PARAMETERS: DOC TYPES - PRAR PRAP PRE PRECA PRES STATUS: EF QU 5 YEARS ONLY:

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
AP-CCW.1	LEAKAGE INTO THE COMPONENT COOLING LOOP	015	06/26/02	06/26/02	06/26/07	EF
AP-CCW.2	LOSS OF CCW DURING POWER OPERATION	016	06/26/02	06/26/02	06/26/07	EF
AP-CCW.3	LOSS OF CCW - PLANT SHUTDOWN	014	06/26/02	06/26/02	06/26/07	EF
AP-CR.1	CONTROL ROOM INACCESSIBILITY	018	06/26/02	06/26/02	06/26/07	EF
AP-CVCS.1	CVCS LEAK	013	06/26/02	06/03/02	06/03/07	EF
AP-CVCS.3	LOSS OF ALL CHARGING FLOW	003	06/26/02	02/26/99	02/26/04	EF
AP-CW.1	LOSS OF A CIRC WATER PUMP	011	06/26/02	05/01/98	05/01/03	EF
AP-ELEC.1	LOSS OF 12A AND/OR 12B BUSSES	023	06/26/02	06/26/02	06/26/07	EF
AP-ELEC.2	SAFEGUARD BUSSES LOW VOLTAGE OR SYSTEM LOW FREQUENCY	010	06/26/02	06/26/02	06/26/07	EF
AP-ELEC.3	LOSS OF 12A AND/OR 12B TRANSFORMER (BELOW 350 F)	011	06/26/02	06/26/02	06/26/07	EF
AP-ELEC.14/16	LOSS OF SAFEGUARDS BUS 14/16	004	06/26/02	06/26/02	06/26/07	EF
AP-ELEC.17/18	LOSS OF SAFEGUARDS BUS 17/18	004	06/26/02	06/26/02	06/26/07	EF
AP-FW.1	ABNORMAL MAIN FEEDWATER FLOW	014	07/25/02	06/26/02	06/26/07	EF
AP-IA.1	LOSS OF INSTRUMENT AIR	018	06/26/02	05/01/98	05/01/03	EF
AP-PRZR.1	ABNORMAL PRESSURIZER PRESSURE	013	06/26/02	06/26/02	06/26/07	EF
AP-RCC.1	CONTINUOUS CONTROL ROD WITHDRAWAL/INSERTION	008	06/26/02	05/14/98	05/14/03	EF
AP-RCC.2	RCC/RPI MALFUNCTION	010	06/26/02	01/22/02	01/22/07	EF
AP-RCC.3	DROPPED ROD RECOVERY	005	06/26/02	02/27/98	02/27/03	EF
AP-RCP.1	RCP SEAL MALFUNCTION	014	06/26/02	05/01/98	05/01/03	EF
AP-RCS.1	REACTOR COOLANT LEAK	016	06/26/02	05/01/98	05/01/03	EF
AP-RCS.2	LOSS OF REACTOR COOLANT FLOW	011	06/26/02	05/01/98	05/01/03	EF
AP-RCS.3	HIGH REACTOR COOLANT ACTIVITY	010	06/26/02	04/01/02	01/22/07	EF
AP-RCS.4	SHUTDOWN LOCA	012	06/26/02	05/01/98	05/01/03	EF
AP-RHR.1	LOSS OF RHR	018	07/25/02	05/01/98	05/01/03	EF

PARAMETERS: DOC TYPES - PRAR PRAP PRE PRECA PRES STATUS: EF QU 5 YEARS ONLY:

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
AP-RHR.2	LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS	012	05/30/02	03/31/00	03/31/05	EF
AP-SG.1	STEAM GENERATOR TUBE LEAK	002	06/26/02	06/26/02	06/26/07	EF
AP-SW.1	SERVICE WATER LEAK	017	06/26/02	06/03/98	06/03/03	EF
AP-SW.2	LOSS OF SERVICE WATER	002	06/26/02	10/31/01	10/31/06	EF
AP-TURB.1	TURBINE TRIP WITHOUT RX TRIP REQUIRED	011	06/26/02	06/26/02	06/26/07	EF
AP-TURB.2	TURBINE LOAD REJECTION	018	06/26/02	06/26/02	06/26/07	EF
AP-TURB.3	TURBINE VIBRATION	011	06/26/02	06/26/02	06/26/07	EF
AP-TURB.4	LOSS OF CONDENSER VACUUM	016	07/25/02	05/01/98	05/01/03	EF
AP-TURB.5	RAPID LOAD REDUCTION	006	06/26/02	06/26/02	06/26/07	EF

TOTAL FOR PRAP 33

PARAMETERS: DOC TYPES - PRAR PRAP PRE PRECA PRES STATUS: EF QU 5 YEARS ONLY:

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
E-0	REACTOR TRIP OR SAFETY INJECTION	031	05/30/02	05/01/98	05/01/03	EF
E-1	LOSS OF REACTOR OR SECONDARY COOLANT	025	07/25/02	05/01/98	05/01/03	EF
E-2	FAULTED STEAM GENERATOR ISOLATION	010	07/25/02	05/01/98	05/01/03	EF
E-3	STEAM GENERATOR TUBE RUPTURE	031	07/25/02	05/01/98	05/01/03	EF

TOTAL FOR PRE 4

PARAMETERS: DOC TYPES - PRAR PRAP PRE PRECA PRES STATUS: EF QU 5 YEARS ONLY:

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
ECA-0.0	LOSS OF ALL AC POWER	024	06/14/02	05/01/98	05/01/03	EF
ECA-0.1	LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED	020	07/25/02	05/01/98	05/01/03	EF
ECA-0.2	LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED	013	07/25/02	05/01/98	05/01/03	EF
ECA-1.1	LOSS OF EMERGENCY COOLANT RECIRCULATION	021	07/25/02	05/01/98	05/01/03	EF
ECA-1.2	LOCA OUTSIDE CONTAINMENT	005	05/01/98	05/01/98	05/01/03	EF
ECA-2.1	UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS	023	05/02/02	05/01/98	05/01/03	EF
ECA-3.1	SGTR WITH LOSS OF REACTOR COOLANT SUBCOOLED RECOVERY DESIRED	023	07/25/02	05/01/98	05/01/03	EF
ECA-3.2	SGTR WITH LOSS OF REACTOR COOLANT SATURATED RECOVERY DESIRED	026	07/25/02	05/01/98	05/01/03	EF
ECA-3.3	SGTR WITHOUT PRESSURIZER PRESSURE CONTROL	027	07/25/02	05/01/98	05/01/03	EF

TOTAL FOR PRECA 9

PARAMETERS: DOC TYPES PRAR PRAP PRE PRECA PRES STATUS: EF QU 5 YEARS ONLY:

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
ES-0.0	REDIAGNOSIS	010	05/01/98	05/01/98	05/01/03	EF
ES-0.1	REACTOR TRIP RESPONSE	020	07/25/02	05/01/98	05/01/03	EF
ES-0.2	NATURAL CIRCULATION COOLDOWN	012	05/01/98	05/01/98	05/01/03	EF
ES-0.3	NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL	008	05/01/98	05/01/98	05/01/03	EF
ES-1.1	SI TERMINATION	022	07/25/02	05/01/98	05/01/03	EF
ES-1.2	POST LOCA COOLDOWN AND DEPRESSURIZATION	024	07/25/02	05/01/98	05/01/03	EF
ES-1.3	TRANSFER TO COLD LEG RECIRCULATION	033	07/25/02	05/01/98	05/01/03	EF
ES-3.1	POST-SGTR COOLDOWN USING BACKFILL	014	07/25/02	05/01/98	05/01/03	EF
ES-3.2	POST-SGTR COOLDOWN USING BLOWDOWN	015	07/25/02	05/01/98	05/01/03	EF
ES-3.3	POST-SGTR COOLDOWN USING STEAM DUMP	015	07/25/02	05/01/98	05/01/03	EF

TOTAL FOR PRES 10

PARAMETERS: DOC TYPES - PRFR PRER STATUS: EF QU 5 YEARS ONLY:

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
FR-C.1	RESPONSE TO INADEQUATE CORE COOLING	019	07/25/02	05/01/98	05/01/03	EF
FR-C.2	RESPONSE TO DEGRADED CORE COOLING	016	07/25/02	05/01/98	05/01/03	EF
FR-C.3	RESPONSE TO SATURATED CORE COOLING	008	05/01/98	05/01/98	05/01/03	EF
FR-H.1	RESPONSE TO LOSS OF SECONDARY HEAT SINK	026	07/25/02	05/01/98	05/01/03	EF
FR-H.2	RESPONSE TO STEAM GENERATOR OVERPRESSURE	004	05/01/98	05/01/98	05/01/03	EF
FR-H.3	RESPONSE TO STEAM GENERATOR HIGH LEVEL	005	05/01/98	05/01/98	05/01/03	EF
FR-H.4	RESPONSE TO LOSS OF NORMAL STEAM RELEASE CAPABILITIES	004	05/01/98	05/01/98	05/01/03	EF
FR-H.5	RESPONSE TO STEAM GENERATOR LOW LEVEL	008	05/02/02	05/01/98	05/01/03	EF
FR-I.1	RESPONSE TO HIGH PRESSURIZER LEVEL	014	10/31/01	05/01/98	05/01/03	EF
FR-I.2	RESPONSE TO LOW PRESSURIZER LEVEL	009	10/31/01	05/01/98	05/01/03	EF
FR-I.3	RESPONSE TO VOIDS IN REACTOR VESSEL	016	10/31/01	05/01/98	05/01/03	EF
FR-P.1	RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION	024	05/02/02	05/01/98	05/01/03	EF
FR-P.2	RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION	007	05/01/98	05/01/98	05/01/03	EF
FR-S.1	RESPONSE TO REACTOR RESTART/ATWS	014	07/25/02	05/01/98	05/01/03	EF
FR-S.2	RESPONSE TO LOSS OF CORE SHUTDOWN	008	05/01/98	05/01/98	05/01/03	EF
FR-Z.1	RESPONSE TO HIGH CONTAINMENT PRESSURE	005	12/14/98	05/01/98	05/01/03	EF
FR-Z.2	RESPONSE TO CONTAINMENT FLOODING	004	01/14/99	05/01/98	05/01/03	EF
FR-Z.3	RESPONSE TO HIGH CONTAINMENT RADIATION LEVEL	004	05/01/98	05/01/98	05/01/03	EF

TOTAL FOR PRFR 18

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 steps necessary to respond to a MFW system malfunction resulting in a decrease in or complete loss of main feedwater, or an uncontrolled increase in main feedwater.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - Other APs if feedwater flow can not be controlled.

2. SYMPTOMS - The symptoms of ABNORMAL MAIN FEEDWATER FLOW are;

a. Annunciator G-3(5), S/G A(B) LEVEL DEVIATION ± 7%, lit, or

b. Annunciator G-19(21), S/G A(B) FLOW MISMATCH, lit, or

c. Annunciator G-20, ADFCS SYSTEM SWITCH TO MANUAL, lit, or

d. Annunciator K-18, MAIN FEEDWATER PUMPS TRIPPED, lit, or

e. Low indicated MFW pump suction flow on 1 pump, or

f. MFW pump indicates tripped, or

g. MFW pump discharge valve indicates shut.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Check MFW Flow - LESS THAN STEAM FLOW	Perform the following: a. Place affected S/G(s) MFW regulating valve and bypass valve in MANUAL. b. Restore S/G level to 52%. IF S/G level greater than 52% AND can NOT be controlled manually, THEN perform the following: a. Trip the reactor. b. Stop all running MFW pumps. c. Close both MFW pump discharge valves. d. Go to E-0, REACTOR TRIP OR SAFETY INJECTION.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: IF power reduction is required the thumb rule for initial boron addition is ~2 gal/% load reduction.

2 Check MFW Requirements:

a. Power - GREATER THAN 50%

a. IF power less than 50%, THEN go to Step 3.

b. Both MFW pumps - RUNNING

b. IF power greater than 75%, THEN trip the reactor and go to E-0, REACTOR TRIP OR SAFETY INJECTION.

IF only one MFW pump has tripped, THEN perform the following:

1) Start all 3 AFW pumps and verify flow.

2) Place turbine in manual.

3) Depress MANUAL CONTROL VALVE LOWER AND MANUAL CONTROL VALVE FAST pushbuttons.

4) Ensure control rods inserting to control Tavg at program.

5) IF S/G level drops to ≤ 20% AND feed flow less than steam flow, THEN trip the reactor and go to E-0, REACTOR TRIP OR SAFETY INJECTION.

6) WHEN feed flow greater than steam flow, THEN stop load reduction.

7) IF a PORV opens during load reduction, THEN ensure PORV closes when PRZR pressure is below 2335 psig.

8) Go to Step 4.

IF both MFW pumps have tripped, THEN ensure reactor trip and go to E-0, REACTOR TRIP OR SAFETY INJECTION.

c. Go to Step 4

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Verify At Least One MFW Pump - RUNNING	IF power greater than 35%, THEN trip the reactor and go to E-0, REACTOR TRIP OR SAFETY INJECTION. IF NOT, THEN perform the following: a. Start all 3 AFW pumps and verify flow. b. IF turbine previously latched, THEN ensure turbine trip and go to AP-TURB.1, TURBINE TRIP WITHOUT RX TRIP REQUIRED OR E-0, REACTOR TRIP or SAFETY INJECTION. IF turbine NOT previously latched, THEN perform the following: 1) Reduce reactor power to less than 2%. 2) Go to Step 11.
4	Verify MFW Pump Suction Pressure - GREATER THAN 185 PSIG	Perform the following: a. Verify standby condensate pump running, if required. b. Verify condensate bypass valve open. c. Place Hotwell level controller in MANUAL at 50%. d. Place trim valve controller to manual and close trim valves. e. If condensate booster pumps have tripped THEN reduce turbine load until MFW pump suction pressure greater than 200 psig AND stable.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Verify Adequate MFW Flow: o A MFW flow - GREATER THAN OR EQUAL TO A STEAM FLOW o B MFW flow - GREATER THAN OR EQUAL TO B STEAM FLOW	Check MFW regulating valves controlling in AUTO. IF NOT, THEN control MFW flow in MANUAL. IF MFW flow can NOT be adjusted to greater than steam flow, THEN trip the reactor and go to E-0, REACTOR TRIP OR SAFETY INJECTION.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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

6 Establish Stable Plant Conditions:

a. Tavg - TRENDING TO TREF

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

- Insert control rods
- RCS boration

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

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

b. PRZR pressure - TRENDING TO 2235 PSIG IN AUTO

b. Control PRZR pressure by one of the following:

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

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

c. PRZR level - TRENDING TO PROGRAM IN AUTO CONTROL

c. Perform the following:

1) Place affected charging pump(s) in MANUAL

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

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

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 6 continued from previous page)	
	d. MFW regulating valves - RESTORING S/G LEVEL TO 52% IN AUTO	d. Perform the following: 1) Place affected S/G(s) MFW regulating valve in MANUAL. 2) Restore S/G level to 52%.
	e. Rod insertion limit alarms - EXTINGUISHED	e. Borate and withdraw control rods to clear insertion limit alarms (refer to affected rod bank alarm response procedures if necessary).
7	Check Status Of MFW System:	
	a. Check MFW pump suction pressure: o Pressure - GREATER THAN 200 PSIG o Pressure - STABLE	a. Return to Step 4.
	b. Automatic feedwater control - AVAILABLE	b. Continue with Step 8. <u>WHEN</u> malfunction identified, <u>THEN</u> do Step 7c.
	c. Restore feedwater control system to AUTO if desired	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Check Status Of Condensate System:	
	a. Check condensate bypass valve - CLOSED, IN AUTO	a. Perform the following: 1) Close condensate bypass valve <u>AND</u> place in AUTO. 2) Verify MFW pump suction pressure remains greater than 200 psig. <u>IF NOT</u>, <u>THEN</u> manually open condensate bypass valve.
	b. Verify hotwell level - AT SETPOINT	b. Slowly restore hotwell level to setpoint.
	c. Place hotwell level controller in AUTO	
	d. Check condensate pump - ONLY 2 PUMPS RUNNING	d. Stop one condensate pump. (Refer to T-5F, STARTING <u>OR</u> STOPPING THE CONDENSATE PUMPS)
	e. Verify trim valves in AUTO	e. Adjust trim valve controller to 300 to 375 psig (PI-2043) and place controller in AUTO.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Establish Control Systems In Auto	
	a. Verify 431K in AUTO	a. Place 431K in AUTO, if desired.
	b. Verify PRZR spray valves in AUTO	b. Place PRZR spray valves in AUTO, if desired.
	c. Verify PRZR Heaters restored: o PRZR proportional heater breaker - CLOSED o PRZR backup heater breaker - RESET/IN AUTO	c. Restore PRZR heater, if desired.
	d. Verify one charging pump in AUTO	d. Place one charging pump in AUTO, if desired.
	e. Verify MFW regulating valves in AUTO	e. Place MFW regulating valves in AUTO, if desired.
	f. Restore EH controls 1) Place in OP PAN, IMP OUT 2) Place load rate thumbwheel to 10%/hr 3) Match setter and reference	
	g. Verify steam dump controller, HC-484, in AUTO at 1005 psig	
	h. Verify annunciator G-15, STEAM DUMP ARMED - EXTINGUISHED	h. <u>WHEN</u> Tavg within 5°F of Tref, <u>THEN</u> perform the following: 1) Ensure steam dump valves closed. 2) Reset steam dump.
	i. Verify Rods in AUTO	i. Place Rods in AUTO, if desired.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Restore AFW System To Auto Standby:	
	a. Verify MFW regulating valves - RESTORING S/G LEVEL TO 52% IN AUTO	a. IF level low, THEN return to Step 5. WHEN S/G levels return to 52%, THEN do Steps 10b through g.
	b. Close TDAFW pump steam supply valves • MOV-3504A • MOV-3505A	
	c. Direct AO to locally isolate S/G blowdowns. (Refer to T-14N, BLOWDOWN SYSTEM FLOW CHANGES)	
	d. WHEN AO has locally isolated S/G blowdowns, THEN stop MDAFW pumps and place switches in AUTO	
	e. Open AFW pump discharge valves • MOV-4007 • MOV-4008 • MOV-3996	
	f. Open TDAFW pump flow control valves • AOV-4297 • AOV-4298	
	g. Direct AO to locally restore S/G blowdowns to desired flow rate. (Refer to T-14N, BLOWDOWN SYSTEM FLOW CHANGES)	
	h. Go to Step 12	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Establish Stable Plant Conditions:	
	a. Verify reactor power - LESS THAN 2%	a. Adjust control rods to CONTROL reactor power BETWEEN 1% AND 2%.
	b. Adjust MDAFW pumps flow to restore S/G level to 52%.	
	c. PRZR pressure - TRENDING TO 2235 PSIG IN AUTO	c. Control PRZR pressure by one of the following: • 431K in manual • Manual control of PRZR heaters and sprays IF PRZR pressure can NOT be controlled manually, THEN refer to AP-PRZR.1, ABNORMAL PRESSURIZER PRESSURE.
	d. PRZR level - TRENDING TO PROGRAM IN AUTO CONTROL	d. Perform the following: 1) Place affected charging pump(s) in MANUAL 2) Adjust charging pump speed to restore PRZR level to program. IF PRZR level can NOT be controlled manually, THEN refer to AP-RCS.1, REACTOR COOLANT LEAK.
	e. Rod insertion limit alarms - EXTINGUISHED	e. IF the reactor is to remain critical, THEN borate and withdraw control rods to clear insertion limit alarms (refer to affected rod bank alarm response procedures if necessary).
	f. Tavg - STABLE AT APPROXIMATELY 547°F	f. Verify proper operation of steam dump OR manually control steam dump as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

12 Evaluate MCB Annunciator Status (Refer to AR procedures)

13 Check If PRZR Boron Should Be Mixed

a. Boration performed for load reduction — a. Go to Step 14.

b. Place PRZR backup heaters switch to ON

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

14 Notify Higher Supervision

15 Return To Procedure Or Guidance In Effect

-END-

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 guidance in the event of a loss of RHR cooling at or above normal loop levels. (i.e. RCS loop levels of 64 inches or greater)

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from;

   a. FR-C.3, RESPONSE TO SATURATED CORE COOLING, or

   b. AP-ELEC.3, LOSS OF 12A AND/OR 12B TRANSFORMER (BELOW 350° F), when RHR flow can NOT be restored, or

   c. AP-CCW.3, LOSS OF CCW - PLANT SHUTDOWN when CCW is inadequate for RHR cooling

2. SYMPTOMS - The following are symptoms of LOSS OF RHR;

   a. No RHR pumps running, or

   b. Annunciator A-20, RESIDUAL HEAT REMOVAL LOOP LO FLOW 2900 GPM (Set at 400 GPM per 0-2.2 in RHR Cooling mode), lit, or

   c. Unexpected increase in temperature while on RHR cooling, or

   d. Erratic or no flow on FI-626, RHR Loop Flow, or

   e. Annunciator J-9, SAFEGUARD BREAKER TRIP, lit.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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

1	Check PRZR Wide Range Level - GREATER THAN 0 INCHES	IF RCS loop level indicator in service and loop level less than 64 inches, THEN go to AP-RHR.2, LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS.
2	Check RHR Pumps - AT LEAST ONE RUNNING	IF running pump tripped due to loss of NPSH, THEN go to step 4. IF NOT, THEN go to step 11.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF BOTH RHR PUMPS RUNNING WITH DISCHARGE CROSSTIES OPEN, THEN TOTAL RHR FLOW SHOULD BE MAINTAINED GREATER THAN 1200 GPM.

* *

3 Check If RHR Pump(s) Should Be Stopped:

a. RHR pump - ANY RUNNING

a. Go to Step 4.

b. Check RHR pump flow - LESS THAN 1500 GPM PER OPERATING PUMP

b. Manually decrease RHR flow to less than 1500 gpm per operating pump. IF RHR flow can NOT be controlled from the MCB, THEN perform the following:

1) Stop running RHR pump.

2) Dispatch an AO with a locked valve key to locally close RHR Hx outlet valves.

- A RHR Hx, HCV-625 handwheel
- B RHR Hx, HCV-624 handwheel

3) Start an RHR pump.

4) Direct AO to locally adjust RHR flow to less than 1500 gpm.

c. RHR pumps cavitating:

o RHR pump flow - OSCILLATING

-OR-

o RHR pump NPSH - APPROXIMATELY ZERO (PPCS Group Display NPSH)

c. Go to Step 19.

d. Stop RHR pumps

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- DO NOT INITIATE ANY ACTIONS WHICH MAY ADD POSITIVE REACTIVITY TO THE CORE.
- NOTIFY S/G OFFICE THAT CNMT BREATHING AIR MAY BE LOST.
- IF REFUELING IN PROGRESS, THEN STOP REFUELING OPERATIONS (NOTIFY REFUELING SRO).

* *

NOTE: Personnel remaining in CNMT to assist in event mitigation should consult Health Physics for changes in radiological concerns.

4 Initiate Actions To Protect Personnel In CNMT:

a. Evacuate non-essential personnel from CNMT

b. Verify all available CNMT RECIRC fan(s) - RUNNING

b. Manually start available CNMT RECIRC fans.

c. Initiate monitoring of CNMT area and process radiation monitors

c. Refer to appropriate alarm response procedures for required actions.

d. Verify CNMT penetrations with direct access to outside atmosphere - CLOSED (Refer to ATT-3.1, ATTACHMENT CNMT CLOSURE)

d. Within 4 hours, close all CNMT penetrations to outside atmosphere.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

SYSTEM MAY BE PRESSURIZED. EXTRA CARE SHOULD BE EXERCISED WHEN OPERATING THE RHR VENT VALVE.

* *

NOTE: If adequate time to completely vent the RHR system is not available, then air can be swept out of the RHR lines by running an RHR pump at a flowrate between 1200 gpm and 1400 gpm.

5 Vent RHR System As Necessary

a. Check vent hose at RHR suction V-2764 - INSTALLED — a. Go to step 6.

b. Check RCS temperature - LESS THAN 200°F — b. Go to step 6.

c. Maintain RCS level while venting RHR system

d. Direct AO to vent RHR suction line from loop A at V-2764 (in CNMT by loop A)

6 Check RHR Cooling Valve Alignment - NORMAL (Refer to ATT-14.0, ATTACHMENT NORMAL RHR COOLING) — Manually or locally align valves as necessary.

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.

* *

7 Check IA Available For RHR Flow Control:

- o Verify adequate air compressors - RUNNING
- o Verify IA pressure - GREATER THAN 60 PSIG
- o IA available to HCV-624 AND HCV-625

Perform the following:

a. Manually start adequate air compressors (75 kw each). IF air compressors can NOT be started manually, THEN dispatch AO to locally reset and start compressors (75 kw each).

   IF electric air compressor(s) can NOT be restored, THEN start diesel air compressor. (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR)

b. IF IA pressure can NOT be restored, THEN perform the following:

   1) Dispatch AO with a locked valve key to locally close RHR Hx outlet valves.

      - A RHR Hx, HCV-625 handwheel
      - B RHR Hx, HCV-624 handwheel

   2) WHEN conditions permit, THEN refer to AP-IA.1, LOSS OF INSTRUMENT AIR, to restore IA.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* **8**	Monitor RCS Temperature - GREATER THAN 200° F	Perform the following: a. Notify Plant Staff to attempt to establish CNMT integrity AND CNMT heat removal capability. b. Go to step 10.

* *

CAUTION

o CHANGES IN RCS PRESSURE COULD RESULT IN INACCURACIES IN RCS LOOP LEVEL INDICATION

o UNSTABLE OR FLUCTUATING LEVEL INSTRUMENTS SHOULD NOT BE RELIED ON FOR INDICATION OF RCS INVENTORY.

* *

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Verify RCS Intact: o PRZR level - GREATER THAN 5% AND STABLE o RCS pressure - STABLE o RCS subcooling based on core exit T/Cs - GREATER THAN 0° F USING FIG-1.0, FIGURE MIN SUBCOOLING o RCS vent paths - CLOSED	Perform the following: a. Verify charging line flow control valve, HCV-142, open as necessary. b. Ensure charging line valve to loop B cold leg, AOV-294, open. c. Start charging pumps as necessary. d. Control charging pump speed and letdown flow to stabilize RCS conditions. • PRZR pressure • PRZR level • Loop level IF charging flow greater than 75 gpm with letdown isolated OR unable to verify RCS inventory, THEN go to AP-RCS.4, SHUTDOWN LOCA.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Establish Conditions To Start RHR Pump:	
	a. RHR pump - AVAILABLE	a. Perform the following: 1) Start trending core exit TCs. 2) IF RCS closed, THEN go to Step 12. IF RCS open to atmosphere, THEN go to Step 18.
	b. Verify CCW cooling to RHR system in service o CCW pumps - ENSURE AT LEAST ONE RUNNING o CCW to RHR Hxs, MOV-738A AND MOV-738B - ADJUSTED TO OBTAIN DESIRED COOLING o Check CCW flow ≤ 4900 gpm (FI-619)	b. Perform the following: 1) Increase SW from CCW Hx • CCW Hx A, V-4619 • CCW Hx B, V-4620 2) Adjust MOV-738A and MOV-738B to obtain desired cooling. 3) IF > 4900 gpm CCW flow required for desired RHR cooling, THEN notify the Shift Supervisor. IF CCW can NOT be restored, THEN continue with Step 11 while attempting to restore CCW (Refer to AP-CCW.3, LOSS OF CCW - PLANT SHUTDOWN).
	c. Close RHR pump flow control valves (controllers at 100% demand) • HCV-624 • HCV-625	
	d. Place RHR Hx bypass valve, HCV-626, to MANUAL and close valve	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

STARTING AN RHR PUMP MAY RESULT IN AN RCS LEVEL OR PRESSURE DECREASE DUE TO SHRINK OR VOID COLLAPSE.

* *

11 Restore RHR Flow:

a. Start one RHR pump - RHR PUMP RUNNING	a. Go to Step 11e.
b. Check RHR flow - LESS THAN 1500 GPM PER PUMP	b. Manually adjust RHR flow to less than 1500 gpm per pump.
c. Adjust RHR Hx bypass flow control valve, HCV-626, to desired flowrate	
d. Place RHR Hx bypass flow control valve, HCV-626, controller in AUTO	
e. RHR flow - RESTORED	e. Perform the following: 1) Start trending core exit T/Cs. 2) IF RCS closed, THEN go to Step 12. IF RCS vented to atmosphere, THEN go to Step 18.
f. Adjust RHR Hx outlet valves to control RCS temperature • HCV-624 • HCV-625	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Monitor RCS Temperature:	
	a. RCS temperature - STABLE OR DECREASING	a. IF RCS closed, THEN go to Step 13. IF RCS open to atmosphere, THEN go to Step 18.
	b. Go to Step 21	
13	Check Any S/G Level - GREATER THAN 17%	Verify at least 200 gpm AFW flow available. IF NOT, THEN go to Step 19.
14	Check RCS Pressure - GREATER THAN 300 PSIG	Increase RCS pressure to greater than 300 psig. IF RCS pressure can NOT be increased, THEN go to Step 19.
15	Check RCP Status - ANY RCP RUNNING	Perform the following: a. Establish conditions for starting an RCP. o Verify bus 11A or 11B energized. o Refer to ATT-15.0, ATTACHMENT RCP START. b. Start one RCP. IF an RCP can NOT be started, THEN verify natural circulation. (Refer to ATT-13.0, ATTACHMENT NC) IF natural circulation NOT verified, THEN increase dumping steam.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Establish Condenser Steam Dump Manual Control:	
	a. Verify condenser available: o Any MSIV - OPEN o Annunciator G-15, STEAM DUMP ARMED - LIT	a. Perform the following: 1) Place S/G ARV controller in MANUAL and adjust ARVs to stabilize RCS temperature. 2) Go to Step 17.
	b. Place condenser steam dump controller HC-484 in MANUAL	
	c. Place steam dump mode selector switch to MANUAL	
	d. Adjust steam dump valves to stabilize RCS temperature	
17	Monitor RCS Temperature:	
	a. RCS temperature - STABLE OR DECREASING	a. IF dumping steam does NOT provide adequate cooling, THEN perform the following: 1) Initiate S/G blowdown from both S/Gs. 2) Maintain both S/G levels stable by controlling AFW flow. 3) Go to Step 19.
	b. Go to Step 20	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Check RCS Conditions:	
	a. Rx vessel head - REMOVED	a. Go to Step 19.
	b. Stop refueling operations if in progress	
	c. Verify Refueling Cavity Level - GREATER THAN 23 FEET ABOVE VESSEL FLANGE	c. Increase refueling cavity level to greater than 23 feet (Refer to O-15.3, FILLING REFUELING CANAL).
	d. Verify refueling cavity sweep fans - RUNNING	d. Locally start refueling cavity sweep fans if available.
19	Check CCW System Operation: o CCW pumps - AT LEAST ONE RUNNING o RCS temperature - STABLE OR DECREASING o Annunciator A-21, COMP COOLING HX OUT HI TEMP - EXTINGUISHED o Annunciator A-22, CCW PUMP DISCHARGE LO PRESS - EXTINGUISHED o Annunciator A-30, CCW PUMP INLET HEADER HI TEMP - EXTINGUISHED o CCW flow ≤ 4900 gpm (FI-619)	To restore CCW cooling to RHR Hxs, perform the following: a. Ensure the standby CCW pump is running. b. Increase SW from CCW Hx • CCW Hx A, V-4619 • CCW Hx B, V-4620 c. Adjust MOV-738A and MOV-738B to maintain RCS temperature stable or decreasing. d. IF > 4900 gpm CCW flow required for desired RHR cooling (FI-619), THEN notify the Shift Supervisor. IF CCW can NOT be restored, THEN continue attempts to restore CCW (Refer to AP-CCW.3, LOSS OF CCW - PLANT SHUTDOWN).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: Consult with Plant Staff to determine alternatives for long term cooling.

20 Monitor RHR Cooling:

- o RHR cooling - RESTORED
- o RCS temperature - STABLE OR DECREASING

Perform the following:

a. Evaluate alternatives for long term cooling (Consult Plant Staff)
   - Consider establishing secondary heat sink
   - Refer to ER-RHR.1, RCDT PUMP OPERATION FOR CORE COOLING
   - Consider RCS feed and bleed

b. Continue attempts to restore RHR to operable.

c. Return to Step 2.

21 Evaluate MCB Annunciator Status (Refer to AR Procedures)

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

22 Notify Higher Supervision

23 Return to Procedure Or Guidance In Effect

-END-

AP-RHR.1 APPENDIX LIST

TITLE

1) FIGURE MIN SUBCOOLING (FIG-1.0)
2) ATTACHMENT NORMAL RHR COOLING (ATT-14.0)
3) ATTACHMENT RCP START (ATT-15.0)
4) ATTACHMENT NC (ATT-13.0)
5) ATTACHMENT CNMT CLOSURE (ATT-3.1)
6) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)

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 actions to control the plant with decreasing condenser vacuum.

B. ENTRY CONDITIONS/SYMPTOMS

2. SYMPTOMS - The symptoms of LOSS OF CONDENSER VACUUM are;

a. Low or decreasing condenser vacuum, or

b. Annunciator H-7, CONDENSER HI PRESSURE 25.5" HG, lit, or

c. PPCS high condenser backpressure alarm, or

d. Unexplained decreasing generator output, or

e. Annunciator I-18, CONDENSER EXP JOINT A LO LEVEL, or

f. Annunciator I-19, CONDENSER EXP JOINT B LO LEVEL.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Check Condenser Circulating Water System o CW pump discharge valves - BOTH OPEN o CW pumps - BOTH RUNNING	IF a loss of circulating water has occurred, THEN go to AP-CW.1, LOSS OF A CIRC WATER PUMP.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- TURBINE LOAD DECREASE SHOULD BE COMPLETED AS QUICKLY AS POSSIBLE WHILE MINIMIZING THE AMOUNT OF STEAM DUMP OPERATION.
- EXCESSIVE BACK PRESSURE MAY RESULT IN SEVERE TURBINE BLADE VIBRATION. MINIMIZE TIME OUTSIDE THE SATISFACTORY OPERATION REGION.

* *

* **2** Check Condenser Indications:

a. Turbine back pressure - EACH CONDENSER WITHIN THE SATISFACTORY OPERATING REGION OF FIG-13.0, FIGURE BACK PRESSURE

a. IF back pressure is in the DO NOT OPERATE region for > 5 minutes, THEN perform the following:

- o IF power > P-9, THEN trip the reactor and go to E-0, REACTOR TRIP OR SAFETY INJECTION.
- o IF power < P-9, THEN trip the turbine and go to AP-TURB.1, TURBINE TRIP WITHOUT RX TRIP REQUIRED.

IF in the AVOID region, THEN adjust turbine load to return to the SATISFACTORY OPERATING REGION.

b. Condenser vacuum - STABLE OR IMPROVING

b. WHILE continuing with this procedure, decrease turbine load to stabilize condenser vacuum. (Refer to AP-TURB.5, RAPID LOAD REDUCTION)

IF condenser vacuum can NOT be stabilized, THEN perform the following:

1) Decrease turbine load to less than 15 MW.

2) Trip turbine.

3) Go to AP-TURB.1, TURBINE TRIP WITHOUT RX TRIP REQUIRED.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

3 Dispatch AO To Perform Local Actions To Attempt To Restore Condenser Vacuum (Refer to ATT-6.0, ATTACHMENT COND VACUUM)

* *

CAUTION

- D/P LIMITS ON THE GENERATOR HYDROGEN COOLER AND CONDENSATE COOLER SHOULD NOT BE EXCEEDED (D/P LIMITS INDICATED AT D/P METERS AT MCB REAR).
- CLOSELY MONITOR FEED PUMP SUCTION PRESSURE WHEN ADJUSTING CONDENSATE COOLING VALVES.

* *

4 Check Condensate Temperature - LESS THAN 100°F (PPCS point ID T2053)

Perform the following:

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

b. IF condensate cooler in service, THEN perform the following:

   1) Place generator hydrogen temperature controller in MANUAL at 50%.

   2) Dispatch AO to throttle close condensate cooler bypass valve to control condensate temperature.

   3) Adjust hydrogen temperature controller and condensate cooler manual bypass valve to establish maximum condensate cooling.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Dispatch AO To Check Condenser For Air Inleakage - NO INLEAKAGE DETECTED • Vacuum breaker • Condenser boot area • Condenser areas	IF condenser inleakage is detected, THEN isolate if possible.
6	Determine If Load Reduction Can Be Stopped:	
	a. Monitor condenser indications: o Condenser back pressure - EACH CONDENSER WITHIN THE SATISFACTORY OPERATING REGION OF FIG-13.0, FIGURE BACK PRESSURE o Vacuum - STABLE OR IMPROVING	a. Return to Step 2.
	b. Stop the load reduction	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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

* 7 Establish Stable Plant Conditions:

a. Tavg - TRENDING TO TREF

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

- Insert control rods
- RCS boration

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

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

b. PRZR pressure - TRENDING TO 2235 PSIG IN AUTO

b. Control PRZR pressure by one of the following:

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

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

c. PRZR level - TRENDING TO PROGRAM IN AUTO CONTROL

c. Perform the following:

1) Place affected charging pumps in MANUAL

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

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

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 7 continued from previous page)

d.	MFW regulating valves - RESTORING S/G LEVEL TO 52% IN AUTO	d. Perform the following: 1) Place affected S/G(s) MFW regulating valve in MANUAL 2) Restore S/G level to 52% IF S/G level can NOT be controlled manually, THEN refer to AP-FW.1, ABNORMAL MAIN FEEDWATER FLOW.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Establish Normal Plant Operation:	
	a. Check condenser indications o Condenser pressure - EACH CONDENSER WITHIN THE SATISFACTORY OPERATING REGION OF FIG-13.0, FIGURE BACK PRESSURE o Vacuum - STABLE OR IMPROVING	a. Return to Step 2.
	b. Restore EH controls 1) Place in OP PAN, IMP OUT 2) Place load rate thumbwheel to 10%/hour 3) Match setter and reference	
	c. Verify annunciator G-15, STEAM DUMP ARMED - EXTINGUISHED	c. <u>WHEN</u> Tavg within 5°F of Tref, <u>THEN</u> perform the following: 1) Ensure steam dump valves closed. 2) Reset steam dump.
	d. Verify one charging pump in AUTO	d. Place one charging pump in AUTO, if desired.
	e. Verify Rods in AUTO	e. Place rods AUTO, if desired.
	f. Verify 431K in AUTO	f. Place 431K in AUTO, if desired.
	g. Verify PRZR spray valves in AUTO	g. Place PRZR spray valves in AUTO, if desired.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 8 continued from previous page)	
	h. Verify PRZR heaters restored: o PRZR proportional heaters breaker - CLOSED o PRZR backup heaters breaker - RESET, IN AUTO	h. Restore PRZR heaters, if desired.
	i. Verify MFW regulating valves in AUTO	i. Place MFW regulating valves in AUTO, if desired.
	j. Dispatch AO to remove priming ejector from service if desired	
	k. Verify S/G blowdown and sample valve master isolation switch in REMOTE	k. Perform the following: 1) Dispatch AO to locally isolate blowdown. 2) <u>WHEN</u> blowdown locally isolated, <u>THEN</u> place blowdown and sample valve master switch to REMOTE. 3) Direct AO to restore blowdown flow (Refer to T-14N, BLOWDOWN SYSTEM FLOW CHANGES).
9	Evaluate MCB Annunciator Status (Refer to AR Procedures)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

10 Perform Notifications:

a. Notify higher supervision

b. Request Turbine System Engineer evaluate effect of back pressure transient on the turbine.

11 Return To Procedure Or Guidance In Effect

-END-

AP-TURB.4 APPENDIX LIST

TITLE

1) FIGURE BACK PRESSURE (FIG-13.0)

2) ATTACHMENT COND VACUUM (ATT-6.0)

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 to recover from a loss of reactor or secondary coolant.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

a. E-0, REACTOR TRIP OR SAFETY INJECTION, and FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, when a PRZR PORV is stuck open and its block valve can not be closed.

b. E-0, REACTOR TRIP OR SAFETY INJECTION, with any of the following symptoms: high containment radiation, high containment pressure, or high containment recirculation sump level.

c. E-0, REACTOR TRIP OR SAFETY INJECTION, ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF BOTH STEAM GENERATORS, and FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, when RCS pressure is less than the shutoff head pressure of the RHR pumps or is decreasing.

d. ES-1.1, SI TERMINATION, and FR-I.2, RESPONSE TO LOW PRESSURIZER LEVEL, if SI has to be reinitiated.

e. E-2, FAULTED STEAM GENERATOR ISOLATION, after identification and isolation of a faulted S/G.

f. ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, after normal injection mode conditions are established.

g. ECA-1.2, LOCA OUTSIDE CONTAINMENT, when a LOCA outside containment is isolated.

h. FR-C.1, RESPONSE TO INADEQUATE CORE COOLING, and FR-C.2, RESPONSE TO DEGRADED CORE COOLING, after core cooling has been reestablished.

i. FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, after secondary heat sink has been reestablished and all PRZR PORVs are closed.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF RWST LEVEL DECREASES TO LESS THAN 28%, THEN THE SI SYSTEM SHOULD BE ALIGNED FOR COLD LEG RECIRCULATION USING ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, STEP 1.

* *

NOTE:
- o FOLDOUT page should be open AND monitored periodically.
- o Critical Safety Function Status Trees should be monitored. (Refer to Appendix 1 for Red Path Summary.)
- o Conditions should be evaluated for Site Contingency Reporting (Refer to EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION).
- o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr.

1 Monitor RCP Trip Criteria:

a. RCP status - ANY RCP RUNNING	a. Go to Step 2.
b. SI pumps - AT LEAST TWO RUNNING	b. Go to Step 2.
c. RCS pressure minus maximum S/G pressure - LESS THAN 175 psig [400 psig adverse CNMT]	c. Go to Step 2.
d. Stop both RCPs	

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

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

* 3	Monitor Intact S/G Levels: a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]	a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in at least one S/G.
	b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	b. IF narrow range level in any S/G continues to increase in an uncontrolled manner, THEN go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.
* 4	Monitor If Secondary Radiation Levels Are Normal o Steamline radiation monitor (R 31 and R-32) o Request RP sample S/Gs for activity	IF steamline radiation monitors NOT available, THEN dispatch AO to locally check steamline radiation. IF abnormal radiation levels detected in any S/G, THEN go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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

* *

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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

* *

6 Reset SI

7 Reset CI:

a. Depress CI reset pushbutton

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

b. Perform the following:

1) Reset SI.

2) Depress CI reset pushbutton.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Verify Adequate SW Flow:	
	a. Check at least two SW pumps - RUNNING	a. Manually start SW pumps as power supply permits (257 kw each). IF less than two SW pumps running, THEN perform the following: 1) Ensure SW isolation. 2) Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1) 3) IF NO SW pumps running, THEN refer to ATT-2.4, ATTACHMENT NO SW PUMPS. 4) IF only one SW pump running, THEN refer to AP-SW.2, LOSS OF SERVICE WATER. 5) Go to Step 10.
	b. Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Establish IA to CNMT:	
a.	Verify non-safeguards busses energized from offsite power o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED	a. Perform the following: 1) Close non-safeguards bus tie breakers: • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each). IF NOT, THEN evaluate if CNMT RECIRC fans should be stopped (Refer to Attachment CNMT RECIRC FANS). 3) 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 compressors 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 10. WHEN IA restored, THEN do Steps 9e and f.
e.	Reset both trains of XY relays for IA to CNMT AOV-5392	
f.	Verify IA to CNMT AOV-5392 - OPEN	

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

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Check If SI Should Be Terminated:	
	a. RCS pressure: o Pressure - GREATER THAN 1625 psig [1825 psig adverse CNMT] o Pressure - STABLE OR INCREASING	a. Do NOT stop SI pumps. Go to Step 13.
	b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING	b. Do NOT stop SI pumps. Go to Step 13.
	c. Secondary heat sink: o Total feed flow to intact S/Gs - GREATER THAN 200 GPM -OR- o Narrow range level in at least one intact S/G - GREATER THAN 5% [25% adverse CNMT]	c. IF neither condition satisfied, THEN do NOT stop SI pumps. Go to Step 13.
	d. PRZR level - GREATER THAN 5% [30% adverse CNMT]	d. Do NOT stop SI pumps. Perform the following: 1) IF normal PRZR spray available, THEN try to stabilize RCS pressure with PRZR spray. 2) Go to Step 13.
	e. Go to ES-1.1, SI TERMINATION, Step 1.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
***13**	Monitor If CNMT Spray Should Be Stopped:	
	a. CNMT spray pumps - RUNNING	a. Go to Step 14.
	b. Check the following: o CNMT pressure - LESS THAN 4 PSIG o Sodium hydroxide tank level - LESS THAN 55%	b. Continue with Step 14. <u>WHEN</u> BOTH conditions satisfied, <u>THEN</u> do Steps 13c through f.
	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

* *

CAUTION

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

* *

***14** Monitor If RHR Pumps Should Be Stopped:

a. Check RCS pressure:

1) Pressure - GREATER THAN 250 psig [465 psig adverse CNMT] — 1) Go to Step 16.

2) RCS pressure - STABLE OR INCREASING — 2) Go to Step 15.

b. Stop RHR pumps and place in AUTO

15 Check RCS And S/G Pressures

a. Check pressures in both S/Gs - STABLE OR INCREASING — a. Return to Step 1.

b. Check pressures in both S/Gs - GREATER THAN 110 PSIG — b. Monitor RCS pressure. IF RCS pressure does NOT increase after faulted S/G dryout, THEN go to Step 16.

c. Check RCS pressure - STABLE OR DECREASING — c. Return to Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Check If Emergency D/Gs Should Be Stopped:	
	a. Verify AC emergency busses energized by offsite power: o Emergency D/G output breakers - OPEN o AC emergency bus voltage - GREATER THAN 420 VOLTS o AC emergency bus normal feed breakers - CLOSED	a. Perform the following: 1) Close non-safeguards bus tie breakers as necessary: • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Place the following pumps in PULL STOP: • EH pumps • Turning gear oil pump • HP seal oil backup pump 3) Ensure condenser steam dump mode control in MANUAL. 4) Restore power to MCCs: • A from Bus 13 • B from Bus 15 • E from Bus 15 • F from Bus 15 5) Start HP seal oil backup pump. 6) Ensure D/G load within limits. 7) WHEN bus 15 restored, THEN reset control room lighting breaker. 8) Refer to Attachment SI/UV for other equipment lost with loss of offsite power. 9) Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
	b. Stop any unloaded emergency D/G and place in standby (Refer to Attachment D/G STOP)	

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Verify CNMT Sump Recirculation Capability:	
	a. Check RHR and CCW systems:	a. Restore power to at least one train of emergency AC busses. IF at least one train of cold leg recirculation capability can NOT be verified, THEN go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.
	1) Power available to emergency AC busses and MCCs required for CNMT sump recirculation o Bus 14 and bus 18 - ENERGIZED o MCC C - ENERGIZED o Bus 16 and bus 17 - ENERGIZED o MCC D - ENERGIZED	
	2) RHR pumps and valves - OPERABLE	
	3) CCW pumps and Hx - OPERABLE	
	b. Check SW pumps - AT LEAST 2 PUMPS AVAILABLE	b. Attempt to restore at least 2 SW pumps to operable. IF only 1 SW pump available, THEN refer to Attachment MIN SW for additional guidance.
	c. Dispatch AO to check AUX BLDG sub basement for RHR system leakage (AUX BLDG sub-basement key may be required)	c. IF any RHR pump seal leakage indicated, THEN leakage should be evaluated and isolated if necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	Evaluate Plant Status:	
	a. Check auxiliary building radiation - NORMAL • Plant vent iodine (R-10B) • Plant vent particulate (R-13) • Plant vent gas (R-14) • CCW liquid monitor (R-17) • LTDN line monitor (R-9) • CHG pump room (R-4)	a. Notify RP and refer to appropriate AR-RMS procedure. <u>IF</u> the cause is a loss of RCS inventory outside CNMT, <u>THEN</u> go to ECA-1.2, LOCA OUTSIDE CONTAINMENT, Step 1.
	b. Direct RP to obtain following samples: • RCS boron • RCS activity • CNMT hydrogen • CNMT sump boron	
	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)

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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

21 Establish Adequate SW Flow:

a. Verify at least two SW pumps - RUNNING

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

1) Ensure Attachment MIN SW is in progress.

2) Go to Step 22.

b. Verify AUX BLDG SW isolation valves - OPEN

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

b. Manually align valves.

c. Dispatch AO to check BOTH CCW Hx IN SERVICE

c. Locally place BOTH CCW Hxs in service

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 21 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
22	Establish CCW flow to RHR Hxs:	
	a. Check both CCW pumps - RUNNING	a. Perform the following: 1) Start CCW pumps as power supply permits (122 kw each) 2) IF both CCW pumps are running, THEN go to step 22b. 3) IF only one CCW pump is running, THEN perform the following: a) Direct AO to isolate CCW to boric acid evaporator o Close V-760A b) Manually open CCW MOV to only one operable RHR Loop o Open MOV-738A -OR o Open MOV-738B c) Go to step 23.
	b. Manually open CCW valves to RHR Hxs • MOV-738A • MOV-738B	b. Dispatch AO to locally open valves.

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

-END-

E-1 APPENDIX LIST

TITLE

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

RED PATH SUMMARY

a. SUBCRITICALITY - Nuclear power greater than 5%

b. CORE COOLING - Core exit T/Cs greater than 1200°F
-OR-
Core exit T/Cs greater than 700°F AND RVLIS level (no RCPs) less than 52% [55% adverse CNMT]

c. HEAT SINK - Narrow range level in all S/Gs less than 5% [25% adverse CNMT] AND total feedwater flow less than 200 gpm

d. INTEGRITY - Cold leg temperatures decrease greater than 100°F in last 60 minutes AND RCS cold leg temperature less than 285°F

e. CONTAINMENT - CNMT pressure greater than 60 psig

FOLDOUT PAGE

1. RCP TRIP CRITERIA

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

   a. SI pumps - AT LEAST TWO RUNNING

   b. RCS pressure minus maximum S/G pressure - LESS THAN 175 PSIG [400 psig adverse CNMT]

2. SI REINITIATION CRITERIA

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

3. SI TERMINATION CRITERIA

   IF ALL conditions listed below occur, THEN go to ES-1.1, SI TERMINATION, Step 1:
   a. RCS subcooling based on core exit T/Cs - GREATER THAN 0° F USING FIGURE MIN SUBCOOLING

   b. Total feed flow to intact S/Gs - GREATER THAN 200 GPM
   - OR -
   Narrow range level in at least one intact S/G - GREATER THAN 5% [25% adverse CNMT]

   c. RCS pressure:
   - o GREATER THAN 1625 PSIG [1825 psig adverse CNMT]
   - o STABLE OR INCREASING

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

4. SECONDARY INTEGRITY CRITERIA

   IF any S/G pressure is decreasing in an uncontrolled manner or is completely depressurized AND has not been isolated, THEN go to E-2, FAULTED S/G ISOLATION, Step 1.

5. E-3 TRANSITION CRITERIA

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

6. COLD LEG RECIRCULATION SWITCHOVER CRITERION

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

7. 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 identify and isolate a faulted steam generator.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

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

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

2) Any S/G completely depressurized.

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

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

2) Any S/G complete depressurized.

3) Faulted S/G isolation not verified.

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

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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

* *

NOTE:
- Critical Safety Function Status Trees should be monitored.
- Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr.

1 Check MSIV Of Faulted S/G(s) - CLOSED	Manually close valve. IF valve will NOT close from MCB, THEN dispatch AO with locked valve key to locally closed faulted S/G(s) MSIV as follows: o S/G A • close IA to MSIV, V-5408A • open vent valves V-5471 AND V-5473 o S/G B • close IA to MSIV, V-5409B • open vent valves V-5472 AND V-5474

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

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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

* *

5 Isolate Steam Flow From Faulted S/G:

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

* *

CAUTION

IF CST LEVEL DECREASES TO LESS THAN 5 FEET, THEN ALTERNATE WATER SOURCES FOR AFW PUMPS WILL BE NECESSARY (REFER TO ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

* *

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

* 6 Monitor Intact S/G Levels:

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

a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in at least one S/G.

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

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

7 Check Secondary Radiation Levels - NORMAL

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

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

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

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

-END-

E-2 APPENDIX LIST

TITLE

1) FIGURE INTACT S/G PRESSURE (FIG-7.0)

2) ATTACHMENT FAULTED S/G (ATT-10.0)

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

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

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

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

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

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

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE:
- o FOLDOUT page should be open AND monitored periodically.
- o Critical Safety Function Status Trees should be monitored (Refer to Appendix 1 for Red Path Summary).
- o Personnel should be available for sampling during this procedure.
- o Conditions should be evaluated for Site Contingency Reporting (EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION).
- o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr.

* **1** Monitor RCP Trip Criteria:

a. RCP status - ANY RCP RUNNING	a. Go to Step 2.
b. SI pumps - AT LEAST TWO RUNNING	b. Go to Step 2.
c. RCS pressure minus maximum S/G pressure - LESS THAN 175 psig [400 psig adverse CNMT]	c. Go to Step 2.
d. Stop both RCPs	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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

* *

2 Identify Ruptured S/G(s):

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

  -OR-

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

  -OR-

- o AO reports local indication of high steamline radiation

  -OR-

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

Perform the following:

a. Reset SI

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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

* *

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

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

b. Check ruptured S/G ARV - CLOSED

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

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

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

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

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

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

d. Verify ruptured S/G blowdown valve - CLOSED

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

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

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

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

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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

* *

5 Check Ruptured S/G Level:

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

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

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

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

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

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

b. Dispatch AO to locally close valve.

c. Pull stop MDAFW pump for ruptured S/G

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

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

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

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

e. Verify MDAFW pump crosstie valves - CLOSED

- MOV-4000A
- MOV-4000B

e. Manually close valves.

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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

* *

8 Reset SI

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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

* *

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

9 Initiate RCS Cooldown:

a. Determine required core exit temperature from below table

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

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

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

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

- o Use faulted S/G.

-OR-

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

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

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

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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

10 Monitor Intact S/G Level:

a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]	a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in at least one S/G.
b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	b. IF narrow range level in the intact S/G continues to increase in an uncontrolled manner, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF ANY PRZR PORV OPENS BECAUSE OF HIGH PRZR PRESSURE, IT SHOULD BE CLOSED AFTER PRESSURE DECREASES TO LESS THAN 2335 PSIG (REFER TO STEP 11B).

* *

11 Monitor PRZR PORVs And Block Valves:

a. Power to PORV block valves - AVAILABLE

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

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

b. PORVs - CLOSED

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

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

c. Block valves - AT LEAST ONE OPEN

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Reset CI:	
	a. Depress CI reset pushbutton	
	b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED	b. Perform the following: 1) Reset SI. 2) Depress CI reset pushbutton.

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Verify Adequate SW Flow:	
	a. Check at least two SW pumps - RUNNING	a. Manually start SW pumps as power supply permits (257 kw each). IF less than two SW pumps running, THEN: 1) Ensure SW isolation. 2) Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1) 3) IF NO SW pumps running, THEN refer to ATT-2.4, ATTACHMENT NO SW PUMPS. 4) IF only one SW pump running, THEN refer to AP-SW.2, LOSS OF SERVICE WATER. 5) Go to Step 16.
	b. Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Establish IA to CNMT:	
	a. Verify non-safeguards busses energized o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED	a. Perform the following: 1) Close non-safeguards bus tie breakers: • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each). IF NOT, THEN evaluate if CNMT RECIRC fans should be stopped (Refer to Attachment CNMT RECIRC FANS).
	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 compressors - 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 16. WHEN IA restored, THEN do Steps 15e and f.
	e. Reset both trains of XY relays for IA to CNMT AOV-5392	
	f. Verify IA to CNMT AOV-5392 - OPEN	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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

* *

16 Check If RHR Pumps Should Be Stopped:

a. Check RCS pressure - GREATER THAN 250 psig [465 psig adverse CNMT]

a. Go to Step 17.

b. Stop RHR pumps and place both in AUTO

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Establish Charging Flow:	
	a. Charging pumps - ANY RUNNING	a. Perform the following: 1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN dispatch AO with key to RWST gate to locally close seal injection needle valves to affected RCP. • V-300A for RCP A • V-300B for RCP B 2) Ensure HCV-142 demand at 0%.
	b. Align charging pump suction to RWST: o LCV-112B - OPEN o LCV-112C - CLOSED	b. IF LCV-112B can NOT be opened, THEN dispatch AO to locally open 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 and establish 75 gpm total charging flow • Charging line flow • Seal injection	

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: SI ACCUMs may inject during RCS depressurization.

21 Depressurize RCS To Minimize Break Flow And Refill PRZR:

a. Check the following:

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

a. Go to Step 22.

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

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

-OR-

- o RCS pressure - LESS THAN SATURATION USING FIGURE MIN SUBCOOLING

-OR-

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

c. Close normal PRZR spray valves:

1) Adjust normal spray valve controller to 0% DEMAND

2) Verify PRZR spray valves - CLOSED

- PCV-431A
- PCV-431B

c. Stop associated RCP(s).

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

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

e. Go to Step 24

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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

* *

NOTE:
- If auxiliary spray is in use, spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves.
- When using a PRZR PORV select one with an operable block valve.

22 Depressurize RCS Using PRZR PORV To Minimize Break Flow And Refill PRZR:		
	a. Verify IA to CNMT - AVAILABLE	a. Refer to Attachment N2 PORVS to operate PORVs.
	b. PRZR PORVs - AT LEAST ONE AVAILABLE	b. IF auxiliary spray available, THEN return to Step 21b. IF auxiliary spray can NOT be established, THEN go to ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, Step 1.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 22 continued from previous page)

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

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

-OR-

- RCS pressure - LESS THAN SATURATION USING FIGURE MIN SUBCOOLING

-OR-

- BOTH of the following:

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

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

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

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

d. Close PRZR PORVs

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

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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

* *

24 Check If SI Flow Should Be Terminated:

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

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

b. Secondary heat sink:

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

-OR-

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

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

c. RCS pressure - STABLE OR INCREASING

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

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

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	Stop SI Pumps And Place In AUTO	
26	Establish Required Charging Line Flow:	
	a. Charging pumps - ANY RUNNING	a. Perform the following: 1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN dispatch AO with key to RWST gate to locally isolate seal injection to affected RCP: • RCP A, V-300A • RCP B, V-300B 2) Ensure HCV-142 open. 3) Start one charging pump.
	b. Establish 20 gpm charging line flow	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
***27**	Monitor SI Reinitiation Criteria:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING	a. Manually start SI pumps as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level. IF PRZR level can NOT be maintained, THEN manually start SI pumps as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28	Check If SI ACCUMs Should Be Isolated:	
	a. Check the following: o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING o PRZR level - GREATER THAN 5% [30% adverse CNMT]	a. Manually operate SI pumps as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves • MOV-841, MCC C position 12F • MOV-865, MCC D position 12C	
	c. Close SI ACCUM discharge valves • MOV-841 • MOV-865	c. Vent any unisolated ACCUMs: 1) Open vent valves for unisolated SI ACCUMs. • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945.
	d. Locally reopen breakers for MOV-841 and MOV-865	

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

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 29 continued from previous page)

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

c. Perform the following:

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

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

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

o IF on normal SW discharge:

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

-OR-

o IF on alternate SW discharge:

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

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

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

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

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

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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CAUTION

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

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

a. Perform appropriate action(s) from table:

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

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

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
37	Monitor If CNMT Spray Should Be Stopped:	
	a. CNMT spray pumps - ANY RUNNING	a. Go to Step 38.
	b. Verify CNMT pressure - LESS THAN 4 PSIG	b. Continue with Step 38. <u>WHEN</u> CNMT pressure less than 4 psig, <u>THEN</u> do Steps 37c through f.
	c. Reset CNMT spray	
	d. Check NaOH 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
38	Check If Emergency D/Gs Should Be Stopped:	
	a. Verify AC emergency busses energized by offsite power: o Emergency D/G output breakers - OPEN o AC emergency bus voltage - GREATER THAN 420 VOLTS o AC emergency bus normal feed breakers - CLOSED	a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
	b. Stop any unloaded emergency D/G and place in standby (Refer to Attachment D/G STOP)	
39	Minimize Secondary System Contamination:	
	a. Isolate reject from hotwell to CST: o Place hotwell level controller (LC-107) in MANUAL at 50% o Verify hotwell level - STABLE	a. IF hotwell level increasing, THEN direct RP to sample hotwells for activity.
	b. Check status of local actions to complete ruptured S/G isolation (Refer to Attachment RUPTURED S/G)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
40	Energize PRZR Heaters As Necessary To Saturate PRZR Water At Ruptured S/G Pressure	
41	Check RCP Cooling: a. Check CCW to RCPs: o Annunciator A-7, RCP 1A CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED o Annunciator A-15, RCP 1B CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED b. Check RCP seal injection: o Labyrinth seal D/Ps - GREATER THAN 15 INCHES OF WATER -OR- o RCP seal injection flow to each RCP - GREATER THAN 6 GPM	Establish normal cooling to RCPs (Refer to Attachment SEAL COOLING).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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

* *

42 Check RCP Status:

a. RCPs - AT LEAST ONE RUNNING

a. Perform the following:

1) Try to start one RCP:

a) Ensure conditions for starting an RCP.

- o Bus 11A or 11B energized.
- o Refer to Attachment RCP START.

b) IF RVLIS level (no RCPs) less than 95%, THEN perform the following:

- o Increase PRZR level to greater than 65% [82% adverse CNMT].
- o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using Figure MIN SUBCOOLING.
- o Energize PRZR heaters as necessary to saturate PRZR water

c) Start one RCP.

2) IF an RCP can NOT be started, THEN verify natural circulation (Refer to Attachment NC).

IF natural circulation can NOT be verified, THEN increase dumping steam.

b. Stop all but one RCP

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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

43	Check If Source Range Detectors Should Be Energized:	
	a. Source range channels - DEENERGIZED	a. Go to Step 43e.
	b. Check intermediate range flux - EITHER CHANNEL LESS THAN 10^{-10} AMPS	b. Perform the following: 1) IF neither intermediate range channel is decreasing, THEN initiate boration. 2) Continue with Step 44. WHEN flux is LESS THAN 10^{-10} amps on any operable channel, THEN do Steps 43c through e.
	c. Check the following: o Both intermediate range channels - LESS THAN 10^{-10} AMPS -OR- o Greater than 20 minutes since reactor trip	c. Continue with Step 44. WHEN either condition met, THEN do Steps 43d and e.
	d. Verify source range detectors - ENERGIZED	d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2). IF source ranges can NOT be restored, THEN refer to ER-NIS.1, SR MALFUNCTION and go to Step 44.
	e. Transfer Rk-45 recorder to one source range and one intermediate range channel	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
44	Establish Normal Shutdown Alignment:	
	a. Check condenser - AVAILABLE	a. Dispatch AO to perform 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

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

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

-OR-

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

-OR-

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

-END-

E-3 APPENDIX LIST

TITLE

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

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

OR

- o PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN 5% [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. COLD LEG RECIRCULATION SWITCHOVER CRITERION

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

4. AFW SUPPLY SWITCHOVER CRITERION

IF CST level decreases to less than 5 feet, THEN switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

5. MULTIPLE S/G TUBE RUPTURE CRITERIA

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

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

RESPONSIBLE MANAGER

7-25-2002
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY:_____

A. PURPOSE - This procedure provides actions to use normal operational systems to stabilize plant conditions following restoration of AC emergency power.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

a. ECA-0.0, LOSS OF ALL AC POWER, when AC emergency power is restored and SI is not required.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

IF AN SI SIGNAL IS ACTUATED PRIOR TO PERFORMING STEP 10 OF THIS PROCEDURE, THEN SI SHOULD BE RESET TO PERMIT MANUAL LOADING OF EQUIPMENT ON AN AC EMERGENCY BUS.

* *

NOTE: o CSFSTs should be monitored for information only. FR procedures should not be implemented prior to completion of Step 10.

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

1 Check RCP Seal Isolation Status:

a. RCP seal injection needle valves - CLOSED

- V-300A
- V-300B

a. Dispatch AO with key to RWST gate to locally close valves before starting charging pump.

b. RCP CCW return valves - CLOSED

- MOV-759A
- MOV-759B

b. IF valves open or position not known, THEN check CCW pump status:

1) IF pump running, THEN go to Step 2.

2) IF pump NOT running, THEN manually close valves.

IF valve(s) can NOT be closed, THEN place switches for RCP thermal barrier CCW outlet valves to CLOSE.

- AOV-754A
- AOV-754B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Check CI Annunciator A-26, CONTAINMENT ISOLATION - EXTINGUISHED	Perform the following: a. Depress CI reset pushbutton b. Verify annunciator A-26, CONTAINMENT ISOLATION, extinguished.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Establish IA to CNMT:	
	a. Verify non-safeguards busses energized from offsite power o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED	a. Perform the following: 1) Close non-safeguards bus tie breakers: • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie
	b. Check at least two SW pumps - RUNNING	b. Manually start SW pumps as power supply permits (257 kw each). IF less than two SW pumps running, THEN go to Step 4.
	c. Verify turbine building SW isolation valves - OPEN • MOV-4613 and MOV-4670 • MOV-4614 and MOV-4664	c. Manually align valves.
	d. Start adequate air compressor(s) (75 kw each)	d. IF air compressors can NOT be started, THEN dispatch AO to locally reset compressors as necessary.
	e. Check IA supply: o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING	e. Perform the following: 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR). 2) Continue with Step 6. WHEN IA restored, THEN do Steps 3f through 5.
	f. Reset both trains of XY relays for IA to CNMT (AOV-5392) if necessary	
	g. Verify IA to CNMT AOV-5392 - OPEN	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

THE LOADS PLACED ON THE ENERGIZED AC EMERGENCY BUS SHOULD NOT EXCEED THE CAPACITY OF THE POWER SOURCE.

4 Manually Load Following Equipment On AC Emergency Busses:

a. Start one CCW pump (122 kw)

b. Energize MCCs as power supply permits

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

c. Verify instrument bus D - ENERGIZED

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

d. WHEN bus 15 restored, THEN reset control room lighting

e. Start at least one CNMT RECIRC fan

f. Restore Rx head cooling as power supply permits:

1) Start one Rx compartment cooling fan (23 kw each)

1) Perform the following:

- o Dispatch AO to reset UV relays at MCC C and MCC D.
- o Manually start one fan as power supply permits. (23 kw)

2) Start both control rod shroud fans (45 kw each)

2) Manually start at least one fan (45 kw)

g. Dispatch AO to establish normal shutdown alignment (Refer to Attachment SD-1)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Check If Charging Flow Has Been Established:	
	a. Charging pumps - ANY RUNNING	a. Perform the following: 1) Ensure seal injection needle valves to both RCPs isolated: • RCP A, V-300A • RCP B, V-300B 2) Ensure HCV-142 open, demand at 0%.
	b. Charging pump suction aligned to RWST: o LCV-112B - OPEN o LCV-112C - CLOSED	b. Manually align valves as necessary. IF LCV-112B can NOT be opened, THEN dispatch AO to locally open 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 (75 kw each) as necessary and adjust charging flow to restore PRZR level	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 6	Monitor SI Initiation Criteria:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING	a. Go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level. IF PRZR level can NOT be maintained, THEN go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.
7	Check PRZR Level - GREATER THAN 13% [40% FOR ADVERSE CONTAINMENT]	Control charging flow as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- IF CST LEVEL DECREASES TO LESS THAN 5 FEET, THEN ALTERNATE WATER SOURCES FOR AFW PUMPS WILL BE NECESSARY (REFER TO ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).
- IF S/G NR LEVEL DECREASES TO LESS THAN 5% [25% ADVERSE CNMT] AND FEED FLOW IS LESS THAN 200 GPM, THEN THE MDAFW PUMPS SHOULD BE MANUALLY LOADED ON AC EMERGENCY BUS TO SUPPLY WATER TO THE S/G(S).

* *

NOTE:
- If MDAFW pump operation is not required, pump switches should be maintained in PULL-STOP to prevent automatic start.
- TDAFW pump flow control AOVs may drift open on loss of IA.

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

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

a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in at least one S/G.

IF feed flow less than 200 gpm, THEN perform the following:

1) Verify MDAFW pump discharge valves open.
   - MOV-4007
   - MOV-4008

2) Manually start MDAFW pumps as necessary (223 kw each).

b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 52%

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

9 Establish S/G Pressure Control:

a. Adjust S/G ARV controllers to maintain existing S/G pressure

b. Verify S/G ARV controllers in AUTO

c. Dispatch AO to perform Attachment SD-2

* *

CAUTION

IF AN SI SIGNAL IS ACTUATED AFTER THE SI PUMP SWITCHES ARE PLACED IN AUTO, THEN ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, SHOULD BE PERFORMED.

* *

NOTE: Safeguards pump switches should be placed in AUTO only if associated bus is energized.

10 Place Following Pump Switches In AUTO:

- SI pumps
- RHR pumps
- CNMT spray pumps

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: FR procedures may now be implemented as necessary.

11 Verify Adequate SW Flow To CCW Hx:

a. Verify at least two SW pumps - RUNNING

a. Manually start pumps as power supply permits (257 kw each). IF less than two SW pumps can be operated, THEN perform the following:

1) IF NO SW pumps running, THEN refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2) IF ony one SW pump running, THEN refer to AP-SW.2, LOSS OF SERVICE WATER.

3) Go to Step 17.

b. Verify AUX BLDG SW isolation valves - OPEN

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

b. Manually align valves. IF valves must be locally operated, THEN continue with Step 17. WHEN SW restored to AUX BLDG, THEN do Steps 11c through 16.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 11 continued from previous page)

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

c. Perform the following:

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

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

2) Direct AO to adjust SW flow to required value

o IF on normal SW discharge:

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

-OR-

o IF on alternate SW discharge:

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Check If Normal CVCS Operation Can Be Established	
	a. Verify IA restored: o IA to CNMT (AOV-5392) - OPEN o IA pressure - GREATER THAN 60 PSIG	a. Continue with Step 17. WHEN IA restored, THEN do Steps 12 through 16.
	b. Charging pump - ANY RUNNING	b. Continue with Step 17. WHEN any charging pump running, THEN do Steps 13 through 16.
13	Verify PRZR Level - GREATER THAN 13% [40% adverse CNMT]	Continue with Step 17. WHEN PRZR level increases to greater than 13% [40% adverse CNMT], THEN do Steps 14 through 16.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Establish Normal Letdown: a. Establish charging line flow to REGEN Hx - GREATER THAN 20 GPM b. Place the following switches to CLOSE: • Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202) • AOV-371, letdown isolation valve • AOV-427, loop B cold leg to REGEN Hx c. Place letdown controllers in MANUAL at 40% open • TCV-130 • PCV-135 d. Reset both trains of XY relays for AOV-371 and AOV-427 if necessary e. Open AOV-371 and AOV-427 f. Open letdown orifice valves as necessary g. Place TCV-130 in AUTO at 105°F h. Place PCV-135 in AUTO at 250 psig i. Adjust charging pump speed and HCV-142 as necessary	Consult TSC to determine if excess letdown should be placed in service.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Check VCT Makeup System:	
	a. Verify the following: 1) Boric acid and RMW flow control valves - SET FOR REQUIRED CSD CONCENTRATION (Refer to Figure SDM) 2) At least one BA and RMW pump in AUTO 3) RMW mode selector switch in AUTO 4) RMW control armed - RED LIGHT LIT	a. IF VCT auto makeup can NOT be established, THEN manually control VCT level (Refer to ER-CVCS.1, REACTOR MAKEUP CONTROL MALFUNCTION).
	b. Check VCT level o Level - GREATER THAN 20% -OR- o Level - STABLE OR INCREASING	b. Manually increase VCT makeup flow as follows: 1) Ensure BA transfer pumps and RMW pumps running. IF NOT, THEN dispatch AO to reset MCC C and MCC D UV lockouts as necessary. 2) Place RMW flow control valve HCV-111 in MANUAL and increase RMW flow. 3) Increase boric acid flow as necessary. IF VCT level can NOT be restored, THEN go to Step 17.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Check Charging Pump Suction Aligned To VCT:	
	a. VCT level - GREATER THAN 20%	a. IF VCT level can NOT be maintained greater than 5%, THEN perform the following: 1) Ensure charging pump suction aligned to RWST: o LCV-112B open o LCV-112C closed 2) Continue with Step 17. WHEN VCT level greater than 40%, THEN do Step 16b.
	b. Verify charging pumps aligned to VCT o LCV-112C - OPEN o LCV-112B - CLOSED	b. Manually align valves as necessary.
17	Control PRZR Level:	
	a. Check letdown - IN SERVICE	a. Stop and start charging pumps as necessary to control PRZR level.
	b. Maintain PRZR level between 13% [40% adverse CNMT] and 50%	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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

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

18 Establish PRZR Pressure Control:

a. Check letdown - IN SERVICE

a. Perform the following:

1) Use PRZR heaters and one PRZR PORV to maintain RCS pressure.

IF IA NOT available, THEN Refer to Attachment N2 PORVS to operate PORV.

2) Go to Step 19.

b. Use PRZR heaters and auxiliary spray valve (AOV-296) to maintain RCS pressure

19 Verify Natural Circulation:

Increase dumping steam from intact S/Gs.

o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING

o S/G pressures - STABLE OR DECREASING

o RCS hot leg temperatures - STABLE OR DECREASING

o Core exit T/Cs - STABLE OR DECREASING

o RCS cold leg temperatures - AT SATURATION TEMPERATURE FOR S/G PRESSURE

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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

20 Check If Source Range Detectors Should Be Energized:

a. Source range channels - DEENERGIZED

a. Go to Step 20e.

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

b. Perform the following:

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

2) Continue with Step 21. WHEN flux is LESS THAN 10^{-10} amps on any operable channel, THEN do Steps 20c through e.

c. Check the following:

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

-OR-

- Greater than 20 minutes since reactor trip

c. Continue with Step 21. WHEN either condition met, THEN do Steps 20d and e.

d. Verify source range detectors - ENERGIZED

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

IF source ranges can NOT be restored, THEN refer to ER-NIS.1, SR MALFUNCTION and go to Step 21.

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	Verify Adequate Shutdown Margin:	
	a. Direct RP to sample RCS and PRZR liquid for boron concentration	
	b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIGURE SDM	b. Borate as necessary.
22	Maintain Stable Plant Conditions	
	a. RCS pressure - STABLE	a. Control PRZR heaters and auxiliary spray if available.
	b. RCS temperature - STABLE	b. Control dumping steam as necessary.
	c. PRZR level - BETWEEN 13% [40% adverse CNMT] and 50%	c. Control charging as necessary.
	d. Intact S/G level - BETWEEN 17% [25% adverse CNMT] and 52%	d. Control S/G feed flow as necessary.
*23	Monitor SI Initiation Criteria:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING	a. Go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level. IF PRZR level can NOT be maintained, THEN go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	Try To Restore Offsite Power To All AC Busses (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER)	Maintain plant condition stable using AC emergency power.
25	Implement Plant Recovery Procedures:	
	a. Review plant systems for realignment to normal conditions (Refer to ATT-26.0, ATTACHMENT RETURN TO NORMAL OPERATIONS)	
	b. Consult plant staff to determine if RCS cooldown is necessary	b. IF cooldown NOT required, THEN go to O-3, HOT SHUTDOWN WITH XENON PRESENT.
	c. At least one RCP - OPERABLE	c. Go to ES-0.2, NATURAL CIRCULATION COOLDOWN.
	d. Go to O-2.2, PLANT SHUTDOWN FROM HOT SHUTDOWN TO COLD SHUTDOWN	

-END-

ECA-0.1 APPENDIX LIST

TITLE

1) FIGURE MIN SUBCOOLING (FIG-1.0)
2) FIGURE SDM (FIG-2.0)
3) ATTACHMENT SD-1 (ATT-17.0)
4) ATTACHMENT SD-2 (ATT-17.1)
5) ATTACHMENT N2 PORVS (ATT-12.0)
6) ATTACHMENT NO SW PUMPS (ATT-2.4)
7) ATTACHMENT RETURN TO NORMAL OPERATIONS (ATT-26.0)

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 use engineered safeguards systems to recover plant conditions following restoration of AC emergency power.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

   a. ECA-0.0, LOSS OF ALL AC POWER, when AC emergency power is restored and SI is required.

   b. ECA-0.1, LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED, if SI is required.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: o CSFSTs should be monitored for information only. FR procedures should not be implemented prior to completion of Step 10.

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

1 Reset SI

2 Check RCP CCW Isolation Status:

a. CCW pumps - BOTH PUMPS OFF

a. Go to Step 3.

b. RCP CCW return valves - CLOSED

- MOV-759A
- MOV-759B

b. Manually close valves as necessary:

o RCP CCW thermal barrier outlet valves

- AOV-754A
- AOV-754B

-OR-

o RCP CCW supply valves

- MOV-749A
- MOV-749B

3 Check RWST Level - GREATER THAN 28%

Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: SI actuation to establish safeguards valve alignment is not recommended.

4 Manually Align SI And RHR Pumps To Establish SI Injection:

a. SI pump suction valves from RWST - OPEN

- MOV-825A
- MOV-825B

a. Ensure at least one SI pump suction valve from RWST open.

- MOV-825A
- MOV-825B

b. Verify SI pump C discharge valves - OPEN

- MOV-871A
- MOV-871B

b. Manually open valves as necessary.

c. RHR pump discharge to Rx vessel deluge - OPEN

- MOV-852A
- MOV-852B

c. Ensure at least one deluge valve open.

- MOV-852A
- MOV-852B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

THE LOADS PLACED ON THE ENERGIZED AC EMERGENCY BUS SHOULD NOT EXCEED THE CAPACITY OF THE POWER SOURCE.

5	Manually Load Following Safeguards Equipment On AC Emergency Bus:	
	a. Start all SI pumps	a. Perform the following: 1) Start available SI pumps. 2) IF SI pump A or B NOT available, THEN verify SI pump C aligned as follows: o IF SI pump A NOT available, THEN ensure MOV-871B closed. o IF SI pump B NOT available, THEN ensure MOV-871A closed.
	b. Check RCS pressure: o Pressure - GREATER THAN 250 psig [465 psig adverse CNMT] o Pressure - STABLE OR INCREASING	b. Manually start both RHR pumps and go to Step 5d.
	c. Place RHR pump switches in AUTO	
	d. Start all available CNMT RECIRC fans	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- IF CST LEVEL DECREASES TO LESS THAN 5 FEET, THEN ALTERNATE WATER SOURCES FOR AFW PUMPS WILL BE NECESSARY (REFER TO ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).
- IF S/G NR LEVEL DECREASES TO LESS THAN 5% [25% ADVERSE CNMT] AND FEED FLOW IS LESS THAN 200 GPM, THEN THE MDAFW PUMPS SHOULD BE MANUALLY LOADED ON AC EMERGENCY BUS TO SUPPLY WATER TO THE S/G(S).

* *

NOTE:
- If MDAFW pump operation is not required, pump switches should be maintained in PULL-STOP to prevent automatic start.
- TDAFW pump flow control AOVs may drift open on loss of IA.

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

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

a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in at least one S/G.

IF feed flow less than 200 gpm, THEN perform the following:

1) Verify MDAFW pump discharge valve to intact S/G(s) open.
   - S/G A, MOV-4007
   - S/G B, MOV-4008

2) Manually start MDAFW pumps as necessary (223 kw).

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Verify CI And CVI:	
	a. CI and CVI annunciators - LIT • Annunciator A-26, CNMT ISOLATION • Annunciator A-25, CONTAINMENT VENTILATION ISOLATION	a. Depress manual CI pushbutton.
	b. Verify CI and CVI valve status lights - BRIGHT	b. Manually close CI and CVI valves. IF valves can NOT be verified closed by MCB indication, THEN dispatch AO to locally close valves (Refer to Attachment CI/CVI).
	c. CNMT RECIRC fan coolers SW outlet valve status lights - BRIGHT • AOV-4561 • AOV-4562	c. Dispatch AO to locally fail open valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Verify CNMT Spray Not Required: o Annunciator A-27, CNMT SPRAY - EXTINGUISHED o CNMT pressure - LESS THAN 28 PSIG	IF CNMT pressure is less than 28 psig, THEN perform the following: a. Reset CNMT spray. b. Place CNMT spray pump discharge valve switches to CLOSE to deenergize open contactor. IF NOT, THEN perform the following: a. Depress manual CNMT spray pushbuttons (2 of 2). b. Ensure CNMT spray pump discharge valves open. o CNMT spray pump A: • MOV-860A • MOV-860B o CNMT spray pump B: • MOV-860C • MOV-860D c. Ensure NaOH tank outlet valves open. • AOV-836A • AOV-836B d. Start both CNMT spray pumps. e. Go to step 10.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

9 Place CNMT Spray Pumps In AUTO

10 Check RCP Seal Injection Needle Valves - CLOSED

Locally close valves before starting charging pump.

- V-300A
- V-300B

NOTE: FR procedures may now be implemented as necessary.

11 Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1

-END-

ECA-0.2 APPENDIX LIST

TITLE

1) ATTACHMENT CI/CVI (ATT-3.0)

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 emergency coolant recirculation capability, to delay depletion of the RWST by adding makeup and reducing outflow, and to depressurize the RCS to minimize break flow.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

a. E-1, LOSS OF REACTOR OR SECONDARY COOLANT, when cold leg recirculation capability cannot be verified.

b. ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, when recirculation cannot be established or maintained OR when RWST level is < 15% and recirculation has not been established.

c. ECA-1.2, LOCA OUTSIDE CONTAINMENT, when a LOCA outside containment cannot be isolated.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

- IF EMERGENCY COOLANT RECIRCULATION IS ESTABLISHED DURING THIS PROCEDURE, FURTHER RECOVERY ACTIONS SHOULD CONTINUE BY RETURNING TO ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.
- IF SUCTION SOURCE IS LOST TO ANY SI OR CNMT SPRAY PUMP, THE PUMP SHOULD BE STOPPED.

* *

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

*** 1** Verify CNMT Sump Recirculation Capability:

a. Check CNMT Sump B level - AT LEAST 113 INCHES

a. IF Sump B level less than 113 inches due to a loss of RCS inventory outside CNMT, THEN go to Step 2.

b. Check RHR system:

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

b. Perform the following:

1) Manually or locally try to restore at least one train (Refer to ATT-14.5, ATTACHMENT RHR SYSTEM to identify minimum components for one train).

2) Continue with step 2. WHEN at least one train is restored, THEN do steps 1c, d and e.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 1 continued from previous page)	
	c. Check at least two SW pumps - RUNNING	c. Manually start SW pumps as power supply permits (257 kw each).
	d. Check RWST level - GREATER THAN 28%	d. Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 2 AND continue with step 2 of this procedure until such time as Emergency Coolant Recirculation is established.
	e. Return to procedure and step in effect.	
2	Verify CNMT RECIRC Fans Running:	
	a. All fans - RUNNING	a. Manually start fans.
	b. Charcoal filter dampers green status lights - EXTINGUISHED	b. Dispatch personnel with relay rack key to locally open dampers using trip relay pushbuttons in relay room racks. • AUX RELAY RACK RA-2 for fan A • AUX RELAY RACK RA-3 for fan C
* 3	Monitor RWST Level - GREATER THAN 15%	Go to Step 27.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

4 Determine CNMT Spray Requirements:

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

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

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

(Step 4 continued from previous page)

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

b. Manually operate CNMT spray pumps as necessary.

IF CNMT spray pump(s) must be stopped, THEN perform the following:

1) Reset CNMT spray.

2) Place CNMT spray pump in PULL STOP.

3) IF CNMT pressure less than 28 psig, THEN close discharge valves for idle CNMT spray pump(s).

- o Pump A
  - MOV-860A
  - MOV-860B
- o Pump B
  - MOV-860C
  - MOV-860D

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

5 Add Makeup To RWST As Necessary

- o Refer to ATT-18.0, ATTACHMENT SFP-RWST (~ 400 gpm can be expected)

-OR-

- o Refer to S-3.2D, TRANSFERRING WATER FROM CVCS HUT(S) TO RWST OR SFP (~ 60 gpm can be expected)

-OR-

- o Refer to S-9J, BLENDING TO RWST (~ 50 gpm can be expected)

* *

CAUTION

IF CST LEVEL DECREASES TO LESS THAN 5 FEET, THEN ALTERNATE WATER SOURCES FOR AFW PUMPS WILL BE NECESSARY (REFER TO ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

* *

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

* 6 Monitor Intact S/G Levels:

a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]	a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in at least one S/G.
b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	b. IF narrow range level in any S/G continues to increase, THEN stop feed flow to that S/G.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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

7 Initiate RCS Cooldown To Cold Shutdown:

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

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

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

o Use S/G ARVs

-OR-

o Open TDAFW pump steam supply valves.

-OR-

o Dispatch AO to perform the following:

1) Open S/G MSIV bypass valves.

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

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

- V-3580
- V-3581

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Check ECCS Pump Status: o SI Pumps - ANY RUNNING -OR- o RHR Pumps - ANY RUNNING IN INJECTION MODE	Go to step 19.

* *

CAUTION

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

* *

9	Reset SI If Necessary	
10	Establish One Train Of SI Flow	
	a. SI pumps - LESS THAN THREE RUNNING	a. Stop one SI pump.
	b. RCS pressure - LESS THAN 250 psig [465 psig adverse CNMT]	b. Stop RHR pumps and go to Step 11.
	c. RHR pump - ONLY ONE RUNNING	c. IF two RHR pumps running, THEN stop one RHR pump. IF no RHR pumps running, THEN start one RHR pump.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Verify No Backflow From RWST To Sump:	
	a. Any RHR suction valve from sump B - OPEN • MOV-850A • MOV-850B	a. IF both RHR suction valves from sump B closed, THEN go to Step 12.
	b. RWST outlet valve to RHR pump suction (MOV-856) - CLOSED	b. Perform the following: 1) Place MOV-856 key switch to ON 2) Manually close valve IF valve can NOT be closed manually, THEN direct AO to locally close valve.
12	Reset CI:	
	a. Depress CI reset pushbutton	
	b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED	b. Perform the following: 1) Reset SI. 2) Depress CI reset pushbutton.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	Verify Adequate SW Flow:	
	a. Check at least two SW pumps - RUNNING	a. Manually start SW pumps as power supply permits (257 kw each). IF less than two SW pumps running, THEN perform the following: 1) Ensure SW isolation. 2) Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1) 3) IF NO SW pumps running, THEN refer to ATT-2.4, ATTACHMENT NO SW PUMPS. 4) IF only one SW pump running, THEN refer to AP-SW.2, LOSS OF SERVICE WATER. 5) Go to Step 16.
	b. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Establish IA to CNMT:	
a.	Verify non-safeguards busses energized from offsite power o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED	a. Perform the following: 1) Close non-safeguards bus tie breakers: • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each). IF NOT, THEN evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS). 3) WHEN bus 15 restored, THEN reset control room lighting.
b.	Verify SW isolation valves to turbine building - 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 15. WHEN IA restored, THEN do Steps 14e and f.
e.	Reset both trains of XY relays for IA to CNMT AOV-5392	
f.	Verify IA to CNMT AOV-5392 - OPEN	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Establish Required Charging Line Flow:	
	a. Charging pumps - ANY RUNNING	a. Perform the following: 1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN dispatch AO with RWST area key to locally close seal injection needle valves to affected RCP: • RCP A, V-300A • RCP B, V-300B 2) Ensure HCV-142 demand at 0%. 3) Start one charging pump.
	b. Establish 20 gpm total charging flow	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

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

* *

16 Check If An RCP Should Be Started:

a. All RCPs - STOPPED

a. Stop all but one RCP and go to step 17.

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

b. Go to Step 17.

c. Try to start an RCP:

1) Establish conditions for starting an RCP

- o Bus 11A or 11B energized
- o Refer to ATT-15.0, ATTACHMENT RCP START

2) Start one RCP.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
***17**	Monitor SI Termination Criteria:	
	a. Check RVLIS indication: o Level (no RCPs) - GREATER THAN 77% [82% adverse CNMT] -OR- o Fluid fraction (any RCP running) - GREATER THAN 84%	a. Go to step 19.
	b. RCS subcooling based on core exit T/Cs - GREATER THAN 50°F USING FIG-1.0, FIGURE MIN SUBCOOLING	b. Limit RCS injection flow (SI, RHR and charging) to that required to remove decay heat: o Determine required injection flow using FIG-6.0, FIGURE MIN RCS INJECTION o Stop SI and/or RHR pumps as necessary to establish and maintain minimum required injection flow. o IF required injection flow is less than 100 gpm, THEN establish charging at required flow and go to Step 18. IF required injection flow is greater than 100 gpm, THEN perform the following: 1) Establish minimum charging flow for RCP seal injection. 2) Establish sufficient SI pumps and adjust charging flow to satisfy minimum required injection flow. 3) Consult TSC to determine if SI pump discharge valves should be locally throttled. (Locked valve key required.) 4) Go to Step 19.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Stop SI And RHR Pumps And Place In Auto	
*19	Verify Adequate RCS Makeup Flow:	
	a. Check RVLIS indication: o Level (no RCPs) - GREATER THAN 77% [82% adverse CNMT] -OR- o Fluid fraction (any RCP running) - GREATER THAN 84%	a. Increase RCS injection flow as necessary to maintain RVLIS indication stable.
	b. Core exit T/Cs - STABLE OR DECREASING	b. Increase RCS injection flow to maintain core exit T/Cs stable or decreasing.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	Check If Emergency D/Gs Should Be Stopped:	
	a. Verify AC emergency busses energized by offsite power: o Emergency D/G output breakers - OPEN o AC emergency bus voltage - GREATER THAN 420 VOLTS o AC emergency bus normal feed breakers - CLOSED	a. Perform the following: 1) Close non-safeguards bus tie breakers as necessary: • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Place the following pumps in PULL STOP: • EH pumps • Turning gear oil pump • HP seal oil backup pump 3) Ensure condenser steam dump mode control in MANUAL. 4) Restore power to MCCs: • A from Bus 13 • B from Bus 15 • E from Bus 15 • F from Bus 15 5) Start HP seal oil backup pump. 6) Ensure D/G load within limits. 7) WHEN bus 15 restored, THEN reset control room lighting breaker. 8) Refer to ATT-8.4, ATTACHMENT SI/UV for other equipment lost with loss of offsite power. 9) Try to restore offsite power. (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER)
	b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

* *

CAUTION

VOIDING MAY OCCUR IN THE RCS DURING RCS DEPRESSURIZATION. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.

* *

NOTE: If normal RCP support conditions can NOT be satisfied, then any running RCP(s) should be stopped.

21 Depressurize RCS To Decrease RCS Subcooling:

a. Check RCS subcooling based on core exit T/Cs - GREATER THAN 10°F USING FIG-1.0, FIGURE MIN SUBCOOLING

a. Go to Step 22.

b. Normal PRZR spray -AVAILABLE

b. Use one PRZR PORV. IF IA NOT available, THEN refer to ATT-12.0, ATTACHMENT N2 PORVS.

IF no PRZR PORV available, THEN use auxiliary spray valve (AOV-296).

c. Depressurize RCS until either of the following conditions satisfied:

- o RCS subcooling based on core exit T/Cs - LESS THAN 10°F USING FIG-1.0, FIGURE MIN SUBCOOLING

-OR-

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

d. WHEN either condition met, THEN stop RCS depressurization

e. Check RCS subcooling - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING

e. Increase RCS makeup flow as necessary to restore subcooling.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	Check If RHR Normal Cooling Can Be Established:	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Go to Step 23.
	b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Go to Step 23.
	c. Place letdown pressure controller (PCV-135) in MANUAL CLOSED	
	d. Check following valves - OPEN • AOV-371, letdown isolation valve • AOV-427, loop B cold leg to REGEN Hx • At least one letdown orifice valve (AOV-200A, AOV-200B, or AOV-202)	d. Perform the following: 1) Reset both trains of XY relays for AOV-371 and AOV-427. 2) Open AOV-371. 3) Place AOV-427 switch to OPEN. 4) Open one letdown orifice valve.
	e. Verify pressure on PI-135 - LESS THAN 400 PSIG	e. Go to Step 23.
	f. Place RCS overpressure protection system in service (Refer to O-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	
	g. Consult TSC to determine if RHR normal cooling should be established using ATT-14.1, ATTACHMENT RHR COOL	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	Check If SI ACCUMs Should Be Isolated:	
	a. Both RCS hot leg temperatures - LESS THAN 400°F	a. Continue with Step 24. WHEN both RCS hot leg temperatures less than 400°F, THEN do Steps 23b, c and d.
	b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves • MOV-841, MCC C position 12F • MOV-865, MCC D position 12C	
	c. Close SI ACCUM discharge valves • MOV-841 • MOV-865	c. Vent any unisolated ACCUMs: 1) Open vent valves for unisolated SI ACCUMs. • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945.
	d. Locally reopen breakers for MOV-841 and MOV-865	
*24	Monitor RCP Operation:	
	a. RCPs - ANY RUNNING	a. Go to Step 25.
	b. Check the following: o RCP #1 seal D/P - GREATER THAN 220 PSID o Check RCP seal leakage - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0, FIGURE RCP SEAL LEAKOFF	b. Stop affected RCP(s).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	Check Core Exit T/Cs - GREATER THAN 200°F	Go to Step 40.
26	Check RWST Level - LESS THAN 15%	Return to Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
27	Minimize RWST Outflow:	
	a. Any SI pump(s) - RUNNING	a. IF charging pump suction aligned to RWST, THEN perform the following: 1) Verify SI pump suction aligned to RWST, MOV-825A or MOV-825B open. 2) Start one SI pump and verify flow. 3) Stop running charging pumps. 4) Go to Step 27d.
	b. Stop all but one SI pump	
	c. Check charging pump suction from RWST (AOV-112B) - CLOSED	c. Stop all charging pumps
	d. Stop both RHR pumps	
	e. Pull Stop both CNMT spray pumps	
	f. Check CNMT pressure - LESS THAN 28 PSIG	f. Go to Step 28.
	g. Reset CNMT spray	
	h. Close discharge valves for idle CNMT spray pump o Pump A • MOV-860A • MOV-860B o Pump B • MOV-860C • MOV-860D	
	i. Determine required injection flow using FIG-6.0, FIGURE MIN RCS INJECTION	
	j. Consult TSC to determine if SI pump discharge valve should be locally throttled (locked valve key required)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
***28**	Check SI pump flow - STABLE	IF SI flow zero or erratic, THEN stop running SI pump.
29	Try To Add Makeup To RCS From VCT:	
	a. Check VCT level - GREATER THAN 5%	a. Stop charging pumps taking suction from VCT and continue with Step 30. WHEN VCT level greater than 5%, THEN do Steps 29b and c.
	b. Verify charging pumps aligned to VCT o LCV-112C - OPEN o LCV-112B - CLOSED	b. Manually align valves as necessary.
	c. Establish two charging pumps running	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

30 Establish Maximum VCT Makeup:

a. Check RMW control armed - RED LIGHT LIT

a. Place RMW mode switch in AUTO and place RMW control switch to START.

b. Check VCT level - LESS THAN 20%

b. Continue with Step 31. WHEN VCT level less than 20%, THEN do Steps 30c, d and e.

c. Check VCT makeup system - OPERATING IN AUTO

c. Perform the following:

1) Open makeup system valves.

- AOV-110B
- AOV-110C
- AOV-111

2) Start BA transfer pumps and RMW pumps.

3) Open boric acid flow control valve (AOV-110A).

d. Increase VCT makeup flow

1) Start both RMW pumps

2) Start both boric acid pumps

3) Adjust RMW controller (HC-111) to maximum flow from table

BAST CONC (PPM)	MAX RMW FLOW (GPM)
8750 (5%)	40
10500 (6%)	50
12250 (7%)	60
14000 (8%)	70
15750 (9%)	80
17500 (10%)	90

4) Adjust boric acid flow controller (HC-110A) in MANUAL to 9.5 gpm

e. Adjust charging pump speed to stabilize VCT level

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

31 Add Makeup To RWST As Necessary

- o Refer to ATT-18.0, ATTACHMENT SFP-RWST (~ 400 gpm can be expected)

-OR-

- o Refer to S-3.2D, TRANSFERRING WATER FROM CVCS HUT(S) TO RWST OR SFP (~ 60 gpm can be expected)

-OR-

- o Refer to S-9J, BLENDING TO RWST (~ 50 gpm can be expected)

32 Try To Add Makeup To RCS From Alternate Source:

a. Evaluate Use Of RCDT Pumps (Refer to ER-RHR.1, RCDT PUMP OPERATION FOR CORE COOLING)

b. Consult TSC to determine other means of makeup

33 Verify SI ACCUM Isolation Valves - OPEN

- MOV-841
- MOV-865

IF valves were closed to prevent SI ACCUM nitrogen injection, THEN go to Step 37.

IF NOT, THEN perform the following:

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

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

b. Open SI ACCUM discharge valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34	Depressurize All Intact S/Gs To 785 PSIG:	
	a. Check S/G pressures - GREATER THAN 785 PSIG	a. Go to Step 35.
	b. Dump steam to condenser at maximum rate	b. Manually or locally dump steam at maximum rate from intact S/G(s): o Use S/G ARVs -OR- o Open steam supply valves to TDAFW pump -OR- o Dispatch AO to perform the following: 1) Open S/G MSIV bypass valves. 2) Open priming air ejector steam isolation valves • V-3580 • V-3581
	c. Check S/G pressures - LESS THAN 785 PSIG	c. Return to Step 34b.
	d. Stop S/G depressurization	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

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

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

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

- o Level (no RCPs) - BETWEEN 77% AND 82% [82% AND 85% adverse CNMT]

-OR-

- o Fluid fraction (any RCP running) - BETWEEN 84% AND 90%

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

- o Use S/G ARVs

-OR-

- o Open steam supply valves to TDAFW pump

-OR-

- o Dispatch AO to perform the following:

  1) Open affected S/G MSIV bypass valve.

  2) Open priming air ejector steam isolation valves

     - V-3580
     - V-3581

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

b. Return to Step 35a.

c. Stop S/G depressurization

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
36	Check If SI ACCUMs Should Be Isolated:	
	a. Both RCS hot leg temperatures - LESS THAN 400°F	a. Continue with Step 37. WHEN both RCS hot leg temperatures less than 400°F, THEN do Steps 36b, c and d.
	b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves • MOV-841, MCC C position 12F • MOV-865, MCC D position 12C	
	c. Close SI ACCUM discharge valves • MOV-841 • MOV-865	c. Vent any unisolated ACCUMs: 1) Open vent valves for unisolated SI ACCUMs. • ACCUM A, AOV-834A • ACCUM B, AOV-834B 2) Open HCV-945.
	d. Locally reopen breakers for MOV-841 and MOV-865	
*37	Monitor RCP Operation:	
	a. RCPs - ANY RUNNING	a. Go to Step 38.
	b. Check the following: o RCP #1 seal D/P - GREATER THAN 220 PSID o Check RCP seal leakage - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0, FIGURE RCP SEAL LEAKOFF	b. Stop affected RCP(s).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38	Depressurize All Intact S/Gs To Atmospheric Pressure:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Dump steam to condenser	b. Manually or locally dump steam from intact S/G(s): o Use S/G ARVs -OR- o Open steam supply valves to TDAFW pump -OR- o Dispatch AO to perform the following: 1) Open S/G MSIV bypass valves. 2) Open priming air ejector steam isolation valves • V-3580 • V-3581

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
39	Check If RHR Normal Cooling Can Be Established:	
	a. RCS cold leg temperature - LESS THAN 350°F	a. Return to Step 38.
	b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]	b. Return to Step 38.
	c. Place letdown pressure controller in MANUAL CLOSED	
	d. Check following valves - OPEN • AOV-371, letdown isolation valve • AOV-427, loop B cold leg to REGEN Hx • At least one letdown orifice valve (AOV-200A, AOV-200B, or AOV-202)	d. Perform the following: 1) Reset both trains of XY relays for AOV-371 and AOV-427. 2) Open AOV-371 and AOV-427. 3) Open one letdown orifice valve.
	e. Verify pressure on PI-135 - LESS THAN 400 PSIG	e. Return to Step 38.
	f. Place RCS overpressure protection system in service (Refer to O-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)	
	g. Consult TSC to determine if RHR normal cooling should be established using ATT-14.1, ATTACHMENT RHR COOL	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
40	Maintain RCS Heat Removal:	
	a. Use RHR system if in service	
	b. Dump steam to condenser from intact S/Gs	b. Manually or locally dump steam from intact S/G(s): o Use S/G ARVs -OR- o Open steam supply valves to TDAFW pump -OR- o Dispatch AO to perform the following: 1) Open S/G MSIV bypass valves. 2) Open priming air ejector steam isolation valves • V-3580 • V-3581 IF no intact S/G available and RHR system NOT in service, THEN use faulted S/G.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE: This procedure should be continued while obtaining CNMT hydrogen sample in the next step.

41 Check CNMT Hydrogen Concentration:

a. Direct RP to start CNMT hydrogen monitors as necessary

b. Hydrogen concentration - LESS THAN 0.5%

b. Consult TSC to determine if hydrogen recombiners should be placed in service.

42 Consult TSC

-END-

ECA-1.1 APPENDIX LIST

TITLE

1) FIGURE MIN SUBCOOLING (FIG-1.0)
2) FIGURE SDM (FIG-2.0)
3) FIGURE MIN RCS INJECTION (FIG-6.0)
4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
5) ATTACHMENT RHR COOL (ATT-14.1)
6) ATTACHMENT SFP-RWST (ATT-18.0)
7) ATTACHMENT RCP START (ATT-15.0)
8) ATTACHMENT SD-1 (ATT-17.0)
9) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
10) ATTACHMENT RHR SYSTEM (ATT-14.5)
11) ATTACHMENT N2 PORVS (ATT-12.0)
12) ATTACHMENT NO SW PUMPS (ATT-2.4)
13) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
14) ATTACHMENT SI/UV (ATT-8.4)