ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

7-25-2002

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

- 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)
- CONSULT WITH RADIATION PROTECTION BEFORE DISPATCHING PERSONNEL TO AUXILIARY BUILDING. SWITCHOVER TO RECIRCULATION MAY CAUSE HIGH RADIATION LEVELS.

* *

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**	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 Attachment MIN SW.

2) Go to Step 5.

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

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

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 4 continued from previous page)

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 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:

- 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 controllers in manual, full 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 Attachment RHR NPSH for further guidance). 2) Go to 9e. IF neither valve will open, THEN refer to 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 Attachment RHR SYSTEM).

IF neither flow path can be aligned, THEN refer to 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 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 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. Open NaOH tank outlet valves • AOV-836A • AOV-836B	
	f. WHEN CNMT pressure decreases to 22 psig, THEN perform the following:	
	1) Reset CNMT spray	
	2) Check NaOH tank outlet valves - CLOSED • AOV-836A • AOV-836B	2) Place NaOH tank outlet valve controllers to MANUAL and close valves.
	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

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

***16** 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%	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Establish Normal Shutdown Alignment:	
	a. Check condenser - AVAILABLE	a. Dispatch AO to perform 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 Attachment SD-1 - COMPLETE	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	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 Attachment D/G STOP)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	Check If SI ACCUMs Should Be Isolated:	
	a. Both RCS hot leg temperatures - LESS THAN 400°F	a. Continue with Step 20. WHEN both RCS hot leg temperatures less than 400°F, THEN do Steps 19b 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.
	d. Locally reopen breakers for MOV-841 and MOV-865	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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CAUTION

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

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20	Check If Intact S/Gs Should Be Depressurized To RCS Pressure:	
	a. RCS pressure - LESS THAN INTACT S/G PRESSURES	a. Go to Step 21.
	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.
21	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 22.

22 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.

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

Consult TSC to evaluate long term plant status.

24 Secure CNMT Spray

a. Reset CNMT spray

b. Place NaOH Tank outlet valve controllers 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
25	Verify Two SI Pumps - RUNNING	Manually start pumps.
26	Check Core Exit T/Cs - LESS THAN REQUIREMENTS OF FIGURE RHR INJECTION	Perform the following: a. Manually open both PRZR PORVs and block valves. b. Verify core exit T/Cs decreasing to less than requirements of Figure RHR INJECTION. IF NOT, THEN dump steam from intact S/Gs until core exit T/Cs less than required.
27	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) ATTACHMENT D/G STOP (ATT-8.1)
5) ATTACHMENT SD-1 (ATT-17.0)
6) ATTACHMENT SD-2 (ATT-17.1)
7) ATTACHMENT RHR NPSH (ATT-14.3)
8) ATTACHMENT RHR SYSTEM (ATT-14.5)
9) ATTACHMENT MIN SW (ATT-2.1)
10) ATTACHMENT RHR PRESS REDUCTION (ATT-14.6)
11) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
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. 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. 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

7-25-2002

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

INADVERTANT CRITICALITY MAY OCCUR FOLLOWING NATURAL CIRCULATION COOLDOWN IF THE RCP IN THE RUPTURED LOOP IS STARTED FIRST.

* *

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	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 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.
	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.

3 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 FIGURE SDM

b. Borate as necessary.

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

* 4 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.

5 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
* 6	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].
* 7	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 8.
	b. PRZR level - LESS THAN 75% [65% adverse CNMT]	b. Decrease charging flow to decrease level and go to Step 10.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: o The upper head region may void during RCS depressurization if RCPs are not running. This may result in a rapidly increasing PRZR level.

o 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.

* **8** 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 FIGURE MIN SUBCOOLING

9 Establish Required RCS Hydrogen Concentration (Refer to S-3.3C, H2 Or O2 REMOVAL FROM PRIMARY SYSTEM BY BURPING VCT)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check If RHR Normal Cooling Can Be Established:	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Go to Step 11.
	b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Go to Step 11.
	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 Attachment RHR COOL)	
*11	Monitor RCP Operation:	
	a. RCPs - ANY RUNNING	a. Go to Step 12.
	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 FIGURE RCP SEAL LEAKOFF	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Check Core Exit T/Cs - LESS THAN 200° F	Return to Step 3.
13	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) 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. 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 FIGURE MIN SUBCOOLING.

OR

- PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN 5% [30% adverse CNMT].

2. 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.

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).

4. 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

7-25-2002

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

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

2 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 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.

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.

3 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 FIGURE SDM

b. Borate as necessary.

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

* 4 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.

5	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.

* *

* **6** 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 6b.	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 6b.	Energize PRZR heaters	Maintain RCS and ruptured S/G pressure equal
BETWEEN 50% AND 75% [65% ADVERSE CNMT]	o Depressurize RCS using Step 6b. 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 6a

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
7	Establish Required RCS Hydrogen Concentration (Refer to S-3.3C, H2 OR O2 REMOVAL FROM PRIMARY SYSTEM BY BURPING VCT)	
8	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 3.
* 9	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.

10 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.

***11** 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 12.

b. PRZR level - LESS THAN 75% [65% adverse CNMT]

b. Decreases charging flow to decrease level and go to Step 13.

NOTE: The upper head region may void during depressurization if RCPs are not running. This may result in a rapidly increasing PRZR level.

***12** 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 FIGURE MIN SUBCOOLING

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*13	Monitor RCP Operation:	
	a. RCPs - ANY RUNNING	a. Go to Step 14.
	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 FIGURE RCP SEAL LEAKOFF	
14	Check If RHR Normal Cooling Can Be Established:	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Return to Step 9.
	b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Return to Step 9.
	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 Attachment RHR COOL)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	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.
16	Check Core Exit T/Cs - LESS THAN 200°F	Return to Step 9.
17	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) 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. 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 FIGURE MIN SUBCOOLING.

OR

- PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN 5% [30% adverse CNMT].

2. 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.

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).

4. 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

7-25-2002

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

- o STEAM SHOULD NOT BE RELEASED FROM ANY RUPTURED S/G IF WATER MAY EXIST IN ITS STEAMLINE.
- o AN OFFSITE DOSE EVALUATION SHOULD BE COMPLETED PRIOR TO USING THIS PROCEDURE.

* *

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	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 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.
	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.

3 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 FIGURE SDM

b. Borate as necessary.

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

* 4 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.

5 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.

* *

* **6** 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 6b.	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 6b.	Energize PRZR heaters	Maintain RCS and ruptured S/G pressure equal
BETWEEN 50% AND 75% [65% ADVERSE CNMT]	o Depressurize RCS using Step 6b. 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 6a

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
7	Establish Required RCS Hydrogen Concentration (Refer to S-3.3C, H2 OR O2 REMOVAL FROM PRIMARY SYSTEM BY BURPING VCT)	
8	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 3.
* **9**	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.

10 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 11.

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

***11** 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 12.

b. PRZR level - LESS THAN 75% [65% adverse CNMT]

b. Decrease charging flow to decrease level and go to Step 13.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: The upper head region may void during depressurization if RCPs are not running. This may result in a rapidly increasing PRZR level.

***12** 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 FIGURE MIN SUBCOOLING

***13** Monitor RCP Operation:

a. RCPs - ANY RUNNING

a. Go to Step 14.

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 FIGURE RCP SEAL LEAKOFF

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Check If RHR Normal Cooling Can Be Established	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Return to Step 9.
	b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Return to Step 9.
	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 Attachment RHR COOL)	
15	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
16	Check Core Exit T/Cs - LESS THAN 200°F	Return to Step 9.
17	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) 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. 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 FIGURE MIN SUBCOOLING.

   OR

   - PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN 5% [30% adverse CNMT].

2. 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.

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).

4. 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

7-25-2002
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to restore core cooling.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

a. F-0.2, CORE COOLING Critical Safety Function Status Tree, on a RED condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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

* 1	Monitor RWST Level - GREATER THAN 28%	Perform the following: a. Ensure SI system aligned for cold leg recirculation using Steps 1 through 13 of ES-1.3, TRANSFER TO COLD LEG RECIRCULATION. b. WHEN the SI system is aligned for sump recirculation, THEN go to Step 4.
2	Verify SI Pump Suction Aligned to RWST:	
	a. Verify 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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

RHR PUMPS SHOULD NOT BE RUN LONGER THAN 1 HOUR WITHOUT CCW TO THE RHR HEAT EXCHANGERS.

3 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 both RHR pumps - RUNNING

   b. Manually start pumps

c. Verify SI pump C - RUNNING

   c. Manually start pump on available bus.

d. Verify SI pump A - RUNNING

   d. Perform the following:
   1) Ensure SI pumps B and C running.
   2) Ensure SI pump C aligned to discharge line A:
      - o MOV-871B closed
      - o MOV-871A open
   3) Go to Step 4.

e. Verify SI pump B - RUNNING

   e. Perform the following:
   1) Ensure SI pumps A and C running.
   2) Ensure SI pump C aligned to discharge line B:
      - o MOV-871B open
      - o MOV-871A closed
   3) Go to Step 4.

f. Verify both SI pump C discharge valves - OPEN
   - MOV-871A
   - MOV-871B

   f. Manually open valves as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Verify SI Flow In Both Trains: o SI line loop A and B flow indicators - CHECK FOR FLOW o RHR loop flow indicator - CHECK FOR FLOW	Perform the following: a. Manually start pumps and align valves as necessary. b. Establish maximum charging flow.
5	Check RCP Support Conditions: a. Verify Bus 11A or 11B - ENERGIZED b. Check other RCP support conditions (Refer to Attachment RCP START)	a. Restore power to Bus 11A or 11B (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER). b. Continue attempts to establish RCP support conditions.
6	Check SI ACCUM Discharge Valves - OPEN • MOV-841 • MOV-865	IF SI ACCUM discharge valves closed after ACCUM discharge, THEN go to Step 7. IF NOT, THEN perform the following: 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. Open SI ACCUM discharge valves. • ACCUM A, MOV-841 • ACCUM B, MOV-865

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Check Core Exit T/Cs - LESS THAN 1200°F	Go to Step 10.
8	Check RVLIS Indication:	
	a. RCPs - BOTH SECURED	a. Return to procedure and step in effect
	b. RVLIS level - GREATER THAN 52% [55% adverse CNMT]	b. IF RVLIS increasing, THEN return to Step 1. IF NOT, THEN go to Step 9.
	c. Return to procedure and step in effect	
9	Check Core Exit T/Cs:	
	a. Temperature - LESS THAN 700°F	a. IF decreasing, THEN return to Step 1. IF NOT, THEN go to Step 10.
	b. Return to procedure and step in effect	

* *

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)

* *

10 Reset SI

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Reset CI:	
	a. Depress CI reset pushbutton	
	b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED	b. Perform the following: 1) Reset SI. 2) Depress CI reset pushbutton.
	NOTE: This procedure should be continued while obtaining CNMT hydrogen sample in Step 12.	
12	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.

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).
- A FAULTED OR RUPTURED S/G SHOULD NOT BE USED IN SUBSEQUENT STEPS UNLESS NO INTACT S/G IS AVAILABLE.

* *

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

***13** 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 total feed flow greater than 200 gpm can NOT be established, THEN perform the following:

1) Continue attempts to establish a heat sink in at least one S/G (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

2) Go to Step 23.

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

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 14B).

* *

14 Check RCS Vent Paths:

a. Power to PRZR 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.
c. Block valves - AT LEAST ONE OPEN	c. Open one block valve unless it was closed to isolate an open PORV.
d. Rx vessel head vent valves - CLOSED • SOV-590 • SOV-591 • SOV-592 • SOV-593	d. Manually close valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Establish Condenser Steam Dump Manual Control	
	a. Verify condenser available: o Intact S/G MSIV - OPEN o Annunciator G-15, STEAM DUMP ARMED - LIT	a. Place intact S/G ARV controller in MANUAL and go to Step 16.
	b. Place steam dump mode selector switch in MANUAL	
	c. Place steam dump controller in MANUAL	
	NOTE: Partial uncovering of S/G tubes is acceptable in the following steps.	
16	Depressurize All Intact S/Gs To 200 PSIG:	
	a. Dump steam to condenser at maximum rate	a. Manually or locally dump steam at maximum rate using S/G ARVs.
	b. Check S/G pressure - LESS THAN 200 PSIG	b. IF S/G pressure decreasing, THEN return to Step 13. IF NOT, THEN go to Step 23.
	c. Check RCS hot leg temperatures - BOTH LESS THAN 400°F	c. IF RCS hot leg temperatures decreasing, THEN return to Step 13. IF NOT, THEN go to Step 23.
	d. Stop S/G depressurization	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Check If SI ACCUMs Should Be Isolated:	
	a. RCS hot leg temperatures - BOTH LESS THAN 400°F	a. Go to Step 23.
	b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves if necessary • MOV-841 MCC C position 12F • MOV-865 MCC D position 12C	
	c. Verify SI reset	c. Manually reset SI.
	d. Close SI ACCUM discharge valves • ACCUM A, MOV-841 • ACCUM B, MOV-865	d. Perform the following: 1) Reset CI. 2) Ensure adequate air compressor(s) running. 3) Establish IA to CNMT. 4) Open vent valves for unisolated SI ACCUMs. • ACCUM A, AOV-834A • ACCUM B, AOV-834B 5) Open HCV-945.
	e. Locally reopen breakers for MOV-841 and MOV-865	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Stop Both RCPs	
19	Dump Steam to Condenser At Maximum Rate To Depressurize All Intact S/Gs To Atmospheric Pressure	Manually or locally dump steam at maximum rate using S/G ARVs.
20	Verify SI Flow: o SI line loop A and B flow indicators - CHECK FOR FLOW -OR- o RHR loop flow indicator - CHECK FOR FLOW	Perform the following: a. Continue efforts to establish SI flow. b. Try to establish charging flow. c. IF core exit T/Cs less than 1200°F, THEN return to Step 19. IF NOT, THEN go to Step 23.
21	Check Core Cooling: a. Core exit T/Cs - LESS THAN 1200°F b. RCS hot leg temperatures - BOTH LESS THAN 320°F c. RVLIS level (no RCPs) - GREATER THAN 77% [82% adverse CNMT]	a. Go to Step 23. b. Return to Step 19. c. Return to Step 19.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	Go to Appropriate Plant Procedure	
	a. Check RWST level - GREATER THAN 28%	a. Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.
	b. Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 17	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Normal conditions are desired but not required for starting the RCPs.

23 Check If RCPs Should Be Started:

a. Core Exit T/Cs - GREATER THAN 1200°F

a. Go to Step 24.

b. Check if an idle RCS cooling loop is available

- o Narrow range S/G level - GREATER THAN 5% [25% adverse CNMT]
- o RCP in associated loop - AVAILABLE AND NOT OPERATING

b. Perform the following:

1) Reset SI.

2) Reset CI.

3) Ensure adequate air compressor(s) running.

4) Establish IA to CNMT.

5) Open all PRZR PORVs and block valves

a) IF any block valve can NOT be opened, THEN ensure power supplied to block valve.

b) IF IA NOT available, THEN refer to Attachment N2 PORVS.

6) IF core exit T/Cs remain greater than 1200°F, THEN open Rx vessel head vent valves.

- SOV-590
- SOV-591
- SOV-592
- SOV-593

7) Go to Step 24.

c. Start RCP in one idle RCS cooling loop

d. Return to Step 23a

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	Try To Locally Depressurize All Intact S/Gs To Atmospheric Pressure: o Use intact S/G(s) ARVs -OR- o Open TDAFW pump steam supply valve from intact S/G(s) • S/G A, MOV-3505A • S/G B, MOV-3504A -OR- o Perform the following: a. Open intact S/G MSIV bypass valves b. Open both priming air ejector steam inlet valves • V-3580 • V-3581	Use faulted or ruptured S/G.
25	Check Core Exit T/Cs - LESS THAN 1200°F	IF core exit temperatures decreasing, THEN return to step 23. IF core exit temperatures increasing, THEN go to SACRG-1, SEVERE ACCIDENT CONTROL ROOM GUIDELINE INITIAL RESPONSE, step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26	Check If SI ACCUMs Should Be Isolated:	
	a. RHR loop flow indicator - AT LEAST INTERMITTENT FLOW	a. Return to Step 23.
	b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves if necessary • MOV-841 MCC C position 12F • MOV-865 MCC D position 12C	
	c. Reset SI.	
	d. Close SI ACCUM discharge valves • ACCUM A, MOV-841 • ACCUM B, MOV-865	d. Perform the following: 1) Reset CI. 2) Ensure adequate air compressor(s) running. 3) Establish IA to CNMT. 4) Open vent valves for unisolated SI ACCUMs. • ACCUM A, AOV-834A • ACCUM B, AOV-834B 5) Open HCV-945.
	e. Locally reopen breakers for MOV-841 and MOV-865	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
27	Check If RCPs Should Be Stopped: a. Both RCS hot leg temperatures - LESS THAN 320°F b. Stop all RCPs	a. Go to Step 28.
28	Verify SI Flow: o SI line loop A and B flow indicators - CHECK FOR FLOW -OR- o RHR loop flow indicator - CHECK FOR FLOW	Perform the following: a. Continue efforts to establish SI flow. b. Try to establish charging flow. c. Return to Step 23.
29	Check Core Cooling: a. RCPs - BOTH SECURED b. RCS hot leg temperatures - LESS THAN 320°F c. RVLIS level - GREATER THAN 77% [82% adverse CNMT]	a. Return to Step 23. b. Return to Step 23. c. Return to Step 23.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30	Go to Appropriate Plant Procedure	
	a. IF PRZR PORVs and head vents were opened in Step 23, THEN consult TSC to evaluate long term status AND continue with transitions.	
	b. Check RWST level - GREATER THAN 28%	b. Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.
	c. Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 17.	

-END-

FR-C.1 APPENDIX LIST

TITLE

1) ATTACHMENT RCP START (ATT-15.0)

2) ATTACHMENT N2 PORVS (ATT-12.0)

3) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

7-25-2002
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to restore adequate core cooling.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

a. F-0.2, CORE COOLING Critical Safety Function Status Tree, on any ORANGE condition.

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 Normal conditions for running RCPs are desired, but RCPs should NOT be tripped if normal conditions cannot be established or maintained.

* 1	Monitor RWST Level - GREATER THAN 28%	Perform the following: a. Ensure SI system aligned for cold leg recirculation using Steps 1 through 13 of ES-1.3, TRANSFER TO COLD LEG RECIRCULATION. b. Go to Step 4.
2	Verify SI Pump Suction Aligned To RWST:	
	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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	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. 2) Ensure SI pump C aligned to discharge line A: o MOV-871B closed o MOV-871A open 3) Go to Step 4.
	d. Verify SI pump B - RUNNING	d. Perform the following: 1) Ensure SI pumps A and C running. 2) Ensure SI pump C aligned to discharge line B: o MOV-871B open o MOV-871A closed 3) Go to Step 4.
	e. Verify both SI pump C discharge valves - OPEN • MOV-871A • MOV-871B	e. Manually open valves as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Verify SI Flow In Both Trains:	
	a. SI line loop A and B flow indicators - CHECK FOR FLOW	a. Perform the following: 1) Manually start SI pumps and align valves as necessary. 2) Establish maximum charging flow.
	b. RCS pressure - LESS THAN 250 psig [465 psig adverse CNMT]	b. Go to Step 5.
	c. RHR loop flow indicator - CHECK FOR FLOW	c. Manually start RHR pumps and align valves.

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 Check RCS Vent Paths:

a. Power to PRZR 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.
c. Block valves - AT LEAST ONE OPEN	c. Open one block valve unless it was closed to isolate an open PORV.
d. Rx vessel head vent valves - CLOSED • SOV-590 • SOV-591 • SOV-592 • SOV-593	d. Manually close valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Check RCP Status:	
	a. At least one RCP - RUNNING	a. Go to Step 9.
	b. Support conditions for the operating RCP(s) available (Refer to Attachment RCP START)	b. Try to establish support conditions for the operating RCP.
7	Check RVLIS Fluid Fraction	
	a. Fluid fraction (any RCP on) - GREATER THAN 64%	a. IF increasing, THEN return to Step 1. IF NOT, then go to Step 8.
	b. Return to procedure and step in effect.	
8	Check If One RCP Should Be Stopped:	
	a. Both RCPs - RUNNING	a. Go to Step 10.
	b. Stop one RCP	
	c. Go to Step 10	
9	Check Core Cooling:	
	a. RVLIS level (no RCPs) - GREATER THAN 52% [55% adverse CNMT]	a. IF increasing, THEN return to Step 1. IF NOT, THEN go to Step 10.
	b. Core exit T/Cs - LESS THAN 700°F	b. IF decreasing, THEN return to Step 1. IF NOT, THEN go to Step 10.
	c. Return to procedure and step in effect	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check SI ACCUM Discharge Valves - OPEN • MOV-841 • MOV-865	IF SI ACCUM discharge valves closed after ACCUM discharge, THEN go to Step 11. IF NOT, THEN perform the following: 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. Open SI ACCUM discharge valves. • ACCUM A, MOV-841 • ACCUM B, MOV-865

* *

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).
- A FAULTED OR RUPTURED S/G SHOULD NOT BE USED IN SUBSEQUENT STEPS UNLESS NO INTACT S/G IS AVAILABLE.

* *

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

*11	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. Increase total feed flow to restore narrow range level greater than 5% [25% adverse CNMT] in at least one S/G.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Establish Condenser Steam Dump Manual Control	
	a. Verify condenser available: o Intact S/G MSIV - OPEN o Annunciator G-15, STEAM DUMP ARMED - LIT	a. Place intact S/G ARV controller in MANUAL and go to Step 13.
	b. Place steam dump mode selector switch in MANUAL	
	c. Place steam dump controller in MANUAL	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

THE FOLLOWING STEP WILL CAUSE SI ACCUMULATOR INJECTION WHICH MAY RESULT IN A RED PATH CONDITION IN F-0.4, INTEGRITY STATUS TREE. THIS PROCEDURE SHOULD BE COMPLETED BEFORE TRANSITION TO FR-P.1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK.

* *

13 Depressurize All Intact S/Gs To 200 PSIG:

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/Gs:

- o Use S/G ARVs.

-OR-

- o Open TDAFW pump steam supply valve(s) for affected S/G(s):
  - S/G A, MOV-3505A
  - S/G B, MOV-3504A

-OR-

- o Locally perform the following:
  - o Open intact S/G MSIV bypass valve.
  - o Open priming air ejector steam isolation valves.
    - V-3580
    - V-3581

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

c. Return to Step 11.

d. Stop S/G depressurization

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

RHR PUMPS SHOULD NOT BE RUN LONGER THAN 1 HOUR WITHOUT CCW TO THE RHR HEAT EXCHANGERS.

* *

14 Check RHR Pumps - RUNNING

Manually start pumps as necessary.

15 Check If SI ACCUMs Should Be Isolated:

a. RCS hot leg temperatures - BOTH LESS THAN 400°F

a. Go to Step 17.

b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves if necessary

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

c. Reset SI

d. Close SI ACCUM discharge valves

- MOV-841
- MOV-865

d. Perform the following:

1) Reset CI

2) Ensure adequate air compressor(s) running

3) Establish IA to CNMT

4) Open vent valves for unisolated SI ACCUMs.

- ACCUM A, AOV-834A
- ACCUM B, AOV-834B

5) Open HCV-945.

e. Locally reopen breakers for MOV-841 and MOV-865

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

SYMPTOMS FOR FR-C.1, RESPONSE TO INADEQUATE CORE COOLING, SHOULD BE CLOSELY MONITORED DURING SUBSEQUENT STEPS.

* *

16 Stop All RCPs

17 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/Gs:

1) Use S/G ARVs.

2) Open TDAFW pump steam supply valve(s) for affected S/G(s):

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

3) Locally perform the following:

o Open intact S/G MSIV bypass valve.

o Open priming air ejector steam isolation valves.

- V-3580
- V-3581

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Verify SI Flow: o SI line loop A and B flow indicators - CHECK FOR FLOW -OR- o RHR loop flow indicator - CHECK FOR FLOW	Perform the following: a. Continue efforts to establish SI flow. b. Try to establish maximum charging flow. c. Return to Step 17.
19	Isolate Both SI ACCUMs: a. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves if necessary • MOV-841, MCC C position 12F • MOV-865, MCC D position 12C b. Reset SI c. Close SI ACCUM discharge valves • MOV-841 • MOV-865 d. Locally reopen breakers for MOV-841 and MOV-865	c. Perform the following: 1) Reset CI. 2) Ensure adequate air compressor(s) running. 3) Establish IA to CNMT. 4) Open vent valves for unisolated SI ACCUMs. • ACCUM A, AOV-834A • ACCUM B, AOV-834B 5) Open HCV-945.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	Stop All RCPs	
21	Check Core Cooling: o RVLIS level (no RCPs) - GREATER THAN 77% [82% adverse CNMT] o Both RCS hot leg temperatures - LESS THAN 320°F	Return to Step 17.
22	Go to Appropriate Plant Procedure	
	a. Check RWST level - GREATER THAN 28%	a. Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.
	b. Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 17	

-END-

FR-C.2 APPENDIX LIST

TITLE

1) ATTACHMENT RCP START (ATT-15.0)

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

7-25-2002
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions for responding to a loss of secondary heat sink in both S/Gs.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

a. E-0, REACTOR TRIP OR SAFETY INJECTION, when minimum AFW flow is not verified AND normal range level in both S/Gs is less than 5% [25% adverse CNMT]

b. F-0.3, HEAT SINK Critical Safety Function Status Tree on a RED condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- IF TOTAL FEED FLOW IS LESS THAN 200 GPM DUE TO OPERATOR ACTION, THIS PROCEDURE SHOULD NOT BE PERFORMED.
- FEED FLOW SHOULD NOT BE REESTABLISHED TO A FAULTED S/G IF A NON-FAULTED S/G IS AVAILABLE.

* *

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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Check If Secondary Heat Sink Is Required:	
	a. RCS pressure - GREATER THAN ANY NON-FAULTED S/G PRESSURE	a. IF RWST level greater than 28%, THEN return to procedure and step in effect. IF RWST level less than 28%, THEN go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 1 continued from previous page)

b. Check RCS cold leg temperature - GREATER THAN 350°F

b. IF RCS pressure less than 400 psig [300 psig adverse CNMT], THEN try to place RHR System in service while continuing with this procedure:

1) Reset SI.

2) Place letdown pressure controller in MANUAL CLOSED.

3) Open the following valves (reset xy relays):

- 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)

4) IF pressure on PI-135 less than 400 psig, THEN establish RHR normal cooling (Refer to ATT-14.1, ATTACHMENT RHR COOL).

5) IF adequate cooling with RHR system established, THEN return to procedure and step in effect.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 2	Monitor Secondary Heat Sink: o Verify either S/G level - WIDE RANGE GREATER THAN 50 inches [100 inches adverse CNMT] o Verify PRZR pressure - LESS THAN 2335 PSIG	IF a loss of heat sink is indicated, THEN perform the following: a. Trip both RCPs. b. Go to Step 13 to initiate bleed and feed cooling.

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).

* *

3 Try to Establish AFW Flow To At Least One S/G:

a. Check S/G blowdown and samples valves - CLOSED

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

b. Check MCB indications for cause of AFW failure:

1) Verify CST level - GREATER THAN 5 FEET

1) Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS.

2) Verify busses supplying power to MDAFW pumps - ENERGIZED

- Bus 14
- Bus 16

2) Continue attempts to restore power to MDAFW pumps.

3) Determine AFW flow requirements per ATT-22.0, ATTACHMENT RESTORING FEED FLOW

4) Check AFW valve alignment

o AFW pump discharge valves - OPEN

- MOV-4007
- MOV-4008
- MOV-3996

4) Dispatch AO to locally align valves.

o TDAFW pump flow control valves - OPEN

- AOV-4297
- AOV-4298

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 3 continued from previous page)

c. Check AFW pumps - ALL RUNNING

c. Perform the following:

1) Manually start MDAFW pumps.

2) Check TDAFW pump steam supply valves OPEN.

- MOV-3504A
- MOV-3505A

3) If necessary dispatch AO to locally reset TDAFW pump governor valve.

4) IF NO AFW pumps operable, THEN go to Step 4.

d. Control AFW flow per requirements of ATT-22.0, ATTACHMENT RESTORING FEED FLOW

e. Check total flow to S/Gs - GREATER THAN 200 GPM

e. Continue attempts to restore AFW flow and go to Step 4.

f. Return to procedure and step in effect

4 Stop Both RCPs

* *

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)

* *

5 Reset SI If Actuated

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Try To Establish MFW Flow To At Least One S/G:	
	a. Check any MFW pump - AVAILABLE	a. Go to Step 7.
	b. Check condensate system: o Condensate pump - ANY RUNNING o MFW pump suction pressure - GREATER THAN 185 PSIG	b. IF offsite power available, THEN try to place condensate system in service. IF NOT, THEN go to Step 7.
	c. Establish MFW flow: 1) Check MFW pump discharge valves - CLOSED 2) Verify MFW regulating or bypass valves - OPERABLE 3) Place A and B MFW regulating valve and bypass valve controllers in MANUAL at 0% demand. 4) Dispatch AO to restore MFW pump SW cooling 5) Verify S/G blowdown key switches in NORMAL 6) Ensure Annunciator H-4,MAIN FEED PUMP OIL SYSTEM - EXTINGUISHED 7) Close Condensate Bypass valve, AOV-3959. 8) Ensure Annunciator H-11, FEED PUMP SEAL WATER LO DIFF PRESS 15 PSI - EXTINGUISHED 9) Ensure one MFW pump recirc valve - OPEN 10) Start selected MFW pump	c. IF MFW flow can NOT be established, THEN go to Step 7.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 6 continued from previous page)

11) Open MFW pump discharge valve

12) Adjust MFW regulating or bypass valves to control MFW flow per requirements of ATT-22.0, ATTACHMENT RESTORING FEED FLOW

d. Go to Step 11

7 Establish SAFW Flow:

a. Perform the following:

1) Align SAFW system for operation (Refer to ATT-5.1, ATTACHMENT SAFW)

2) Determine SAFW flow requirements per ATT-22.0, ATTACHMENT RESTORING FEED FLOW

3) Start both SAFW pumps

4) Control SAFW flow per requirements of ATT-22.0, ATTACHMENT RESTORING FEED FLOW

5) Verify SAFW total flow - GREATER THAN 200 GPM

b. Go to Step 11

a. IF greater than 200 gpm total SAFW flow can NOT be established, THEN go to Step 8.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF WIDE RANGE LEVEL IN BOTH S/GS DECREASES TO LESS THAN 50 INCHES [100 INCHES ADVERSE CNMT] OR IF PRZR PRESSURE INCREASES TO GREATER THAN 2335 PSIG DUE TO LOSS OF HEAT SINK, THEN STEPS 13 THROUGH 15 SHOULD BE IMMEDIATELY INITIATED FOR BLEED AND FEED.

* *

8 Establish Conditions to Feed S/G(s) From Condensate System:

a. Check condensate pumps - ANY RUNNING

a. IF offsite power available, THEN manually start at least one condensate pump. IF a condensate pump can NOT be started, THEN go to Step 12.

b. Establish condensate flowpath (Refer to ATT-5.0, ATTACHMENT COND TO S/G)

c. De-energize PRZR heaters

9 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 10.

b. Adjust condenser steam dump controller HC-484 to highest S/G pressure

c. Verify condenser steam dump controller HC-484 in AUTO

d. Place steam dump mode selector switch to MANUAL

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

FOLLOWING BLOCK OF AUTOMATIC SI ACTUATION, MANUAL SI ACTUATION MAY BE REQUIRED IF CONDITIONS DEGRADE.

* *

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

10 Establish Condensate Flow to S/G:

a. Check RCS pressure - GREATER THAN 1950 PSIG

a. Go to Step 10c.

b. Depressurize RCS to less than 1950 psig:

1) Check letdown - IN SERVICE

1) Use one PRZR PORV. IF IA to CNMT, AOV-5392, NOT open, THEN refer to ATT-12.0, ATTACHMENT N2 PORVS.

a) IF PORV NOT available, THEN use auxiliary spray valve, AOV-296 and go to step 10c.

2) Depressurize using auxiliary spray valve (AOV-296)

2) Use one PRZR PORV. IF IA to CNMT, AOV-5392, NOT open, THEN refer to ATT-12.0, ATTACHMENT N2 PORVS.

c. WHEN PRZR pressure less than 1950 psig, THEN place SI block switches to BLOCK

- Train A
- Train B

d. Verify SAFETY INJECTION BLOCKED status light - LIT

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 10 continued from previous page)

e. Stop depressurizing RCS and maintain RCS pressure less than 1950 psig

f. Manually adjust MFW regulating or bypass valves to control feed flow per requirements of ATT-22.0, ATTACHMENT RESTORING FEED FLOW

g. Dump steam to condenser at maximum rate to depressurize at least one S/G to less than 380 psig

g. Manually or locally dump steam using intact S/G ARV at maximum rate to depressurize at least one S/G to less than 380 psig.

h. Verify condensate flow to S/Gs

h. Go to Step 12.

11 Check S/G Levels:

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

a. IF feed flow verified and level increasing in at least one S/G, THEN maintain flow to restore narrow range level greater than 5% [25% adverse CNMT]. IF NOT verified, THEN go to Step 12.

b. Return to procedure and step in effect

12 Verify Secondary Heat Sink:

a. Check the following:

- o Either S/G level - WIDE RANGE GREATER THAN 50 inches [100 inches adverse CNMT]
- o PRZR pressure - LESS THAN 2335 PSIG

a. IF loss of heat sink is indicated, THEN perform the following:

1) Go to Step 13 to initiate bleed and feed cooling.

b. Return to Step 1

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

STEPS 13 THROUGH 15 MUST BE PERFORMED QUICKLY IN ORDER TO ESTABLISH RCS HEAT REMOVAL BY RCS BLEED AND FEED.

* *

13 Actuate SI and CI

14 Verify RCS Feed Path:

a. Check SI pumps - AT LEAST ONE RUNNING

b. Check valve alignment for operating SI pumps - PROPER EMERGENCY ALIGNMENT

Manually start pumps and align valves as necessary to establish RCS feed path.

IF a feed path can NOT be established, THEN continue attempts to establish feed flow. Return to Step 3.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Establish RCS Bleed Path:	
	a. Open both PRZR PORV block valves	a. Ensure power to MCCs supplying block valves. • MCC D for MOV-515 • MCC C for MOV-516 IF any block valve can NOT be opened, THEN dispatch AO to locally check breaker: • MOV-515, MCC D position 6C • MOV-516, MCC C position 6C
	b. Place both PRZR PORV switches to OPEN	
	c. Align RCS overpressure protection system to open both PRZR PORVs (Refer to ATT-12.0, ATTACHMENT N2 PORVS)	
	d. Verify PORVs - BOTH OPEN	d. IF BOTH PRZR PORVs can NOT be opened, THEN ensure both PORV switches in OPEN.

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)

* *

16 Check If SI Can Be Reset:

a. Check SI blocked status light - EXTINGUISHED

a. Place SI block switches to UNBLOCK

b. Check the following:

- o PRZR pressure - LESS THAN 1750 PSIG

-OR-

- o Either steamline pressure - LESS THAN 514 PSIG

b. IF PRZR pressure stable or increasing, THEN reset SI and go to Step 17.

IF PRZR pressure decreasing, THEN perform the following:

1) WHEN PRZR pressure less than 1750 psig, THEN reset SI.

2) Go to Step 17.

c. Reset SI

17 Reset CI:

a. Depress CI reset pushbutton

b. Verify annunciator A-26, CONTAINMENT ISOLATION - EXTINGUISHED

b. Perform the following:

1) Reset SI.

2) Depress CI reset pushbutton

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Verify Adequate SW Flow:	
	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 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 21.
	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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	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 evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS). 3) Start HP seal oil backup pump. 4) WHEN bus 15 restored, THEN reset control room lighting.
b.	Verify turbine building SW isolation valves - OPEN • MOV-4613 and MOV-4670 • MOV-4614 and MOV-4664	b. Manually align valves.
c.	Verify adequate air compressor(s) - RUNNING	c. 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.
d.	Check IA supply: o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING	d. Perform the following: 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR). 2) Continue with Step 21. WHEN IA restored, THEN do Steps 19e, f and 20.
e.	Reset both trains of XY relays for IA to CNMT AOV-5392	
f.	Verify IA to CNMT AOV-5392 - OPEN	f. Continue with Step 21. WHEN IA restored to CNMT, THEN do Step 20.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: PRZR PORVs may close temporarily until adequate IA pressure is restored in CNMT.

20 Restore RCS Overpressure Protection System To Standby:

a. Verify instrument bus D - ENERGIZED

a. Perform the following:

1) Ensure steam dump mode control in MANUAL.

2) Restore power to instrument bus D from MCC B or MCC A (maintenance supply).

b. Place PORV PCV-430 and PCV-431C N_2 arming switches to BLOCK

- SOV-8619A
- SOV-8619B

c. Close PORV PCV-430 and PCV-431C N_2 SURGE TK VLVs

- SOV-8616A
- SOV-8616B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	Verify Adequate RCS Bleed Path: o Core exit T/Cs - STABLE OR DECREASING o RVLIS Level (no RCPs) - GREATER THAN 77% [82% adverse CNMT]	Perform the following: a. Open Rx head vent valves. • SOV-590 • SOV-591 • SOV-592 • SOV-593 b. Align any available low pressure water source to intact S/Gs. <u>IF</u> no low pressure water source can be aligned, <u>THEN</u> go to Step 22. c. Depressurize at least one intact S/G to atmospheric pressure using S/G ARV.

* *

<u>CAUTION</u>

ACTIONS TAKEN TO INITIATE RCS BLEED AND FEED SHALL NOT BE REVERSED WHEN PERFORMING STEPS 1 THROUGH 12 OF E-0, REACTOR TRIP OR SAFETY INJECTION.

* *

22 Complete Steps 1 through 12 Of E-0, REACTOR TRIP OR SAFETY INJECTION, While Continuing With This Procedure

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

THE RCS BLEED PATH MUST BE MAINTAINED EVEN IF RCS PRESSURE REMAINS GREATER THAN SI PUMP SHUTOFF HEAD.

* *

23 Maintain RCS Heat Removal:

- o Maintain SI flow
- o Maintain both PRZR PORVs and block valves - OPEN

24 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
25	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 with key to RWST gate to locally 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 manual charging pump suction from RWST (V-358 located in charging pump room). IF LCV-112C can NOT be closed, THEN perform the following: 1) Verify charging pump A NOT running and place in PULL STOP. 2) Direct AO to close V-268 to isolate charging pumps B and C from VCT (V-268 located in charging pump room).
	c. Start charging pumps as necessary to establish maximum charging flow	

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 STEPS 1 THROUGH 14 OF ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.
- IF CONTAINMENT PRESSURE INCREASES TO GREATER THAN 28 PSIG, CONTAINMENT SPRAY SHOULD BE VERIFIED.
- RHR PUMPS SHOULD NOT BE RUN LONGER THAN 1 HOUR WITHOUT CCW TO THE RHR HEAT EXCHANGERS.

* *

***26** Monitor If CNMT Spray Should Be Stopped:

a. CNMT spray pumps - RUNNING

a. Go to Step 27.

b. Check the following:

- CNMT pressure - LESS THAN 4 PSIG
- Sodium hydroxide tank level - LESS than 55%

b. Continue with Step 27. WHEN BOTH conditions satisfied, THEN do Steps 26c through 26f.

c. Reset CNMT spray

d. Check NaOH tank outlet valves - CLOSED

- AOV-836A
- AOV-836B

d. Place NaOH tank outlet valve controllers to MANUAL and close valves.

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
27	Continue Attempts To Establish Secondary Heat Sink In At Least One S/G:	
	a. Attempt to restore one or more of the following: • AFW flow • Main FW flow • Standby AFW flow • Condensate flow	
	b. WHEN a feed source is available, THEN control feed flow per requirements of ATT-22.0, ATTACHMENT RESTORING FEED FLOW	
28	Check For Adequate Secondary Heat Sink:	
	a. Check narrow range level in at least one S/G - GREATER THAN 5% [25% adverse CNMT]	a. Return to Step 27.
	b. Adjust S/G ARV controllers to existing S/G pressure	

* *

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.

* *

29	Monitor RCS Temperatures: o Core exit T/Cs - DECREASING o RCS hot leg temperatures - DECREASING	Perform the following: a. Control steam dump and feed flow to establish natural circulation and stabilize RCS temperature. b. Return to Step 27.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30	Check CCW Pumps - ANY RUNNING	Perform the following: a. 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 b. Manually start one CCW pump (122 kw).

* *

CAUTION

IF RCS IS SOLID, CLOSURE OF HEAD VENTS MAY RESULT IN RAPID RCS PRESSURE INCREASE UNLESS RCS TEMPERATURE AND RCS INFLOW AND OUTFLOW ARE CAREFULLY CONTROLLED.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31	Verify Reactor Head Vent Valves - CLOSED • SOV-590 • SOV-591 • SOV-592 • SOV-593	Manually close valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

IF RCS IS SOLID, THEN TERMINATION OF BLEED AND FEED MAY RESULT IN RAPID RCS PRESSURE INCREASE UNLESS RCS TEMPERATURE AND RCS INFLOW AND OUTFLOW ARE CAREFULLY CONTROLLED.

32	Check If One Of Three SI Pumps Should Be Stopped:	
	a. Three SI pumps - RUNNING	a. Go to Step 33.
	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. Check the following: o RCS pressure greater than 1625 psig [1825 psig adverse CNMT] o RCS subcooling based on core exit T/Cs greater than 0°F using FIG-1.0, FIGURE MIN SUBCOOLING IF NOT, THEN go to Step 35.
	c. Check PRZR level - GREATER THAN 13% [40% adverse CNMT]	c. Do NOT stop SI pump. Go to Step 35.
	d. Stop one SI pump	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

33 Check If One Of Two SI Pumps Should Be Stopped:

a. Two SI pumps - RUNNING

a. Go to Step 34.

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. Check the following:

- o RCS pressure greater than 1625 psig [1825 psig adverse CNMT]
- o RCS subcooling based on core exit T/Cs greater than 0°F using FIG-1.0, FIGURE MIN SUBCOOLING

IF NOT, THEN go to Step 35.

d. PRZR level - GREATER THAN 13% [40% adverse CNMT]

d. Do NOT stop SI pump. Go to Step 35.

e. Stop one SI pump

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34	Check If Last SI Pump Should Be Stopped:	
	a. One SI pump - RUNNING	a. Go to Step 37.
	b. Check the following:	b. Go to Step 35.
	o RCS subcooling based on core exit T/Cs greater than 0°F using FIG-1.0, FIGURE MIN SUBCOOLING	
	o RCS pressure greater than 1625 psig [1825 psig adverse CNMT]	
	c. PRZR level - GREATER THAN 13% [40% adverse CNMT]	c. Do <u>NOT</u> stop SI pump. Go to Step 35.
	d. Stop running SI pump	
	e. Go to Step 37	

<u>NOTE</u>: After closing a PORV, it may be necessary to wait for RCS pressure to increase to permit stopping SI pumps in SI reduction steps.

35	Check PRZR PORVs And Associated Block Valves - ANY BLEED PATH OPEN	Go to appropriate plant procedure: o <u>IF</u> RWST level greater than 28%, <u>THEN</u> go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT. -OR- o <u>IF</u> RWST level less than 28%, <u>THEN</u> go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

IF RCS IS SOLID, CLOSURE OF PORVS WILL RESULT IN RAPID RCS PRESSURE INCREASE UNLESS RCS TEMPERATURE AND RCS INFLOW AND OUTFLOW ARE CAREFULLY CONTROLLED.

36 Isolate PRZR Bleed Paths:

a. PRZR PORVs - BOTH OPEN

a. Perform the following:

1) Stop all but one charging pump.

2) Control charging flow as necessary to maintain RCS pressure and PRZR level.

3) Establish excess letdown as follows:

a) Place AOV-312 to NORMAL.

b) Ensure CCW pump running.

c) Manually open CCW from excess letdown Hx open (AOV-745).

d) Ensure excess letdown flow control valve, HCV-123 is closed, demand at 0.

e) Reset both trains of XY relays for MOV-313.

f) Open MOV-313.

g) Open excess letdown isolation valve AOV-310.

h) Slowly open HCV-123.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 36 continued from previous page)

b. Close one open PRZR PORV

b. Close PORV block valve. IF block valve can NOT be closed, THEN go to appropriate plant procedure:

- o IF RWST level greater than 28%, THEN go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT.

-OR-

- o IF RWST level less than 28%, THEN go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.

c. Return to Step 32

37 Check PRZR PORVs - BOTH CLOSED

Close both PRZR PORVs. IF any PRZR PORV can NOT be closed, THEN manually close its block valve.

38 Check If RHR Pumps Should Be Stopped:

a. RHR pumps - ANY RUNNING IN INJECTION MODE

a. Go to Step 39.

b. Check RCS pressure:

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

2) Pressure - STABLE OR INCREASING

b. Go to appropriate plant procedure:

- o IF RWST level greater than 28%, THEN go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.

-OR-

- o IF RWST level less than 28%, THEN go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

c. Stop RHR pumps and place in AUTO

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

39 Start Charging Pumps As Necessary And Control Charging Flow To Maintain PRZR Level

40 Go To ES-1.1, SI TERMINATION, Step 8

-END-

FR-H.1 APPENDIX LIST

TITLE

1) FIGURE MIN SUBCOOLING (FIG-1.0)
2) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
3) ATTACHMENT COND TO S/G (ATT-5.0)
4) ATTACHMENT N2 PORVS (ATT-12.0)
5) ATTACHMENT RHR COOL (ATT-14.1)
6) ATTACHMENT SAFW (ATT-5.1)
7) ATTACHMENT RESTORING FEED FLOW (ATT-22.0)
8) ATTACHMENT NO SW PUMPS (ATT-2.4)
9) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)

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GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

7-25-2002
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to add negative reactivity to a core which is observed to be critical when expected to be shut down.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

a. E-0, REACTOR TRIP OR SAFETY INJECTION, when reactor trip is not verified and manual trip is not effective.

b. F-0.1, SUBCRITICALITY, Critical Safety Function Status Tree on either a RED or ORANGE condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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

1	Verify 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 manually insert control rods.
2	Verify Turbine Stop Valves - CLOSED	Manually trip turbine. IF turbine trip can NOT be verified, THEN close both MSIVs.
3	Check AFW Pumps Running: a. MDAFW pumps - RUNNING b. TDAFW pump - RUNNING IF NECESSARY	a. Manually start MDAFW pumps. b. Manually open steam supply valves. • MOV-3505A • MOV-3504A

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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CAUTION

ACTIONS TAKEN TO INITIATE RCS BORATION SHALL NOT BE REVERSED WHEN PERFORMING STEPS 1 THROUGH 12 OF E-0, REACTOR TRIP OR SAFETY INJECTION.

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NOTE: If offsite power is lost coincident with SI, then MCC C and MCC D lockout relays must be reset to restore BA and RMW pumps.

4 Initiate Emergency Boration Of RCS:	
a. Check SI status: o All SI annunciators - EXTINGUISHED o All SI pumps - OFF IN AUTO	a. Perform the following: 1) Complete steps 1 through 12 of E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure 2) IF SI flow indicated, THEN go to Step 5. IF NOT, THEN go to Step 4b.
b. Verify at least one charging pump - RUNNING	b. Perform the following: 1) Reset SI if necessary. 2) Start one charging pump.
c. Align boration path: 1) Start two BA transfer pumps 2) Open MOV-350 3) Verify BA flow	c. Initiate normal boration at maximum rate using the boric acid flow control valve, FCV-110A. IF flow can NOT be established, THEN refer to ER-CVCS.1, REACTOR MAKEUP CONTROL MALFUNCTION.
d. Verify charging flow path: o Charging valve to loop B cold leg (AOV-294) - OPEN o Charging flow control valve (HCV-142) - DEMAND AT 0%	d. Manually align valves and verify flow.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Check PRZR PORV Status:	
	a. RCS pressure - LESS THAN 2335 PSIG	a. Verify PRZR PORVs and block valves open. IF NOT, THEN open PRZR PORVs and block valves as necessary until PRZR pressure less than 2335 psig.
	b. Check PORVs - BOTH 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
6	Verify CNMT Ventilation Isolation	
	a. CVI annunciator - LIT • Annunciator A-25, CNMT VENTILATION ISOLATION	a. Momentarily deenergize CNMT particulate monitor, R-11, to actuate CVI.
	b. Verify CVI valve status lights - BRIGHT	b. Manually close CVI valves as required IF valves can NOT be verified closed by MCB indication, THEN dispatch AO to locally close valves (Refer to Attachment CI/CVI FOR ALTERNATE ISOLATION VALVES).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Check If The Following Trips Have Occurred:	
	a. Reactor trip	a. Dispatch AO to locally trip reactor: o Trip MG set breakers at bus 13 and bus 15. -OR- o Open reactor trip breakers locally.
	b. Turbine trip	b. Dispatch AO to locally trip turbine using manual trip lever on west end of HP turbine.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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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).

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* **8** Monitor S/G Level:

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

a. Perform the following:

1) Verify total feed flow greater than 400 gpm.

   IF NOT, THEN manually start pumps and align valves as necessary.

   IF AFW can NOT be established, THEN establish SAFW (Refer to ATT-5.1, ATTACHMENT SAFW)

2) Maintain total feed flow greater than 400 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%

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Verify Dilution Paths - ISOLATED	
	a. Place RMW mode switch to BORATE	
	b. Stop RMW pumps	b. Perform the following: 1) Close RMW to blender (AOV-111) 2) Direct AO to locally open RMW pump breaker • RMW Pump A, MCC C Pos 13B • RMW Pump B, MCC D Pos 1B
10	Stabilize RCS Temperature:	
	a. Control steam dump as necessary	
	b. Verify the following: o Core exit T/Cs - STABLE OR INCREASING o Pressure in both S/Gs - STABLE OR INCREASING o Pressure in both S/Gs - GREATER THAN 110 PSIG	b. IF RCS cooldown can NOT be controlled, THEN close both MSIVs and go to Step 11.
	c. Go to Step 15	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Verify MFW Isolation: a. MFW pumps - TRIPPED b. Place A and B S/G MFW regulating valve and bypass valve controllers to MANUAL at 0% demand.	a. Manually close MFW pump discharge valves and trip MFW pumps.
12	Identify Faulted S/G: o Any S/G Pressure - DECREASING IN AN UNCONTROLLED MANNER -OR- o Any S/G Pressure - LESS THAN 110 PSIG	Go to Step 15.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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CAUTION

- AT LEAST ONE S/G SHALL BE MAINTAINED AVAILABLE FOR RCS COOLDOWN.
- IF BOTH S/GS ARE FAULTED, AT LEAST 50 GPM FEED FLOW SHOULD BE MAINTAINED TO EACH S/G.

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13 Isolate Feed Flow To Faulted S/G:

- Close faulted S/G MDAFW pump discharge valve
  - S/G A, MOV-4007
  - S/G B, MOV-4008
- Pull stop faulted S/G MDAFW pump
- Close faulted S/G TDAFW flow control valve
  - S/G A, AOV-4297
  - S/G B, AOV-4298
- 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
- Verify MDAFW pump crosstie valves - BOTH CLOSED
  - MOV-4000A
  - MOV-4000B
- 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

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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.

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14 Isolate Steam Flow From Faulted S/G:

- 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 Attachment FAULTED S/G)

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
15	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.

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

16	Verify Reactor Subcritical: o Power range channels - LESS THAN 5% o Intermediate range channels - STABLE OR DECREASING o Intermediate range channels startup rate - NEGATIVE o Core exit T/Cs - STABLE	Perform the following: a. Stabilize RCS temperature. b. Continue to inject boric acid. c. Perform actions of other FR procedures in effect which do NOT cooldown or otherwise add positive reactivity to the core. d. Direct RP to sample RCS and PRZR for boron concentration. e. Verify boron concentration greater than Figure SDM. IF adequate shutdown margin verified, THEN go to Step 17. IF NOT, THEN perform the following: a. Allow RCS to heat up. b. Perform actions of other FR procedures in effect which do NOT cooldown or otherwise add positive reactivity to the core. c. Return to Step 4.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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CAUTION

BORATION SHOULD CONTINUE TO OBTAIN ADEQUATE SHUTDOWN MARGIN DURING SUBSEQUENT ACTIONS.

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17 Return to Procedure And Step In Effect

-END-

FR-S.1 APPENDIX LIST

TITLE

1) FIGURE SDM (FIG-2.0)
2) ATTACHMENT FAULTED S/G (ATT-10.0)
3) ATTACHMENT CI/CVI (ATT-3.0)
4) ATTACHMENT SAFW (ATT-5.1)