZR level - GREATER THAN 13% [40% adverse CNMT]

d. Do NOT stop SI pump. Return to Step 10.

e. Stop one SI pump

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

14 Check If Last SI Pump Should Be Stopped:

a. One SI pump - RUNNING

a. IF any RHR pump running in injection mode, THEN go to Step 19. IF NOT, THEN go to Step 15.

b. Determine required RCS subcooling from table:

Charging Pump Availability	RCS Subcooling Criteria
NONE	Insufficient subcooling to stop SI pump.
ONE	255°F [295°F adverse CNMT]
TWO	235°F [285°F adverse CNMT]
THREE	210°F [270°F adverse CNMT]

c. RCS subcooling based on core exit T/Cs - GREATER THAN VALUE FROM TABLE ABOVE USING FIG-1.0, FIGURE MIN SUBCOOLING

c. IF RCS hot leg temperatures greater than 320°F [310°F adverse CNMT] OR IF RHR normal cooling in service, THEN go to Step 19.

IF RHR normal cooling NOT in service AND RCS hot leg temperatures less than 320°F [310°F adverse CNMT], THEN ensure at least one RHR pump running in injection mode and go to Step 14d. IF no RHR pump can be started in injection mode, THEN go to Step 19.

d. PRZR level - GREATER THAN 13% [40% adverse CNMT]

d. Do NOT stop SI pump. Return to Step 10.

e. Stop running SI pump

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Check If Charging Flow Should Be Controlled To Maintain PRZR Level:	
	a. Check RHR pumps - RUNNING IN INJECTION MODE	a. Start charging pump and control charging flow to maintain PRZR level and go to Step 16.
	b. Go to Step 19	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	CAUTION IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.	
16	Check RCP Status:	
	a. Both RCPs - STOPPED	a. Stop all but one RCP and go to Step 17.
	b. Check RVLIS level (no RCPs) - ≥ 95%	b. IF RVLIS level (no RCPs) less than 95%, THEN perform the following: o Increase PRZR level to greater than 65% [82% adverse CNMT]. o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING. o WHEN PRZR level indicates greater than minimum recommended by TSC, THEN energize PRZR heaters as necessary to saturate PRZR water. IF conditions NOT met, THEN continue with Step 17. WHEN conditions met, THEN do Steps 16c and d.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 16 continued from previous page)	
	c. Establish conditions for starting an RCP: o Ensure Bus 11A or 11B energized. o Refer to ATT-15.0, ATTACHMENT RCP START.	c. IF conditions can NOT be met, THEN perform the following: 1) Verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC). IF natural circulation can NOT be verified, THEN increase dumping steam. 2) Go to Step 17.
	d. Start one RCP	d. IF an RCP can NOT be started, THEN verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC). IF natural circulation can NOT be verified, THEN increase dumping steam.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION IF RCPS ARE NOT RUNNING. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.
- IF SI HAS BEEN TERMINATED, THE ACCUMS SHOULD BE ISOLATED PRIOR TO DEPRESSURIZING THE RCS TO LESS THAN 1000 PSIG. (REFER TO STEP 20).

NOTE: 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.

17 Depressurize RCS To Minimize RCS Subcooling:

a. Depressurize using normal PRZR spray if available

a. IF normal spray NOT available, THEN use one PRZR PORV. IF IA NOT available, THEN refer to ATT-12.0, ATTACHMENT N2 PORVS.

IF no PRZR PORV available, THEN use auxiliary spray valve (AOV-296).

b. WHEN PRZR level indicates greater than minimum recommended by TSC, THEN energize PRZR heaters as necessary

c. Depressurize RCS until EITHER of the following conditions satisfied:

- o RCS subcooling based on core exit T/Cs - LESS THAN 10°F USING FIG-1.0, FIGURE MIN SUBCOOLING

-OR-

- o PRZR level - GREATER THAN 75% [65% adverse CNMT]

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Verify Adequate Shutdown Margin	
	a. Direct RP to sample RCS for boron concentration	
	b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0, FIGURE SDM	b. Borate as necessary.
19	Monitor SI Reinitiation Criteria:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	a. Manually start SI pumps as necessary and go to Step 20.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Manually start SI pumps as necessary and return to Step 10.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	**Check If SI ACCUMs Should Be Isolated:**	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	a. IF both RCS hot leg temperatures less than 400°F, THEN go to Step 20c. IF NOT, THEN go to Step 21.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Return to Step 10.
	c. 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	
	d. Close SI ACCUM discharge valves • ACCUM A, MOV-841 • ACCUM B, MOV-865	d. Vent any unisolated ACCUMs: 1) Open vent valves for unisolated SI ACCUMs. • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945. IF an accumulator can NOT be isolated or vented, THEN consult TSC to determine contingency actions.
	e. Locally reopen breakers for MOV-841 and MOV-865	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	**Check If Emergency D/Gs Should Be Stopped:**	
	a. Verify AC emergency busses energized by offsite power: o Emergency D/G output breakers - OPEN o AC emergency bus voltage - GREATER THAN 420 VOLTS o AC emergency bus normal feed breakers - CLOSED	a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
	b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	Verify Adequate SW Flow To CCW Hx:	
	a. Verify at least two SW pumps - RUNNING	a. Manually start pumps as power supply permits (257 kw per pump). IF less than two SW pumps can be operated, THEN perform the following: 1) IF NO SW pumps running, THEN perform the following: a) Pull stop any D/G that is NOT supplied by alternate cooling AND immediately depress VOLTAGE SHUTDOWN pushbutton. b) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. 2) IF only one SW pump running, THEN refer to AP-SW.2, LOSS OF SERVICE WATER. 3) Go to Step 23.
	b. Verify AUX BLDG SW isolation valves - OPEN • MOV-4615 and MOV-4734 • MOV-4616 and MOV-4735	b. Manually align valves.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 22 continued from previous page)

c. Verify CNMT RECIRC fan annunciator C-2, HIGH TEMPERATURE ALARM - EXTINGUISHED

c. Perform the following:

1) Determine required SW flow to CCW HXs per table:

SW DISCHARGE ALIGNMENT	CCW HXs IN SERVICE	REQUIRED SW FLOW
Normal	2	Total of 5000 - 6000 gpm equally divided to both HXs
Normal	1	5000 - 6000 gpm to in-service HX
Alternate	2	30-33" d/p across each HX
Alternate	1	95-100" d/p across in-service HX

2) Direct AO to adjust SW flow to required value.

o IF on normal SW discharge:

- V-4619, CCW Hx A
- V-4620, CCW Hx B

-OR-

o IF on alternate SW discharge:

- V-4619C, CCW Hx A
- V-4620B, CCW Hx B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	Check RCP Cooling a. Check CCW to RCPs o Annunciator A-7, RCP 1A CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED o Annunciator A-15, RCP 1B CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED b. Check RCP seal injection o Labyrinth seal D/Ps - GREATER THAN 15 INCHES WATER -OR- o RCP seal injection flow to each RCP - GREATER THAN 6 GPM	Establish normal cooling to RCPs (Refer to ATT-15.2, ATTACHMENT SEAL COOLING).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	Check If Seal Return Flow Should Be Established:	
	a. Verify instrument bus D - ENERGIZED	a. Restore power to instrument bus D from MCC B or MCC A (maintenance supply).
	b. Verify RCP #1 seal outlet temperature - LESS THAN 235°F	b. Go to Step 25.
	c. Verify RCP seal outlet valves - OPEN • AOV-270A • AOV-270B	c. Manually open valves as necessary.
	d. Reset both trains of XY relays for RCP seal return isolation valve MOV-313	
	e. Open RCP seal return isolation valve MOV-313	e. Perform the following: 1) Place MOV-313 switch to OPEN. 2) Dispatch AO to locally open MOV-313.
	f. Verify RCP #1 seal leakoff flow - LESS THAN 6.0 GPM	f. Perform the following: 1) Trip the affected RCP 2) Allow 4 minutes for pump coast down, THEN close the affected RCP seal discharge valve • RCP A, AOV-270A • RCP B, AOV-270B IF both RCP seal discharge valves are shut, THEN go to Step 25.
	g. Verify RCP #1 seal leakoff flow - GREATER THAN 0.8 GPM	g. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Adverse CNMT conditions or loss of forced air cooling may result in failure of NIS detectors.

25	**Check If Source Range Detectors Should Be Energized:**	
	a. Source range channels - DEENERGIZED	a. Go to Step 25e.
	b. Check intermediate range flux - EITHER CHANNEL LESS THAN 10^{-10} AMPS	b. Perform the following: 1) IF neither intermediate range channel is decreasing, THEN initiate boration. 2) Continue with Step 26. WHEN flux is LESS THAN 10^{-10} amps on any operable channel, THEN do Steps 25c, d and e.
	c. Check the following: o Both intermediate range channels - LESS THAN 10^{-10} AMPS -OR- o Greater than 20 minutes since reactor trip	c. Continue with Step 26. WHEN either condition met, THEN do Steps 25d and e.
	d. Verify source range detectors - ENERGIZED	d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2). IF source ranges can NOT be restored, THEN refer to ER-NIS.1, SR MALFUNCTION and go to Step 25.
	e. Transfer Rk-45 recorder to one source range and one intermediate range channel	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26	**Establish Normal Shutdown Alignment:**	
	a. Check condenser - AVAILABLE	a. Dispatch AO to perform ATT-17.1, ATTACHMENT SD-2.
	b. Perform the following: o Open generator disconnects • 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	
	c. Verify adequate Rx head cooling: 1) Verify at least one control rod shroud fan - RUNNING 2) Verify one Rx compartment cooling fan - RUNNING	1) Manually start one fan as power supply permits (45 kw) 2) Perform the following: o Dispatch AO to reset UV relays at MCC C and MCC D. o Manually start one fan as power supply permits (23 kw)
	d. Verify ATT-17.0, ATTACHMENT SD-1 - COMPLETE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*27	Monitor RCP Operation:	
	a. RCPs - ANY RUNNING	a. Go to Step 28.
	b. Check the following:	b. Stop affected RCP(s).
	o RCP #1 seal D/P - GREATER THAN 220 PSID	
	o RCP #1 seal leakoff - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0, FIGURE RCP SEAL LEAKOFF	
28	Check Condenser Steam Dump Available - CONDENSER VACUUM GREATER THAN 20 INCHES HG	Use intact S/G ARV for RCS temperature control.
29	Check If RHR Normal Cooling Can Be Established:	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Go to Step 30.
	b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Go to Step 30.
	c. Place RCS overpressure protection system in service (Refer to O-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	
	d. Consult TSC to determine if RHR normal cooling should be established using ATT-14.1, ATTACHMENT RHR COOL	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: This procedure should be continued while obtaining CNMT hydrogen sample in Step 30.

30 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.

31 Check Core Exit T/Cs - LESS THAN 200°F

Return to Step 1.

32 Evaluate Long Term Plant Status:

a. Maintain cold shutdown conditions

b. Consult TSC

-END-

ES-1.2 APPENDIX LIST

TITLE

1) RED PATH SUMMARY
2) FIGURE MIN SUBCOOLING (FIG-1.0)
3) FIGURE SDM (FIG-2.0)
4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
5) ATTACHMENT SEAL COOLING (ATT-15.2)
6) ATTACHMENT RCP START (ATT-15.0)
7) ATTACHMENT NC (ATT-13.0)
8) ATTACHMENT D/G STOP (ATT-8.1)
9) ATTACHMENT SD-1 (ATT-17.0)
10) ATTACHMENT SD-2 (ATT-17.1)
11) ATTACHMENT SI/UV (ATT-8.4)
12) ATTACHMENT N2 PORVS (ATT-12.0)
13) ATTACHMENT RHR COOL (ATT-14.1)
14) ATTACHMENT NO SW PUMPS (ATT-2.4)
15) FOLDOUT

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 52% [55% 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

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

   IF no SW pumps are available, THEN perform the following:

   a. Pull stop any D/G that is NOT supplied by alternate cooling AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

   b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. SI REINITIATION CRITERIA

   IF EITHER condition listed below occurs, THEN manually start SI pumps as necessary:
   - RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING
   - OR -
   - PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN 5% [30% adverse CNMT]

3. 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 FIG-1.0, 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:
      - GREATER THAN 1625 PSIG [1825 psig adverse CNMT]
      - STABLE OR INCREASING

   d. PRZR level - GREATER THAN 5% [30% adverse CNMT]

4. 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.

5. 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.

6. 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).

7. E-3 TRANSITION CRITERIA

   IF any S/G level increases in an uncontrolled manner or any S/G has abnormal radiation, THEN manually start SI Pumps as necessary, stop RCS cooldown AND go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

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 RECOVERY WITH SI REQUIRED, or,

c. ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF BOTH 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%).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- o IF OFFSITE POWER IS LOST AFTER SI RESET, THEN MANUAL ACTION MAY BE REQUIRED TO RESTART SAFEGUARDS EQUIPMENT. (REFER TO ATT-8.5, ATTACHMENT LOSS OF OFFSITE POWER)

- o CONSULT WITH RADIATION PROTECTION BEFORE DISPATCHING PERSONNEL TO AUXILIARY BUILDING. SWITCHOVER TO RECIRCULATION MAY CAUSE HIGH RADIATION LEVELS.

* *

NOTE: 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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 1	**Verify RWST level - GREATER THAN 15%**	IF sump recirculation NOT in progress, THEN pull-stop all pumps taking suction from RWST, EXCEPT one SI pump AND go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.
2	**Verify CNMT Sump B Level - AT LEAST 113 INCHES**	IF RWST level is less than 28% AND CNMT sump B level is less than 113 inches, THEN go to ECA-1.2, LOCA OUTSIDE CONTAINMENT, Step 1.

NOTE: Steps 3 through 13 should be performed without delay. FR procedures should not be implemented prior to completion of these steps.

3 **Reset SI**

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: IF D/Gs supplying emergency AC busses, THEN non-essential loads may be shed as necessary to allow start of additional SW pumps.

4 Establish Adequate SW Flow:

a. Verify at least two SW pumps - RUNNING

a. Start additional SW pumps as power supply permits (257 kw each). IF only 1 SW pump operable, THEN perform the following:

1) Ensure SW aligned to one CCW Hx per ATT-2.1, ATTACHMENT MIN SW.

2) Go to Step 5.

IF no SW pumps are available, THEN perform the following:

1) Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

2) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

b. Verify AUX BLDG SW isolation valves - OPEN

- MOV-4615 and MOV-4734
- MOV-4616 and MOV-4735

b. Manually align valves.

c. Dispatch AO to Check BOTH CCW Hxs - IN SERVICE

c. Locally place BOTH CCW Hxs in service

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 4 continued from previous page)

d. Determine required SW flow to CCW HXs per table:

SW DISCHARGE ALIGNMENT	CCW HXs IN SERVICE	REQUIRED SW FLOW
Normal	2	Total of 5000 - 6000 gpm equally divided to both HXs
Normal	1	5000 - 6000 gpm to in-service HX
Alternate	2	30-33" d/p across each HX
Alternate	1	95-100" d/p across in-service HX

e. Direct AO to adjust SW flow to required value

o IF on normal SW discharge:

- V-4619, CCW HX A
- V-4620, CCW HX B

-OR-

o IF on alternate SW discharge:

- V-4619C, CCW HX A
- V-4620B, CCW HX B

e. IF the required SW flow can NOT be obtained, THEN perform the following:

1) Isolate SW to screenhouse and air conditioning headers.

- MOV-4609/MOV-4780 - AT LEAST ONE CLOSED
- MOV-4663/MOV-4733 - AT LEAST ONE CLOSED

2) Direct AO to locally adjust SW flow to required value.

3) Direct AO to locally isolate SW return from SFP Hxs:

- SFP Hx A (V-4622) (for alternate SW discharge use V-4622A)
- SFP Hx B (V-8689)

4) Verify SW portions of ATT-17.0, ATTACHMENT SD-1 are complete.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Establish CCW flow to RHR Hxs:	
	a. Check both CCW pumps - RUNNING	a. Perform the following: 1) Start CCW pumps as power supply permits (122 kw each). 2) IF both CCW pumps are running, THEN go to step 5b. 3) IF only one CCW pump is running, THEN perform the following: a) Direct AO to isolate CCW to boric acid evaporator o Close V-760A b) Manually open CCW MOV to only one operable RHR loop. o Open MOV-738A -OR- o Open MOV-738B c) Go to step 6.
	b. Open CCW valves to RHR Hxs • MOV-738A • MOV-738B	b. Dispatch AO to locally open valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- THE RHR HX OUTLET VALVES (HCV-624 AND HCV-625) WILL FAIL OPEN ON LOSS OF INSTRUMENT AIR PRESSURE.
- CONSULT WITH RADIATION PROTECTION BEFORE DISPATCHING PERSONNEL TO AUXILIARY BUILDING. SWITCHOVER TO RECIRCULATION MAY CAUSE HIGH RADIATION LEVELS.

6 Check RHR Flow: o RHR flow - LESS THAN 1500 GPM PER OPERATING PUMP		Manually adjust RHR Hx outlet valves equally to reduce flow to less than 1500 gpm per operating pump • RHR Hx A, HCV-625 • RHR Hx B, HCV-624 IF flow can NOT be reduced manually, THEN dispatch an AO with locked valve key to locally adjust RHR Hx outlet valve handwheels equally to reduce flow. • RHR Hx A, HCV-625 handwheel • RHR Hx B, HCV-624 handwheel

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Check IF Unnecessary Pumps Can Be Stopped:	
	a. Three SI pumps - RUNNING	a. Go to Step 7c.
	b. Stop SI pump C and place both switches in PULL STOP	
	c. Stop both RHR pumps and place in PULL STOP	
	d. Both CNMT spray pumps - RUNNING	d. Pull stop any idle CNMT spray pump and go to Step 7f.
	e. Pull stop one CNMT spray pump	
	f. Check CNMT pressure - LESS THAN 28 PSIG.	f. Go to Step 8.
	g. Place NaOH Tank outlet valve switches to OPEN. • AOV-836A • AOV-836B	
	h. Reset CNMT spray	
	i. Close discharge valves for idle CNMT spray pump(s) o Pump A • MOV-860A • MOV-860B o Pump B • MOV-860C • MOV-860D	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	**Verify RHR System Alignment:**	
	a. Verify the following valves - CLOSED o RHR suction valves from loop A hot leg • MOV-700 • MOV-701 o RHR discharge valves to loop B cold leg • MOV-720 • MOV-721	a. Ensure at least one suction valve and one discharge valve closed.
	b. Verify RHR pump suction crosstie valves - OPEN • MOV-704A • MOV-704B	b. Manually open valves. If valves can NOT be opened, THEN dispatch AO to locally open valves.
	c. Verify the following valves - OPEN o RHR pump discharge to Rx vessel deluge valves • MOV-852A • MOV-852B o RHR suction from sump B (inside CNMT) • MOV-851A • MOV-851B	c. Ensure at least one valve in each set open.
	d. Verify RCDT pump suction valves from sump B - CLOSED • MOV-1813A • MOV-1813B	d. Manually close valves.

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.

* *

9 Initiate RHR Sump Recirculation:

a. Close RWST outlet valve to RHR pump suction, MOV-856 (turn on DC power key switch)

a. Dispatch AO to locally close valve and continue with Step 9b.

b. Open both RHR suction valves from sump B (outside CNMT)

- o MOV-850A - OPEN
- o MOV-850B - OPEN

b. IF only one valve will open, THEN perform the following:

1) Initiate only one train of RHR recirculation (Refer to ATT-14.3, ATTACHMENT RHR NPSH for further guidance).

2) Go to step 9e.

IF neither valve will open, THEN refer to ATT-14.6, ATTACHMENT RHR PRESS REDUCTION for further guidance.

c. Check MOV-738A AND MOV-738B - BOTH OPEN

c. Perform the following:

1) IF MOV-738A open, THEN start RHR Pump A and go to step 9e.

2) IF MOV-738B open, THEN start RHR Pump B and go to step 9e.

d. Start both RHR pumps

e. Verify at least one RHR pump - RUNNING

e. IF no RHR pump can be started, THEN go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

SUMP RECIRCULATION FLOW TO RCS MUST BE MAINTAINED AT ALL TIMES, EXCEPT DURING ALIGNMENT FOR HIGH HEAD RECIRCULATION.

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.

10 Check RWST Level - LESS THAN 15%

DO NOT continue with this procedure until RWST level is less than 15%.

11 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 12.

e. Reset CNMT spray if necessary

f. Close CNMT spray pump discharge valves

- MOV-860A
- MOV-860B
- MOV-860C
- MOV-860D

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

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.

* *

12 Align SI And CNMT Spray For Sump Recirculation:

a. Verify SI pump suction valves from BASTs - CLOSED

- MOV-826A and MOV-826B
- MOV-826C and MOV-826D

a. Ensure at least one valve in each flowpath closed.

b. Close RWST outlet valves to SI and CNMT spray pumps (turn on DC power key switches)

- MOV-896A
- MOV-896B

b. Ensure at least one valve closed.

c. Close SI pump RECIRC valves

- MOV-898
- MOV-897

c. Ensure at least one valve closed.

d. Verify SI pump suction valves from RWST - OPEN

- MOV-825A
- MOV-825B

d. Ensure at least one valve open.

e. Align operating RHR pump flow path(s) to SI and CNMT spray pump suction.

- o IF RHR Pump A operating, THEN open MOV-857A and MOV-857C
- o IF RHR Pump B operating, THEN open MOV-857B

e. Ensure at least one flowpath aligned from RHR pump(s) to SI and CS pump suction header (Refer to ATT-14.5, ATTACHMENT RHR SYSTEM).

IF neither flow path can be aligned, THEN refer to ATT-14.6, ATTACHMENT RHR PRESS REDUCTION for further guidance.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

SI PUMPS SHOULD BE STOPPED IF RCS PRESSURE IS GREATER THAN THEIR SHUTOFF HEAD PRESSURE.

* *

NOTE: Operation of SI pump C is preferred since it delivers to both RCS loops.

13 Verify Adequate RCS Makeup Flow:

a. RCS pressure - LESS THAN 225 psig [425 psig adverse CNMT]

a. Perform the following:

1) Check RCS conditions:

- o RCS subcooling based on core exit T/Cs greater than FIG-1.0, FIGURE MIN SUBCOOLING.
- o PRZR level greater than 5% [30% adverse CNMT].

IF either condition NOT met, THEN start one SI pump.

2) Go to Step 14.

b. RHR injection flow adequate:

- o Core exit T/Cs - LESS THAN REQUIREMENTS OF FIG-5.0, FIGURE RHR INJECTION
- o Check RVLIS level (no RCPS) - GREATER THAN 52% [55% adverse CNMT]

b. Start one SI pump.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF A CNMT SPRAY PUMP IS STARTED, THEN CNMT PRESSURE SHOULD BE CLOSELY MONITORED. CNMT PRESSURE SHOULD NOT BE REDUCED TO LESS THAN 22 PSIG.

* *

***14 Check If CNMT Spray Is Required:**

a. CNMT pressure - GREATER THAN 28 PSIG

a. Perform the following:

1) IF CNMT spray previously actuated and NaOH tank level greater than 55%, THEN consult TSC to determine if CNMT spray should be restarted.

2) Go to Step 15.

b. Verify CNMT spray pump discharge valves - OPEN

- MOV-860A
- MOV-860B
- MOV-860C
- MOV-860D

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. Start selected CNMT spray pump

c. IF the selected CNMT spray pump will not start, THEN align and start the other CNMT spray pump. IF neither pump will start, THEN continue with Step 15. WHEN a CNMT spray pump can be started, THEN do steps 14d, e and f.

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.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 14 continued from previous page)	
	e. Verify NaOH flow (FI-930)	e. IF NaOH flow NOT indicated, THEN place switches for NaOH tank outlet valves to OPEN. • AOV-836A • AOV-836B
	f. WHEN CNMT pressure decreases to 22 psig, THEN perform the following: 1) Reset CNMT spray 2) Check NaOH flow (FI-930) - NO FLOW	2) Place NaOH tank outlet valve switches to close • AOV-836A • AOV-836B
	3) Stop CNMT spray pumps and place in PULL STOP 4) Close CNMT spray pump discharge valves • MOV-860A • MOV-860B • MOV-860C • MOV-860D	
15	Verify Adequate Core Cooling: o Core exit T/Cs - STABLE OR DECREASING o RVLIS level (no RCPs) - STABLE OR INCREASING o RVLIS level (no RCPs) - GREATER THAN 52% [55% adverse CNMT]	IF both RHR pumps running, THEN ensure two SI pumps running. IF only one RHR pump running, THEN perform the following: a. Ensure one SI pump running. b. WHEN CNMT spray pumps stopped, THEN start one additional SI pump.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*16	Monitor Indications Of CNMT Sump B Blockage o Check running RHR Pump motor current - STABLE • RHR Pump A, PPCS point I0685AD • RHR Pump B, PPCS point I0685BD o Check running RHR pump discharge flows - STABLE	Perform the following: a. Stop all but one RHR pump b. Reduce RHR flow as low as possible but NOT less than requirements of FIG-6.0, FIGURE MIN RCS INJECTION. c. Contact the TSC for additional guidance.

NOTE: TDAFW pump flow control AOVs may drift open on loss of IA.

*17	Monitor Intact S/G Levels: 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%	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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	**Establish Normal Shutdown Alignment:**	
	a. Check condenser - AVAILABLE	a. Dispatch AO to perform ATT-17.1, ATTACHMENT SD-2.
	b. Perform the following: o Open generator disconnects • 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	
	c. Verify adequate Rx head cooling: 1) Verify at least one control rod shroud fan - RUNNING 2) Verify one Rx compartment cooling fan - RUNNING	1) Manually start one fan as power supply permits (45 kw) 2) Perform the following: o Dispatch AO to reset UV relays at MCC C and MCC D. o Manually start one fan as power supply permits (23 kw)
	d. Verify ATT-17.0, ATTACHMENT SD-1 - COMPLETE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	**Check If Emergency D/Gs Should Be Stopped:**	
	a. Verify AC emergency busses energized by offsite power: o Emergency D/G output breakers - OPEN o AC emergency bus voltage - GREATER THAN 420 VOLTS o AC emergency bus normal feed breakers - CLOSED	a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
	b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	Check If SI ACCUMs Should Be Isolated:	
	a. Both RCS hot leg temperatures - LESS THAN 400°F	a. Continue with Step 21. WHEN both RCS hot leg temperatures less than 400°F, THEN do Steps 20b through d.
	b. 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	
	c. Close SI ACCUM discharge valves • ACCUM A, MOV-841 • ACCUM B, MOV-865	c. Vent any unisolated ACCUMs: 1) Open vent valves for unisolated SI ACCUMs. • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945. IF an accumulator can NOT be isolated or vented, THEN consult TSC to determine contingency actions.
	d. Locally reopen breakers for MOV-841 and MOV-865	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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

* *

21	**Check If Intact S/Gs Should Be Depressurized To RCS Pressure:**	
	a. RCS pressure - LESS THAN INTACT S/G PRESSURES	a. Go to Step 22.
	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 NOT 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. IF steam dump to condenser NOT available, THEN dump steam using intact S/G ARVs until S/G pressure less than RCS pressure.
22	**Consult TSC to Determine If Rx Vessel Head Should Be Vented**	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: This procedure should be continued while obtaining CNMT hydrogen sample in Step 23.

23 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.

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

Consult TSC to evaluate long term plant status.

25 Secure CNMT Spray

a. Reset CNMT spray

b. Place NaOH Tank outlet valve switches in AUTO

- AOV-836A
- AOV-836B

c. Place CNMT spray pumps in PULL STOP

d. Close discharge valves for idle CNMT spray pumps

o Pump A

- MOV-860A
- MOV-860B

o Pump B

- MOV-860C
- MOV-860D

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26	Verify Two SI Pumps - RUNNING	Manually start pumps.
27	Check Core Exit T/Cs - LESS THAN REQUIREMENTS OF FIG-5.0, 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 FIG-5.0, FIGURE RHR INJECTION. IF NOT, THEN dump steam from intact S/Gs until core exit T/Cs less than required.
28	Consult TSC To Evaluate Long Term Plant Status	

-END-

ES-1.3 APPENDIX LIST

TITLE

1) RED PATH SUMMARY
2) FIGURE RHR INJECTION (FIG-5.0)
3) FIGURE MIN SUBCOOLING (FIG-1.0)
4) FIGURE MIN RCS INJECTION (FIG-6.0)
5) ATTACHMENT D/G STOP (ATT-8.1)
6) ATTACHMENT SD-1 (ATT-17.0)
7) ATTACHMENT SD-2 (ATT-17.1)
8) ATTACHMENT RHR NPSH (ATT-14.3)
9) ATTACHMENT RHR SYSTEM (ATT-14.5)
10) ATTACHMENT MIN SW (ATT-2.1)
11) ATTACHMENT RHR PRESS REDUCTION (ATT-14.6)
12) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
13) ATTACHMENT NO SW PUMPS (ATT-2.4)
14) FOLDOUT

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 52% [55% 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

FOLDOUT PAGE

1. ECA-1.1 TRANSITION CRITERIA

   IF emergency coolant recirculation is established and subsequently lost, THEN go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.

2. LOSS OF SW CRITERIA

   IF no SW pumps are available, THEN perform the following:

   a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pusbutton.

   b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

   c. Go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION.

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).

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to cool down and depressurize the plant to cold shutdown conditions following a SGTR. This recovery method depressurizes the ruptured S/G by draining it through the ruptured S/G tubes into the RCS.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

   a. E-3, STEAM GENERATOR TUBE RUPTURE, if plant staff selects backfill method.

   b. ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, when blowdown is not available and plant staff selects backfill method.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- INADVERTENT CRITICALITY MAY OCCUR FOLLOWING NATURAL CIRCULATION COOLDOWN IF THE RCP IN THE RUPTURED LOOP IS STARTED FIRST.
- IF RCP 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.
- 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 Check RCP Status		
	a. Both RCPs - STOPPED	a. Stop all but one RCP and go to Step 2.
	b. Ensure conditions for starting an RCP. o Bus 11A or 11B energized. o Refer to ATT-15.0, ATTACHMENT RCP START.	b. IF conditions can NOT be met, THEN perform the following: 1) Verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC). IF natural circulation can NOT be verified, THEN increase dumping steam. 2) Go to Step 2.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 1 continued from previous page)	
	c. Check RVLIS level (no RCPs) - ≥ 95%	c. IF RVLIS level (no RCPs) less than 95%, THEN perform the following: o Increase PRZR level to greater than 65% [82% adverse CNMT]. o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING. o Energize PRZR heaters as necessary to saturate PRZR water. IF conditions NOT met, THEN continue with Step 2. WHEN conditions met, THEN do Step 1d.
	d. Start one RCP	d. IF an RCP can NOT be started, THEN verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC). IF natural circulation can NOT be verified, THEN increase dumping steam.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Energize PRZR Heaters As Necessary To Saturate PRZR Water At Ruptured S/G Pressure	
3	Check If SI ACCUMs Should Be Isolated:	
	a. Check the following: o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING o PRZR level - GREATER THAN 5% [30% adverse CNMT]	a. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	b. 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	
	c. Close SI ACCUM outlet valves • ACCUM A, MOV-841 • ACCUM B, MOV-865	c. Vent any unisolated ACCUMs: 1) Open vent valves for unisolated SI ACCUMs. • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945. IF an accumulator can NOT be isolated or vented, THEN consult TSC to determine contingency actions.
	d. Locally reopen breakers for MOV-841 and MOV-865	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Leakage from ruptured S/G into RCS will dilute RCS boron concentration.

4 Verify Adequate Shutdown Margin

a. Direct RP to sample RCS and ruptured S/G for boron concentration

b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0, FIGURE SDM

b. Borate as necessary.

NOTE: TDAFW pump flow control AOVs may drift open on loss of IA.

* 5 Monitor Intact S/G Level:

a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]

a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in the intact S/G.

b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%

b. IF narrow range level in the intact S/G continues to increase in an uncontrolled manner, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Since ruptured S/G may continue to depressurize to less than the minimum RCS pressure necessary for continued RCP operation, cooldown to cold shutdown should not be delayed.

6 Initiate RCS Cooldown To Cold Shutdown:

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

b. Use RHR system if in service

c. Dump steam to condenser from intact S/G

c. Manually or locally dump steam using intact S/G ARV.

IF no intact S/G available and RHR system NOT in service, THEN perform the following:

- Use faulted S/G.

-OR-

- Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 7	Monitor Ruptured S/G Narrow Range Level - LEVEL GREATER THAN 17% [25% adverse CNMT]	Refill ruptured S/G to 80% [60% adverse CNMT] using feed flow. IF any of the following conditions occurs, THEN stop feed flow to ruptured S/G: o Ruptured S/G pressure decreases in an uncontrolled manner. -OR- o Ruptured S/G pressure increases to 1020 psig. -OR- o Ruptured S/G pressure decreases to 350 psig AND ruptured S/G level greater than 5% [25% adverse CNMT].
* 8	Control Charging And Letdown Flow To Maintain PRZR Level: a. PRZR level - GREATER THAN 13% [40% adverse CNMT] b. PRZR level - LESS THAN 75% [65% adverse CNMT]	a. Increase charging flow as necessary and go to Step 9. b. Decrease charging flow to decrease level and go to Step 11.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION IF RCPS ARE NOT RUNNING. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.

NOTE: RCS depressurization may be stopped when RCS pressure decreases to less than 400 psig [300 psig adverse CNMT] to maintain adequate RCP #1 seal D/P.

* 9	**Depressurize RCS To Backfill From Ruptured S/G:**	
	a. Depressurize using normal PRZR spray	a. IF letdown is in service, THEN depressurize using auxiliary spray valve (AOV-296). IF NOT, THEN use one PRZR PORV.
	b. Maintain PRZR level - BETWEEN 13% AND 75% [BETWEEN 40% AND 65% adverse CNMT]	
	c. Check ruptured S/G level - GREATER THAN 5% [25% adverse CNMT]	c. Stop RCS depressurization.
	d. Energize PRZR heaters as necessary	
	e. Maintain RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Establish Required RCS Hydrogen Concentration (Refer to S-3.3C, H2 Or O2 REMOVAL FROM PRIMARY SYSTEM BY BURPING VCT)	
11	Check If RHR Normal Cooling Can Be Established:	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Go to Step 12.
	b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Go to Step 12.
	c. Place RCS overpressure protection system in service (Refer to O-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	c. IF RCS overpressure protection system can NOT be placed in service, THEN notify TSC of potential Tech Spec violation if RHR system is placed in service.
	d. Establish RHR normal cooling (Refer to ATT-14.1, ATTACHMENT RHR COOL)	
*12	Monitor RCP Operation:	
	a. RCPs - ANY RUNNING	a. Go to Step 13.
	b. Check the following:	b. Stop affected RCP(s).
	o RCP #1 seal D/P - GREATER THAN 220 PSID	
	o Check RCP seal leakage - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0, FIGURE RCP SEAL LEAKOFF	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	Check Core Exit T/Cs - LESS THAN 200°F	Return to Step 4.
14	Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions (Refer to O-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS) b. Consult TSC	

-END-

ES-3.1 APPENDIX LIST

TITLE

1) RED PATH SUMMARY
2) FIGURE MIN SUBCOOLING (FIG-1.0)
3) FIGURE SDM (FIG-2.0)
4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
5) ATTACHMENT RHR COOL (ATT-14.1)
6) ATTACHMENT RCP START (ATT-15.0)
7) ATTACHMENT NC (ATT-13.0)
8) ATTACHMENT NO SW PUMPS (ATT-2.4)
9) FOLDOUT

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 52% [55% 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

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

IF no SW pumps are available, THEN perform the following:

a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. SI REINITIATION CRITERIA

Following SI termination, IF either condition listed below occurs, THEN start SI pumps manually as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1:

- RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING REQUIREMENTS OF FIG-1.0, FIGURE MIN SUBCOOLING.

OR

- PRZR level - CHARGING CAN NOT CONTROL 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, UNLESS faulted S/G needed for RCS cooldown.

4. 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).

5. MULTIPLE S/G TUBE RUPTURE CRITERIA

IF any intact S/G level increases in in an uncontrolled manner OR IF any intact S/G has abnormal radiation, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to cool down and depressurize the plant to cold shutdown conditions following a SGTR. This recovery method depressurizes the ruptured S/G by draining via S/G blowdown.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

   a. E-3, STEAM GENERATOR TUBE RUPTURE, if plant staff selects the blowdown method.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.

* *

NOTE: 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 Check RCP Status

a. Both RCPs - STOPPED

a. Stop all but one RCP and go to Step 2.

b. Ensure conditions for starting an RCP.

- o Bus 11A or 11B energized.
- o Refer to ATT-15.0, ATTACHMENT RCP START.

b. IF conditions can NOT be met, THEN perform the following:

1) Verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC).

IF natural circulation can NOT be verified, THEN increase dumping steam.

2) Go to Step 2.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 1 continued from previous page)	
	c. Check RVLIS level (no RCPs) - ≥ 95%	c. IF RVLIS level (no RCPs) less than 95%, THEN perform the following: o Increase PRZR level to greater than 65% [82% adverse CNMT]. o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING. o Energize PRZR heaters as necessary to saturate PRZR water. IF conditions not met, THEN continue with Step 2. WHEN conditions met, THEN do Step 1d.
	d. Start one RCP	d. IF an RCP can NOT be started, THEN verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC). IF natural circulation can NOT be verified, THEN increase dumping steam.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Energize PRZR Heaters As Necessary To Saturate PRZR Water At Ruptured S/G Pressure	
3	Check If SI ACCUMs Should Be Isolated:	
	a. Check the following: o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING o PRZR level - GREATER THAN 5% [30% adverse CNMT]	a. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	b. 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	
	c. Close SI ACCUM outlet valves • ACCUM A, MOV-841 • ACCUM B, MOV-865	c. Vent any unisolated ACCUMs: 1) Open vent valves for unisolated SI ACCUMs. • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945. IF an accumulator can NOT be isolated or vented, THEN consult TSC to determine contingency actions.
	d. Locally reopen breakers for MOV-841 and MOV-865	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Leakage from ruptured S/G into RCS will dilute RCS boron concentration.

4 Verify Adequate Shutdown Margin

a. Direct RP to sample RCS and ruptured S/G for boron concentration

b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0, FIGURE SDM

b. Borate as necessary.

NOTE: TDAFW pump flow control AOVs may drift open on loss of IA.

* 5 Monitor Intact S/G Level:

a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]

a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in intact S/G.

b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%

b. IF narrow range level in the intact S/G continues to increase in an uncontrolled manner, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Since ruptured S/G may continue to depressurize to less than the minimum RCS pressure necessary for continued RCP operation, cooldown to cold shutdown should not be delayed.

6 Initiate RCS Cooldown To 350°F:

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

b. Dump steam to condenser from intact S/G

b. Manually or locally dump steam from intact S/G using S/G ARV.

IF no intact S/G available, THEN perform the following:

- Use faulted S/G.

-OR-

- Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

RCS AND RUPTURED S/G PRESSURES MUST BE MAINTAINED LESS THAN 1050 PSIG.

* 7 Control RCS Pressure And Charging Flow To Minimize RCS-To-Secondary Leakage:

a. Perform appropriate action(s) from table:

PRZR LEVEL	RUPTURED S/G NARROW RANGE LEVEL		
	INCREASING	DECREASING	OFFSCALE HIGH
LESS THAN 13% [40% ADVERSE CNMT]	o Increase charging flow o Depressurize RCS using Step 7b.	Increase charging flow	o Increase charging flow o Maintain RCS and ruptured S/G pressure equal
BETWEEN 13% [40% ADVERSE CNMT] AND 50%	Depressurize RCS using Step 7b.	Energize PRZR heaters	Maintain RCS and ruptured S/G pressure equal
BETWEEN 50% AND 75% [65% ADVERSE CNMT]	o Depressurize RCS using Step 7b. o Decrease charging flow	Energize PRZR heaters	Maintain RCS and ruptured S/G pressure equal
GREATER THAN 75% [65% ADVERSE CNMT]	o Decrease charging flow	Energize PRZR heaters	Maintain RCS and ruptured S/G pressure equal

b. Use normal PRZR spray to obtain desired results for Step 7a

b. IF letdown is in service, THEN use auxiliary spray (AOV-296). IF NOT, THEN use one PRZR PORV.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Establish Required RCS Hydrogen Concentration (Refer to S-3.3C, H2 OR O2 REMOVAL FROM PRIMARY SYSTEM BY BURPING VCT)	
9	Check If RCS Cooldown Should Be Stopped: a. RCS cold leg temperatures - LESS THAN 350°F b. Stop RCS cooldown c. Maintain RCS cold leg temperature - LESS THAN 350°F	a. Return to Step 4.
*10	Monitor Ruptured S/G Narrow Range Level - LEVEL GREATER THAN 17% [25% adverse CNMT]	Refill ruptured S/G to 80% [60% adverse CNMT] using feed flow. IF any of the following conditions occurs, THEN stop feed flow to ruptured S/G: o Ruptured S/G pressure decreases in an uncontrolled manner. -OR- o Ruptured S/G pressure increases to 1020 psig. -OR- o Ruptured S/G pressure decreases to 350 psig psig AND ruptured S/G level greater than 5% [25% adverse CNMT].

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Blowdown from ruptured S/G may be stopped when RCS pressure decreases to less than 400 psig [300 psig adverse CNMT] to maintain adequate RCP #1 seal ΔP.

11	Consult TSC To Determine Appropriate Procedure To Establish Blowdown From Ruptured S/G	IF blowdown can NOT be initiated, THEN go to alternate post-SGTR cooldown procedure, ES-3.1, POST-SGTR COOLDOWN USING BACKFILL, Step 1, OR ES-3.3, POST-SGTR COOLDOWN USING STEAM DUMP, Step 1.
*12	Control Charging And Letdown Flow To Maintain PRZR Level:	
	a. PRZR level - GREATER THAN 13% [40% adverse CNMT]	a. Increase charging flow as necessary and go to Step 13.
	b. PRZR level - LESS THAN 75% [65% adverse CNMT]	b. Decreases charging flow to decrease level and go to Step 14.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION IF RCPS ARE NOT RUNNING. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.

***13 Depressurize RCS To Minimize RCS-To-Secondary Leakage:**

a. Depressurize using normal PRZR spray — a. IF letdown is in service, THEN depressurize using auxiliary spray valve (AOV-296). IF NOT, THEN use one PRZR PORV.

b. Energize PRZR heaters as necessary

c. Maintain RCS pressure at ruptured S/G pressure

d. Maintain RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING

***14 Monitor RCP Operation:**

a. RCPs - ANY RUNNING — a. Go to Step 15.

b. Check the following: — b. Stop affected RCP(s).

- o RCP #1 seal D/P - GREATER THAN 220 PSID
- o Check RCP seal leakage - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0, FIGURE RCP SEAL LEAKOFF

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Check If RHR Normal Cooling Can Be Established:	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Return to Step 10.
	b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Return to Step 10.
	c. Place RCS overpressure protection system in service (Refer to O-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	c. IF RCS overpressure protection system can NOT be placed in service, THEN notify TSC of potential Tech Spec violation if RHR system is placed in service.
	d. Establish RHR normal cooling (Refer to ATT-14.1, ATTACHMENT RHR COOL)	
16	Continue RCS Cooldown To Cold Shutdown:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Use RHR System	
	c. Dump steam to condenser from intact S/G	c. Manually or locally dump steam using intact S/G ARV. IF no intact S/G available and RHR system NOT in service, THEN perform the following: o Use faulted S/G. -OR- o Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Check Core Exit T/Cs - LESS THAN 200°F	Return to Step 10.
18	Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions - (Refer to O-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS) b. Consult TSC	

-END-

ES-3.2 APPENDIX LIST

TITLE

1) RED PATH SUMMARY
2) FIGURE MIN SUBCOOLING (FIG-1.0)
3) FIGURE SDM (FIG-2.0)
4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
5) ATTACHMENT RHR COOL (ATT-14.1)
6) ATTACHMENT RCP START (ATT-15.0)
7) ATTACHMENT NC (ATT-13.0)
8) ATTACHMENT NO SW PUMPS (ATT-2.4)
9) FOLDOUT

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 52% [55% 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

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

IF no SW pumps are available, THEN perform the following:

a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. SI REINITIATION CRITERIA

Following SI termination, IF either condition listed below occurs, THEN start SI pumps manually as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1:

- RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING REQUIREMENTS OF FIG-1.0, FIGURE MIN SUBCOOLING.

OR

- PRZR level - CHARGING CAN NOT CONTROL 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, UNLESS faulted S/G needed for RCS cooldown.

4. 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).

5. MULTIPLE S/G TUBE RUPTURE CRITERIA

IF any intact S/G level increases in in an uncontrolled manner OR IF any intact S/G has abnormal radiation, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to cool down and depressurize the plant to cold shutdown conditions following a SGTR. This recovery method depressurizes the ruptured S/G by dumping steam.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

   a. E-3, STEAM GENERATOR TUBE RUPTURE, if plant staff selects steam dump method.

   b. ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, when blowdown is not available and plant staff selects steam dump method.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- STEAM SHOULD NOT BE RELEASED FROM ANY RUPTURED S/G IF WATER MAY EXIST IN ITS STEAMLINE.
- AN OFFSITE DOSE EVALUATION SHOULD BE COMPLETED PRIOR TO USING THIS PROCEDURE.
- 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.
- 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 Check RCP Status		
a. Both RCPs - STOPPED		a. Stop all but one RCP and go to Step 2.
b. Ensure conditions for starting an RCP.		b. IF conditions can NOT be met, THEN perform the following:
	o Bus 11A or 11B energized.	1) Verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC).
	o Refer to ATT-15.0, ATTACHMENT RCP START.	IF natural circulation can NOT be verified, THEN increase dumping steam.
		2) Go to Step 2.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 1 continued from previous page)	
	c. Check RVLIS level (no RCPs) - ≥ 95%	c. IF RVLIS level (no RCPs) less than 95%, THEN perform the following: o Increase PRZR level to greater than 65% [82% adverse CNMT]. o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING. o Energize PRZR heaters as necessary to saturate PRZR water. IF conditions NOT met, THEN continue with Step 2. WHEN conditions met, THEN do Step 1d.
	d. Start one RCP	d. IF an RCP can NOT be started, THEN verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC). IF natural circulation can NOT be verified, THEN increase dumping steam.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Energize PRZR Heaters As Necessary To Saturate PRZR Water At Ruptured S/G Pressure	
3	Check If SI ACCUMs Should Be Isolated:	
	a. Check the following: o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING o PRZR level - GREATER THAN 5% [30% adverse CNMT]	a. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	b. 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	
	c. Close SI ACCUM outlet valves • ACCUM A, MOV-841 • ACCUM B, MOV-865	c. Vent any unisolated ACCUMs: 1) Open vent valves for unisolated SI ACCUMs. • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945. IF an accumulator can NOT be isolated or vented, THEN consult TSC to determine contingency actions.
	d. Locally reopen breakers for MOV-841 and MOV-865	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Leakage from ruptured S/G into RCS will dilute RCS boron concentration.

4 Verify Adequate Shutdown Margin

a. Direct RP to sample RCS and ruptured S/G for boron concentration

b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0, FIGURE SDM

b. Borate as necessary.

NOTE: TDAFW pump flow control AOVs may drift open on loss of IA.

* 5 Monitor Intact S/G Level:

a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]

a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in intact S/G.

b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%

b. IF narrow range level in the intact S/G continues to increase in an uncontrolled manner, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Since ruptured S/G may continue to depressurize to less than the minimum RCS pressure necessary for continued RCP operation, cooldown to cold shutdown should not be delayed.

6	**Initiate RCS Cooldown To 350°F:**	
	a. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Dump steam to condenser from intact S/G	b. Manually or locally dump steam from intact S/G using S/G ARV. IF no intact S/G available, THEN perform the following: o Use faulted S/G. -OR- o Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP — ACTION/EXPECTED RESPONSE — RESPONSE NOT OBTAINED

* *

CAUTION

RCS AND RUPTURED S/G PRESSURES MUST BE MAINTAINED LESS THAN 1050 PSIG.

* *

*** 7 Control RCS Pressure And Charging Flow To Minimize RCS-To-Secondary Leakage:**

a. Perform appropriate action(s) from table:

PRZR LEVEL	RUPTURED S/G NARROW RANGE LEVEL		
	INCREASING	DECREASING	OFFSCALE HIGH
LESS THAN 13% [40% ADVERSE CNMT]	o Increase charging flow o Depressurize RCS using Step 7b.	Increase charging flow	o Increase charging flow o Maintain RCS and ruptured S/G pressure equal
BETWEEN 13% [40% ADVERSE CNMT] AND 50%	Depressurize RCS using Step 7b.	Energize PRZR heaters	Maintain RCS and ruptured S/G pressure equal
BETWEEN 50% AND 75% [65% ADVERSE CNMT]	o Depressurize RCS using Step 7b. o Decrease charging flow	Energize PRZR heaters	Maintain RCS and ruptured S/G pressure equal
GREATER THAN 75% [65% ADVERSE CNMT]	o Decrease charging flow	Energize PRZR heaters	Maintain RCS and ruptured S/G pressure equal

b. Use normal PRZR spray to obtain desired results for Step 7a

b. IF letdown is in service, THEN use auxiliary spray (AOV-296). IF NOT, THEN use one PRZR PORV.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Establish Required RCS Hydrogen Concentration (Refer to S-3.3C, H2 OR O2 REMOVAL FROM PRIMARY SYSTEM BY BURPING VCT)	
9	Check If RCS Cooldown Should Be Stopped:	
	a. RCS cold leg temperatures - LESS THAN 350°F	a. Return to Step 4.
	b. Stop RCS cooldown	
	c. Maintain RCS cold leg temperature - LESS THAN 350°F	
*10	Monitor Ruptured S/G Narrow Range Level - LEVEL GREATER THAN 17% [25% adverse CNMT]	Refill ruptured S/G to 80% [60% adverse CNMT] using feed flow. IF any of the following conditions occurs, THEN stop feed flow to ruptured S/G: o Ruptured S/G pressure decreases in an uncontrolled manner. -OR- o Ruptured S/G pressure increases to 1020 psig. -OR- o Ruptured S/G pressure decreases to 350 psig psig AND ruptured S/G level greater than 5% [25% adverse CNMT].

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

RUPTURED S/G PRESSURE MAY DECREASE RAPIDLY WHEN STEAM IS RELEASED.

* *

NOTE: Steam release from ruptured S/G may be stopped when RCS pressure decreases to less than 400 psig [300 psig adverse CNMT] to maintain adequate RCP #1 seal ΔP.

11 Initiate Cooldown Of Ruptured S/G:

a. Verify condenser available:

- o Intact S/G MSIV - OPEN
- o Annunciator G-15, STEAM DUMP ARMED - LIT

a. Manually or locally dump steam using ruptured S/G ARV and go to Step 12.

b. Dispatch AO to locally align steam traps associated with the ruptured S/G.

c. Dispatch AO to locally open ruptured S/G MSIV bypass valve

d. Dump steam to condenser using steam dump pressure controller

***12 Control Charging And Letdown Flow To Maintain PRZR Level:**

a. PRZR level - GREATER THAN 13% [40% adverse CNMT]

a. Increase charging flow as necessary and go to Step 13.

b. PRZR level - LESS THAN 75% [65% adverse CNMT]

b. Decrease charging flow to decrease level and go to Step 14.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION IF RCPS ARE NOT RUNNING. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.

***13 Depressurize RCS To Minimize RCS-To-Secondary Leakage:**

a. Depressurize using normal PRZR spray associated with running RCP

a. IF letdown is in service, THEN depressurize using auxiliary spray valve (AOV-296). IF NOT, THEN use one PRZR PORV.

b. Energize PRZR heaters as necessary

c. Maintain RCS pressure at ruptured S/G pressure

d. Maintain RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING

***14 Monitor RCP Operation:**

a. RCPs - ANY RUNNING

a. Go to Step 15.

b. Check the following:

b. Stop affected RCP(s).

o RCP #1 seal D/P - GREATER THAN 220 PSID

2) Check RCP seal leakage - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0, FIGURE RCP SEAL LEAKOFF

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Check If RHR Normal Cooling Can Be Established	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Return to Step 10.
	b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Return to Step 10.
	c. Place RCS overpressure protection system in service (Refer to O-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	c. IF RCS overpressure protection system can NOT be placed in service, THEN notify TSC of potential Tech Spec violation if RHR system is placed in service.
	d. Establish RHR normal cooling (Refer to ATT-14.1, ATTACHMENT RHR COOL)	
16	Continue RCS Cooldown To Cold Shutdown:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Use RHR System	
	c. Dump steam to condenser from intact S/G	c. Manually or locally dump steam using intact S/G ARV IF no intact S/G available and RHR system NOT in service, THEN perform the following: o Use faulted S/G. -OR- o Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Check Core Exit T/Cs - LESS THAN 200°F	Return to Step 10.
18	Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions (Refer to O-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD CONDITIONS) b. Consult TSC	

-END-

ES-3.3 APPENDIX LIST

TITLE

1) RED PATH SUMMARY
2) FIGURE MIN SUBCOOLING (FIG-1.0)
3) FIGURE SDM (FIG-2.0)
4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
5) ATTACHMENT RHR COOL (ATT-14.1)
6) ATTACHMENT RCP START (ATT-15.0)
7) ATTACHMENT NC (ATT-13.0)
8) ATTACHMENT NO SW PUMPS (ATT-2.4)
9) FOLDOUT

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 52% [55% 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

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

IF no SW pumps are available, THEN perform the following:

a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. SI REINITIATION CRITERIA

Following SI termination, IF either condition listed below occurs, THEN start SI pumps manually as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1:

- RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING REQUIREMENTS OF FIG-1.0, FIGURE MIN SUBCOOLING.

OR

- PRZR level - CHARGING CAN NOT CONTROL 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, UNLESS faulted S/G needed for RCS cooldown.

4. 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).

5. MULTIPLE S/G TUBE RUPTURE CRITERIA

IF any intact S/G level increases in in an uncontrolled manner OR IF any intact S/G has abnormal radiation, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to respond to a loss of all AC power.

B. ENTRY CONDITIONS/SYMPTOMS

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

   a. E-0, REACTOR TRIP OR SAFETY INJECTION, on the indication that both Bus 14 and Bus 16 are deenergized. |

2. SYMPTOMS - Which indicate a loss of all AC power are:

   a. Neither 480 volt AC emergency bus 14 nor 16 available. |

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

DUE TO POTENTIALLY EXTREME ENVIRONMENTAL CONDITIONS, CAUTION SHOULD BE USED WHEN ENTERING THE INTERMEDIATE BLDG FOR LOCAL ACTIONS.

NOTE: o CSFSTs should be monitored for information only. FR procedures should not be implemented.

o Local actions may require portable lighting and communication devices.

1	**Verify Reactor Trip:** o At least one train of reactor trip breakers - OPEN o Neutron flux - DECREASING o MRPI indicates - ALL CONTROL AND SHUTDOWN RODS ON BOTTOM	Manually trip reactor. IF reactor trip breakers NOT open, THEN perform the following: a. Open Bus 13 and Bus 15 normal feed breakers. b. Verify rod drive MG sets tripped. c. Close Bus 13 and Bus 15 normal feed breakers. d. Reset lighting breakers.
2	**Verify Turbine Stop Valves - CLOSED**	Manually trip turbine. IF turbine trip can NOT be verified, THEN close both MSIVs.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: FOLDOUT page should be open and monitored periodically.

* 3 Adjust S/G ARVs To Control Tavg At Approximately 547°F

4 Stop Both RCPs

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.

5 Check If RCS Is Isolated:

a. PRZR PORVs - CLOSED

a. IF PRZR pressure less than 2335 psig, THEN manually close PORVs.

b. Verify RCS isolation valves closed:

1) Place letdown orifice valve switches to CLOSE

- AOV-200A
- AOV-200B
- AOV-202

2) Place letdown isolation valve switches to CLOSE

- AOV-371
- AOV-427

3) Place excess letdown isolation valve switch to CLOSE (AOV-310)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	**Verify Adequate TDAFW Flow:**	
	a. Verify TDAFW pump - RUNNING	a. Perform the following: 1) Verify governor valve, V-3652, latched. IF governor valve tripped, THEN dispatch AO to locally reset valve. 2) Manually or locally open at least one TDAFW pump steam supply valve. • MOV-3505A • MOV-3504A
	b. Verify TDAFW pump flow - GREATER THAN 200 GPM	b. Verify proper TDAFW valve alignment: 1) TDAFW pump discharge valve (MOV-3996) open. 2) Intact S/G TDAFW pump flow control valves open. IF NOT, THEN manually align valves as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: o Conditions should be evaluated for Site Contingency Reporting (Refer to EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION).

o AO should increase surveillance of TDAFW pump until AC power is restored.

7 Try To Restore Power to Any Train Of AC Emergency Busses:

a. Verify emergency D/G aligned for unit operation

- o Mode switch in UNIT
- o Voltage control selector in AUTO

a. Manually align switches on rear of MCB.

b. Check emergency D/Gs - BOTH D/G RUNNING

b. WHEN non-running D/G available for starting, THEN perform the following:

1) Depress D/G FIELD RESET pushbutton

2) Depress D/G RESET pushbutton

3) Start D/G

4) IF D/G starts, THEN go to Step 7c.

5) IF D/G will NOT start, THEN dispatch AO to locally start emergency D/Gs.

IF no emergency D/G available, THEN perform the following:

a) Direct AO to attempt to restore emergency D/G (Refer to ER-D/G.1, RESTORING D/G)

b) Go to Step 8.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 7 continued from previous page)	
c.	Check D/G voltage and frequency	
	1) Voltage - APPROXIMATELY 480v	1) Adjust voltage control to restore voltage to approximately 480v
	2) Frequency - APPROXIMATELY 60 Hz	2) Adjust governor to restore frequency to approximately 60 Hz
d.	Verify adequate D/G cooling o Bus 17 and/or Bus 18 - ENERGIZED o One SW Pump running for each running D/G	d. Manually energize busses and start SW Pumps. IF adequate cooling can NOT be supplied to a running D/G, THEN perform the following: 1) Pull stop the D/G AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. 2) Align alternate cooling (Refer to ER-D/G.2, ALTERNATE COOLING FOR EMERGENCY D/Gs).
e.	Verify at least one train of AC emergency busses - ENERGIZED • Bus 14 and Bus 18 • Bus 16 and Bus 17	e. Manually energize AC emergency busses. IF Bus 14 AND Bus 16 are deenergized, THEN go to Step 8.
f.	Return to procedure and step in effect	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- WHEN POWER IS RESTORED TO BUS 14 AND/OR BUS 16, RECOVERY ACTIONS SHOULD CONTINUE STARTING WITH STEP 27.
- IF AN SI SIGNAL EXISTS OR IF AN SI SIGNAL IS ACTUATED DURING THIS PROCEDURE, IT SHOULD BE RESET TO PERMIT MANUAL LOADING OF EQUIPMENT ON AN AC EMERGENCY BUS.

8 Establish The Following Equipment Alignment:

a. Pull stop AC emergency bus loads

- RHR pumps
- CNMT RECIRC fans
- CNMT spray pumps
- SI pumps
- CCW pumps
- Charging pumps
- MDAFW pumps

b. Evaluate non-vital loads (Refer to ATT-8.3, ATTACHMENT NONVITAL)

c. Place non-running SW pump switches to STOP, then return to AUTO

d. Place switch for MOV-313, RCP seal return isolation valve, to CLOSE

e. Momentarily place to CLOSE RCP CCW return valves

- MOV-759A
- MOV-759B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Temporary power may be provided to Bus 16 by performing procedure ER-ELEC.4 and to Bus 13 by performing procedure ER-ELEC.5 at the Shift Supervisor's discretion.

9 Try To Restore Offsite Power:

a. Consult Power Control to determine if either normal offsite power supply - AVAILABLE

- o 12B transformer via breaker 76702

-OR-

- o 12A transformer via breaker 75112

a. IF normal offsite power supply NOT readily available, THEN perform the following:

1) Restore IA system using the Diesel Air Compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).

2) Evaluate Main transformer backfeed for long term concerns (Refer to ER-ELEC.3, EMERGENCY OFFSITE BACKFEED VIA MAIN & UNIT TRANSFORMER).

3) Go to Step 10.

b. Reset SI, if necessary

c. Restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

10 Initiate Local Actions To Isolate RCS And To Provide Cooling To Vital Areas And Equipment

a. Open all Reactor Protection and Control System rack doors in the Control Room.

b. Direct Security personnel to open the following vital area doors to increase cooling:

- Control Room Door S51
- Intermediate Bldg Door S37 (AFW pump area)
- Intermediate Bldg Door F36 (Automatic fire door, Rod Drive MG set area)
- Intermediate Bldg Door S44 (Steam Header area)

c. Dispatch AO To Locally Isolate RCP Seals and BASTs (Refer to ATT-21.0, ATTACHMENT RCS ISOLATION)

d. Dispatch AO to align backup cooling water to TDAFW Pump (Refer to ATT-5.2, ATTACHMENT FIRE WATER COOLING TO TDAFW PUMP)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Isolate Makeup And Reject From Hotwell To CST By Placing Hotwell Level Controller (LC-107) In Manual AT 50%	IF valves can NOT be manually closed, THEN dispatch AO to locally isolate makeup and reject lines. • Makeup isolation V-4058 • Reject isolation V-4055
12	Isolate S/G: a. Manually close both MSIVs b. Manually close MFW flow control valves • MFW regulating valves • MFW bypass valves c. Place MCB master switch for S/G blowdown and sample valves to CLOSE	IF valves can NOT be manually closed, THEN dispatch AO to locally isolate the affected flow path.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

A FAULTED OR RUPTURED S/G THAT IS ISOLATED SHOULD REMAIN ISOLATED. STEAM SUPPLY TO THE TDAFW PUMP MUST BE MAINTAINED FROM AT LEAST ONE S/G.

* *

13 Check If S/G Secondary Side Is Intact:

- o Pressure in both S/Gs - STABLE OR INCREASING
- o Pressure in both S/Gs - GREATER THAN 110 PSIG

Perform the following:

a. IF any S/G pressure decreasing in an uncontrolled manner OR completely depressurized, THEN isolate faulted S/G unless needed for RCS cooldown:

1) Close faulted S/G MDAFW pump discharge valve.

- S/G A, MOV-4007
- S/G B, MOV-4008

2) Close faulted S/G TDAFW flow control valve.

- S/G A, AOV-4297
- S/G B, AOV-4298

3) Verify faulted S/G ARV controller in MANUAL with output at 0%.

- S/G A, AOV-3411
- S/G B, AOV-3410

4) Pull stop faulted S/G TDAFW pump steam supply valve.

- S/G A, MOV-3505A
- S/G B, MOV-3504A

IF valve(s) can NOT be closed manually, THEN dispatch AO to locally close valve(s) to isolate flow.

b. Dispatch AO to complete faulted S/G isolation (Refer to ATT-10.0, ATTACHMENT FAULTED S/G).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Check If S/G Tubes Are Intact: o Dispatch RP tech or AO to locally check steamline radiation - NORMAL	Try to identify ruptured S/G. Continue with Step 15. WHEN ruptured S/G identified, THEN perform the following: a. Isolate ruptured S/G unless needed for RCS cooldown: 1) Close ruptured S/G MDAFW pump discharge valve. • S/G A, MOV-4007 • S/G B, MOV-4008 2) Pull stop ruptured S/G MDAFW pump. 3) Close ruptured S/G TDAFW flow control valve. • S/G A, AOV-4297 • S/G B, AOV-4298 4) Adjust ruptured S/G ARV controller to 1050 psig in AUTO. WHEN S/G pressure less than 1050 psig, THEN ensure ruptured S/G ARV closed. • S/G A, AOV-3411 • S/G B, AOV-3410 5) Pull stop ruptured S/G TDAFW pump steam supply valve. • S/G A, MOV-3505A • S/G B, MOV-3504A IF valve(s) can NOT be closed manually, THEN dispatch AO to locally close valve(s) to isolate flow. b. Dispatch AO to complete ruptured S/G isolation (Refer to ATT-16.0, ATTACHMENT RUPTURED S/G).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF CST LEVEL DECREASES TO LESS THAN 5 FEET, THEN ALTERNATE WATER SOURCES FOR AFW PUMPS, USING FIRE OR CITY WATER, WILL BE NECESSARY (REFER TO ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

* *

NOTE: TDAFW pump AOV flow control AOVs may drift open on loss of IA.

***15 Monitor Intact S/G Levels:**

a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]	a. Maintain maximum AFW flow until narrow range level greater than 5% [25% adverse CNMT] in at least one S/G.
b. Control AFW flow by throttling TDAFW flow control valves • S/G A, AOV-4297 • S/G B, AOV-4298	b. Control AFW flow by throttling TDAFP discharge MOV-3996. IF MOV-3996 can NOT be controlled, THEN dispatch AO to locally control AFW flow by throttling TDAFW flow control valves. • S/G A, AOV-4297 • S/G B, AOV-4298 IF valves can NOT be throttled, THEN control AFW flow by starting and stopping TDAFW pump.
c. Control AFW flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	c. IF narrow range level in any intact S/G continues to increase in an uncontrolled manner, THEN return to Step 14.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: IF the loss of power is expected to continue beyond 4 hours, THEN degassing of main generator should commence as soon as personnel become available (Refer to ATT-8.2, ATTACHMENT GEN DEGAS).

16 Check DC Bus Loads:

a. Place control switches for MFW pump AC oil pumps to OFF (allows timer to stop DC oil pumps)

b. Stop all large non-essential DC loads

1) Evaluate DC loads (Refer to ATT-8.0, ATTACHMENT DC LOADS).

2) WHEN turbine is stopped, THEN perform the following:

a) Locally close Turbine backup seal oil reg outlet valve V-5475J.

b) Stop Turbine DC lube oil pump (within 1 hour).

c. Check DC bus voltage - GREATER THAN 105 VOLTS DC

- Bus A
- Bus B

c. IF either DC bus less than 105 volts DC, THEN refer to ER-ELEC.2, RECOVERY FROM LOSS OF A or B DC BUS.

d. Direct electricians to locally monitor DC power supply

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Verify source range detector N-31 - ENERGIZED	Dispatch personnel with relay rack key to turn off 125 VDC power switches in REACTOR PROTECTION racks RLTR-1 and RLTR-2 to deenergize source range block relays.

CAUTION

WHEN POWER IS RESTORED TO BUS 14 AND/OR BUS 16, RECOVERY ACTIONS SHOULD CONTINUE STARTING WITH STEP 27.

18	Check CST Level - GREATER THAN 5 FEET	Initiate makeup to CSTs using fire or city water as a source. (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- S/G PRESSURES SHOULD BE MAINTAINED GREATER THAN 200 PSIG TO PREVENT INJECTION OF SI ACCUM NITROGEN INTO THE RCS.
- S/G NARROW RANGE LEVEL SHOULD BE MAINTAINED GREATER THAN 5% [25% ADVERSE CNMT] IN AT LEAST ONE INTACT S/G. IF LEVEL CANNOT BE MAINTAINED, S/G DEPRESSURIZATION SHOULD BE STOPPED UNTIL LEVEL IS RESTORED IN AT LEAST ONE S/G.

* *

NOTE:
- The S/Gs should be depressurized at maximum rate to minimize RCS inventory loss.
- PRZR level may be lost and reactor vessel upper head voiding may occur due to depressurization of S/Gs. Depressurization should not be stopped to prevent these occurrences.
- S/G ARV nitrogen pressure should be monitored and nitrogen supply bottles changed as necessary.

19 Initiate Depressurization Of Intact S/Gs To 300 PSIG:		
a. Check S/G narrow range levels - GREATER THAN 17% [25% adverse CNMT] IN AT LEAST ONE S/G		a. Perform the following: 1) Maintain maximum AFW flow until narrow range level greater than 17% [25% adverse CNMT] in at least one S/G. 2) Continue with Step 20. WHEN narrow range level greater than 17% [25% adverse CNMT] in at least one S/G, THEN do Steps 19b and 20.
b. Manually dump steam from intact S/Gs at maximum rate using S/G ARVs		b. Locally dump steam from intact S/Gs at maximum rate using S/G ARV.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: o Adverse CNMT conditions or loss of forced air cooling may result in failure of NIS detectors.

o IF Instrument Bus D deenergized, THEN NIS SUR meters will NOT be available.

*20 Monitor Reactor For Subcriticality:

a. Verify Subcriticality using the following indications:

1) Check source range, N-31

- o Indicator - ON SCALE
- o Power - STABLE OR DECREASING

2) Check intermediate range, N-35

- o Indicator - ON SCALE
- o Power - STABLE OR DECREASING

3) Check power range, N-41 and N-43

- o Indicators - LESS THAN 5%
- o Power - STABLE OR DECREASING

a. IF unable to verify subcriticality using NIS, THEN perform the following:

- o Control S/G ARVs to stop S/G depressurization and allow RCS to heat up.
- o Direct RP to sample RCS and PRZR for boron concentration.
- o Request plant staff assistance in evaluating core reactivity status

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Depressurization of S/Gs will result in a SI actuation. SI should be reset to permit manual loading of equipment on emergency busses.

21 Check SI Signal Status:

a. Any SI annunciator - LIT

a. Go to Step 25. WHEN SI actuated, THEN do Steps 21b, 22, 23 and 24.

b. Reset SI

22 Verify CI And CVI:

a. CI and CVI annunciators - LIT

- Annunciator A-26, CNMT ISOLATION
- Annunciator A-25, CONTAINMENT VENTILATION ISOLATION

a. Depress manual CI pushbutton.

b. Verify CI and CVI valve status lights - BRIGHT

b. Manually close CI and CVI valves. IF valves can NOT be verified closed by MCB indication, THEN dispatch AO to locally close valves (Refer to ATT-3.0, ATTACHMENT CI/CVI).

c. CNMT RECIRC fan coolers SW outlet valve status lights - BRIGHT

- AOV-4561
- AOV-4562

c. Dispatch AO to locally fail open valves.

d. Verify RHR Pump Suction from CNMT Sump B valves - CLOSED

- MOV-850A
- MOV-850B

d. IF sump recirculation NOT in progress, THEN manually close valves.

IF valves can NOT be verified closed by MCB indication, THEN dispatch AO to locally close valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	**Check If S/G Depressurization Should Be Stopped:**	
	a. Check RCS cold leg temperatures - GREATER THAN 315°F	a. Perform the following: 1) Control S/G ARVs to stop S/G depressurization. 2) Go to Step 24.
	b. Check S/G pressures - LESS THAN 300 PSIG	b. Continue with Step 24. <u>WHEN</u> S/G pressure decreases to less than 300 psig, <u>THEN</u> do Step 23c and d.
	c. Check IA supply: o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING	c. Control S/G ARVs in manual to maintain S/G pressures at 300 psig <u>IF</u> manual control is <u>NOT</u> available, <u>THEN</u> locally control S/G ARVs to maintain S/G pressures at 300 psig.
	d. Control S/G ARVs to maintain S/G pressures at 300 psig IN AUTO	d. Control S/G ARVs in manual to maintain S/G pressures at 300 psig <u>IF</u> manual control is <u>NOT</u> available, <u>THEN</u> locally control S/G ARVs to maintain S/G pressures at 300 psig.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	Check CNMT Pressure - HAS REMAINED LESS THAN 28 PSIG o Annunciator A-27, CNMT SPRAY - EXTINGUISHED o CNMT pressure indicators - LESS THAN 28 PSIG	IF CNMT pressure is less than 28 psi, THEN perform the following: a. Reset CNMT spray. b. Place CNMT spray pump discharge valve switches to CLOSE to deenergize open contactor. IF NOT, THEN continue with step 25. WHEN CNMT pressure less than 28 psig, THEN reset CNMT spray and place CNMT spray pump discharge valve switches to CLOSE.
25	Check Core Exit T/Cs - LESS THAN 1200°F	IF core exit temperatures greater than 1200°F and increasing, THEN go to SACRG-1, SEVERE ACCIDENT CONTROL ROOM GUIDELINE INITIAL RESPONSE, step 1.
26	Check If AC Emergency Power Is Restored - BUSSES 14 AND/OR 16 ENERGIZED	Continue to control RCS conditions and monitor plant status: a. Check status of desired actions: o AC power restoration o ARV nitrogen pressure o Diesel air compressor to IA system o RCP seal isolation o DC power supply b. Return to Step 13.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
27	**Manually Control S/G ARVs To Stabilize S/G Pressures**	Locally control S/G ARVs.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: SW isolation may occur when power is restored to AC emergency busses.

28 Verify SW System Operation:

a.	Check Bus 17 and Bus 18 - AT LEAST ONE ENERGIZED	a. Perform the following: 1) Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. 2) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. 3) Go to Step 29.
b.	Verify two SW pumps - RUNNING	b. IF normal power available, THEN establish two SW pumps running. IF normal power NOT available, THEN establish one SW pump running for each operating D/G. IF NO SW pumps running, THEN perform the following: 1) Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. 2) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. IF only one SW pump running, THEN perform the following: 1) Manually perform SW isolation. 2) Refer to AP-SW.2, LOSS OF SERVICE WATER.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

THE LOADS PLACED ON THE ENERGIZED AC EMERGENCY BUS SHOULD NOT EXCEED THE CAPACITY OF THE POWER SOURCE.

29 **Verify Following Equipment Loaded On Available AC Emergency Busses:**

Manually load equipment as power supply permits.

- o 480 volt MCCs - ENERGIZED
  - MCC C from Bus 14
  - MCC D from Bus 16
- o Verify instrument busses - ENERGIZED
  - Bus A from MCC C (A battery)
  - Bus B from MCC C
  - Bus C from MCC D (B battery)
- o Dispatch personnel to verify proper operation of battery chargers

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30	**Select Recovery Procedure:**	
	a. Check RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	a. Go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.
	b. Check PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.
	c. Check SI and RHR Pumps - NONE RUNNING	c. Go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.
	d. Go to ECA-0.1, LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED, Step 1	

-END-

ECA-0.0 APPENDIX LIST

TITLE

1) FIGURE MIN SUBCOOLING (FIG-1.0)
2) ATTACHMENT DC LOADS (ATT-8.0)
3) ATTACHMENT FAULTED S/G (ATT-10.0)
4) ATTACHMENT RUPTURED S/G (ATT-16.0)
5) ATTACHMENT CI/CVI (ATT-3.0)
6) ATTACHMENT NONVITAL (ATT-8.3)
7) ATTACHMENT GEN DEGAS (ATT-8.2)
8) ATTACHMENT RCS ISOLATION (ATT-21.0)
9) ATTACHMENT FIRE WATER COOLING TO TDAFW PUMP (ATT-5.2)
10) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
11) ATTACHMENT NO SW PUMPS (ATT-2.4)
12) FOLDOUT

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

   IF no SW pumps are available, THEN perform the following:

   a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

   b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to use normal operational systems to stabilize plant conditions following restoration of AC emergency power.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

a. ECA-0.0, LOSS OF ALL AC POWER, when AC emergency power is restored and SI is not required.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF AN SI SIGNAL IS ACTUATED PRIOR TO PERFORMING STEP 10 OF THIS PROCEDURE, THEN SI SHOULD BE RESET TO PERMIT MANUAL LOADING OF EQUIPMENT ON AN AC EMERGENCY BUS.

* *

NOTE:
- o CSFSTs should be monitored for information only. FR procedures should not be implemented prior to completion of Step 10.
- 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.
- o FOLDOUT page should be open and monitored periodically.

1 Check RCP Seal Isolation Status:

a. RCP seal injection needle valves - CLOSED

- V-300A
- V-300B

a. Dispatch AO to locally close valves before starting charging pump.

b. RCP CCW return valves - CLOSED

- MOV-759A
- MOV-759B

b. IF valves open or position not known, THEN check CCW pump status:

1) IF pump running, THEN go to Step 2.

2) IF pump NOT running, THEN manually close valves.

IF valve(s) can NOT be closed, THEN place switches for RCP thermal barrier CCW outlet valves to CLOSE.

- AOV-754A
- AOV-754B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Check CI Annunciator A-26, CONTAINMENT ISOLATION - EXTINGUISHED	Perform the following: a. Depress CI reset pushbutton b. Verify annunciator A-26, CONTAINMENT ISOLATION, extinguished.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	**Establish IA to CNMT:**	
	a. Verify non-safeguards busses energized from offsite power o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED	a. Perform the following: 1) Close non-safeguards bus tie breakers: • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie
	b. Check SW pumps - AT LEAST TWO PUMPS RUNNING	b. Manually start SW pumps as power supply permits (257 kw each). IF no SW pumps are available, THEN perform the following: 1) Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. 2) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. IF less than two SW pumps running, THEN perform the following: 1) Restore IA using service air compressor OR diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR). 2) Go to Step 3d.
	c. Verify turbine building SW isolation valves - OPEN • MOV-4613 and MOV-4670 • MOV-4614 and MOV-4664	c. Perform the following: 1) Manually align valves. 2) Dispatch AO to locally reset compressors as necessary.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 3 continued from previous page)	
d.	Start adequate air compressor(s) (75 kw each)	d. IF electric air compressors can NOT be started, THEN start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).
e.	Check IA supply: o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING	e. Perform the following: 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR). 2) Continue with Step 4. WHEN IA restored, THEN do Steps 3f and g.
f.	Reset both trains of XY relays for IA to CNMT (AOV-5392) if necessary	
g.	Verify IA to CNMT AOV-5392 - OPEN	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	CAUTION THE LOADS PLACED ON THE ENERGIZED AC EMERGENCY BUS SHOULD NOT EXCEED THE CAPACITY OF THE POWER SOURCE.	
4	Manually Load Following Equipment On AC Emergency Busses:	
	a. Start one CCW pump (122 kw)	
	b. Energize MCCs as power supply permits • MCC A from Bus 13 • MCC B from Bus 15 • MCC E from Bus 15 • MCC F from Bus 15	
	c. Verify instrument bus D - ENERGIZED	c. Restore power to instrument bus D from MCC B or MCC A (maintenance supply).
	d. WHEN bus 15 restored, THEN reset control room lighting	
	e. Start at least one CNMT RECIRC fan	
	f. Restore Rx head cooling as power supply permits:	
	1) Start one Rx compartment cooling fan (23 kw each)	1) Perform the following: o Dispatch AO to reset UV relays at MCC C and MCC D. o Manually start one fan as power supply permits. (23 kw)
	2) Start both control rod shroud fans (45 kw each)	2) Manually start at least one fan (45 kw)
	g. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Check If Charging Flow Has Been Established:	
	a. Charging pumps - ANY RUNNING	a. Perform the following: 1) Ensure seal injection needle valves to both RCPs isolated: • RCP A, V-300A • RCP B, V-300B 2) Ensure HCV-142 open, demand at 0%.
	b. Charging pump suction aligned to RWST: o LCV-112B - OPEN o LCV-112C - CLOSED	b. Manually align valves as necessary. IF LCV-112B can NOT be opened, THEN dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room). IF LCV-112C can NOT be closed, THEN perform the following: 1) Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room). 2) Verify charging pump A NOT running and place in PULL STOP. 3) WHEN V-358 open, THEN direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
	c. Start charging pumps (75 kw each) as necessary and adjust charging flow to restore PRZR level	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 6	Monitor SI Initiation Criteria:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	a. Go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level. IF PRZR level can NOT be maintained, THEN go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.
7	Check PRZR Level - GREATER THAN 13% [40% FOR ADVERSE CONTAINMENT]	Control charging flow as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

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).
- IF S/G NR LEVEL DECREASES TO LESS THAN 5% [25% ADVERSE CNMT] AND FEED FLOW IS LESS THAN 200 GPM, THEN THE MDAFW PUMPS SHOULD BE MANUALLY LOADED ON AC EMERGENCY BUS TO SUPPLY WATER TO THE S/G(S).

* *

NOTE:
- If MDAFW pump operation is not required, pump switches should be maintained in PULL-STOP to prevent automatic start.
- TDAFW pump flow control AOVs may drift open on loss of IA.

* 8 Monitor Intact S/G Levels:

a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]

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.

IF feed flow less than 200 gpm, THEN perform the following:

1) Verify MDAFW pump discharge valves open.
   - MOV-4007
   - MOV-4008

2) Manually start MDAFW pumps as necessary (223 kw each).

b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 52%

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

9 Establish S/G Pressure Control:

a. Adjust S/G ARV controllers to maintain existing S/G pressure

b. Verify S/G ARV controllers in AUTO

c. Dispatch AO to perform ATT-17.1, ATTACHMENT SD-2

* *

CAUTION

IF AN SI SIGNAL IS ACTUATED AFTER THE SI PUMP SWITCHES ARE PLACED IN AUTO, THEN ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, SHOULD BE PERFORMED.

* *

NOTE: Safeguards pump switches should be placed in AUTO only if associated bus is energized.

10 Place Following Pump Switches In AUTO:

- SI pumps
- RHR pumps
- CNMT spray pumps

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: FR procedures may now be implemented as necessary.

11 Verify Adequate SW Flow To CCW Hx:

a. Verify at least two SW pumps - RUNNING

a. Manually start pumps as power supply permits (257 kw each). IF less than two SW pumps can be operated, THEN perform the following:

1) IF NO SW pumps running, THEN perform the following:

a) Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

b) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2) IF only one SW pump running, THEN refer to AP-SW.2, LOSS OF SERVICE WATER.

3) Go to Step 17.

b. Verify AUX BLDG SW isolation valves - OPEN

- MOV-4615 and MOV-4734
- MOV-4616 and MOV-4735

b. Manually align valves. IF valves must be locally operated, THEN continue with Step 17. WHEN SW restored to AUX BLDG, THEN do Steps 11c through 16.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 11 continued from previous page)

c. Verify CNMT RECIRC fan annunciator C-2, HIGH TEMPERATURE ALARM - EXTINGUISHED

c. Perform the following:

1) Determine required SW flow to CCW HXs per table:

SW DISCHARGE ALIGNMENT	CCW HXs IN SERVICE	REQUIRED SW FLOW
Normal	2	Total of 5000 - 6000 gpm equally divided to both HXs
Normal	1	5000 - 6000 gpm to in-service HX
Alternate	2	30-33" d/p across each HX
Alternate	1	95-100" d/p across in-service HX

2) Direct AO to adjust SW flow to required value

o IF on normal SW discharge:

- V-4619, CCW HX A
- V-4620, CCW HX B

-OR-

o IF on alternate SW discharge:

- V-4619C, CCW HX A
- V-4620B, CCW HX B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	**Check If Normal CVCS Operation Can Be Established** a. Verify IA restored: o IA to CNMT (AOV-5392) - OPEN o IA pressure - GREATER THAN 60 PSIG b. Charging pump - ANY RUNNING	a. Continue with Step 17. WHEN IA restored, THEN do Steps 12 through 16. b. Continue with Step 17. WHEN any charging pump running, THEN do Steps 13 through 16.
13	**Verify PRZR Level - GREATER THAN 13% [40% adverse CNMT]**	Continue with Step 17. WHEN PRZR level increases to greater than 13% [40% adverse CNMT], THEN do Steps 14 through 16.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	**Establish Normal Letdown:** a. Establish charging line flow to REGEN Hx - GREATER THAN 20 GPM b. Place the following switches to CLOSE: • Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202) • AOV-371, letdown isolation valve • AOV-427, loop B cold leg to REGEN Hx c. Place letdown controllers in MANUAL at 40% open • TCV-130 • PCV-135 d. Reset both trains of XY relays for AOV-371 and AOV-427 if necessary e. Open AOV-371 and AOV-427 f. Open letdown orifice valves as necessary g. Place TCV-130 in AUTO at 105°F h. Place PCV-135 in AUTO at 250 psig i. Adjust charging pump speed and HCV-142 as necessary	Consult TSC to determine if excess letdown should be placed in service.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

15 Check VCT Makeup System:

a. Verify the following:

1) Boric acid and RMW flow control valves - SET FOR REQUIRED CSD CONCENTRATION (Refer to FIG-2.0, FIGURE SDM)

2) At least one BA and RMW pump in AUTO

3) RMW mode selector switch in AUTO

4) RMW control armed - RED LIGHT LIT

a. IF VCT auto makeup can NOT be established, THEN manually control VCT level (Refer to ER-CVCS.1, REACTOR MAKEUP CONTROL MALFUNCTION).

b. Check VCT level

- Level - GREATER THAN 20%

-OR-

- Level - STABLE OR INCREASING

b. Manually increase VCT makeup flow as follows:

1) Ensure BA transfer pumps and RMW pumps running. IF NOT, THEN dispatch AO to reset MCC C and MCC D UV lockouts as necessary.

2) Place RMW flow control valve HCV-111 in MANUAL and increase RMW flow.

3) Increase boric acid flow as necessary.

IF VCT level can NOT be restored, THEN go to Step 17.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	**Check Charging Pump Suction Aligned To VCT:**	
	a. VCT level - GREATER THAN 20%	a. IF VCT level can NOT be maintained greater than 5%, THEN perform the following: 1) Ensure charging pump suction aligned to RWST: o LCV-112B open o LCV-112C closed 2) Continue with Step 17. WHEN VCT level greater than 40%, THEN do Step 16b.
	b. Verify charging pumps aligned to VCT o LCV-112C - OPEN o LCV-112B - CLOSED	b. Manually align valves as necessary.
17	**Control PRZR Level:**	
	a. Check letdown - IN SERVICE	a. Stop and start charging pumps as necessary to control PRZR level.
	b. Maintain PRZR level between 13% [40% adverse CNMT] and 50%	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: o If auxiliary spray is in use, spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves.

o When using a PRZR PORV select one with an operable block valve.

18 Establish PRZR Pressure Control:

a. Check letdown - IN SERVICE

a. Perform the following:

1) Use PRZR heaters and one PRZR PORV to maintain RCS pressure.

IF IA NOT available, THEN Refer to ATT-12.0, ATTACHMENT N2 PORVS to operate PORV.

2) Go to Step 19.

b. Use PRZR heaters and auxiliary spray valve (AOV-296) to maintain RCS pressure

19 Verify Natural Circulation:

Increase dumping steam from intact S/Gs.

o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING

o S/G pressures - STABLE OR DECREASING

o RCS hot leg temperatures - STABLE OR DECREASING

o Core exit T/Cs - STABLE OR DECREASING

o RCS cold leg temperatures - AT SATURATION TEMPERATURE FOR S/G PRESSURE

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Adverse CNMT conditions or loss of forced air cooling may result in failure of NIS detectors.

20 Check If Source Range Detectors Should Be Energized:

a. Source range channels - DEENERGIZED

a. Go to Step 20e.

b. Check intermediate range flux - EITHER CHANNEL LESS THAN 10^{-10} AMPS

b. Perform the following:

1) IF neither intermediate range channel is decreasing THEN initiate boration.

2) Continue with Step 21. WHEN flux is LESS THAN 10^{-10} amps on any operable channel, THEN do Steps 20c through e.

c. Check the following:

- Both intermediate range channels - LESS THAN 10^{-10} AMPS

-OR-

- Greater than 20 minutes since reactor trip

c. Continue with Step 21. WHEN either condition met, THEN do Steps 20d and e.

d. Verify source range detectors - ENERGIZED

d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2).

IF source ranges can NOT be restored, THEN refer to ER-NIS.1, SR MALFUNCTION and go to Step 21.

e. Transfer Rk-45 recorder to one source range and one intermediate range channel

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	Verify Adequate Shutdown Margin:	
	a. Direct RP to sample RCS and PRZR liquid for boron concentration	
	b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0, FIGURE SDM	b. Borate as necessary.
22	Maintain Stable Plant Conditions	
	a. RCS pressure - STABLE	a. Control PRZR heaters and auxiliary spray if available.
	b. RCS temperature - STABLE	b. Control dumping steam as necessary.
	c. PRZR level - BETWEEN 13% [40% adverse CNMT] and 50%	c. Control charging as necessary.
	d. Intact S/G level - BETWEEN 17% [25% adverse CNMT] and 52%	d. Control S/G feed flow as necessary.
*23	Monitor SI Initiation Criteria:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	a. Go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level. IF PRZR level can NOT be maintained, THEN go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	Try To Restore Offsite Power To All AC Busses (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER)	Maintain plant condition stable using AC emergency power.
25	Implement Plant Recovery Procedures:	
	a. Review plant systems for realignment to normal conditions (Refer to ATT-26.0, ATTACHMENT RETURN TO NORMAL OPERATIONS)	
	b. Consult plant staff to determine if RCS cooldown is necessary	b. IF cooldown NOT required, THEN go to O-3, HOT SHUTDOWN WITH XENON PRESENT.
	c. At least one RCP - OPERABLE	c. Go to ES-0.2, NATURAL CIRCULATION COOLDOWN.
	d. Go to O-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD SHUTDOWN	

-END-

ECA-0.1 APPENDIX LIST

TITLE

1) FIGURE MIN SUBCOOLING (FIG-1.0)
2) FIGURE SDM (FIG-2.0)
3) ATTACHMENT SD-1 (ATT-17.0)
4) ATTACHMENT SD-2 (ATT-17.1)
5) ATTACHMENT N2 PORVS (ATT-12.0)
6) ATTACHMENT NO SW PUMPS (ATT-2.4)
7) ATTACHMENT RETURN TO NORMAL OPERATIONS (ATT-26.0)
8) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2) |
9) FOLDOUT |

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

   IF no SW pumps are available, THEN perform the following:

   a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

   b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to use engineered safeguards systems to recover plant conditions following restoration of AC emergency power.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

   a. ECA-0.0, LOSS OF ALL AC POWER, when AC emergency power is restored and SI is required.

   b. ECA-0.1, LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED, if SI is required.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: o CSFSTs should be monitored for information only. FR procedures should not be implemented prior to completion of Step 10.

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.

o FOLDOUT page should be open and monitored periodically.

1 Reset SI

2 Check RCP CCW Isolation Status:

a. CCW pumps - BOTH PUMPS OFF

a. Go to Step 3.

b. RCP CCW return valves - CLOSED

- MOV-759A
- MOV-759B

b. Manually close valves as necessary:

o RCP CCW thermal barrier outlet valves

- AOV-754A
- AOV-754B

-OR-

o RCP CCW supply valves

- MOV-749A
- MOV-749B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Check RWST Level - GREATER THAN 28%	Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

NOTE: SI actuation to establish safeguards valve alignment is not recommended.

4	Manually Align SI And RHR Pumps To Establish SI Injection:	
	a. SI pump suction valves from RWST - OPEN • MOV-825A • MOV-825B	a. Ensure at least one SI pump suction valve from RWST open. • MOV-825A • MOV-825B
	b. Verify SI pump C discharge valves - OPEN • MOV-871A • MOV-871B	b. Manually open valves as necessary.
	c. RHR pump discharge to Rx vessel deluge - OPEN • MOV-852A • MOV-852B	c. Ensure at least one deluge valve open. • MOV-852A • MOV-852B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

THE LOADS PLACED ON THE ENERGIZED AC EMERGENCY BUS SHOULD NOT EXCEED THE CAPACITY OF THE POWER SOURCE.

5	**Manually Load Following Safeguards Equipment On AC Emergency Bus:**	
	a. Start all SI pumps	a. Perform the following: 1) Start available SI pumps. 2) IF SI pump A or B NOT available, THEN verify SI pump C aligned as follows: o IF SI pump A NOT available, THEN ensure MOV-871B closed. o IF SI pump B NOT available, THEN ensure MOV-871A closed.
	b. Check RCS pressure: o Pressure - GREATER THAN 250 psig [465 psig adverse CNMT] o Pressure - STABLE OR INCREASING	b. Manually start both RHR pumps and go to Step 5d.
	c. Place RHR pump switches in AUTO	
	d. Start all available CNMT RECIRC fans	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

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).
- IF S/G NR LEVEL DECREASES TO LESS THAN 5% [25% ADVERSE CNMT] AND FEED FLOW IS LESS THAN 200 GPM, THEN THE MDAFW PUMPS SHOULD BE MANUALLY LOADED ON AC EMERGENCY BUS TO SUPPLY WATER TO THE S/G(S).

* *

NOTE:
- o If MDAFW pump operation is not required, pump switches should be maintained in PULL-STOP to prevent automatic start.
- o TDAFW pump flow control AOVs may drift open on loss of IA.

* 6 Monitor Intact S/G Levels:

a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]

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.

IF feed flow less than 200 gpm, THEN perform the following:

1) Verify MDAFW pump discharge valve to intact S/G(s) open.
   - S/G A, MOV-4007
   - S/G B, MOV-4008

2) Manually start MDAFW pumps as necessary (223 kw).

b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	**Verify CI And CVI:**	
	a. CI and CVI annunciators - LIT • Annunciator A-26, CNMT ISOLATION • Annunciator A-25, CONTAINMENT VENTILATION ISOLATION	a. Depress manual CI pushbutton.
	b. Verify CI and CVI valve status lights - BRIGHT	b. Manually close CI and CVI valves. IF valves can NOT be verified closed by MCB indication, THEN dispatch AO to locally close valves (Refer to ATT-3.0, ATTACHMENT CI/CVI).
	c. CNMT RECIRC fan coolers SW outlet valve status lights - BRIGHT • AOV-4561 • AOV-4562	c. Dispatch AO to locally fail open valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	**Verify CNMT Spray Not Required:** o Annunciator A-27, CNMT SPRAY - EXTINGUISHED o CNMT pressure - LESS THAN 28 PSIG	IF CNMT pressure is less than 28 psig, THEN perform the following: a. Reset CNMT spray. b. Place CNMT spray pump discharge valve switches to CLOSE to deenergize open contactor. IF NOT, THEN perform the following: a. Depress manual CNMT spray pushbuttons (2 of 2). b. Ensure CNMT spray pump discharge valves open. o CNMT spray pump A: • MOV-860A • MOV-860B o CNMT spray pump B: • MOV-860C • MOV-860D c. Verify NaOH tank flow (FI-930). IF NaOH flow NOT indicated, THEN place switches for NaOH tank outlet valves to OPEN. • AOV-836A • AOV-836B d. Start both CNMT spray pumps. e. Go to step 10.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

9 Place CNMT Spray Pumps In AUTO

10 Check RCP Seal Injection Needle Valves - CLOSED

Locally close valves before starting charging pump.

- V-300A
- V-300B

NOTE: FR procedures may now be implemented as necessary.

11 Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1

-END-

ECA-0.2 APPENDIX LIST

TITLE

1) ATTACHMENT CI/CVI (ATT-3.0)

2) ATTACHMENT NO SW PUMPS (ATT-2.4)

3) FOLDOUT

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

   IF no SW pumps are available, THEN perform the following:

   a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

   b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

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 OR when RWST level is < 15% and recirculation has not been established.

c. ECA-1.2, LOCA OUTSIDE CONTAINMENT, when a LOCA outside containment cannot be isolated.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- IF EMERGENCY COOLANT RECIRCULATION IS ESTABLISHED DURING THIS PROCEDURE, FURTHER RECOVERY ACTIONS SHOULD CONTINUE BY RETURNING TO ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.
- 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.
- FOLDOUT page should be open and monitored periodically.

* 1 Verify CNMT Sump Recirculation Capability:

a. Check CNMT Sump B level - AT LEAST 113 INCHES

a. IF Sump B level less than 113 inches due to a loss of RCS inventory outside CNMT, THEN go to Step 2.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 1 continued from previous page)	
b.	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	b. Perform the following: 1) Manually or locally try to restore at least one flowpath (Refer to ATT-14.5, ATTACHMENT RHR SYSTEM to identify minimum components for one flowpath). 2) Continue with step 2. <u>WHEN</u> at least one flowpath is restored, <u>THEN</u> do steps 1c, d and e.
c.	Check at least two SW pumps - RUNNING	c. Manually start SW pumps as power supply permits (257 kw each).
d.	Check RWST level - GREATER THAN 28%	d. Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 2 <u>AND</u> continue with step 2 of this procedure until such time as Emergency Coolant Recirculation is established.
e.	Return to procedure and step in effect.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Verify CNMT RECIRC Fans Running:	
	a. All fans - RUNNING	a. Manually start fans.
	b. Charcoal filter dampers green status lights - EXTINGUISHED	b. Dispatch personnel with relay rack key to locally open dampers using trip relay pushbuttons in relay room racks. • AUX RELAY RACK RA-2 for fan A • AUX RELAY RACK RA-3 for fan C
* 3	Monitor RWST Level - GREATER THAN 15%	Go to Step 27.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

4 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

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 4 continued from previous page)

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 perform the following:

1) Reset CNMT spray.

2) Place CNMT spray pump in PULL STOP.

3) IF CNMT pressure less than 28 psig, THEN close discharge valves for idle CNMT spray pump(s).

- o Pump A
  - MOV-860A
  - MOV-860B
- o Pump B
  - MOV-860C
  - MOV-860D

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

5 Add Makeup To RWST As Necessary

- o Refer to ATT-18.0, ATTACHMENT SFP-RWST (~ 400 gpm can be expected)

-OR-

- o Refer to S-3.2D, TRANSFERRING WATER FROM CVCS HUT(S) TO RWST OR SFP (~ 60 gpm can be expected)

-OR-

- o Refer to S-9J, BLENDING TO RWST (~ 50 gpm can be expected)

* *

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).

* *

NOTE: TDAFW pump flow control AOVs may drift open on loss of IA.

*** 6 Monitor Intact S/G Levels:**

a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]	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. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	b. IF narrow range level in any S/G continues to increase, THEN stop feed flow to that S/G.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Shutdown margin should be monitored during RCS cooldown (Refer to FIG-2.0, FIGURE SDM).

7	**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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Check ECCS Pump Status: o SI Pumps - ANY RUNNING -OR- o RHR Pumps - ANY RUNNING IN INJECTION MODE	Go to step 19.

* *

CAUTION

IF OFFSITE POWER IS LOST AFTER SI RESET, THEN MANUAL ACTION MAY BE REQUIRED TO RESTART SAFEGUARDS EQUIPMENT. (REFER TO ATT-8.5, ATTACHMENT LOSS OF OFFSITE POWER)

* *

9	Reset SI If Necessary	
10	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 11.
	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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	**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 12.
	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.
12	**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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	**Verify Adequate SW Flow:**	
	a. Check at least two SW pumps - RUNNING	a. Manually start SW pumps as power supply permits (257 kw each). IF less than two SW pumps running, THEN perform the following: 1) Ensure SW isolation. 2) IF NO SW pumps running, THEN perform the following: a) Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. b) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. 3) IF only one SW pump running, THEN refer to AP-SW.2, LOSS OF SERVICE WATER.
	b. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Establish IA to CNMT:	
	a. Verify non-safeguards busses energized from offsite power o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED	a. Perform the following: 1) Close non-safeguards bus tie breakers: • 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). IF NOT, THEN perform the following: o Start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) -OR- o Evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS). 3) WHEN bus 15 restored, THEN reset control room lighting.
	b. Check SW pumps - AT LEAST TWO PUMPS RUNNING	b. Perform the following: 1) Restore IA using service air compressor OR diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) 2) Go to Step 14d.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 14 continued from previous page)

c. Verify SW isolation valves to turbine building - OPEN • MOV-4613 and MOV-4670 • MOV-4614 and MOV-4664	c. Perform the following: 1) Manually align valves. 2) Dispatch AO to locally reset compressors as necessary.
d. Verify adequate air compressor(s) - RUNNING	d. Manually start electric air compressors as power supply permits (75 kw each). IF electric air compressor can NOT be started, THEN start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).
e. Check IA supply: o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING	e. Perform the following: 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR). 2) Continue with Step 15. WHEN IA restored, THEN do Steps 14f and g.
f. Reset both trains of XY relays for IA to CNMT AOV-5392	
g. Verify IA to CNMT AOV-5392 - OPEN	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	**Establish Required Charging Line Flow:**	
	a. Charging pumps - ANY RUNNING	a. Perform the following: 1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN dispatch AO to locally close seal injection needle valves to affected RCP: • RCP A, V-300A • RCP B, V-300B 2) Ensure HCV-142 demand at 0%. 3) Start one charging pump.
	b. Establish 20 gpm total charging flow	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP(S) SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.

16 Check If An RCP Should Be Started:

a. All RCPs - STOPPED

a. Stop all but one RCP and go to step 17.

b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING

b. Go to Step 17.

c. Try to start an RCP:

1) Establish conditions for starting an RCP

- o Bus 11A or 11B energized
- o Refer to ATT-15.0, ATTACHMENT RCP START

2) Start one RCP.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*17	Monitor SI Termination Criteria:	
	a. Check RVLIS indication: o Level (no RCPs) - GREATER THAN 77% [82% adverse CNMT] -OR- o Fluid fraction (any RCP running) - GREATER THAN 84%	a. Go to step 19.
	b. RCS subcooling based on core exit T/Cs - GREATER THAN 50°F USING FIG-1.0, FIGURE MIN SUBCOOLING	b. Limit RCS injection flow (SI, RHR and charging) to that required to remove decay heat: o Determine required injection flow using FIG-6.0, FIGURE MIN RCS INJECTION o Stop SI and/or RHR pumps as necessary to establish and maintain minimum required injection flow. o IF required injection flow is less than 100 gpm, THEN establish charging at required flow and go to Step 18. IF required injection flow is greater than 100 gpm, THEN perform the following: 1) Establish minimum charging flow for RCP seal injection. 2) Establish sufficient SI pumps and adjust charging flow to satisfy minimum required injection flow. 3) Consult TSC to determine if SI pump discharge valves should be locally throttled. (Locked valve key required.) 4) Go to Step 19.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Stop SI And RHR Pumps And Place In Auto	
*19	Verify Adequate RCS Makeup Flow:	
	a. Check RVLIS indication: o Level (no RCPs) - GREATER THAN 77% [82% adverse CNMT] -OR- o Fluid fraction (any RCP running) - GREATER THAN 84%	a. Increase RCS injection flow as necessary to maintain RVLIS indication stable.
	b. Core exit T/Cs - STABLE OR DECREASING	b. Increase RCS injection flow to maintain core exit T/Cs stable or decreasing.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

20 Check If Emergency D/Gs Should Be Stopped:

a. Verify AC emergency busses energized by offsite power:

- o Emergency D/G output breakers - OPEN
- o AC emergency bus voltage - GREATER THAN 420 VOLTS
- o AC emergency bus normal feed breakers - CLOSED

a. Perform the following:

1) Close non-safeguards bus tie breakers as necessary:
   - Bus 13 to Bus 14 tie
   - Bus 15 to Bus 16 tie
2) Place the following pumps in PULL STOP:
   - 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:
   - A from Bus 13
   - B from Bus 15
   - E from Bus 15
   - F from Bus 15
5) Start HP seal oil backup pump.
6) Ensure D/G load within limits.
7) WHEN bus 15 restored, THEN reset control room lighting breaker.
8) Refer to ATT-8.4, ATTACHMENT SI/UV for other equipment lost with loss of offsite power.
9) Try to restore offsite power. (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER)

b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION IF RCPS ARE NOT RUNNING. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.

NOTE: If normal RCP support conditions can NOT be satisfied, then any running RCP(s) should be stopped.

21 Depressurize RCS To Decrease RCS Subcooling:

a. Check RCS subcooling based on core exit T/Cs - GREATER THAN 10°F USING FIG-1.0, FIGURE MIN SUBCOOLING

a. Go to Step 22.

b. Normal PRZR spray -AVAILABLE

b. Use one PRZR PORV. IF IA NOT available, THEN refer to ATT-12.0, ATTACHMENT N2 PORVS.

IF no PRZR PORV available, THEN use auxiliary spray valve (AOV-296).

c. Depressurize RCS until either of the following conditions satisfied:

- o RCS subcooling based on core exit T/Cs - LESS THAN 10°F USING FIG-1.0, FIGURE MIN SUBCOOLING

-OR-

- o PRZR level - GREATER THAN 75% [65% adverse CNMT]

d. WHEN either condition met, THEN stop RCS depressurization

e. Check RCS subcooling - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING

e. Increase RCS makeup flow as necessary to restore subcooling.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	**Check If RHR Normal Cooling Can Be Established:**	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Go to Step 23.
	b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Go to Step 23.
	c. Place letdown pressure controller (PCV-135) 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)	d. Perform the following: 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 23.
	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 ATT-14.1, ATTACHMENT RHR COOL	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	Check If SI ACCUMs Should Be Isolated:	
	a. Both RCS hot leg temperatures - LESS THAN 400°F	a. Continue with Step 24. WHEN both RCS hot leg temperatures less than 400°F, THEN do Steps 23b, c and d.
	b. 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	
	c. Close SI ACCUM discharge valves • MOV-841 • MOV-865	c. Vent any unisolated ACCUMs: 1) Open vent valves for unisolated SI ACCUMs. • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945. IF an accumulator can NOT be isolated or vented, THEN consult TSC for contingency actions.
	d. Locally reopen breakers for MOV-841 and MOV-865	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*24	Monitor RCP Operation:	
	a. RCPs - ANY RUNNING	a. Go to Step 25.
	b. Check the following: o RCP #1 seal D/P - GREATER THAN 220 PSID o Check RCP seal leakage - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0, FIGURE RCP SEAL LEAKOFF	b. Stop affected RCP(s).
25	Check Core Exit T/Cs - GREATER THAN 200°F	Go to Step 40.
26	Check RWST Level - LESS THAN 15%	Return to Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
27	**Minimize RWST Outflow:**	
	a. Any SI pump(s) - RUNNING	a. IF charging pump suction aligned to RWST, THEN 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 27d.
	b. Stop all but one SI pump	
	c. Check charging pump suction from RWST (AOV-112B) - CLOSED	c. Stop all charging pumps
	d. Stop both RHR pumps	
	e. Pull Stop both CNMT spray pumps	
	f. Check CNMT pressure - LESS THAN 28 PSIG	f. Go to Step 28.
	g. Reset CNMT spray	
	h. Close discharge valves for idle CNMT spray pump o Pump A • MOV-860A • MOV-860B o Pump B • MOV-860C • MOV-860D	
	i. Determine required injection flow using FIG-6.0, FIGURE MIN RCS INJECTION	
	j. Consult TSC to determine if SI pump discharge valve should be locally throttled (locked valve key required)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*28	Check SI pump flow - STABLE	IF SI flow zero or erratic, THEN stop running SI pump.
29	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 30. WHEN VCT level greater than 5%, THEN do Steps 29b and c.
	b. Verify charging pumps aligned to VCT o LCV-112C - OPEN o LCV-112B - CLOSED	b. Manually align valves as necessary.
	c. Establish two charging pumps running	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

30 Establish Maximum VCT Makeup:

a. Check RMW control armed - RED LIGHT LIT

a. Place RMW mode switch in AUTO and place RMW control switch to START.

b. Check VCT level - LESS THAN 20%

b. Continue with Step 31. WHEN VCT level less than 20%, THEN do Steps 30c, d and e.

c. Check VCT makeup system - OPERATING IN AUTO

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).

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

31 Add Makeup To RWST As Necessary

- o Refer to ATT-18.0, ATTACHMENT SFP-RWST (~ 400 gpm can be expected)

-OR-

- o Refer to S-3.2D, TRANSFERRING WATER FROM CVCS HUT(S) TO RWST OR SFP (~ 60 gpm can be expected)

-OR-

- o Refer to S-9J, BLENDING TO RWST (~ 50 gpm can be expected)

32 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

33 Verify SI ACCUM Isolation Valves - OPEN

- MOV-841
- MOV-865

IF valves were closed to prevent SI ACCUM nitrogen injection, THEN go to Step 37.

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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34	**Depressurize All Intact S/Gs To 785 PSIG:**	
	a. Check S/G pressures - GREATER THAN 785 PSIG	a. Go to Step 35.
	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 34b.
	d. Stop S/G depressurization	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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

35 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 77% AND 82% [82% AND 85% adverse CNMT]

-OR-

- o Fluid fraction (any RCP running) - BETWEEN 84% 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 35a.

c. Stop S/G depressurization

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
36	**Check If SI ACCUMs Should Be Isolated:**	
	a. Both RCS hot leg temperatures - LESS THAN 400°F	a. Continue with Step 37. WHEN both RCS hot leg temperatures less than 400°F, THEN do Steps 36b, c and d.
	b. 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	
	c. Close SI ACCUM discharge valves • MOV-841 • MOV-865	c. Vent any unisolated ACCUMs: 1) Open vent valves for unisolated SI ACCUMs. • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945. IF an accumulator can NOT be isolated or vented, THEN consult TSC for contingency actions.
	d. Locally reopen breakers for MOV-841 and MOV-865	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*37	Monitor RCP Operation:	
	a. RCPs - ANY RUNNING	a. Go to Step 38.
	b. Check the following: o RCP #1 seal D/P - GREATER THAN 220 PSID o Check RCP seal leakage - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0, FIGURE RCP SEAL LEAKOFF	b. Stop affected RCP(s).
38	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): 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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
39	**Check If RHR Normal Cooling Can Be Established:**	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Return to Step 38.
	b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Return to Step 38.
	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)	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. Verify pressure on PI-135 - LESS THAN 400 PSIG	e. Return to Step 38.
	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 ATT-14.1, ATTACHMENT RHR COOL	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
40	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): 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 IF no intact S/G available and RHR system NOT in service, THEN use faulted S/G.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: This procedure should be continued while obtaining CNMT hydrogen sample in the next step.

41 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.

42 Consult TSC

-END-

ECA-1.1 APPENDIX LIST

TITLE

1) FIGURE MIN SUBCOOLING (FIG-1.0)
2) FIGURE SDM (FIG-2.0)
3) FIGURE MIN RCS INJECTION (FIG-6.0)
4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
5) ATTACHMENT RHR COOL (ATT-14.1)
6) ATTACHMENT SFP-RWST (ATT-18.0)
7) ATTACHMENT RCP START (ATT-15.0)
8) ATTACHMENT SD-1 (ATT-17.0)
9) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
10) ATTACHMENT RHR SYSTEM (ATT-14.5)
11) ATTACHMENT N2 PORVS (ATT-12.0)
12) ATTACHMENT NO SW PUMPS (ATT-2.4)
13) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
14) ATTACHMENT SI/UV (ATT-8.4)
15) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
16) FOLDOUT

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

IF no SW pumps are available, THEN perform the following:

a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to identify and isolate a LOCA outside containment.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

a. E-0, REACTOR TRIP OR SAFETY INJECTION, and E-1, LOSS OF REACTOR OR SECONDARY COOLANT, on abnormal radiation in the auxiliary building due to a loss of RCS inventory outside containment.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: 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.

o FOLDOUT page should be open and monitored periodically.

1 Verify Proper RHR Normal Cooling Valve Alignment:

- o MOV-700 and MOV-701, RHR suction valves from A hot leg - CLOSED
- o MOV-720 and MOV-721, RHR discharge valves to B cold leg - CLOSED

Manually close valves.

IF neither MOV-700 nor MOV-701 can be closed, THEN perform the following:

a. Stop any running RHR pumps.

b. Close the following valves:

- MOV-856, RHR suction from RWST
- MOV-704A and MOV-704B, RHR pump suction cross tie valves

IF neither MOV-720 nor MOV-721 can be closed, THEN:

a. Stop any running RHR pump.

b. Close the following valves:

- HCV-624 and HCV-625, RHR Hx outlet valves
- HCV-626, RHR Hx bypass valve, if open

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Check CVCS Valve Alignment:	
	a. Verify the following valves - CLOSED • AOV-310, Excess letdown isolation valve • AOV-296, Auxiliary spray valve • AOV-392A, Charging line isolation valve to loop B hot leg	a. Manually close valves. IF AOV-310 can NOT be closed, THEN ensure seal return isolation valve, MOV-313, closed. IF AOV-296 or AOV-392A can NOT be closed, THEN perform the following: 1) Manually close HCV-142 charging line flow control valve. 2) Dispatch AO to locally close V-384A.
	b. Verify the following CI valves - CLOSED • MOV-313, seal return isolation valve • AOV-371, letdown isolation valve	b. Manually close valves. IF either valve can NOT be closed, THEN dispatch AO to locally isolate flowpath as necessary. o Close V-315A, seal return filter inlet, to isolate MOV-313 (reach rod outside SWRF room). o Close V-204A, NRHX inlet, to isolate AOV-371 (inside NRHX room).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Check Safeguards Valves For Backflow:	
	a. Ensure SI reset	
	b. Close RHR pump discharge to Rx vessel deluge MOV-852A (turn on DC power keyswitch)	
	c. Check for RCS pressure increase	c. Perform the following: 1) Place MOV-852A DC power keyswitch to OFF. 2) Open MOV-852A. 3) Close RHR pump discharge to Rx vessel deluge MOV-852B (turn on DC power keyswitch). 4) Check for RCS pressure increase. IF NOT, THEN place MOV-852B DC power keyswitch to OFF, open MOV-852B and go to Step 3e.
	d. Go to Step 7.	
	e. Dispatch AO with locked valve key to locally close breakers for SI pump discharge to cold leg isolation valves • MOV-878B, MCC D position 8C • MOV-878D, MCC D position 8F	
	f. Close SI pump discharge to cold leg B (MOV-878B) and check for pressure increase	f. Perform the following: 1) Open MOV-878B. 2) Close SI pump discharge to cold leg A (MOV-878D). 3) Check for RCS pressure increase. IF NOT, THEN open MOV-878D, open breakers for MOV-878B and MOV-878D, AND go to Step 4.
	g. Open breakers for MOV-878B and MOV-878D	
	h. Go to Step 7.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	**Check Charging Valves For Backflow:**	
	a. Check charging pumps - ALL PUMPS OFF	a. Go to Step 5.
	b. Close charging line isolation valve to loop B cold, AOV-294	b. Perform the following: 1) Manually close HCV-142, charging line flow control valve. 2) Dispatch AO to locally close V-384A.
	c. Check RCS pressure - INCREASING	c. Restore charging line as necessary and go to Step 5.
	d. Go to Step 7	
5	**RCP Seal Injection Flow To Each RCP - GREATER THAN 6 GPM**	<u>IF</u> CCW is being supplied to either RCP thermal barrier, <u>THEN</u> perform the following: a. Ensure at least one charging pump running. b. Increase charging pump speed and adjust charging line flow control valve (HCV-142) as necessary to establish required seal injection flow. c. Go to Step 6. <u>IF</u> neither CCW pump is running, <u>THEN</u> perform the following: a. Close RCP CCW return valves. • MOV-759A • MOV-759B b. Go to Step 7.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Check RCP Thermal Barrier:	
a.	Check the following for indications of CCW System in leakage o CCW Surge Tank Level, LI-618 - INCREASING -OR- o R-17 - ON ALARM OR INCREASING	a. Go to Step 7.
b.	Close RCP A thermal barrier return valve, AOV-754A	b. Perform the following: 1) Trip RCP A. 2) Close RCP A CCW return valve, MOV-759A.
c.	Check RCS pressure - INCREASING	c. Restore RCP A thermal barrier cooling, if desired, and go to Step 6e.
d.	Go to Step 7.	
e.	Close RCP B thermal barrier return valve, AOV-754B	e. Perform the following: 1) Trip RCP B. 2) Close RCP B CCW return valve, MOV-759B.
f.	Check RCS pressure - INCREASING	f. Restore RCP B thermal barrier cooling if desired.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Check If Break Is Isolated: a. RCS pressure - INCREASING b. Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1 -END-	a. Go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.

APPENDIX LIST

TITLE

1) ATTACHMENT NO SW PUMPS (ATT-2.4)

2) FOLDOUT

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

   IF no SW pumps are available, THEN perform the following:

   a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

   b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to mitigate and minimize a loss of secondary coolant from both steam generators.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

a. E-2, FAULTED STEAM GENERATOR ISOLATION, when an uncontrolled depressurization of both steam generators occurs.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

IF THE TDAFW PUMP IS THE ONLY AVAILABLE SOURCE OF FEED FLOW, THEN STEAM SUPPLY TO THE TDAFW PUMP MUST BE MAINTAINED FROM ONE S/G.

NOTE: o FOLDOUT page should be open AND monitored periodically.

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.

1 Check Secondary Pressure Boundary:

o MSIVs - CLOSED

o MFW flow control valves - CLOSED

- MFW regulating valves
- MFW bypass valves

o MFW pump discharge valves - CLOSED

o S/G blowdown and sample valves - CLOSED

o TDAFW pump steam supply valves - PULL STOP

o TDAFW pump flow control valves - CLOSED

o S/G ARVs - CLOSED

o Dispatch AO to locally isolate S/Gs (Refer to ATT-10.0, ATTACHMENT FAULTED S/G)

Manually close valves one loop at a time.

IF valves can NOT be closed, THEN dispatch AO to locally isolate flowpaths, as necessary, one loop at a time.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

A MINIMUM FEED FLOW OF 50 GPM MUST BE MAINTAINED TO EACH S/G WITH A NARROW RANGE LEVEL LESS THAN 5% [25% ADVERSE CNMT].

* *

NOTE: Shutdown margin should be monitored during RCS cooldown (Refer to FIG-2.0, FIGURE SDM).

2 Control Feed Flow To Minimize RCS Cooldown:

a. Check cooldown rate in RCS cold legs - LESS THAN 100°F/HR	a. Decrease feed flow to 50 gpm to each S/G and go to Step 2c.
b. Check narrow range level in both S/Gs - LESS THAN 50%	b. Control feed flow to maintain narrow range level less than 50% in both S/Gs.
c. Check RCS hot leg temperatures - STABLE OR DECREASING	c. Control feed flow or dump steam to stabilize RCS hot leg temperatures.

*** 3 Monitor RCP Trip Criteria:**

a. RCP status - ANY RCP RUNNING	a. Go to Step 4.
b. SI pumps - AT LEAST TWO RUNNING	b. Go to Step 4.
c. RCS pressure minus maximum S/G pressure - LESS THAN 175 psig [400 psig adverse CNMT]	c. Go to Step 4.
d. Stop both RCPs	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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 4B).

* *

* 4	Monitor PRZR PORVs And Block Valves:	
	a. Power to PORV block valves - AVAILABLE	a. Restore power to block valves unless block valve was closed to isolate an open PORV: • MOV-515, MCC D position 6C • MOV-516, MCC C position 6C
	b. PORVs - CLOSED	b. IF PRZR pressure less than 2335 psig, THEN manually close PORVs. IF any PORV can NOT be closed, THEN manually close its block valve. IF block valve can NOT be closed, THEN dispatch AO to locally check breaker. • MOV-515, MCC D position 6C • MOV-516, MCC C position 6C
	c. Block valves - AT LEAST ONE OPEN	c. Open one block valve unless it was closed to isolate an open PORV.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	**Check Secondary Radiation Levels - NORMAL** o Steamline radiation monitor (R-31 and R-32) o Dispatch AO to locally check steamline radiation o Request RP sample S/Gs for activity	Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

* *

CAUTION

IF OFFSITE POWER IS LOST AFTER SI RESET, THEN MANUAL ACTION MAY BE REQUIRED TO RESTART SAFEGUARDS EQUIPMENT. (REFER TO ATT-8.5, ATTACHMENT LOSS OF OFFSITE POWER)

* *

6 Reset SI

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

RCS PRESSURE SHOULD BE MONITORED. IF RCS PRESSURE DECREASES IN AN UNCONTROLLED MANNER TO LESS THAN 250 PSIG [465 PSIG ADVERSE CNMT], THEN THE RHR PUMPS MUST BE MANUALLY RESTARTED TO SUPPLY WATER TO THE RCS.

* 7	**Monitor If RHR Pumps Should Be Stopped:**	
	a. RHR pumps - ANY RUNNING IN INJECTION MODE	a. Go to Step 8.
	b. Check RCS Pressure:	
	1) Pressure - GREATER THAN 250 psig [465 psig adverse CNMT]	1) Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	2) Pressure - STABLE OR INCREASING	2) Go to Step 8.
	c. Stop RHR pumps and place in AUTO	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 8	Monitor If CNMT Spray Should Be Stopped:	
	a. CNMT spray pumps - RUNNING	a. Go to Step 9.
	b. Check the following: o CNMT pressure - LESS THAN 4 PSIG o Sodium hydroxide tank level - LESS THAN 55%	b. Continue with Step 9. <u>WHEN</u> BOTH conditions satisfied, <u>THEN</u> do Steps 8c through f.
	c. Reset CNMT spray	
	d. Check NaOH flow (FI-930) - NO FLOW	d. Place NaOH tank outlet valve switches to CLOSE. • 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	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Check RWST Level - GREATER THAN 28%	Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.
10	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.
11	Verify Adequate SW Flow:	
	a. Check at least two SW pumps - RUNNING	a. Manually start SW pumps as power supply permits (257 kw each). IF less than two SW pumps running, THEN perform the following: 1) Ensure SW isolation. 2) IF NO SW pumps running, THEN perform the following: a) Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. b) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. 3) IF only one SW pump running, THEN refer to AP-SW.2, LOSS OF SERVICE WATER.
	b. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Establish IA to CNMT:	
	a. Verify non-safeguards busses energized from offsite power o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED	a. Perform the following: 1) Close non-safeguards bus tie breakers: • 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). IF NOT, THEN perform the following: o Start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) -OR- o Evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS). 3) WHEN bus 15 restored, THEN reset control room lighting.
	b. Check SW pumps - AT LEAST TWO PUMPS RUNNING	b. Perform the following: 1) Restore IA using service air compressor OR diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) 2) Go to Step 12d.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 12 continued from previous page)

c. Verify SW isolation valves to turbine building - OPEN

- MOV-4613 and MOV-4670
- MOV-4614 and MOV-4664

c. Perform the following:

1) Manually align valves.

2) Dispatch AO to locally reset compressors as necessary.

d. Verify adequate air compressor(s) - RUNNING

d. Manually start electric air compressors as power supply permits (75 kw each). IF electric air compressors can NOT be started, THEN start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).

e. Check IA supply:

- o Pressure - GREATER THAN 60 PSIG
- o Pressure - STABLE OR INCREASING

e. Perform the following:

1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR).

2) Continue with Step 13. WHEN IA restored, THEN do Steps 12f and g.

f. Reset both trains of XY relays for IA to CNMT AOV-5392

g. Verify IA to CNMT AOV-5392 - OPEN

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	**Check If SI ACCUMs Should Be Isolated:**	
	a. Both RCS hot leg temperatures - LESS THAN 400°F	a. Go to Step 14.
	b. 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	
	c. Close SI ACCUM discharge valves • MOV-841 • MOV-865	c. Vent any unisolated ACCUMs: 1) Open vent valves for unisolated SI ACCUMs. • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945. IF an accumulator can NOT be isolated or vented, THEN consult TSC for contingency actions.
	d. Locally reopen breakers for MOV-841 and MOV-865	
14	**Check Normal Power Available To Charging Pumps:** o Bus 14 normal feed breaker - CLOSED o Bus 16 normal feed breaker - CLOSED	Verify adequate emergency D/G capacity to run charging pumps (75 kw each). IF NOT, THEN evaluate if CNMT RECIRC fans can be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Check If Charging Flow Has Been Established:	
	a. Charging pumps - ANY RUNNING	a. Perform the following: 1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN dispatch AO to close seal injection needle valve(s) to affected RCP: • RCP A, V-300A • RCP B, V-300B 2) Ensure HCV-142 open, demand at 0%.
	b. Align charging pump suction to RWST: o LCV-112B - OPEN o LCV-112C - CLOSED	b. IF LCV-112B can NOT be opened, THEN dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room). IF LCV-112C can NOT be closed, THEN perform the following: 1) Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room). 2) Verify charging pump A NOT running and place in PULL STOP. 3) WHEN V-358 open, THEN direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
	c. Start charging pumps as necessary and adjust charging flow to restore PRZR level	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*16	Monitor SI Termination Criteria:	
	a. SI pumps - ANY RUNNING	a. Go to Step 18.
	b. Check RCS pressure: o Pressure - GREATER THAN 1625 psig [1825 psig adverse CNMT] o Pressure - STABLE OR INCREASING	b. DO NOT stop SI pumps. Perform the following: 1) Energize PRZR heaters and operate PRZR spray as necessary to stabilize RCS pressure greater than 1625 psig [1825 psig adverse CNMT] 2) Return to Step 2.
	c. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	c. DO NOT stop SI pumps. Return to Step 2.
	d. PRZR level - GREATER THAN 5% [30% adverse CNMT]	d. Do NOT stop SI pumps. Perform the following: 1) IF normal PRZR spray available, THEN try to stabilize RCS pressure with PRZR spray. 2) Return to Step 16a.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	NOTE: o Following SI termination, RCP trip criteria is no longer applicable. o Foldout Page E-2 transition criteria does not apply while performing steps 17 and 18.	
17	Stop SI and RHR Pumps And Place In Auto	
18	Monitor SI Reinitiation Criteria:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	a. Manually start SI pumps as necessary and return to Step 2.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level. IF PRZR level can NOT be maintained, THEN manually start SI pumps as necessary and return to Step 2.
19	Check RCS Hot Leg Temperatures - STABLE OR DECREASING	Control feed flow or dump steam to stabilize RCS hot leg temperatures.
20	Check Narrow Range Level In Both S/Gs - LESS THAN 50%	Control feed flow to maintain narrow range level less than 50% in both S/Gs.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	Verify Adequate SW Flow To CCW Hx:	
	a. Verify at least two SW pumps - RUNNING	a. Manually start pumps as power supply permits (257 kw per pump). IF less than two SW pumps can be operated, THEN perform the following: 1) IF NO SW pumps running, THEN perform the following: a) Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. b) Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. 2) IF only one SW pump running, THEN refer to AP-SW.2, LOSS OF SERVICE WATER. 3) Go to Step 27.
	b. Verify AUX BLDG SW isolation valves - OPEN • MOV-4615 and MOV-4734 • MOV-4616 and MOV-4735	b. Manually align valves.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 21 continued from previous page)

c. Verify CNMT RECIRC fan annunciator C-2, HIGH TEMPERATURE ALARM - EXTINGUISHED

c. Perform the following:

1) Determine required SW flow to CCW HXs per table:

SW DISCHARGE ALIGNMENT	CCW HXs IN SERVICE	REQUIRED SW FLOW
Normal	2	Total of 5000 - 6000 gpm equally divided to both HXs
Normal	1	5000 - 6000 gpm to in-service HX
Alternate	2	30-33" d/p across each HX
Alternate	1	95-100" d/p across in-service HX

2) Direct AO to adjust SW flow to required value.

o IF on normal SW discharge:

- V-4619, CCW Hx A
- V-4620, CCW Hx B

-OR-

o IF on alternate SW discharge:

- V-4619C, CCW Hx A
- V-4620B, CCW Hx B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	**Check If Normal CVCS Operation Can Be Established**	
	a. Verify IA restored: o IA to CNMT (AOV-5392) - OPEN o IA pressure - GREATER THAN 60 PSIG	a. Continue with Step 27. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 22 through 26.
	b. Verify instrument bus D - ENERGIZED	b. Energize MCC B. <u>IF</u> MCC B <u>NOT</u> available, <u>THEN</u> perform the following: 1) Verify MCC A energized. 2) Place instrument bus D on maintenance supply.
	c. CCW pumps - ANY RUNNING	c. Perform the following: 1) <u>IF</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> isolate CCW to thermal barrier of affected RCP(s). • RCP A, MOV-749A and MOV-759A • RCP B, MOV-749B and MOV-759B 2) Manually start one CCW pump.
	d. Charging pump - ANY RUNNING	d. Continue with Step 27. <u>WHEN</u> any charging pump running, <u>THEN</u> do Steps 23 through 26.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	Verify PRZR Level - GREATER THAN 13% [40% adverse CNMT]	Continue with Step 25. WHEN PRZR level increases to greater than 13% [40% adverse CNMT], THEN do Step 24.
24	Establish Normal Letdown: a. Verify charging line flow to REGEN Hx - GREATER THAN 20 GPM b. Place the following switches to CLOSE: • Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202) • AOV-371, letdown isolation valve • AOV-427, loop B cold leg to REGEN Hx c. Place letdown controllers in MANUAL at 40% open • TCV-130 • PCV-135 d. Reset both trains of XY relays for AOV-371 and AOV-427 e. Open AOV-371 and AOV-427 f. Open letdown orifice valves as necessary g. Place TCV-130 in AUTO at 105°F h. Place PCV-135 in AUTO at 250 psig i. Adjust charging pump speed and HCV-142 as necessary	IF RCP seal return has been established, THEN establish excess letdown as follows: o Place excess letdown divert valve, AOV-312, to NORMAL. o Ensure CCW from excess letdown open, (AOV-745). o Open excess letdown isolation valve AOV-310. o Slowly open HCV-123 to maintain excess letdown temperature less than 195°F and pressure less than 100 psig. o Adjust charging pump speed as necessary. IF RCP seal return NOT established, THEN consult TSC to determine if excess letdown should be placed in service.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	Check VCT Makeup System:	
	a. Adjust boric acid flow control valve in AUTO to 9.5 gpm	
	b. Adjust RMW flow control valve in AUTO to 40 gpm	
	c. Verify the following: 1) RMW mode selector switch in AUTO 2) RMW control armed - RED LIGHT LIT	c. Adjust controls as necessary.
	d. Check VCT level: o Level - GREATER THAN 20% -OR- o Level - STABLE OR INCREASING	d. Manually increase VCT makeup flow as follows: 1) Ensure BA transfer pumps and RMW pumps running. IF NOT, THEN reset MCC C and MCC D UV lockouts as necessary. 2) Place RMW flow control valve HCV-111 in MANUAL and increase RMW flow. 3) Increase boric acid flow as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26	Check Charging Pump Suction Aligned To VCT:	
	a. VCT level - GREATER THAN 20%	a. IF VCT level can NOT be maintained greater than 5%, THEN perform the following: 1) Ensure charging pump suction aligned to RWST o LCV-112B open o LCV-112C closed 2) Continue with Step 27. WHEN VCT level greater than 40%, THEN do Step 26b.
	b. Verify charging pumps aligned to VCT: o LCV-112C - OPEN o LCV-112B - CLOSED	b. Manually align valves as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
27	Check RCP Cooling: a. Check CCW to RCPs: o Annunciator A-7, RCP 1A CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED o Annunciator A-15, RCP 1B CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED b. Check RCP seal injection: o Labyrinth seal D/Ps - GREATER THAN 15 INCHES OF WATER -OR- o RCP seal injection flow to each RCP - GREATER THAN 6 GPM	Establish normal cooling to RCPs (Refer to ATT-15.2, ATTACHMENT SEAL COOLING).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28	**Check If Seal Return Flow Should Be Established:**	
	a. Verify RCP #1 seal outlet temperature - LESS THAN 235°F	a. Go to Step 29.
	b. Verify RCP seal outlet valves - OPEN • AOV-270A • AOV-270B	b. Manually open valves as necessary.
	c. Reset both trains of XY relays for RCP seal return isolation valve MOV-313	
	d. Open RCP seal return isolation valve MOV-313	d. Perform the following: 1) Place MOV-313 switch to OPEN. 2) Dispatch AO to locally open MOV-313.
	e. Verify RCP #1 seal leakoff flow - LESS THAN 6.0 GPM	e. Perform the following: 1) Trip the affected RCP 2) Allow 4 minutes for pump coast down, THEN close the affected RCP seal discharge valve • RCP A, AOV-270A • RCP B, AOV-270B IF both RCP seal discharge valves are shut, THEN go to Step 29.
	f. Verify RCP #1 seal leakoff flow - GREATER THAN 0.8 GPM	f. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: o If auxiliary spray is in use, spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves.

o When using PRZR PORV, select one with an operable block valve.

29	**Energize Heaters And Operate Normal Spray As Necessary To Maintain RCS Pressure Stable**	IF normal spray NOT available and letdown is in service, THEN use auxiliary spray valve (AOV-296). IF PRZR spray NOT available, THEN use one PRZR PORV. IF IA NOT available, THEN refer to ATT-12.0, ATTACHMENT N2 PORVS.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30	**Verify All AC Busses - ENERGIZED BY OFFSITE POWER** o Normal feed breakers to all 480 volt busses - CLOSED o 480 bus voltage - GREATER THAN 420 VOLTS o Emergency D/G output breakers - OPEN	Perform the following: a. IF any AC emergency bus normal feed breaker open, THEN ensure associated D/G breaker closed. b. Perform the following, as necessary: 1) Close non-safeguards bus tie breakers: • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Place the following pumps in PULL STOP: • EH pumps • Turning gear oil pump • HP seal oil backup pump 3) Restore power to MCCs. • A from Bus 13 • B from Bus 15 • E from Bus 15 • F from Bus 15 4) Start HP seal oil backup pump 5) Ensure D/G load within limits. 6) WHEN bus 15 restored, THEN reset control room lighting. 7) Refer to ATT-8.4, ATTACHMENT SI/UV for other equipment lost with loss of offsite power. c. Try to restore offsite power to all AC busses (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.

31	Check RCP Status	
	a. Both RCPs - STOPPED	a. Go to Step 32.
	b. Check RVLIS level (no RCPs) - ≥ 95%	b. IF RVLIS level (no RCPs) less than 95%, THEN perform the following: o Increase PRZR level to greater than 65% [82% adverse CNMT] o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING o Energize PRZR heaters as necessary to saturate PRZR water IF conditions NOT met, THEN continue with Step 32. WHEN conditions met, THEN do Steps 31c and d.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 31 continued from previous page)	
c.	Establish conditions for starting an RCP: o Ensure Bus 11A or 11B energized. o Refer to ATT-15.0, ATTACHMENT RCP START.	c. IF conditions can NOT be met, THEN perform the following: 1) Verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC). IF natural circulation can NOT be verified, THEN increase feed flow or dumping steam. 2) Go to Step 32.
d.	Start one RCP.	d. IF an RCP can NOT be started, THEN verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC). IF natural circulation can NOT be verified, THEN increase feed flow or dumping steam.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Adverse CNMT conditions or loss of forced air cooling may result in failure of NIS detectors.

32 Check If Source Range Detectors Should Be Energized:

a. Source range channels - DEENERGIZED

a. Go to Step 32e.

b. Check intermediate range flux - EITHER CHANNEL LESS THAN 10^{-10} AMPS

b. Perform the following:

1) IF neither intermediate range channel is decreasing THEN initiate boration.

2) Continue with Step 33. WHEN flux is LESS THAN 10^{-10} amps on any operable channel, THEN do Steps 32c, d and e.

c. Check the following:

- Both intermediate range channels - LESS THAN 10^{-10} AMPS

-OR-

- Greater than 20 minutes since reactor trip

c. Continue with step 33. WHEN either condition met, THEN do Steps 32d and e.

d. Verify source range detectors - ENERGIZED

d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2).

IF source ranges can NOT be restored, THEN refer to ER-NIS.1, SR MALFUNCTION and go to Step 33.

e. Transfer Rk-45 recorder to one source range and one intermediate range channel.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
33	**Check If Emergency D/Gs Should Be Stopped:**	
	a. Verify AC emergency busses energized by offsite power: o Emergency D/G output breakers - OPEN o AC emergency bus voltage - GREATER THAN 420 VOLTS o AC emergency bus normal feed breakers - CLOSED	a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
	b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34	**Establish Normal Shutdown Alignment:**	
	a. Check condenser - AVAILABLE	a. Dispatch AO to perform ATT-17.1, ATTACHMENT SD-2.
	b. Perform the following: o Open generator disconnects • 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	
	c. Verify adequate Rx head cooling: 1) Verify at least one control rod shroud fan - RUNNING 2) Verify one Rx compartment cooling fan - RUNNING	1) Manually start one fan as power supply permits (45 kw) 2) Perform the following: o Dispatch AO to reset UV relays at MCC C and MCC D. o Manually start one fan as power supply permits (23 kw)
	d. Verify ATT-17.0, ATTACHMENT SD-1 - COMPLETE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
35	**Maintain Plant Conditions - STABLE** o RCS pressure o PRZR level o RCS temperatures	Control plant systems as necessary to maintain conditions stable.
36	**Monitor SI Reinitiation Criteria:**	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	a. Manually start SI pumps as necessary. Return to Step 2.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level. IF PRZR level can NOT be maintained, THEN manually start SI pumps as necessary. Return to Step 2.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
37	Check If SI ACCUMs Should Be Isolated:	
	a. Check the following: o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING o PRZR level - GREATER THAN 5% [30% adverse CNMT]	a. Go to Step 38.
	b. 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	
	c. Close SI ACCUM discharge valves • MOV-841 • MOV-865	c. Vent any unisolated ACCUMs: 1) Open vent valves for unisolated SI ACCUMs. • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945. IF an accumulator can NOT be isolated or vented, THEN consult TSC for contingency actions.
	d. Locally reopen breakers for MOV-841 and MOV-865	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38	Verify Adequate Shutdown Margin	
	a. Direct RP to sample RCS for boron concentration	
	b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0, FIGURE SDM	b. Borate as necessary.
39	Check RCS Hot Leg Temperatures - LESS THAN 350°F	Control feed flow and dump steam to establish RCS cooldown rate less than 100°F/hr in RCS cold legs.
*40	Monitor RCP Operation:	
	a. RCPs - ANY RUNNING	a. Go to Step 41.
	b. Check the following:	b. Stop affected RCP(s).
	o RCP #1 seal D/P - GREATER THAN 220 PSID	
	o RCP #1 seal leakoff - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0, FIGURE RCP SEAL LEAKOFF	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: o If auxiliary spray is in use, spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves.

o When using PRZR PORV, select one with operable block valve.

***41 Check RCS Pressure - LESS THAN 400 PSIG [300 PSIG adverse CNMT]**	Perform the following: a. Depressurize RCS using normal PRZR spray. IF normal spray NOT available and letdown is in service, THEN use auxiliary spray. IF NOT, THEN use one PRZR PORV. IF IA NOT available, THEN refer to ATT-12.0, ATTACHMENT N2 PORVS. b. Maintain RCS subcooling based on core exit T/Cs - GREATER THAN 0°F using FIG-1.0, FIGURE MIN SUBCOOLING. c. Return to Step 36.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
42	**Check If RHR Normal Cooling Can Be Established:**	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Return to Step 36.
	b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Return to Step 40.
	c. Place letdown pressure controller (PCV-135) 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)	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. Verify pressure on PI-135 - LESS THAN 400 PSIG	e. Return to Step 40.
	f. Place RCS overpressure protection system in service (Refer to O-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	f. IF RCS overpressure protection system can NOT be placed in service, THEN notify TSC of potential Tech Spec violation if RHR system is placed in service.
	g. Establish RHR normal cooling (Refer to ATT-14.1, ATTACHMENT RHR COOL)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
43	Continue RCS Cooldown To Cold Shutdown:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Check narrow range level in both S/Gs - LESS THAN 50%	b. Control feed flow to maintain narrow range level less than 50% in both S/Gs.
44	Check Core Exit T/Cs - LESS THAN 200°F	Return to Step 43.
45	Evaluate Long Term Plant Status:	
	a. Maintain cold shutdown conditions	
	b. Consult TSC	

-END-

ECA-2.1 APPENDIX LIST

TITLE

1) RED PATH SUMMARY
2) FIGURE MIN SUBCOOLING (FIG-1.0)
3) FIGURE SDM (FIG-2.0)
4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
5) ATTACHMENT FAULTED S/G (ATT-10.0)
6) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
7) ATTACHMENT NC (ATT-13.0)
8) ATTACHMENT RCP START (ATT-15.0)
9) ATTACHMENT N2 PORVS (ATT-12.0)
10) ATTACHMENT SEAL COOLING (ATT-15.2)
11) ATTACHMENT SI/UV (ATT-8.4)
12) ATTACHMENT D/G STOP (ATT-8.1)
13) ATTACHMENT SD-1 (ATT-17.0)
14) ATTACHMENT SD-2 (ATT-17.1)
15) ATTACHMENT RHR COOL (ATT-14.1)
16) ATTACHMENT NO SW PUMPS (ATT-2.4)
17) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
18) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
19) FOLDOUT

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 52% [55% 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

FOLDOUT PAGE

1. LOSS OF SW CRITERIA

   IF no SW pumps are available, THEN perform the following:

   a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.

   b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. SI REINITIATION CRITERIA

   Manually start SI pumps as necessary if EITHER condition listed below occurs:

   - RCS subcooling based on core exit TCs - LESS THAN 0°F USING REQUIREMENTS OF FIG-1.0, FIGURE MIN SUBCOOLING

   - PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN 5% [30% ADVERSE CNMT]

3. E-2 TRANSITION CRITERIA

   IF any S/G pressure increases at any time (except while performing SI termination in Steps 17 and 18), THEN go to E-2, FAULTED STEAM GENERATOR 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 manually start SI pumps as necessary AND go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.