

EOP: ECA-3.1	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED	REV: 26 PAGE 1 of 39
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23


RESPONSIBLE MANAGER

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CATEGORY 1.0

REVIEWED BY: _____

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A. PURPOSE - This procedure provides actions to cool down and depressurize the RCS to cold shutdown conditions while minimizing loss of RCS inventory and voiding in the RCS for an SGTR concurrent with a LOCA (i.e. Ruptured-Faulted S/G).

B. ENTRY CONDITIONS/SYMPOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. E-3, STEAM GENERATOR TUBE RUPTURE, if ruptured S/G can not be isolated from any intact S/G.
- b. E-3, STEAM GENERATOR TUBE RUPTURE, if PRZR PORV can not be isolated by closing its block valve.
- c. E-3, STEAM GENERATOR TUBE RUPTURE, if ruptured S/G is faulted.
- d. E-3, STEAM GENERATOR TUBE RUPTURE, and ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, if no intact S/G is available for RCS cooldown.
- e. E-3, STEAM GENERATOR TUBE RUPTURE, if minimum D/P between ruptured and intact S/G cannot be maintained.
- f. E-3, STEAM GENERATOR TUBE RUPTURE, if RCS subcooling is less than required.
- g. E-3, STEAM GENERATOR TUBE RUPTURE, if RCS pressure does not increase after closing PRZR PORV and block valve.
- h. E-3, STEAM GENERATOR TUBE RUPTURE, and ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, if SI can not be terminated.
- i. E-3, STEAM GENERATOR TUBE RUPTURE, and ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, if SI is reinitiated after termination.
- j. E-3, STEAM GENERATOR TUBE RUPTURE, ES-3.1, POST-SGTR COOLDOWN USING BACKFILL, ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, and ES-3.3, POST-SGTR COOLDOWN USING STEAM DUMP, if SI accumulators should not be isolated.

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- k. ES-3.1, POST-SGTR COOLDOWN USING BACKFILL,
ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, and
ES-3.3, POST-SGTR COOLDOWN USING STEAM DUMP, if
a non-ruptured S/G is not available for RCS cooldown.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

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

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

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

1 Reset SI

2 Reset CI:

a. Depress CI reset pushbutton

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

b. Perform the following:

1) Reset SI.

2) Depress CI reset pushbutton.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

3 Verify Adequate SW Flow:

a. Check at least two SW pumps -
RUNNING

a. Manually start SW pumps as power
supply permits (257 kw each).

IF less than two SW pumps
running. THEN perform the
following:

1) Ensure SW isolation.

2) IF NO SW pumps running. THEN
perform the following:

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

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

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

b. Dispatch AO to establish normal
shutdown alignment (Refer to
ATT-17.0, ATTACHMENT SD-1)

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

4 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

- b. Check SW pumps - AT LEAST TWO PUMPS RUNNING

- c. Verify SW isolation valves to turbine building - OPEN

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

This Step continued on the next page.

- a. Perform the following:

- 1) Close non-safeguards bus tie breakers:

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

- 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each).

IF NOT. THEN perform the following:

- o Start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR)

-OR-

- o Evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS).

- b. Perform the following:

- 1) Restore IA using service air compressor OR diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).

- 2) Go to Step 4d.

- c. Perform the following:

- 1) Manually align valves.
- 2) Dispatch AO to locally reset compressors as necessary.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 4 continued from previous page)

d. Verify adequate air
compressor(s) - RUNNING

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

e. Check IA supply:

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

e. Perform the following:

- 1) Continue attempts to restore
IA (Refer to AP-IA.1, LOSS OF
INSTRUMENT AIR).
- 2) Continue with Step 5. WHEN
IA restored, THEN do Steps 4f
and g.

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

g. Verify IA to CNMT AOV-5392 - OPEN

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

* 5 Monitor All AC Busses -
BUSSES ENERGIZED BY OFFSITE
POWER

- o Normal feed breakers to all 480
volt busses - CLOSED
- o 480 bus voltage - GREATER THAN
420 VOLTS
- o Emergency D/G output breakers -
OPEN

Perform the following:

- a. IF any AC emergency bus normal
feed breaker open, THEN ensure
associated D/G breaker closed.
- b. Perform the following, as
necessary:
 - 1) Close non-safeguards bus tie
breakers:
 - Bus 13 to Bus 14 tie
 - Bus 15 to Bus 16 tie
 - 2) Place the following pumps in
PULL STOP:
 - EH pumps
 - Turning gear oil pump
 - HP seal oil backup pump
 - 3) Restore power to MCCs.
 - A from Bus 13
 - B from Bus 15
 - E from Bus 15
 - F from Bus 15
 - 4) Start HP seal oil backup pump.
 - 5) Ensure D/G load within limits.
 - 6) WHEN bus 15 restored, THEN
reset control room lighting.
 - 7) Refer to ATT-8.4, ATTACHMENT
SI/UV for other equipment
lost with loss of offsite
power.
- c. Try to restore offsite power to
all AC busses (Refer to
ER-ELEC.1, RESTORATION OF
OFFSITE POWER).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
..... <u>CAUTION</u> PRZR HEATERS SHOULD NOT BE ENERGIZED UNTIL PRZR LEVEL INDICATES GREATER THAN MINIMUM RECOMMENDED BY TSC TO ENSURE HEATERS ARE COVERED.		
	6 Deenergize PRZR Heaters	
	a. Place PRZR proportional heaters in PULL STOP	
	b. Place PRZR backup heaters to OFF	
	c. Consult TSC for a recommended minimum indicated PRZR level that will ensure heaters are covered.	

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

* 7 Monitor If CNMT Spray Should Be Stopped:

a. CNMT spray pumps - ANY RUNNING

a. Go to Step 8.

b. Check the following:

b. Continue with Step 8. WHEN BOTH conditions satisfied, THEN do Steps 7c through f.

o CNMT pressure - LESS THAN 4 PSIG

o Sodium hydroxide tank level - LESS THAN 55%

c. Reset CNMT spray

d. Check NaOH flow (FI-930) - NO FLOW

d. Place NaOH tank outlet valve switches to CLOSE.

- AOV-836A
- AOV-836B

e. Stop CNMT spray pumps and place in AUTO

f. Close CNMT spray pump discharge valves

- MOV-860A
- MOV-860B
- MOV-860C
- MOV-860D

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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.

8 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 9. WHEN ruptured S/G level greater than 5% [25% adverse CNMT], THEN do Steps 8b through e.

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

b. Dispatch A0 to locally close valve.

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

c. Pull stop MDAFW pump for ruptured S/G

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

d. Dispatch A0 with locked valve key to locally close TDAFW pump manual feedwater isolation valve to ruptured S/G.

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

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

e. Verify MDAFW pump crosstie valves - CLOSED

e. Manually close valves.

- MOV-4000A
- MOV-4000B

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.

.....

* 9 Monitor If RHR Pumps Should Be Stopped:

a. RHR pumps - ANY RUNNING IN INJECTION MODE

a. Go to Step 10.

b. Check RCS pressure:

b. Go to Step 10.

o Pressure - GREATER THAN 250 psig [465 psig adverse CNMT]

o Pressure - STABLE OR INCREASING

c. Stop RHR pumps and place in AUTO

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

10 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)
- Letdown line monitor (R-9)
- CHG pump room (R-4)

b. Direct RP to obtain following samples:

- RCS boron
- RCS activity
- CNMT hydrogen
- CNMT sump boron
- CNMT sump pH

c. Verify adequate Rx head cooling:

- 1) Verify at least one control rod shroud fan - RUNNING
- 2) Verify one Rx compartment cooling fan - RUNNING

a. Notify RP and refer to appropriate AR-RMS procedure.

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

11 Establish 75 GPM Charging Flow:

a. Charging pumps - ANY RUNNING

b. Align charging pump suction to RWST:

- o LCV-112B - OPEN
- o LCV-112C - CLOSED

c. Start charging pumps as necessary and establish 75 gpm total charging flow

- Charging line flow
- Seal injection

a. Perform the following:

- 1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN dispatch AO to locally isolate seal injection to affected RCP.

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

2) Ensure HCV-142 open.

b. IF LCV-112B can NOT be opened, THEN dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room).IF LCV-112C can NOT be closed, THEN perform the following:

- 1) Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
- 2) Verify charging pump A NOT running and place in PULL STOP.
- 3) WHEN V-358 open, THEN direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12 Check If S/G Secondary Side Is Intact:	<ul style="list-style-type: none"> o Pressure in both S/Gs - STABLE OR INCREASING o Pressure in both S/Gs - GREATER THAN 110 PSIG 	<p><u>IF</u> any S/G pressure decreasing in an uncontrolled manner <u>OR</u> completely depressurized, <u>THEN</u> verify faulted S/G isolated unless needed for RCS cooldown:</p> <ul style="list-style-type: none"> • Steamlines • Feedlines <p><u>IF NOT. THEN</u> go to E-2. FAULTED STEAM GENERATOR ISOLATION, Step 1.</p>
<p><u>NOTE:</u> TDAFW pump flow control AOVs may drift open on loss of IA.</p>		
<p>*13 Monitor Intact S/G Levels:</p>		
<ul style="list-style-type: none"> a. Narrow range level - GREATER THAN 5% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% 	<ul style="list-style-type: none"> a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in intact S/G. b. <u>IF</u> narrow range level in the intact S/G continues to increase in an uncontrolled manner, <u>THEN</u> consider isolating unnecessary release paths: <ul style="list-style-type: none"> • TDAFW pump steam supply valves • S/G blowdown valves • Refer to ATT-16.0, ATTACHMENT RUPTURED S/G 	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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NOTE: Shutdown margin should be monitored during RCS cooldown (Refer to FIG-2.0, FIGURE SDM).

14 Initiate RCS Cooldown To Cold Shutdown:

- | | |
|--|---|
| <ul style="list-style-type: none"> a. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR b. Use RHR system if in service c. Dump steam to condenser from intact S/G | <ul style="list-style-type: none"> c. Manually or locally dump steam using intact S/G ARV. |
|--|---|

IF no intact S/G available, and RHR system NOT in service, THEN perform the following:

- o Use faulted S/G.

-OR-

- o Use ruptured S/G.

***15 Monitor Conditions For Subcooled Recovery:**

- | | |
|---|--|
| <ul style="list-style-type: none"> a. Check RWST level - GREATER THAN 50% b. Check ruptured S/G narrow level - LESS THAN 90% [80% adverse CNMT] | <ul style="list-style-type: none"> a. <u>IF</u> CNMT sump B level is less than 113 inches, <u>THEN</u> go to ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED, Step 1. b. Consult TSC to determine if recovery should be completed using ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED. |
|---|--|

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

16 Check RCS Subcooling Based On
Core Exit T/Cs - GREATER THAN
0° USING FIG-1.0, FIGURE MIN
SUBCOOLING

Go to Step 28.

17 Check Safeguards Pump Status

Go to Step 24.

o SI pumps - ANY RUNNING

-OR-

o RHR pumps - ANY RUNNING IN
INJECTION MODE

18 Check PRZR level - LESS THAN
13% [40% adverse CNMT]

Go to Step 20.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION IF RCPS ARE NOT RUNNING. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.

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

19 Depressurize RCS To Refill
PRZR:

- | | |
|---|--|
| <ul style="list-style-type: none"> a. Use normal PRZR spray valve associated with running RCP <ul style="list-style-type: none"> • RCP A, PCV-431A • RCP B, PCV-431B b. PRZR level - GREATER THAN 13% [40% adverse CNMT] c. Stop RCS depressurization | <ul style="list-style-type: none"> a. Use one PRZR PORV. <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS.

<u>IF</u> no PORV available, <u>THEN</u> use auxiliary spray valve. b. Continue with Step 20. <u>WHEN</u> level greater than 13% [40% adverse CNMT], <u>THEN</u> stop RCS depressurization. |
|---|--|

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>.....</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>o IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.</p> <p>o INADVERTENT CRITICALITY MAY OCCUR FOLLOWING NATURAL CIRCULATION COOLDOWN IF THE RCP IN THE RUPTURED LOOP IS STARTED FIRST.</p> <p>.....</p>		
20	Check If An RCP Should Be Started:	
a.	Both RCPs - STOPPED	a. Stop all but one RCP and go to Step 21.
b.	RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	b. Go to Step 28.
c.	PRZR level - GREATER THAN 13% [40% adverse CNMT]	c. Return to Step 18.
d.	Try to start an RCP	
	1) Establish conditions for starting an RCP	
	o Bus 11A or 11B energized	
	o Refer to ATT-15.0, ATTACHMENT RCP START	
	2) Start one RCP	

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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

21 Check If One Of Three SI Pumps Should Be Stopped:

- a. Three SI pumps - RUNNING
- b. RCS subcooling based on core exit T/Cs - GREATER THAN 35°F [90°F adverse CNMT] USING FIG-1.0. FIGURE MIN SUBCOOLING
- c. Check PRZR level - GREATER THAN 13% [40% adverse CNMT]
- d. Stop one SI pump

a. Go to Step 22.

b. IF RCS hot leg temperatures greater than 320°F [310°F adverse CNMT], OR IF RHR normal cooling in service, THEN go to Step 28.

IF RHR normal cooling NOT in service AND RCS hot leg temperatures less than 320°F [310°F adverse CNMT], THEN ensure at least one RHR pump running in injection mode and go to Step 21c. IF no RHR pump can be started in injection mode, THEN go to Step 28.

c. Do NOT stop SI pump. Return to Step 18.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

a. Two SI pumps - RUNNING

a. Go to Step 23.

b. Determine required RCS
subcooling from table:

Charging Pump Availability	RCS Subcooling Criteria
NONE	120° F [200° F adverse CNMT]
ONE	115° F [190° F adverse CNMT]
TWO	105° F [180° F adverse CNMT]
THREE	100° F [175° F adverse CNMT]

c. RCS subcooling based on core
exit T/Cs - GREATER THAN VALUE
FROM TABLE ABOVE USING FIG-1.0,
FIGURE MIN SUBCOOLING

c. IF RCS hot leg temperatures
greater than 320° F [310° F
adverse CNMT], OR IF RHR normal
cooling in service, THEN go to
Step 28.

IF RHR normal cooling NOT in
service AND RCS hot leg
temperatures less than 320° F
[310° F adverse CNMT], THEN
ensure at least one RHR pump
running in injection mode and go
to Step 22d. IF no RHR pump can
be started in injection mode,
THEN go to Step 28.

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

d. Do NOT stop SI pump. Return to
Step 18.

e. Stop one SI pump



23 Check If Last SI Pump Should Be Stopped:

- | | |
|---|--|
| <p>a. One SI pump - RUNNING</p> <p>b. Determine required RCS subcooling from table:</p> | <p>a. <u>IF</u> any RHR pump running in injection mode, <u>THEN</u> go to Step 28. <u>IF NOT</u>, <u>THEN</u> go to Step 24.</p> |
|---|--|

Charging Pump Availability	RCS Subcooling Criteria
NONE	Insufficient subcooling to stop SI pump.
ONE	255°F [295°F adverse CNMT]
TWO	235°F [285°F adverse CNMT]
THREE	210°F [270°F adverse CNMT]

- | | |
|---|---|
| <p>c. RCS subcooling based on core exit T/Cs - GREATER THAN VALUE FROM TABLE ABOVE USING FIG-1.0, FIGURE MIN SUBCOOLING</p> | <p>c. <u>IF</u> RCS hot leg temperatures greater than 320°F [310°F adverse CNMT] <u>OR IF</u> RHR normal cooling in service, <u>THEN</u> go to Step 28.</p> <p><u>IF</u> RHR normal cooling <u>NOT</u> in service <u>AND</u> RCS hot leg temperatures less than 320°F [310°F adverse CNMT], <u>THEN</u> ensure at least one RHR pump running in injection mode and go to Step 23d. <u>IF</u> no RHR pump can be started in injection mode, <u>THEN</u> go to Step 28.</p> |
| <p>d. PRZR level - GREATER THAN 13% [40% adverse CNMT]</p> <p>e. Stop running SI pump</p> | <p>d. Do <u>NOT</u> stop SI pump. Return to Step 18.</p> |

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

24 Check If Charging Flow Should
Be Controlled To Maintain
PRZR Level:

a. Check RHR pumps - RUNNING IN
INJECTION MODE

b. Go to Step 28

a. Start charging pumps and control
charging flow to maintain PRZR
level and go to Step 25.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

.....

CAUTION

- o IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.
- o INADVERTENT CRITICALITY MAY OCCUR FOLLOWING NATURAL CIRCULATION COOLDOWN IF THE RCP IN THE RUPTURED LOOP IS STARTED FIRST.

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25 Check RCP Status

a. Both RCPs - STOPPED

a. Stop all but one RCP and go to Step 26.

b. Check RVLIS level (no RCPs) - $\geq 95\%$

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

- o Increase PRZR level to greater than 65% [82% adverse CNMT]
- o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING
- o WHEN PRZR level indicates greater than minimum recommended by TSC, THEN energize PRZR heaters as necessary to saturate PRZR water

IF conditions NOT met, THEN continue with Step 26. WHEN conditions met, THEN do Steps 25c and d.

This Step continued on the next page.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 25 continued from previous page)

c. Establish conditions for starting an RCP:

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

d. Start one RCP

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

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

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

2) Go to Step 26.

d. IF an RCP can NOT be started, THEN verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC).

IF natural circulation NOT verified, THEN increase dumping steam.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

- o THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION IF RCPS ARE NOT RUNNING. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.
- o IF SI HAS BEEN TERMINATED, THE ACCUMS SHOULD BE ISOLATED PRIOR TO DEPRESSURIZING THE RCS TO LESS THAN 1000 PSIG (REFER TO STEP 29).

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

26 Depressurize RCS To Minimize RCS Subcooling:

- | | |
|--|--|
| <ul style="list-style-type: none"> a. Depressurize using normal PRZR spray if available b. <u>WHEN</u> PRZR level indicates greater than minimum recommended by TSC, <u>THEN</u> energize PRZR heaters as necessary c. Depressurize RCS until EITHER of the following conditions satisfied: <ul style="list-style-type: none"> o RCS subcooling based on core exit T/Cs - LESS THAN 10°F USING FIG-1.0, FIGURE MIN SUBCOOLING | <ul style="list-style-type: none"> a. Depressurize using one PRZR PORV. <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS. <u>IF</u> no PORV available, <u>THEN</u> use auxiliary spray valve (AOV-296). |
|--|--|

-OR-

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

EOP:

ECA-3.1

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
SUBCOOLED RECOVERY DESIRED

REV: 26

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: Leakage from ruptured S/G into RCS will dilute RCS boron concentration.

27 Verify Adequate Shutdown Margin

- a. Direct RP to sample RCS and ruptured S/G for boron concentration
- b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0, FIGURE SDM

b. Borate as necessary.

28 Monitor SI Reinitiation Criteria:

- a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING
- b. PRZR level - GREATER THAN 5% [30% adverse CNMT]

a. Manually start SI pumps as necessary and go to Step 29.

b. Manually start SI pumps as necessary and return to Step 18.

EOP: ECA-3.1	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED	REV: 26 PAGE 28 of 39
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

29 Check If SI ACCUMs Should Be Isolated:

- a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING
- b. PRZR level - GREATER THAN 5% [30% adverse CNMT]
- c. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves
 - MOV-841, MCC C position 12F
 - MOV-865, MCC D position 12C
- d. Close SI ACCUM discharge valves
 - MOV-841
 - MOV-865
- e. Locally reopen breakers for MOV-841 and MOV-865

a. IF both RCS hot leg temperatures less than 400°F. THEN go to Step 29c.

IF NOT. THEN go to Step 30.

b. Return to Step 18.

d. Vent any unisolated ACCUMs:

1) Open vent valves for unisolated SI ACCUMs.

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

2) Open HCV-945.

IF an accumulator can NOT be isolated or vented. THEN consult TSC to determine contingency actions.

EOP:

ECA-3.1

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
SUBCOOLED RECOVERY DESIRED

REV: 26

PAGE 29 of 39

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

a. Verify AC emergency busses energized by offsite power:

o Emergency D/G output breakers - OPEN

o AC emergency bus voltage - GREATER THAN 420 VOLTS

o AC emergency bus normal feed breakers - CLOSED

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

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

31 Minimize Secondary System Contamination:

a. Isolate reject from hotwell to CST:

o Place hotwell level controller (HC-107) in MANUAL at 50%

o Verify hotwell level - STABLE

b. Verify local actions to complete isolation of ruptured S/G (Refer to ATT-16.0. ATTACHMENT RUPTURED S/G)

a. IF hotwell level increasing. THEN direct RP to sample hotwells for activity.

EOP: ECA-3.1	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED	REV: 26 PAGE 30 of 39
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

32 Verify Adequate SW Flow To
CCW Hx:

a. Verify at least two SW pumps -
RUNNING

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

1) IF NO SW pumps running, THEN
perform the following:

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

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

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

3) Go to Step 33.

b. Verify AUX BLDG SW isolation
valves - OPEN

b. Manually align valves.

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

This Step continued on the next page.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 32 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

EOP:

ECA-3.1

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
SUBCOOLED RECOVERY DESIRED

REV: 26

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

33 Check RCP Cooling

a. Check CCW to RCPs

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

b. Check RCP seal injection

- o Labyrinth seal D/Ps - GREATER
THAN 15 INCHES OF WATER
- OR-
- o RCP seal injection flow to
each RCP - GREATER THAN 6 GPM

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

EOP:

ECA-3.1

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
SUBCOOLED RECOVERY DESIRED

REV: 26

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

34 Check If Seal Return Flow
Should Be Established:

- a. Verify instrument bus D -
ENERGIZED
- b. Verify RCP #1 seal outlet
temperature - LESS THAN 235°F
- c. Verify RCP seal outlet valves -
OPEN
- AOV-270A
 - AOV-270B
- d. Reset both trains of XY relays
for RCP seal return isolation
valve MOV-313
- e. Open RCP seal return isolation
valve MOV-313
- f. Verify RCP #1 seal leakoff flow
- LESS THAN 6.0 GPM
- g. Verify RCP #1 seal leakoff flow
- GREATER THAN 0.8 GPM

- a. Perform the following:
- 1) Ensure steam dump mode
control in MANUAL.
 - 2) Restore power to instrument
bus D from MCC B or MCC A
(maintenance supply).
- b. Go to Step 35.
- c. Manually open valves as
necessary.
- e. Perform the following:
- 1) Place MOV-313 switch to OPEN.
 - 2) Dispatch AO to locally open
MOV-313.
- f. Perform the following:
- 1) Trip the affected RCP
 - 2) Allow 4 minutes for pump
coast down, THEN close the
affected RCP seal discharge
valve
 - RCP A, AOV-270A
 - RCP B, AOV-270B
- IF both RCP seal discharge
valves are shut, THEN go to
Step 35.
- g. Refer to AP-RCP.1, RCP SEAL
MALFUNCTION.

EOP: ECA-3.1	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED	REV: 26 PAGE 34 of 39
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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NOTE: Adverse CNMT conditions or loss of forced air cooling may result in failure of NIS detectors.

35 Check If Source Range Detectors Should Be Energized:

- | | |
|--|---|
| <p>a. Source range channels -
DEENERGIZED</p> <p>b. Check intermediate range flux -
EITHER CHANNEL LESS THAN
10⁻¹⁰ AMPS</p> <p>c. Check the following:</p> <ul style="list-style-type: none"> o Both intermediate range channels - LESS THAN
10⁻¹⁰ AMPS <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o Greater than 20 minutes since reactor trip <p>d. Verify source range detectors -
ENERGIZED</p> <p>e. Transfer Rk-45 recorder to one source range and one intermediate range channel</p> | <p>a. Go to Step 35e.</p> <p>b. Perform the following:</p> <ul style="list-style-type: none"> 1) <u>IF</u> neither intermediate range channel is decreasing, <u>THEN</u> initiate boration. 2) Continue with Step 36. <u>WHEN</u> flux is LESS THAN 10⁻¹⁰ amps on any operable channel, <u>THEN</u> do Steps 35c, d and e. <p>c. Continue with Step 36. <u>WHEN</u> either condition met, <u>THEN</u> do Steps 35d and e.</p> <p>d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2).</p> <p><u>IF</u> source ranges can <u>NOT</u> be restored, <u>THEN</u> refer to ER-NIS.1, SR MALFUNCTION and go to Step 36.</p> |
|--|---|

EOP:

ECA-3.1

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
SUBCOOLED RECOVERY DESIRED

REV: 26

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

36 Establish Normal Shutdown
Alignment:

a. Check condenser - AVAILABLE

a. Dispatch A0 to perform ATT-17.1,
ATTACHMENT SD-2.

b. Perform the following:

o Open generator disconnects

- 1G13A71
- 9X13A73

o Place voltage regulator to OFF

o Open turbine drain valves

o Rotate reheater steam supply
controller cam to close valves

o Place reheater dump valve
switches to HAND

o Stop all but one condensate
pump

c. Verify ATT-17.0, ATTACHMENT SD-1
- COMPLETE

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

.....

CAUTION

FEED FLOW SHOULD NOT BE ESTABLISHED TO ANY RUPTURED S/G WHICH IS ALSO FAULTED UNLESS IT IS NEEDED FOR RCS COOLDOWN.

.....

***37 Monitor Ruptured S/G(s)
Narrow Range Level - GREATER
THAN 17% [25% adverse CNMT]**

Refill ruptured S/G to 80% [60% adverse CNMT] using feed flow.

IF either of the following conditions occurs, THEN stop feed flow to ruptured S/G unless needed for RCS cooldown:

- o Ruptured S/G pressure decreases in an uncontrolled manner.

-OR-

- o Ruptured S/G pressure increases to 1020 psig.

***38 Monitor RCP Operation:**

- a. RCPs - ANY RUNNING
- 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

- a. Go to Step 39.
- b. Stop affected RCP(s).

EOP:

ECA-3.1

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
SUBCOOLED RECOVERY DESIRED

REV: 26

PAGE 37 of 39

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

39 Check Condenser Steam Dump
Available - CONDENSER VACUUM
GREATER THAN 20 INCHES HG

Manually or locally dump steam
using intact S/G ARV.

IF no intact S/G available and RHR
system NOT in service, THEN:

o Use faulted S/G.

-OR-

o Use ruptured S/G.

EOP:

ECA-3.1

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
SUBCOOLED RECOVERY DESIRED

REV: 26

PAGE 38 of 39

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

40 Check If RHR Normal Cooling
Can Be Established:

- | | |
|--|--|
| a. RCS cold leg temperature - LESS THAN 350°F | a. Go to Step 41. |
| b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT] | b. Go to Step 41. |
| c. Place letdown pressure controller in MANUAL CLOSED | |
| d. Check following valves - OPEN <ul style="list-style-type: none">• AOV-371, letdown isolation valve• AOV-427, loop B cold leg to REGEN Hx• At least one letdown orifice valve (AOV-200A, AOV-200B, or AOV-202) | d. Perform the following: <ul style="list-style-type: none">1) Reset both trains of XY relays for AOV-371 and AOV-427.2) Open AOV-371 and AOV-427.3) Open one letdown orifice valve. |
| e. Verify pressure on PI-135 - LESS THAN 400 PSIG | e. Go to Step 41. |
| f. Place RCS overpressure protection system in service (Refer to 0-7, 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 | |

EOP: ECA-3.1	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED	REV: 26 PAGE 39 of 39
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: This procedure should be continued while obtaining CNMT hydrogen sample in Step 41.

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 Check Core Exit T/Cs - LESS THAN 200°F

Return to Step 9.

43 Evaluate Long Term Plant Status:

a. Maintain cold shutdown conditions

b. Consult TSC

-END-

EOP: ECA-3.1	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED	REV: 26 PAGE 1 of 1
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ECA-3.1 APPENDIX LIST

TITLE

- 1) RED PATH SUMMARY
- 2) FIGURE MIN SUBCOOLING (FIG-1.0)
- 3) FIGURE SDM (FIG-2.0)
- 4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
- 5) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
- 6) ATTACHMENT SI/UV (ATT-8.4)
- 7) ATTACHMENT RUPTURED S/G (ATT-16.0)
- 8) ATTACHMENT N2 PORVS (ATT-12.0)
- 9) ATTACHMENT RCP START (ATT-15.0)
- 10) ATTACHMENT D/G STOP (ATT-8.1)
- 11) ATTACHMENT SEAL COOLING (ATT-15.2)
- 12) ATTACHMENT SD-1 (ATT-17.0)
- 13) ATTACHMENT SD-2 (ATT-17.1)
- 14) ATTACHMENT RHR COOL (ATT-14.1)
- 15) ATTACHMENT NC (ATT-13.0)
- 16) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 17) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
- 18) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
- 19) FOLDOUT

EOP: ECA-3.1	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED	REV: 26 PAGE 1 of 1
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RED PATH SUMMARY

- a. SUBCRITICALITY - Nuclear power greater than 5%
- b. CORE COOLING - Core exit T/Cs greater than 1200°F
-OR-
Core exit T/Cs greater than 700°F AND
RVLIS level (no RCPs) less than 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

EOP: ECA-3.1	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED	REV: 26 PAGE 1 of 1
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FOLDOUT PAGE

1. LOSS OF SW CRITERIA

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

- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. SI REINITIATION CRITERIA

IF EITHER condition listed below occurs, THEN manually start SI pumps as necessary:

- o RCS subcooling based on core exit TCs - LESS THAN 0° F USING REQUIREMENTS OF FIG-1.0, FIGURE MIN SUBCOOLING
- o PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN 5% [30% adverse CNMT]

3. SATURATED RECOVERY CRITERIA

IF ruptured S/G narrow range level increases to greater than 90% [80% adverse CNMT], THEN consult TSC to determine if recovery should be completed using ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED.

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, UNLESS faulted S/G needed for RCS cooldown.

5. COLD LEG RECIRCULATION SWITCHOVER CRITERION

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

6. AFW SUPPLY SWITCHOVER CRITERION

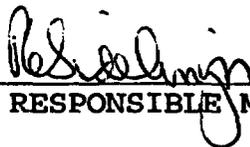
IF CST level decreases to less than 5 feet, THEN switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS)

EOP: ECA-3.2	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED	REV: 27 PAGE 1 of 27
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23



RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: ECA-3.2	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED	REV: 27 PAGE 2 of 27
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A. PURPOSE - This procedure provides actions to cool down and depressurize the RCS to cold shutdown conditions while minimizing loss of RCS inventory and voiding in the RCS.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, when RWST level is low without a corresponding increase in containment sump level.
- b. ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, when the ruptured S/G level is high and plant staff selects saturated recovery method.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

.....

CAUTION

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

.....

- NOTE:
- o Steps 1 through 15 of ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, should be performed before continuing with this procedure.
 - o FOLDOUT page should be open and monitored periodically.
 - o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10⁺⁰⁵ R/hr.

1 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 TO SFP (~ 60 gpm can be expected)
- OR-
- o Refer to S-9J, BLENDING TO RWST (~50 gpm can be expected)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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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.

2 Check Ruptured S/G Level:

- | | |
|--|--|
| <p>a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]</p> <p>b. Close MDAFW pump discharge valve to ruptured S/G</p> <ul style="list-style-type: none"> • S/G A, MOV-4007 • S/G B, MOV-4008 <p>c. Pull stop MDAFW pump for ruptured S/G</p> <p>d. Close TDAFW pump flow control valve to ruptured S/G</p> <ul style="list-style-type: none"> • S/G A, AOV-4297 • S/G B, AOV-4298 <p>e. Verify MDAFW pump crosstie valves - CLOSED</p> <ul style="list-style-type: none"> • MOV-4000A • MOV-4000B | <p>a. <u>IF</u> ruptured S/G <u>NOT</u> faulted, <u>THEN</u> perform the following:</p> <p>1) Maintain feed flow to ruptured S/G until level greater than 5% [25% adverse CNMT].</p> <p>2) Continue with Step 3. <u>WHEN</u> ruptured S/G level greater than 5% [25% adverse CNMT], <u>THEN</u> do Steps 2b through e.</p> <p>b. Dispatch AO to locally close valve.</p> <p>d. Dispatch AO with locked valve key to locally close TDAFW pump manual feedwater isolation valve to ruptured S/G.</p> <ul style="list-style-type: none"> • S/G A, V-4005 • S/G B, V-4006 <p>e. Manually close valves.</p> |
|--|--|

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>.....</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>o IF OFFSITE POWER IS LOST AFTER SI RESET, THEN MANUAL ACTION MAY BE REQUIRED TO RESTART SAFEGUARDS EQUIPMENT. (REFER TO ATT-8.5, ATTACHMENT LOSS OF OFFSITE POWER)</p> <p>o 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.</p> <p>.....</p>		
* 3	<p>Monitor If RHR Pumps Should Be Stopped:</p> <p>a. RHR pumps - ANY RUNNING IN INJECTION MODE</p> <p>b. Check RCS pressure:</p> <p> 1) Pressure - GREATER THAN 250 psig [465 psig adverse CNMT]</p> <p> 2) RCS pressure - STABLE OR INCREASING</p> <p>c. Stop RHR pumps and place in AUTO</p>	<p>a. Go to Step 4.</p> <p>b. Go to Step 4.</p>
4	<p>Check If S/G Secondary Side Is Intact:</p> <p>o Pressure in both S/Gs - STABLE OR INCREASING</p> <p>o Pressure in both S/Gs - GREATER THAN 110 PSIG</p>	<p><u>IF</u> any S/G pressure decreasing in an uncontrolled manner <u>OR</u> completely depressurized, <u>THEN</u> verify faulted S/G isolated unless needed for RCS cooldown:</p> <ul style="list-style-type: none"> • Steamlines • Feedlines <p><u>IF NOT, THEN</u> go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.</p>

EOP:

ECA-3.2

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
SATURATED RECOVERY DESIRED

REV: 27

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

* 5 Monitor Intact S/G Level:

- | | |
|---|--|
| <p>a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]</p> <p>b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%</p> | <p>a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in at least one S/G.</p> <p>b. <u>IF</u> narrow range level in the intact S/G continues to increase in an uncontrolled manner, <u>THEN</u> consider isolating unnecessary release paths:</p> <ul style="list-style-type: none"> • TDAFW pump steam supply valves • S/G blowdown valves • Refer to ATT-16.0, ATTACHMENT RUPTURED S/G |
|---|--|

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

6 Initiate RCS Cooldown To Cold Shutdown:

- | | |
|---|---|
| <p>a. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR</p> <p>b. Use RHR system if in service</p> <p>c. Dump steam to condenser from intact S/G</p> | <p>c. Manually or locally dump steam using intact S/G ARV.</p> <p><u>IF</u> no intact S/G available and RHR system <u>NOT</u> in service, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> o Use faulted S/G. <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o Use ruptured S/G. |
|---|---|

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Check RCS Subcooling Based On Core Exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING	Go to Step 18.
8	Check Safeguards Pump Status <ul style="list-style-type: none"> o SI pumps - ANY RUNNING <li style="text-align: center;">-OR- o RHR pumps - ANY RUNNING IN INJECTION MODE 	Go to Step 14.
..... <u>CAUTION</u> THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION IF RCPS ARE NOT RUNNING. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.		
<u>NOTE:</u> <ul style="list-style-type: none"> o If auxiliary spray is in use, spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves. o When using PRZR PORV, select one with an operable block valve. 		
9	Depressurize RCS To Refill PRZR:	
a.	Use normal PRZR spray valve associated with running RCP <ul style="list-style-type: none"> • PCV-431A for A RCP • PCV-431B for B RCP 	Use one PRZR PORV. <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to ATT-12.0., ATTACHMENT N2 PORVS. <u>IF</u> no PORV available, <u>THEN</u> use auxiliary spray valve.
b.	PRZR level - GREATER THAN 13% [40% adverse CNMT]	Continue with Step 10. <u>WHEN</u> level greater than 13% [40% adverse CNMT], <u>THEN</u> stop RCS depressurization.
c.	Stop RCS depressurization	

EOP:

ECA-3.2

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED

REV: 27

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

- o IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.
- o INADVERTENT CRITICALITY MAY OCCUR FOLLOWING NATURAL CIRCULATION COOLDOWN IF THE RCP IN THE RUPTURED LOOP IS STARTED FIRST.

10 Check If An RCP Should Be Started:

- | | |
|--|---|
| <ul style="list-style-type: none"> a. Both RCPs - STOPPED b. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING c. PRZR level - GREATER THAN 13% [40% adverse CNMT] d. Try to start an RCP <ul style="list-style-type: none"> 1) Establish conditions for starting an RCP <ul style="list-style-type: none"> o Bus 11A or 11B energized o Refer to ATT-15.0. ATTACHMENT RCP START 2) Start one RCP | <ul style="list-style-type: none"> a. Stop all but one RCP and go to Step 11. b. Go to Step 18. c. Return to Step 9. |
|--|---|

EOP:

ECA-3.2

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
SATURATED RECOVERY DESIRED

REV: 27

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

11 Check If One Of Three SI
Pumps Should Be Stopped:

- a. Three SI pumps - RUNNING
- b. RCS subcooling based on core exit T/Cs - GREATER THAN 10°F [10°F adverse CNMT] USING FIG-1.0. FIGURE MIN SUBCOOLING
- c. Check PRZR level - GREATER THAN 13% [40% adverse CNMT]
- d. Stop one SI pump

a. Go to Step 12.

b. IF RCS hot leg temperatures greater than 320°F [310°F adverse CNMT] OR IF RHR normal cooling in service, THEN go to Step 18.

IF RHR normal cooling NOT in service AND RCS hot leg temperatures less than 320°F [310°F adverse CNMT], THEN ensure at least one RHR pump running in injection mode and go to Step 11c. IF no RHR pump can be started in injection mode, THEN go to Step 18.

c. Do NOT stop SI pump. Return to Step 9.

EOP:

ECA-3.2

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
SATURATED RECOVERY DESIRED

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

- a. Two SI pumps - RUNNING
- b. RCS subcooling based on core exit T/Cs - GREATER THAN 35°F [35°F adverse CNMT] USING FIG-1.0, FIGURE MIN SUBCOOLING
- c. PRZR level - GREATER THAN 13% [40% adverse CNMT]
- d. Stop one SI pump

a. Go to Step 13.

b. IF RCS hot leg temperatures greater than 320°F [310°F adverse CNMT] OR IF RHR normal cooling in service, THEN go to Step 18.

IF RHR normal cooling NOT in service AND RCS hot leg temperatures less than 320°F [310°F adverse CNMT], THEN ensure at least one RHR pump running in injection mode and go to Step 12c. IF no RHR pump can be started in injection mode, THEN go to Step 18.

c. Do NOT stop SI pump. Return to Step 9.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

13 Check If Last SI Pump Should Be Stopped:

a. One SI pump - RUNNING

a. IF any RHR pump running in injection mode. THEN go to Step 18. IF NOT. THEN go to Step 14.

b. Determine required RCS subcooling from table:

Charging Pump Availability	RCS Subcooling Criteria
NONE	Insufficient subcooling to stop SI pump.
ONE	215°F [215°F adverse CNMT]
TWO	150°F [150°F adverse CNMT]
THREE	80°F [80°F adverse CNMT]

c. RCS subcooling based on core exit T/Cs - GREATER THAN VALUE FROM TABLE ABOVE USING FIG-1.0, FIGURE MIN SUBCOOLING

c. IF RCS hot leg temperatures greater than 320°F [310°F adverse CNMT] OR IF RHR normal cooling in service. THEN go to Step 18.

IF RHR normal cooling NOT in service AND RCS hot leg temperatures less than 320°F [310°F adverse CNMT]. THEN ensure at least one RHR pump running in injection mode and go to Step 13d. IF no RHR pump can be started in injection mode. THEN go to Step 18.

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

d. Do NOT stop SI pump. Return to Step 9.

e. Stop running SI pump

EOP: ECA-3.2	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED	REV: 27 PAGE 12 of 27
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

14 Check If Charging Flow Should Be Controlled To Maintain RCS Inventory:

a. Check RHR pumps - RUNNING IN INJECTION MODE

a. Perform the following:

1) Control charging flow to maintain RCS inventory:

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

-OR-

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

2) Go to Step 15.

b. Go to Step 18

EOP:

ECA-3.2

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

- o IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.
- o INADVERTENT CRITICALITY MAY OCCUR FOLLOWING NATURAL CIRCULATION COOLDOWN IF THE RCP IN THE RUPTURED LOOP IS STARTED FIRST.

15 Check RCP Status

a. Both RCPs - STOPPED

b. Check RVLIS level (no RCPs) - $\geq 95\%$

a. Stop all but one RCP and go to Step 16.

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

- o Increase PRZR level to greater than 65% [82% adverse CNMT]
- o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING
- o WHEN PRZR level indicates greater than minimum recommended by the TSC, THEN energize PRZR heaters as necessary to saturate PRZR water

IF conditions NOT met, THEN continue with Step 16. WHEN conditions met, THEN do Steps 15c and d.

This Step continued on the next page.

EOP:

ECA-3.2

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED

REV: 27

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 15 continued from previous page)

c. Establish conditions for starting an RCP:

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

d. Start one RCP

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

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

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

2) Go to Step 16.

d. IF an RCP can NOT be started, THEN verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC).

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

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

- o THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION IF RCPS ARE NOT RUNNING. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.
- o IF SI HAS BEEN TERMINATED, THE ACCUMS SHOULD BE ISOLATED PRIOR TO DEPRESSURIZING THE RCS TO LESS THAN 1000 PSIG (REFER TO STEP 19).

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

16 Depressurize RCS To Saturation At Core Exit:

- | | |
|---|---|
| <ul style="list-style-type: none"> a. Determine saturation pressure for core exit T/Cs using FIG-8.0, FIGURE TSAT | <ul style="list-style-type: none"> b. Use one PRZR PORV. <u>IF IA NOT</u> available, <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS. <u>IF PORV NOT</u> available, <u>THEN</u> use auxiliary spray valve (AOV-296). |
| <ul style="list-style-type: none"> • PCV-431A for A RCP • PCV-431B for B RCP | |
| <ul style="list-style-type: none"> c. <u>WHEN</u> PRZR level indicates greater than minimum recommended by the TSC, <u>THEN</u> energize PRZR heaters as necessary | |
| <ul style="list-style-type: none"> d. Depressurize RCS until EITHER of the following conditions satisfied: <ul style="list-style-type: none"> o PRZR level - GREATER THAN 75% [65% adverse CNMT] | |
| -OR- | |
| <ul style="list-style-type: none"> o RCS pressure - AT SATURATION FROM STEP 16a | |

EOP:

ECA-3.2

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
SATURATED RECOVERY DESIRED

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

17 Verify Adequate Shutdown Margin

- a. Direct RP to sample RCS and ruptured S/G for boron concentration
- b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0, FIGURE SDM

b. Borate as necessary.

18 Monitor SI Reinitiation Criteria:

- a. Core exit T/Cs - STABLE OR DECREASING
 - b. Check RVLIS indication:
 - o Level (no RCPs) - GREATER THAN 77% [82% adverse CNMT]
- OR-
- o Fluid Fraction (any RCP running) - GREATER THAN 84%

a. Manually start SI pumps as necessary.

b. Manually start SI pumps as necessary.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

19 Check If SI ACCUMs Should Be Isolated:

- a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING
- b. PRZR level - GREATER THAN 5% [30% adverse CNMT]
- c. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves
 - MOV-841, MCC C position 12F
 - MOV-865, MCC D position 12C
- d. Close SI ACCUM discharge valves
 - MOV-841
 - MOV-865
- e. Locally reopen breakers for MOV-841 and MOV-865

- a. IF both RCS hot leg temperatures less than 400°F, THEN go to Step 19c.

IF NOT, THEN go to Step 20.
- b. Return to Step 9.
- d. Vent any unisolated ACCUMs:
 - 1) Open vent valves for unisolated SI ACCUMs.
 - ACCUM A, AOV-834A
 - ACCUM B, AOV-834B
 - 2) Open HCV-945.

IF an accumulator can NOT be isolated or vented, THEN consult TSC for contingency actions.

EOP: ECA-3.2	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED	REV: 27 PAGE 18 of 27
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	<p>Check If Emergency D/Gs Should Be Stopped:</p> <ul style="list-style-type: none"> a. Verify AC emergency busses energized by offsite power: <ul style="list-style-type: none"> o Emergency D/G output breakers - OPEN o AC emergency bus voltage - GREATER THAN 420 VOLTS o AC emergency bus normal feed breakers - CLOSED b. Stop any unloaded emergency D/G and place in standby (Refer to ATT-8.1, ATTACHMENT D/G STOP) 	<ul style="list-style-type: none"> a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
21	<p>Minimize Secondary System Contamination:</p> <ul style="list-style-type: none"> a. Isolate reject from hotwell to CST: <ul style="list-style-type: none"> o Place hotwell level controller (HC-107) in MANUAL at 50% o Verify hotwell level - STABLE b. Verify local actions to complete isolation of ruptured S/G (Refer to ATT-16.0, ATTACHMENT RUPTURED S/G) 	<ul style="list-style-type: none"> a. <u>IF</u> hotwell level increasing. <u>THEN</u> direct RP to sample hotwells for activity.

EOP:

ECA-3.2

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

22 Verify Adequate SW Flow To
CCW Hx:

a. Verify at least two SW pumps -
RUNNING

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

1) IF NO SW pumps running, THEN
perform the following:

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

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

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

3) Go to Step 23.

b. Verify AUX BLDG SW isolation
valves - OPEN

b. Manually align valves.

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

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
------	--------------------------	-----------------------

(Step 22 continued from previous page)

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

c. Perform the following:

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

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

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

o IF on normal SW discharge:

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

-OR-

o IF on alternate SW discharge:

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

EOP:

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TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
SATURATED RECOVERY DESIRED

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

23 Check RCP Cooling

a. Check CCW to RCPs

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

b. Check RCP seal injection

- o Labyrinth seal D/Ps - GREATER
THAN 15 INCHES OF WATER
- OR-
- o RCP seal injection flow to
each RCP - GREATER THAN 6 GPM

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

EOP:

ECA-3.2

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
SATURATED RECOVERY DESIRED

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

24 Check If Seal Return Flow
Should Be Established:

- a. Verify instrument bus D -
ENERGIZED
- b. Verify RCP #1 seal outlet
temperature - LESS THAN 235°F
- c. Verify RCP seal outlet valves -
OPEN
- AOV-270A
 - AOV-270B
- d. Reset both trains of XY relays
for RCP seal return isolation
valve MOV-313
- e. Open RCP seal return isolation
valve MOV-313
- f. Verify RCP #1 seal leakoff flow
- LESS THAN 6.0 GPM
- g. Verify RCP #1 seal leakoff flow
- GREATER THAN 0.8 GPM

- a. Perform the following:
- 1) Ensure steam dump mode
control in MANUAL.
 - 2) Restore power to instrument
bus D from MCC B or MCC A
(maintenance supply).
- b. Go to Step 25.
- c. Manually open valves as
necessary.
- e. Perform the following:
- 1) Place MOV-313 switch to OPEN.
 - 2) Dispatch AO to locally open
MOV-313.
- f. Perform the following:
- 1) Trip the affected RCP
 - 2) Allow 4 minutes for pump
coast down, THEN close the
affected RCP seal discharge
valve
 - RCP A, AOV-270A
 - RCP B, AOV-270B
- IF both RCP seal discharge
valves are shut, THEN go to
Step 25.
- g. Refer to AP-RCP.1, RCP SEAL
MALFUNCTION.

EOP:

ECA-3.2

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
SATURATED RECOVERY DESIRED

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

25 Check If Source Range Detectors Should Be Energized:

- | | |
|--|---|
| <p>a. Source range channels -
DEENERGIZED</p> | <p>a. Go to Step 25e.</p> |
| <p>b. Check intermediate range flux -
EITHER CHANNEL LESS THAN
10⁻¹⁰ AMPS</p> | <p>b. Perform the following:</p> <ol style="list-style-type: none"> 1) <u>IF</u> neither intermediate range channel is decreasing. <u>THEN</u> initiate boration. 2) Continue with Step 26. <u>WHEN</u> flux is LESS THAN 10⁻¹⁰ amps on any operable channel, <u>THEN</u> do Steps 25c, d and e. |
| <p>c. Check the following:</p> <ul style="list-style-type: none"> o Both intermediate range channels - LESS THAN 10⁻¹⁰ AMPS <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o Greater than 20 minutes since reactor trip | <p>c. Continue with Step 26. <u>WHEN</u> either condition met, <u>THEN</u> do Steps 25d and e.</p> |
| <p>d. Verify source range detectors -
ENERGIZED</p> | <p>d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2).</p> <p><u>IF</u> source ranges can <u>NOT</u> be restored, <u>THEN</u> refer to ER-NIS.1, SR MALFUNCTION and go to Step 26.</p> |
| <p>e. Transfer Rk-45 recorder to one source range and one intermediate range channel</p> | |

EOP:

ECA-3.2

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
SATURATED RECOVERY DESIRED

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

26 Establish Normal Shutdown
Alignment:

a. Check condenser - AVAILABLE

a. Dispatch AO to perform ATT-17.1.
ATTACHMENT SD-2.

b. Perform the following:

- o Open generator disconnects
 - 1G13A71
 - 9X13A73
- o Place voltage regulator to OFF
- o Open turbine drain valves
- o Rotate reheater steam supply controller cam to close valves
- o Place reheater dump valve switches to HAND
- o Stop all but one condensate pump

c. Verify adequate Rx head cooling:

- 1) Verify at least one control rod shroud fan - RUNNING
- 2) Verify one Rx compartment cooling fan - RUNNING

1) Manually start one fan as power supply permits (45 kw)

2) Perform the following:

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

d. Verify ATT-17.0, ATTACHMENT SD-1
- COMPLETE

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

.....

CAUTION

FEED FLOW SHOULD NOT BE ESTABLISHED TO ANY RUPTURED S/G WHICH IS ALSO FAULTED
UNLESS IT IS NEEDED FOR RCS COOLDOWN.

.....

***27 Monitor Ruptured S/G(s)
Narrow Range Level - GREATER
THAN 17% [25% adverse CNMT]**

Refill ruptured S/G to 80% [60%
adverse CNMT] using feed flow.

IF either of the following
conditions occurs, THEN stop feed
flow to ruptured S/G unless needed
for RCS cooldown:

- o Ruptured S/G pressure decreases
in an uncontrolled manner.

-OR-

- o Ruptured S/G pressure increases
to 1020 psig.

***28 Monitor RCP Operation:**

- a. RCPs - ANY RUNNING
- 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

- a. Go to Step 29.
- b. Stop the affected RCP(s).

EOP:

ECA-3.2

TITLE:

SGTR WITH LOSS OF REACTOR COOLANT -
SATURATED RECOVERY DESIRED

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

29 Check Condenser Steam Dump Available - CONDENSER VACUUM GREATER THAN 20 INCHES HG

Use intact S/G ARV for RCS temperature control.

30 Check If RHR Normal Cooling Can Be Established:

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

a. Go to Step 31.

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

b. Go to Step 31.

c. Place letdown pressure controller in MANUAL CLOSED

d. Check following valves - OPEN

d. Perform the following:

- 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)

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. Go to Step 31.

f. Place RCS overpressure protection system in service (Refer to 0-7. 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

EOP: ECA-3.2	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED	REV: 27 PAGE 27 of 27
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: This procedure should be continued while obtaining CNMT hydrogen sample in Step 31.

31 Check CNMT Hydrogen Concentration:

- | | |
|---|--|
| <ul style="list-style-type: none"> a. Direct RP to start CNMT hydrogen monitors as necessary b. Hydrogen concentration - LESS THAN 0.5% | <ul style="list-style-type: none"> b. Consult TSC to determine if hydrogen recombiners should be placed in service. |
|---|--|

32 Check Core Exit T/Cs - LESS THAN 200° F

Return to Step 3.

33 Evaluate Long Term Plant Status:

- a. Maintain cold shutdown conditions
- b. Consult TSC

-END-

EOP: ECA-3.2	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED	REV: 27 PAGE 1 of 1
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ECA-3.2 APPENDIX LIST

TITLE

- 1) RED PATH SUMMARY
- 2) FIGURE MIN SUBCOOLING (FIG-1.0)
- 3) FIGURE SDM (FIG-2.0)
- 4) FIGURE TSAT (FIG-8.0)
- 5) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
- 6) ATTACHMENT SFP-RWST (ATT-18.0)
- 7) ATTACHMENT N2 PORVS (ATT-12.0)
- 8) ATTACHMENT NC (ATT-13.0)
- 9) ATTACHMENT SEAL COOLING (ATT-15.2)
- 10) ATTACHMENT RCP START (ATT-15.0)
- 11) ATTACHMENT D/G STOP (ATT-8.1)
- 12) ATTACHMENT RUPTURED S/G (ATT-16.0)
- 13) ATTACHMENT SD-1 (ATT-17.0)
- 14) ATTACHMENT SD-2 (ATT-17.1)
- 15) ATTACHMENT RHR COOL (ATT-14.1)
- 16) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 17) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
- 18) FOLDOUT

EOP: ECA-3.2	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED	REV: 27 PAGE 1 of 1
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RED PATH SUMMARY

- a. SUBCRITICALITY - Nuclear power greater than 5%
- b. CORE COOLING - Core exit T/Cs greater than 1200°F
-OR-
Core exit T/Cs greater than 700°F AND
RVLIS level (no RCPs) less than 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

EOP: ECA-3.2	TITLE: SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED	REV: 27 PAGE 1 of 1
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FOLDOUT PAGE

1. LOSS OF SW CRITERIA

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

- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. SI REINITIATION CRITERIA

IF EITHER condition listed below occurs, THEN manually start SI pumps as necessary:

- o Core exit T/Cs - INCREASING

-OR-

- o Check RVLIS indication:

Level (no RCPs) - LESS THAN 77% [82% adverse CNMT]

Fluid fraction (any RCP running) - LESS THAN 84%

3. SECONDARY INTEGRITY CRITERIA

IF any S/G pressure is decreasing in an uncontrolled manner or is completely depressurized, and has not been isolated, THEN go to E-2, FAULTED S/G ISOLATION, Step 1, UNLESS faulted S/G needed for RCS cooldown.

4. COLD LEG RECIRCULATION SWITCHOVER CRITERION

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

5. AFW SUPPLY SWITCHOVER CRITERION

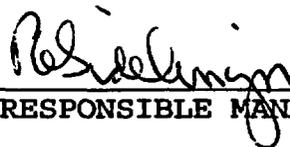
IF CST level decreases to less than 5 feet, THEN switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23



RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: ECA-3.3	TITLE: SGTR WITHOUT PRESSURIZER PRESSURE CONTROL	REV: 29 PAGE 2 of 30
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A. PURPOSE - This procedure provides actions for a SGTR with coincident loss of normal and auxiliary PRZR sprays and PORVs.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. E-3, STEAM GENERATOR TUBE RUPTURE, when PRZR pressure control is not available.

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

- NOTE:**
- o Foldout page should be open AND monitored periodically.
 - o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr.

1 Check Ruptured S/G Narrow Range Level - LESS THAN 80% [60% adverse CNMT]

Go to Step 8.

2 Check RCP Status - AT LEAST ONE RUNNING

Try to start one RCP:

a. Establish conditions for starting RCP.

- o Bus 11A and Bus 11B energized

- o Refer to ATT-15.0, ATTACHMENT RCP START

b. Start one RCP. IF no RCP can be started, THEN go to Step 4.

3 Check IF Normal PRZR Spray Available:

a. Verify the following:

- 1) Verify IA to CNMT - AVAILABLE

- 2) Verify spray valve associated with running RCP - OPERABLE

a. Perform the following:

- 1) Place PRZR proportional heaters in PULL STOP.

- 2) Place PRZR backup heaters to OFF.

- 3) Place normal spray valve controllers to MANUAL at 0%.

- 4) Go to Step 4.

b. Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 21

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

4 Try To Restore PRZR PORV:

a. Block valves - AT LEAST ONE OPEN

- MOV-516 for PCV-430
- MOV-515 for PCV-431C

b. Check IA to CNMT - AVAILABLE

**c. Verify at least one PRZR PORV
flow path - AVAILABLE**

**d. Go to E-3. STEAM GENERATOR TUBE
RUPTURE, Step 22**

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

If block valves can NOT be
opened, THEN dispatch AO to
locally ensure breakers to block
valves closed.

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

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

c. Go to Step 5.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
------	--------------------------	-----------------------

NOTE: If auxiliary spray is the only means of RCS pressure control, THEN the 320°F ΔT limit between the spray line and PRZR does not apply.

5 Try To Establish Auxiliary Spray:

a. Charging pumps - AT LEAST ONE 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 locally isolate seal injection to affected RCP.

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

2) Ensure HCV-142 demand at 0%.

3) Start charging pumps as necessary.

IF charging not available, THEN go to Step 6.

b. Establish auxiliary spray flow:

b. IF auxiliary spray can NOT be established, THEN go to Step 6.

1) Open auxiliary spray valve (AOV-296)

2) Close charging valve to loop B cold leg (AOV-294)

c. Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 21b

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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NOTE: TDAFW pump flow control AOVs may drift open on loss of IA.

* 6 Monitor Intact S/G Level:

- a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]
- b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%

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

7 Check PRZR Level - GREATER THAN 5% [30% adverse CNMT]

Return to Step 1.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

8 Check If SI Can Be Terminated:

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

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

b. Secondary heat sink:

- o Total feed flow to intact S/Gs - GREATER THAN 200 GPM AVAILABLE

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.

-OR-

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

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

c. RVLIS indication

- o Level (no RCPs) - GREATER THAN 77% [82% adverse CNMT]

-OR-

- o Fluid fraction (any RCP running) - GREATER THAN 84%

d. Do NOT stop SI pumps. Return to Step 2.

d. Any ruptured S/G narrow range level - INCREASING IN AN UNCONTROLLED MANNER OR OFFSCALE HIGH

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

9 Stop SI Pumps and Place In
AUTO

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

10 Check If Charging Flow Has Been Established:

a. Charging pumps - ANY RUNNING

a. Perform the following:

- 1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN dispatch AO to close seal injection needle valve(s) to affected RCP:

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

- 2) Ensure HCV-142 open, demand at 0%.

b. Charging pump suction aligned to RWST:

b. Manually align valves as necessary.

- o LCV-112B - OPEN
- o LCV-112C - CLOSED

IF LCV-112B can NOT be opened, THEN dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room).

IF LCV-112C can NOT be closed, THEN perform the following:

- 1) Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
- 2) Verify charging pump A NOT running and place in PULL STOP.
- 3) WHEN V-358 open, THEN direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).

c. Start charging pumps as necessary and adjust charging flow to perform the following:

- o Restore PRZR level
- o Maintain RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

11 Monitor RCS Inventory:

- o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING
- o RVLIS indication
- o Level (no RCPs) - GREATER THAN 77% [82% adverse CNMT]

-OR-

- o Fluid fraction (any RCP running) - GREATER THAN 84%

Perform the following:

- a. Manually start SI pumps as necessary.
- b. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

12 Verify Adequate SW Flow To
CCW Hx:

a. Verify at least two SW pumps -
RUNNING

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

1) IF NO SW pumps running, THEN
perform the following:

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

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

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

3) Go to Step 20.

b. Verify AUX BLDG SW isolation
valves - OPEN

b. Manually align valves.

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

This Step continued on the next page.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 12 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

EOP:

ECA-3.3

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

13 Check If Normal CVCS
Operation Can Be Established

a. Verify IA restored:

- o IA to CNMT (AOV-5392) - OPEN
- o IA pressure - GREATER THAN
60 PSIG

b. Verify instrument bus D -
ENERGIZED

c. CCW pumps - ANY RUNNING

d. Charging pump - ANY RUNNING

a. Continue with Step 17. WHEN IA
restored, THEN do Steps 13
through 16.

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. 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. Continue with Step 20. WHEN any
charging pump running, THEN do
Steps 14 through 17.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: If PRZR level is less than 13%, letdown may be established by placing AOV-427 to OPEN.

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
- 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.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

15 Check VCT Makeup System:

- | | |
|---|--|
| <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 1) RMW mode selector switch in AUTO 2) RMW control armed - RED LIGHT LIT d. Check VCT level: <ul style="list-style-type: none"> o Level - GREATER THAN 20%
-OR- o Level - STABLE OR INCREASING | <ul style="list-style-type: none"> c. Adjust controls as necessary. d. Manually increase VCT makeup flow as follows: <ul style="list-style-type: none"> 1) Ensure BA transfer pumps and RMW pumps running. <u>IF NOT</u>, <u>THEN</u> reset MCC C and MCC D UV lockouts as necessary. 2) Place RMW flow control valve HCV-111 in MANUAL. 3) Increase RMW flow. |
|---|--|

EOP:

ECA-3.3

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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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

b. Manually align valves as
necessary.

o LCV-112C - OPEN

o LCV-112B - CLOSED

EOP:

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

17 Check RCP Cooling:

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

a. Check CCW to RCPs:

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

b. Check RCP seal injection:

- o Labyrinth seal D/Ps - GREATER
THAN 15 INCHES OF WATER
- OR-
- o RCP seal injection flow to
each RCP - GREATER THAN 6 GPM

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

18 Check If Seal Return Flow Should Be Established:

a. Verify RCP #1 seal outlet temperature - LESS THAN 235°F

b. Verify RCP seal outlet valves - OPEN

- AOV-270A
- AOV-270B

c. Reset both trains of XY relays for RCP seal return isolation valve MOV-313

d. Open RCP seal return isolation valve MOV-313

e. Verify RCP #1 seal leakoff flow - LESS THAN 6.0 GPM

f. Verify RCP #1 seal leakoff flow - GREATER THAN 0.8 GPM

a. Go to Step 19.

b. Manually open valves as necessary.

d. Perform the following:

- 1) Place MOV-313 switch to OPEN.
- 2) Dispatch AO to locally open MOV-313.

e. Perform the following:

- 1) Trip the affected RCP
- 2) Allow 4 minutes for pump coast down, THEN close the affected RCP seal discharge valve

- RCP A, AOV-270A
- RCP B, AOV-270B

IF both RCP seal discharge valves are shut, THEN go to Step 19.

f. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.

EOP:

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

19 Equalize Charging And Letdown Flows:

- a. Verify charging pump controllers in manual
- b. Control charging and seal injection flows to equal letdown and seal leakoff flows

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

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

EOP:

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

21 Minimize Secondary System Contamination:

- a. Isolate reject from hotwell to CST:
 - o Place hotwell level controller (HC-107) in MANUAL at 50%
 - o Verify hotwell level - STABLE
- b. Verify local actions to complete isolation of ruptured S/G (Refer to ATT-16.0. ATTACHMENT RUPTURED S/G)

- a. IF hotwell level increasing. THEN direct RP to sample hotwells for activity.

EOP:

ECA-3.3

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

22 Check If Source Range Detectors Should Be Energized:

a. Source range channels -
DEENERGIZED

b. Check intermediate range flux -
EITHER CHANNEL LESS THAN
10⁻¹⁰ AMPS

c. Check the following:

o Both intermediate range
channels - LESS THAN
10⁻¹⁰ AMPS

-OR-

o Greater than 20 minutes since
reactor trip

d. Verify source range detectors -
ENERGIZED

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

a. Go to Step 22e.

b. Perform the following:

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

2) Continue with Step 23. WHEN
flux is LESS THAN 10⁻¹⁰ amps
on any operable channel, THEN
do Steps 22c through e.

c. Continue with Step 23. WHEN
either condition met, THEN do
Steps 22d and e.

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 22.

EOP:

ECA-3.3

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

23 Establish Normal Shutdown Alignment:

a. Check condenser - AVAILABLE

a. Dispatch A0 to perform ATT-17.1, ATTACHMENT SD-2.

b. Perform the following:

- o Open generator disconnects
 - 1G13A71
 - 9X13A73
- o Place voltage regulator to OFF
- o Open turbine drain valves
- o Rotate reheater steam supply controller cam to close valves
- o Place reheater dump valve switches to HAND
- o Stop all but one condensate pump

c. Verify adequate Rx head cooling:

- 1) Verify at least one control rod shroud fan - RUNNING
- 2) Verify one Rx compartment cooling fan - RUNNING

1) Manually start one fan as power supply permits (45 kw)

2) Perform the following:

- o Dispatch A0 to reset UV relays at MCC C and MCC D.
- o Manually start one fan as power supply permits (23 kw)

d. Verify ATT-17.0, ATTACHMENT SD-1 - COMPLETE

EOP:

ECA-3.3

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SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: Plant staff should decide whether to repair PRZR pressure control systems or continue with this procedure. If PRZR pressure control is established, PRZR level should be restored to greater than 5% [30% adverse CNMT] and then further recovery should continue with E-3, STEAM GENERATOR TUBE RUPTURE, Step 32.

24 Check If SI ACCUMs Should Be Isolated:

a. Check the following:

- o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING
- o RVLIS indication
 - o Level (no RCPs - GREATER THAN 77% [82% adverse CNMT])
- OR-
- o Fluid fraction (any RCP running) - GREATER THAN 84%

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

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

a. Return to Step 11.

c. Vent any unisolated ACCUMs:

1) Open vent valves for unisolated SI ACCUMs.

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

2) Open HCV-945.

IF an accumulator can NOT be isolated or vented, THEN consult TSC for contingency actions.

EOP:

ECA-3.3

TITLE:

SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

REV: 29

PAGE 24 of 30

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: Leakage from ruptured S/G into RCS will dilute RCS boron concentration.

25 Verify Adequate Shutdown Margin

- a. Direct RP to sample RCS and ruptured S/G for boron concentration
- b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0, FIGURE SDM

- b. Borate as necessary.

26 Maintain Required RCP Seal Injection Flow And Labyrinth Seal D/P:

- o Labyrinth seal D/P to each RCP - GREATER THAN 15 INCHES OF WATER
- o RCP seal injection flow - GREATER THAN 6 GPM

Perform the following:

- o Adjust charging flow to REGEN Hx, HCV-142 as necessary.

-OR-

- o Dispatch AO to adjust seal injection needle valves V-300A and V-300B if necessary.

27 Initiate RCS Cooldown to 350°F In RCS Cold Legs:

- a. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR
- b. Dump steam to condenser from intact S/G

- b. Manually or locally dump steam using intact S/G ARV.

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

EOP:

ECA-3.3

TITLE:

SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

REV: 29

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

RCS AND RUPTURED S/G PRESSURES MUST BE MAINTAINED LESS THAN THE RUPTURED S/G ARV SETPOINT.

28 Control Charging Flow To Maintain RCS Subcooling:

a. RCS subcooling based on core exit T/Cs - GREATER THAN 20°F USING FIG-1.0, FIGURE MIN SUBCOOLING

b. Ruptured S/G narrow range level - LESS THAN 90% [80% adverse CNMT]

c. Ruptured S/G narrow range level - STABLE OR DECREASING

a. Increase charging flow to maintain subcooling greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING and go to Step 29.

b. Control charging flow to maintain RCS pressure at ruptured S/G pressure and go to Step 29.

c. IF ruptured S/G level increasing, THEN decrease charging flow to stabilize level. Maintain RCS subcooling greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING.

29 Check If RCS Cooldown Should Be Stopped:

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

b. Stop RCS cooldown

a. Return to Step 25.

EOP:

ECA-3.3

TITLE:

SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

REV: 29

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

30 Check RCS Pressure - GREATER THAN 400 PSIG [300 PSIG adverse CNMT]

Go to Step 33.

*31 Monitor Ruptured S/G Narrow Range Level - GREATER THAN 17% [25% adverse CNMT]

Refill ruptured S/G to 80% [60% adverse CNMT] using feed flow.

IF any of the following conditions occurs, THEN stop feed flow to ruptured S/G:

- o Ruptured S/G pressure decreases in an uncontrolled manner.

-OR-

- o Ruptured S/G pressure increases to 1020 psig.

-OR-

- o Ruptured S/G pressure decreases to 350 psig AND ruptured S/G level greater than 5% [25% adverse CNMT]

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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.....

CAUTION

- o STEAM SHOULD NOT BE RELEASED FROM A RUPTURED S/G IF WATER MAY EXIST IN ITS STEAMLINE.
- o RUPTURED S/G PRESSURE MAY DECREASE RAPIDLY WHEN STEAM IS RELEASED.

.....

32 Depressurize RCS And Ruptured S/G To 400 PSIG [300 PSIG adverse CNMT]

- a. Perform the following:
 - o Decrease charging and increase letdown to initiate backfill
 - OR-
 - o Initiate blowdown from ruptured S/G
 - OR-
 - o Dump steam from ruptured S/G
- b. Check RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT]
- c. Stop RCS depressurization

b. Return to Step 31.

EOP:

ECA-3.3

TITLE:

SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

REV: 29

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

33 Check If RHR Normal Cooling Can Be Established:

- | | |
|---|--|
| a. RCS cold leg temperature - LESS THAN 350°F | a. Return to Step 27. |
| b. RCS pressure - LESS THAN 400 psig [300 psig adverse CNMT] | b. Return to Step 31. |
| c. Place RCS overpressure protection system in service (Refer to 0-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM) | c. <u>IF</u> RCS overpressure protection system can <u>NOT</u> be placed in service, <u>THEN</u> notify TSC of potential Tech Spec violation if RHR system is placed in service. |
| d. Establish RHR normal cooling (Refer to ATT-14.1, ATTACHMENT RHR COOL) | |

NOTE: Leakage from ruptured S/G into RCS will dilute RCS boron concentration.

34 Verify Adequate Shutdown Margin

- | | |
|--|-------------------------|
| a. Direct RP to sample RCS and ruptured S/G for boron concentration | |
| b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0, FIGURE SDM | b. Borate as necessary. |

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
35	Initiate RCS Cooldown To Cold Shutdown:	
	<ul style="list-style-type: none"> a. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR b. Use RHR system if in service c. Dump steam to condenser from intact S/G 	<ul style="list-style-type: none"> c. Manually or locally dump steam from intact S/G using ARVs. <p><u>IF</u> no intact S/G available and RHR system <u>NOT</u> in service, <u>THEN</u> use faulted S/G.</p>
36	Control Charging Flow To Maintain RCS Subcooling:	
	<ul style="list-style-type: none"> a. RCS subcooling based on core exit T/Cs - GREATER THAN 20°F USING FIG-1.0, FIGURE MIN SUBCOOLING b. Ruptured S/G narrow range level - LESS THAN 90% [80% adverse CNMT] c. Ruptured S/G narrow range level - STABLE OR DECREASING 	<ul style="list-style-type: none"> a. Increase charging flow to maintain subcooling greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING and go to Step 37. b. Control charging flow to maintain RCS pressure at ruptured S/G pressure and go to Step 37. c. <u>IF</u> ruptured S/G level increasing, <u>THEN</u> decrease charging flow to stabilize level. Maintain RCS subcooling greater than 20°F using FIG-1.0, FIGURE MIN SUBCOOLING.

EOP: ECA-3.3	TITLE: SGTR WITHOUT PRESSURIZER PRESSURE CONTROL	REV: 29 PAGE 30 of 30
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

***37 Monitor RCP Operation:**

- a. RCPs - ANY RUNNING
- 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

- a. Go to Step 39.
- b. Stop the affected RCP(s).

38 Check Core Exit T/Cs - LESS THAN 200°F

Return to Step 34.

39 Evaluate Long Term Plant Status:

- a. Maintain cold shutdown conditions
- b. Consult TSC

-END-

EOP: ECA-3.3	TITLE: SGTR WITHOUT PRESSURIZER PRESSURE CONTROL	REV: 29 PAGE 1 of 1
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ECA-3.3 APPENDIX LIST

TITLE

- 1) RED PATH SUMMARY
- 2) FIGURE MIN SUBCOOLING (FIG-1.0)
- 3) FIGURE SDM (FIG-2.0)
- 4) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
- 5) ATTACHMENT RCP START (ATT-15.0)
- 6) ATTACHMENT N2 PORVS (ATT-12.0)
- 7) ATTACHMENT RUPTURED S/G (ATT-16.0)
- 8) ATTACHMENT D/G STOP (ATT-8.1)
- 9) ATTACHMENT SD-1 (ATT-17.0)
- 10) ATTACHMENT SEAL COOLING (ATT-15.2)
- 11) ATTACHMENT SD-2 (ATT-17.1)
- 12) ATTACHMENT RHR COOL (ATT-14.1)
- 13) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 14) FOLDOUT

EOP: ECA-3.3	TITLE: SGTR WITHOUT PRESSURIZER PRESSURE CONTROL	REV: 29 PAGE 1 of 1
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RED PATH SUMMARY

- a. SUBCRITICALITY - Nuclear power greater than 5%
- b. CORE COOLING - Core exit T/Cs greater than 1200°F
-OR-
Core exit T/Cs greater than 700°F AND
RVLIS level (no RCPs) less than 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

EOP: ECA-3.3	TITLE: SGTR WITHOUT PRESSURIZER PRESSURE CONTROL	REV: 29 PAGE 1 of 1
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FOLDOUT PAGE

1. LOSS OF SW CRITERIA

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

- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

2. SI REINITIATION CRITERIA

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

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

- OR -

- o Check RVLIS indication:

Level (no RCPs) - LESS THAN 77% [82% adverse CNMT]
Fluid Fraction (any RCP running) - LESS THAN 84%

3. SECONDARY INTEGRITY CRITERIA

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

4. COLD LEG RECIRCULATION SWITCHOVER CRITERION

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

5. AFW SUPPLY SWITCHOVER CRITERION

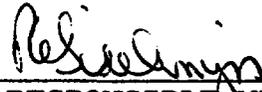
IF CST level decreases to less than 5 feet, THEN switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

EOP: FR-S.1	TITLE: RESPONSE TO REACTOR RESTART/ATWS	REV: 15 PAGE 1 of 13
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23



RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

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EOP: FR-S.1	TITLE: RESPONSE TO REACTOR RESTART/ATWS	REV: 15 PAGE 2 of 13
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A. PURPOSE - This procedure provides actions to add negative reactivity to a core which is observed to be critical when expected to be shut down.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. E-0, REACTOR TRIP OR SAFETY INJECTION, when reactor trip is not verified and manual trip is not effective.
- b. F-0.1, SUBCRITICALITY, Critical Safety Function Status Tree on either a RED or ORANGE condition.

EOP: FR-S.1	TITLE: RESPONSE TO REACTOR RESTART/ATWS	REV: 15 PAGE 3 of 13
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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NOTE: Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr.

- | | |
|---|---|
| <p>1 Verify Reactor Trip:</p> <ul style="list-style-type: none"> o At least one train of reactor trip breakers - OPEN o Neutron flux - DECREASING o MRPI indicates - ALL CONTROL AND SHUTDOWN RODS ON BOTTOM | <p>Manually trip reactor.</p> <p><u>IF</u> reactor trip breakers <u>NOT</u> open, <u>THEN</u> manually insert control rods.</p> |
| <p>2 Verify Turbine Stop Valves - CLOSED</p> | <p>Manually trip turbine.</p> <p><u>IF</u> turbine trip can <u>NOT</u> be verified, <u>THEN</u> close both MSIVs.</p> |
| <p>3 Check AFW Pumps Running:</p> <ul style="list-style-type: none"> a. MDAFW pumps - RUNNING b. TDAFW pump - RUNNING IF NECESSARY | <p>a. Manually start MDAFW pumps.</p> <p>b. Manually open steam supply valves.</p> <ul style="list-style-type: none"> • MOV-3505A • MOV-3504A |

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION
 ACTIONS TAKEN TO INITIATE RCS BORATION SHALL NOT BE REVERSED WHEN PERFORMING STEPS 1 THROUGH 12 OF E-0, REACTOR TRIP OR SAFETY INJECTION.

NOTE: o If offsite power is lost coincident with SI, then MCC C and MCC D lockout relays must be reset to restore BA and RMW pumps.
 o Foldout page should be open and monitored periodically.

4 Initiate Emergency Boration Of RCS:

- | | |
|---|--|
| <p>a. Check SI status:</p> <ul style="list-style-type: none"> o All SI annunciators - EXTINGUISHED o All SI pumps - OFF IN AUTO <p>b. Verify at least one charging pump - RUNNING</p> <p>c. Align boration path:</p> <ol style="list-style-type: none"> 1) Start two BA transfer pumps 2) Open MOV-350 3) Verify BA flow <p>d. Verify charging flow path:</p> <ul style="list-style-type: none"> o Charging valve to loop B cold leg (AOV-294) - OPEN o Charging flow control valve (HCV-142) - DEMAND AT 0% | <p>a. Perform the following:</p> <ol style="list-style-type: none"> 1) Complete steps 1 through 12 of E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure 2) <u>IF</u> SI flow indicated, <u>THEN</u> go to Step 5. <u>IF NOT</u>, <u>THEN</u> go to Step 4b. <p>b. Perform the following:</p> <ol style="list-style-type: none"> 1) Reset SI if necessary. 2) Start one charging pump. <p>c. Initiate normal boration at maximum rate using the boric acid flow control valve, FCV-110A. <u>IF</u> flow can <u>NOT</u> be established, <u>THEN</u> refer to ER-CVCS.1, REACTOR MAKEUP CONTROL MALFUNCTION.</p> <p>d. Manually align valves and verify flow.</p> |
|---|--|

EOP: FR-S.1	TITLE: RESPONSE TO REACTOR RESTART/ATWS	REV: 15 PAGE 5 of 13
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

5 Check PRZR PORV Status:

- a. RCS pressure - LESS THAN 2335 PSIG
- b. Check PORVs - BOTH CLOSED

a. Verify PRZR PORVs and block valves open. IF NOT, THEN open PRZR PORVs and block valves as necessary until PRZR pressure less than 2335 psig.

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

IF any PORV can NOT be closed, THEN manually close its block valve. IF block valve can NOT be closed, THEN dispatch AO to locally check breaker.

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

6 Verify CNMT Ventilation Isolation

- a. CVI annunciator - LIT
 - Annunciator A-25, CNMT VENTILATION ISOLATION
- b. Verify CVI valve status lights - BRIGHT

a. Momentarily deenergize CNMT particulate monitor, R-11, to actuate CVI.

b. Manually close CVI valves as required

IF valves can NOT be verified closed by MCB indication, THEN dispatch AO to locally close valves (Refer to ATT-3.0. ATTACHMENT CI/CVI for alternate isolation valves).

EOP:

FR-S.1

TITLE:

RESPONSE TO REACTOR RESTART/ATWS

REV: 15

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

7 Check If The Following Trips Have Occurred:

a. Reactor trip

a. Dispatch A0 to locally trip reactor:

- o Trip MG set breakers at bus 13 and bus 15.

-OR-

- o Open reactor trip breakers locally.

b. Turbine trip

b. Dispatch A0 to locally trip turbine using manual trip lever on west end of HP turbine.

* 8 Check If Reactor Is Subcritical:

a. Energize MCC A AND B

b. Check power range channels - LESS THAN 5%

b. Go to Step 9.

c. Check Intermediate range channels

c. Go to Step 9.

- o Startup rate - NEGATIVE

-OR-

- o Intermediate range channels - DECREASING

d. Go to Step 18.

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).

.....

* 9 Monitor S/G Level:

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

a. Perform the following:

1) Verify total feed flow greater than 400 gpm.

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

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

2) Maintain total feed flow greater than 400 gpm until narrow range level greater than 5% [25% adverse CNMT] in at least one S/G.

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

EOP:

FR-S.1

TITLE:

RESPONSE TO REACTOR RESTART/ATWS

REV: 15

PAGE 8 of 13

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

10 Verify Dilution Paths -
ISOLATED

- a. Place RMW mode switch to BORATE
- b. Stop RMW pumps

b. Perform the following:

- 1) Close RMW to blender (AOV-111)
- 2) Direct AO to locally open RMW pump breaker
 - RMW Pump A, MCC C Pos 13B
 - RMW Pump B, MCC D Pos 1B

11 Stabilize RCS Temperature:

- a. Control steam dump as necessary
- b. Verify the following:
 - o Core exit T/Cs - STABLE OR INCREASING
 - o Pressure in both S/Gs - STABLE OR INCREASING
 - o Pressure in both S/Gs - GREATER THAN 110 PSIG
- c. Go to Step 16

- b. IF RCS cooldown can NOT be controlled, THEN close both MSIVs and go to Step 12.

EOP: FR-S.1	TITLE: RESPONSE TO REACTOR RESTART/ATWS	REV: 15 PAGE 9 of 13
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

12 Verify MFW Isolation:

- a. MFW pumps - TRIPPED

- b. Place A and B S/G MFW regulating valve and bypass valve controllers to MANUAL at 0% demand.

- a. Manually close MFW pump discharge valves and trip MFW pumps.

13 Identify Faulted S/G:

Go to Step 16.

- o Any S/G Pressure - DECREASING IN AN UNCONTROLLED MANNER

- OR-

- o Any S/G Pressure - LESS THAN 110 PSIG

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
------	--------------------------	-----------------------

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

14 Isolate Feed Flow To Faulted S/G:

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

- 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

EOP:

TITLE:

FR-S.1

RESPONSE TO REACTOR RESTART/ATWS

REV: 15

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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.

15 Isolate Steam Flow From Faulted S/G:

Manually close valves.

o Verify faulted S/G ARV - CLOSED

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

- S/G A. AOV-3411
- S/G B. AOV-3410

o Close faulted S/G TDAFW pump steam supply valve and place in PULL STOP

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

o Verify faulted S/G blowdown and sample valves - CLOSED

- S/G A. AOV-5738 and AOV-5735
- S/G B. AOV-5737 and AOV-5736

o Dispatch AO to complete faulted S/G isolation (Refer to ATT-10.0, ATTACHMENT FAULTED S/G)

EOP:

FR-S.1

TITLE:

RESPONSE TO REACTOR RESTART/ATWS

REV: 15

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

16 Check Core Exit T/Cs - LESS THAN 1200°F

IF core exit temperatures greater than 1200°F and increasing, THEN go to SACRG-1, SEVERE ACCIDENT CONTROL ROOM GUIDELINE INITIAL RESPONSE, step 1.

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

17 Verify Reactor Subcritical:

Perform the following:

- o Power range channels - LESS THAN 5%
- o Intermediate range channels - STABLE OR DECREASING
- o Intermediate range channels startup rate - NEGATIVE
- o Core exit T/Cs - STABLE

- a. Stabilize RCS temperature.
- b. Continue to inject boric acid.
- c. Perform actions of other FR procedures in effect which do NOT cooldown or otherwise add positive reactivity to the core.
- d. Direct RP to sample RCS and PRZR for boron concentration.
- e. Verify boron concentration greater than FIG-2.0, FIGURE SDM.

IF adequate shutdown margin verified, THEN go to Step 18.

IF NOT, THEN perform the following:

- a. Allow RCS to heat up.
- b. Perform actions of other FR procedures in effect which do NOT cooldown or otherwise add positive reactivity to the core.
- c. Return to Step 4.

EOP: FR-S.1	TITLE: RESPONSE TO REACTOR RESTART/ATWS	REV: 15 PAGE 13 of 13
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
***** <u>CAUTION</u> BORATION SHOULD CONTINUE TO OBTAIN ADEQUATE SHUTDOWN MARGIN DURING SUBSEQUENT ACTIONS. *****		
18	Return to Procedure And Step In Effect	
-END-		

EOP: FR-S.1	TITLE: RESPONSE TO REACTOR RESTART/ATWS	REV: 15 PAGE 1 of 1
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FR-S.1 APPENDIX LIST

TITLE

- 1) FIGURE SDM (FIG-2.0)
- 2) ATTACHMENT FAULTED S/G (ATT-10.0)
- 3) ATTACHMENT CI/CVI (ATT-3.0)
- 4) ATTACHMENT SAFW (ATT-5.1)
- 5) ATTACHMENT NO SW PUMPS (ATT-2.4) |
- 6) FOLDOUT |

EOP: FR-S.1	TITLE: RESPONSE TO REACTOR RESTART/ATWS	REV: 15 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-S series procedures.

1. LOSS OF SW CRITERIA

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

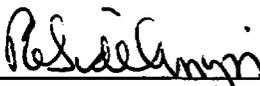
- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

EOP: FR-S.2	TITLE: RESPONSE TO LOSS OF CORE SHUTDOWN	REV: 9 PAGE 1 of 5
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ROCHESTER GAS AND ELECTRIC CORPORATION

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EOP: FR-S.2	TITLE: RESPONSE TO LOSS OF CORE SHUTDOWN	REV: 9 PAGE 2 of 5
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- A. PURPOSE - This procedure provides actions to restore the core to an adequate shutdown condition.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS - This procedure is entered from:
 - a. F-0.1, SUBCRITICALITY, Critical Safety Function Status Tree on a YELLOW condition.

EOP: FR-S.2	TITLE: RESPONSE TO LOSS OF CORE SHUTDOWN	REV: 9 PAGE 3 of 5
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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- NOTE:
- o Adverse CNMT conditions or loss of forced air cooling may result in failure of NIS detectors.
 - o Foldout page should be open and monitored periodically.

1 Check Intermediate Range Flux:

- | | |
|---|---|
| <ul style="list-style-type: none"> a. Flux - EITHER CHANNEL LESS THAN 10⁻¹⁰ AMPS b. Check the following: <ul style="list-style-type: none"> o Both intermediate range channels - LESS THAN 10⁻¹⁰ AMPS <p style="text-align: center;">-OR-</p> o Greater than 20 minutes since reactor trip c. Verify source range detectors - ENERGIZED d. Transfer Rk-45 recorder to one source range and one intermediate range channel | <ul style="list-style-type: none"> a. Continue with Step 2. <u>WHEN</u> flux is LESS THAN 10⁻¹⁰ amps on any operable channel, <u>THEN</u> do Steps 1b, c and d. b. Continue with step 2. <u>WHEN</u> either condition met, <u>THEN</u> do Steps 1c and d. c. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2).

<u>IF</u> source ranges can <u>NOT</u> be restored, <u>THEN</u> refer to ER-NIS.1, SR MALFUNCTION, and go to Step 2. |
|---|---|

EOP: FR-S.2	TITLE: RESPONSE TO LOSS OF CORE SHUTDOWN	REV: 9 PAGE 4 of 5
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

2 Initiate Immediate Boration
Of RCS:

a. Check SI status:

- o All SI annunciators - EXTINGUISHED
- o All SI pumps - OFF IN AUTO

b. Verify at least one charging
pump - RUNNING

c. Align boration path:

- 1) Start two BA transfer pumps
- 2) Open MOV-350
- 3) Verify BA flow

d. Verify charging flow path:

- o Charging valve to loop B cold leg (AOV-294) - OPEN
- o Charging flow control valve (HCV-142) - DEMAND AT 0%

a. Perform the following:

- 1) Complete steps 1 through 12 of E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with this procedure
- 2) IF SI flow indicated, THEN go to Step 3. IF NOT, THEN go to Step 2b.

b. Perform the following:

- 1) Reset SI if necessary.
- 2) Start one charging pump.

c. Initiate normal boration at maximum rate using the boric acid flow control valve, FCV-110A. IF flow can NOT be established, THEN refer to ER-CVCS.1, REACTOR MAKEUP CONTROL MALFUNCTION.

d. Manually align valves and verify flow.



3 Check Source Range Channels:

- | | |
|--|---|
| <p>a. Source range channels - ENERGIZED</p>

<p>b. Source range channels startup rate - ZERO OR NEGATIVE</p> | <p>a. Perform the following:</p> <p>1) Continue boration until adequate shutdown margin is verified by RCS sample (Refer to FIG-2.0, FIGURE SDM).</p> <p>2) Go to Step 4.</p> <p>b. Continue boration. <u>WHEN</u> source range channel startup rate is zero or negative, <u>THEN</u> go to Step 4.</p> |
|--|---|

4 Verify Adequate Shutdown Margin

- | | |
|---|---|
| <p>a. Direct RP to sample RCS for boron concentration</p> <p>b. Verify boron concentration - GREATER THAN REQUIREMENTS OF FIG-2.0, FIGURE SDM</p> <p>c. Stop boration</p> | <p>b. Continue boration until adequate shutdown margin verified and go to Step 5.</p> |
|---|---|

5 Return To Procedure And Step In Effect.

-END-

EOP: FR-S.2	TITLE: RESPONSE TO LOSS OF CORE SHUTDOWN	REV: 9 PAGE 1 of 1
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FR-S.2 APPENDIX LIST

TITLE

- 1) FIGURE SDM (FIG-2.0)
- 2) ATTACHMENT NO SW PUMPS (ATT-2.4) |
- 3) FOLDOUT |

EOP: FR-S.2	TITLE: RESPONSE TO LOSS OF CORE SHUTDOWN	REV: 9 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-S series procedures.

1. LOSS OF SW CRITERIA

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

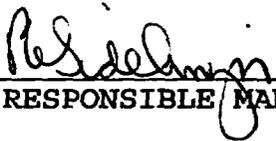
- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

EOP: FR-C.1	TITLE: RESPONSE TO INADEQUATE CORE COOLING	REV: 20 PAGE 1 of 18
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23



RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: FR-C.1	TITLE: RESPONSE TO INADEQUATE CORE COOLING	REV: 20 PAGE 2 of 18
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A. PURPOSE - This procedure provides actions to restore core cooling.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

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

EOP:

FR-C.1

TITLE:

RESPONSE TO INADEQUATE CORE COOLING

REV: 20

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

- NOTE:
- o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr.
 - o Foldout Page should be open and monitored periodically.

* 1 Monitor RWST Level - GREATER THAN 28%

Perform the following:

- a. Ensure SI system aligned for cold leg recirculation using Steps 1 through 13 of ES-1.3. TRANSFER TO COLD LEG RECIRCULATION.
- b. WHEN the SI system is aligned for sump recirculation, THEN go to Step 4.

2 Verify SI Pump Suction Aligned to RWST:

a. Verify SI pump suction valves from RWST - OPEN

- MOV-825A
- MOV-825B

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

- MOV-825A
- MOV-825B

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

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

3 Verify SI Pump And RHR Pump
Emergency Alignment:

a. RHR pump discharge to Rx vessel
deluge - OPEN

- MOV-852A
- MOV-852B

b. Verify both RHR pumps - RUNNING

c. Verify SI pump C - RUNNING

d. Verify SI pump A - RUNNING

e. Verify SI pump B - RUNNING

f. Verify both SI pump C discharge
valves - OPEN

- MOV-871A
- MOV-871B

a. Ensure at least one valve open.

b. Manually start pumps

c. Manually start pump on available
bus.

d. Perform the following:

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

e. Perform the following:

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

f. Manually open valves as
necessary.

EOP:

FR-C.1

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RESPONSE TO INADEQUATE CORE COOLING

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

4 Verify SI Flow In Both Trains:

- o SI line loop A and B flow indicators - CHECK FOR FLOW
- o RHR loop flow indicator - CHECK FOR FLOW

Perform the following:

- a. Manually start pumps and align valves as necessary.
- b. Establish maximum charging flow.
- c. Continue efforts to establish SI or RHR flow.

5 Check RCP Support Conditions:

- a. Verify Bus 11A or 11B - ENERGIZED
- b. Check other RCP support conditions (Refer to ATT-15.0. ATTACHMENT RCP START)

- a. Restore power to Bus 11A or 11B (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
- b. Continue attempts to establish RCP support conditions.

6 Check SI ACCUM Discharge Valves - OPEN

- MOV-841
- MOV-865

IF SI ACCUM discharge valves closed after ACCUM discharge. THEN go to Step 7. IF NOT, THEN perform the following:

- a. Dispatch A0 with locked valve key to locally close breakers for SI ACCUM discharge valves.
 - MOV-841, MCC C position 12F
 - MOV-865, MCC D position 12C
- b. Open SI ACCUM discharge valves.
 - ACCUM A, MOV-841
 - ACCUM B, MOV-865

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

7 Check Core Exit T/Cs - LESS THAN 1200°F

Go to Step 10.

8 Check RVLIS Indication:

a. RCPs - BOTH SECURED

a. Return to procedure and step in effect

b. RVLIS level - GREATER THAN 52% [55% adverse CNMT]

b. IF RVLIS increasing, THEN return to Step 1. IF NOT, THEN go to Step 9.

c. Return to procedure and step in effect

9 Check Core Exit T/Cs:

a. Temperature - LESS THAN 700°F

a. IF decreasing, THEN return to Step 1. IF NOT, THEN go to Step 10.

b. Return to procedure and step in effect

.....

CAUTION

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

.....

10 Reset SI

EOP:

FR-C.1

TITLE:

RESPONSE TO INADEQUATE CORE COOLING

REV: 20

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

11 Reset CI:

- a. Depress CI reset pushbutton
- b. Verify annunciator A-26. CNMT ISOLATION - EXTINGUISHED
- b. Perform the following:
 - 1) Reset SI.
 - 2) Depress CI reset pushbutton.

NOTE: This procedure should be continued while obtaining CNMT hydrogen sample in Step 12.

12 Check CNMT Hydrogen Concentration:

- a. Direct RP to start CNMT hydrogen monitors as necessary
- b. Hydrogen concentration - LESS THAN 0.5%
- b. Consult TSC to determine if hydrogen recombiners should be placed in service.

EOP:

FR-C.1

TITLE:

RESPONSE TO INADEQUATE CORE COOLING

REV: 20

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

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

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

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

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

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

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

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

2) Go to Step 23.

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
------	--------------------------	-----------------------

CAUTION
 IF ANY PRZR PORV OPENS BECAUSE OF HIGH PRZR PRESSURE, IT SHOULD BE CLOSED AFTER PRESSURE DECREASES TO LESS THAN 2335 PSIG (REFER TO STEP 14B).

14 Check RCS Vent Paths:

- | | |
|--|---|
| a. Power to PRZR PORV block valves
- AVAILABLE | a. Restore power to block valves unless block valve was closed to isolate an open PORV:

• MOV-515, MCC D position 6C
• MOV-516, MCC C position 6C |
| b. PORVs - CLOSED. | b. <u>IF</u> PRZR pressure less than 2335 psig, <u>THEN</u> manually close PORVs.

<u>IF</u> any PORV can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve. |
| c. Block valves - AT LEAST ONE OPEN | c. Open one block valve unless it was closed to isolate an open PORV. |
| d. Rx vessel head vent valves - CLOSED

• SOV-590
• SOV-591
• SOV-592
• SOV-593 | d. Manually close valves. |

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**15 Establish Condenser Steam
Dump Manual Control**

- a. Verify condenser available:
- o Intact S/G MSIV - OPEN
 - o Annunciator G-15. STEAM DUMP ARMED - LIT
- b. Place steam dump mode selector switch in MANUAL
- c. Place steam dump controller in MANUAL

- a. Place intact S/G ARV controller in MANUAL and go to Step 16.

NOTE: Partial uncovering of S/G tubes is acceptable in the following steps.

**16 Depressurize All Intact S/Gs
To 200 PSIG:**

- a. Dump steam to condenser at maximum rate
- b. Check S/G pressure - LESS THAN 200 PSIG
- c. Check RCS hot leg temperatures - BOTH LESS THAN 400°F
- d. Stop S/G depressurization

- a. Manually or locally dump steam at maximum rate using S/G ARVs.
- b. IF S/G pressure decreasing, THEN return to Step 13.

IF NOT, THEN go to Step 23.
- c. IF RCS hot leg temperatures decreasing, THEN return to Step 13.

IF NOT, THEN go to Step 23.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

17 Check If SI ACCUMs Should Be Isolated:

- | | |
|--|---|
| <p>a. RCS hot leg temperatures - BOTH LESS THAN 400°F</p> <p>b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves if necessary</p> <ul style="list-style-type: none"> • MOV-841 MCC C position 12F • MOV-865 MCC D position 12C <p>c. Verify SI reset</p> <p>d. Close SI ACCUM discharge valves</p> <ul style="list-style-type: none"> • ACCUM A, MOV-841 • ACCUM B, MOV-865 <p>e. Locally reopen breakers for MOV-841 and MOV-865</p> | <p>a. Go to Step 23.</p> <p>c. Manually reset SI.</p> <p>d. Perform the following to vent an unisolated accumulator:</p> <ol style="list-style-type: none"> 1) Reset CI. 2) Ensure adequate air compressor(s) running. 3) Establish IA to CNMT. 4) Open vent valves for unisolated SI ACCUMs. <ul style="list-style-type: none"> • ACCUM A, AOV-834A • ACCUM B, AOV-834B 5) Open HCV-945. <p><u>IF</u> an accumulator can <u>NOT</u> be isolated or vented, <u>THEN</u> consult TSC to determine contingency actions.</p> |
|--|---|

EOP:

FR-C.1

TITLE:

RESPONSE TO INADEQUATE CORE COOLING

REV: 20

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

18 Stop Both RCPs

19 Dump Steam to Condenser At Maximum Rate To Depressurize All Intact S/Gs To Atmospheric Pressure

Manually or locally dump steam at maximum rate using S/G ARVs.

20 Verify SI Flow:

o SI line loop A and B flow indicators - CHECK FOR FLOW

-OR-

o RHR loop flow indicator - CHECK FOR FLOW

Perform the following:

a. Continue efforts to establish SI or RHR flow.

b. Try to establish charging flow.

c. IF core exit T/Cs less than 1200°F, THEN return to Step 19.

IF NOT, THEN go to Step 23.

21 Check Core Cooling:

a. Core exit T/Cs - LESS THAN 1200°F

b. RCS hot leg temperatures - BOTH LESS THAN 320°F

c. RVLIS level (no RCPs) - GREATER THAN 77% [82% adverse CNMT]

a. Go to Step 23.

b. Return to Step 19.

c. Return to Step 19.

EOP:

FR-C.1

TITLE:

RESPONSE TO INADEQUATE CORE COOLING

REV: 20

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

22 Go to Appropriate Plant Procedure

a. Check RWST level - GREATER THAN 28%

b. Go to E-1. LOSS OF REACTOR OR SECONDARY COOLANT. Step 17

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

EOP: FR-C.1	TITLE: RESPONSE TO INADEQUATE CORE COOLING	REV: 20 PAGE 14 of 18
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
------	--------------------------	-----------------------

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

23 Check If RCPs Should Be Started:

- | | |
|---|--|
| <p>a. Core Exit T/Cs - GREATER THAN 1200°F</p> <p>b. Check if an idle RCS cooling loop is available</p> <ul style="list-style-type: none"> o Narrow range S/G level - GREATER THAN 5% [25% adverse CNMT] o RCP in associated loop - AVAILABLE AND NOT OPERATING <p>c. Start RCP in one idle RCS cooling loop</p> <p>d. Return to Step 23a</p> | <p>a. Go to Step 24.</p> <p>b. Perform the following:</p> <ol style="list-style-type: none"> 1) Reset SI. 2) Reset CI. 3) Ensure adequate air compressor(s) running. 4) Establish IA to CNMT. 5) Open all PRZR PORVs and block valves <ul style="list-style-type: none"> a) <u>IF</u> any block valve can <u>NOT</u> be opened, <u>THEN</u> ensure power supplied to block valve. b) <u>IF</u> IA <u>NOT</u> available, <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS. 6) <u>IF</u> core exit T/Cs remain greater than 1200°F, <u>THEN</u> open Rx vessel head vent valves. <ul style="list-style-type: none"> • SOV-590 • SOV-591 • SOV-592 • SOV-593 7) Go to Step 24. |
|---|--|

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

24 Dump Steam To Condenser At Maximum Rate To Depressurize All Intact S/Gs To Atmospheric Pressure:

Manually or locally dump steam from all intact S/Gs using ARVs.

IF ARVs not available on intact S/Gs. THEN:

o Open TDAFW pump steam supply valve from intact S/G(s)

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

-OR-

o Perform the following:

a. Open intact S/G MISV bypass valves

b. Open both priming air ejector steam inlet valves

- V-3580
- V-3581

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

25 Check Core Exit T/Cs - LESS THAN 1200°F

IF core exit temperatures decreasing, THEN return to step 23.

IF core exit temperatures increasing, THEN go to SACRG-1, SEVERE ACCIDENT CONTROL ROOM GUIDELINE INITIAL RESPONSE, step 1.

EOP:

FR-C.1

TITLE:

RESPONSE TO INADEQUATE CORE COOLING

REV: 20

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

27 Check If RCPs Should Be Stopped:

- a. Both RCS hot leg temperatures - LESS THAN 320°F
- b. Stop all RCPs

a. Go to Step 28.

28 Verify SI Flow:

- o SI line loop A and B flow indicators - CHECK FOR FLOW
- OR-
- o RHR loop flow indicator - CHECK FOR FLOW

Perform the following:

- a. Continue efforts to establish SI or RHR flow.
- b. Try to establish charging flow.
- c. Return to Step 23.

29 Check Core Cooling:

- a. RCS hot leg temperatures - LESS THAN 320°F
- b. RCPs - BOTH SECURED
- c. RVLIS level - GREATER THAN 77% [82% adverse CNMT]

- a. Return to Step 23.
- b. Stop all RCPs.
- c. Return to Step 23.

EOP: FR-C.1	TITLE: RESPONSE TO INADEQUATE CORE COOLING	REV: 20 PAGE 18 of 18
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

30 Go to Appropriate Plant Procedure

- a. IF PRZR PORVs and head vents were opened in Step 23. THEN consult TSC to evaluate long term status AND continue with transitions.
- b. Check RWST level - GREATER THAN 28%
- b. Go to ES-1.3. TRANSFER TO COLD LEG RECIRCULATION, Step 1.
- c. Go to E-1. LOSS OF REACTOR OR SECONDARY COOLANT, Step 17.

-END-

EOP: FR-C.1	TITLE: RESPONSE TO INADEQUATE CORE COOLING	REV: 20 PAGE 1 of 1
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FR-C.1 APPENDIX LIST

TITLE

- 1) ATTACHMENT RCP START (ATT-15.0)
- 2) ATTACHMENT N2 PORVS (ATT-12.0)
- 3) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
- 4) ATTACHMENT NO SW PUMPS (ATT-2.4) |
- 5) FOLDOUT PAGE |

EOP: FR-C.1	TITLE: RESPONSE TO INADEQUATE CORE COOLING	REV: 20 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-C series procedures. |

1. LOSS OF SW CRITERIA |

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

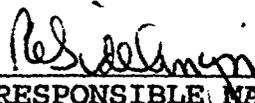
- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. |
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. |

EOP: FR-C.2	TITLE: RESPONSE TO DEGRADED CORE COOLING	REV: 17 PAGE 1 of 14
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23



RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: FR-C.2	TITLE: RESPONSE TO DEGRADED CORE COOLING	REV: 17 PAGE 2 of 14
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A. PURPOSE - This procedure provides actions to restore adequate core cooling.

B. ENTRY CONDITIONS/SYMPOMS

1. ENTRY CONDITIONS - This procedure is entered from:

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
------	--------------------------	-----------------------

- NOTE:**
- o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr.
 - o Normal conditions for running RCPs are desired, but RCPs should NOT be tripped if normal conditions cannot be established or maintained.
 - o Foldout Page should be open and monitored periodically.

*** 1 Monitor RWST Level - GREATER THAN 28%**

Perform the following:

- a. Ensure SI system aligned for cold leg recirculation using Steps 1 through 13 of ES-1.3. TRANSFER TO COLD LEG RECIRCULATION.
- b. Go to Step 4.

2 Verify SI Pump Suction Aligned To RWST:

a. SI pump suction valves from RWST - OPEN

- MOV-825A
- MOV-825B

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

- MOV-825A
- MOV-825B

EOP: FR-C.2	TITLE: RESPONSE TO DEGRADED CORE COOLING	REV: 17 PAGE 4 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Verify SI Pump And RHR Pump Emergency Alignment:	
	a. RHR pump discharge to Rx vessel deluge - OPEN	a. Ensure at least one valve open.
	<ul style="list-style-type: none"> • MOV-852A • MOV-852B 	
	b. Verify SI pump C - RUNNING	b. Manually start pump on available bus.
	c. Verify SI pump A - RUNNING	c. Perform the following: <ol style="list-style-type: none"> 1) Ensure SI pumps B and C running. 2) Ensure SI pump C aligned to discharge line A: <ul style="list-style-type: none"> o MOV-871B closed o MOV-871A open 3) Go to Step 4.
	d. Verify SI pump B - RUNNING	d. Perform the following: <ol style="list-style-type: none"> 1) Ensure SI pumps A and C running. 2) Ensure SI pump C aligned to discharge line B: <ul style="list-style-type: none"> o MOV-871B open o MOV-871A closed 3) Go to Step 4.
	e. Verify both SI pump C discharge valves - OPEN	e. Manually open valves as necessary.
	<ul style="list-style-type: none"> • MOV-871A • MOV-871B 	

EOP: FR-C.2	TITLE: RESPONSE TO DEGRADED CORE COOLING	REV: 17 PAGE 5 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Verify SI Flow In Both Trains:	
a.	SI line loop A and B flow indicators - CHECK FOR FLOW	a. Perform the following: 1) Manually start SI pumps and align valves as necessary. 2) Establish maximum charging flow.
b.	RCS pressure - LESS THAN 250 psig [465 psig adverse CNMT]	b. Go to Step 5.
c.	RHR loop flow indicator - CHECK FOR FLOW	c. Manually start RHR pumps and align valves.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

5 Check RCS Vent Paths:

- | | |
|--|--|
| <p>a. Power to PRZR PORV block valves
- AVAILABLE</p> <p>b. PORVs - CLOSED</p> <p>c. Block valves - AT LEAST ONE OPEN</p> <p>d. Rx vessel head vent valves -
CLOSED</p> <ul style="list-style-type: none"> • SOV-590 • SOV-591 • SOV-592 • SOV-593 | <p>a. Restore power to block valves unless block valve was closed to isolate an open PORV:</p> <ul style="list-style-type: none"> • MOV-515, MCC D position 6C • MOV-516, MCC C position 6C <p>b. <u>IF</u> PRZR pressure less than 2335 psig, <u>THEN</u> manually close PORVs.</p> <p><u>IF</u> any PORV can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve.</p> <p>c. Open one block valve unless it was closed to isolate an open PORV.</p> <p>d. Manually close valves.</p> |
|--|--|

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	<p>Check RCP Status:</p> <ul style="list-style-type: none"> a. At least one RCP - RUNNING b. Support conditions for the operating RCP(s) available (Refer to ATT-15.0, ATTACHMENT RCP START) 	<ul style="list-style-type: none"> a. Go to Step 9. b. Try to establish support conditions for the operating RCP.
7	<p>Check RVLIS Fluid Fraction</p> <ul style="list-style-type: none"> a. Fluid fraction (any RCP on) - GREATER THAN 64% b. Return to procedure and step in effect. 	<ul style="list-style-type: none"> a. <u>IF</u> increasing, <u>THEN</u> return to Step 1. <u>IF NOT</u>, then go to Step 8.
8	<p>Check If One RCP Should Be Stopped:</p> <ul style="list-style-type: none"> a. Both RCPs - RUNNING b. Stop one RCP c. Go to Step 10 	<ul style="list-style-type: none"> a. Go to Step 10.
9	<p>Check Core Cooling:</p> <ul style="list-style-type: none"> a. RVLIS level (no RCPs) - GREATER THAN 52% [55% adverse CNMT] b. Core exit T/Cs - LESS THAN 700°F c. Return to procedure and step in effect 	<ul style="list-style-type: none"> a. <u>IF</u> increasing, <u>THEN</u> return to Step 1. <u>IF NOT</u>, <u>THEN</u> go to Step 10. b. <u>IF</u> decreasing, <u>THEN</u> return to Step 1. <u>IF NOT</u>, <u>THEN</u> go to Step 10.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

10 Check SI ACCUM Discharge Valves - OPEN

- MOV-841
- MOV-865

IF SI ACCUM discharge valves closed after ACCUM discharge. THEN go to Step 11. IF NOT. THEN perform the following:

- a. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves.
 - MOV-841, MCC C position 12F
 - MOV-865, MCC D position 12C
- b. Open SI ACCUM discharge valves.
 - ACCUM A, MOV-841
 - ACCUM B, MOV-865

CAUTION

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

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

*11 Monitor Intact S/G Levels:

- a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]
- a. Increase total feed flow to restore 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%

EOP: FR-C.2	TITLE: RESPONSE TO DEGRADED CORE COOLING	REV: 17 PAGE 9 of 14
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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12 Establish Condenser Steam Dump Manual Control

- | | |
|---|---|
| <ul style="list-style-type: none">a. Verify condenser available:<ul style="list-style-type: none">o Intact S/G MSIV - OPENo Annunciator G-15, STEAM DUMP ARMED - LITb. Place steam dump mode selector switch in MANUALc. Place steam dump controller in MANUAL | <ul style="list-style-type: none">a. Place intact S/G ARV controller in MANUAL and go to Step 13. |
|---|---|

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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.....

CAUTION

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

.....

13 Depressurize All Intact S/Gs To 200 PSIG:

- a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR
- b. Dump steam to condenser
- c. Check S/G pressures - LESS THAN 200 PSIG
- d. Check RCS hot leg temperatures - BOTH LESS THAN 400°F
- e. Stop S/G depressurization
- b. Manually or locally dump steam from intact S/Gs:
 - o Use S/G ARVs.
 - OR-
 - o Open TDAFW pump steam supply valve(s) for affected S/G(s):
 - S/G A, MOV-3505A
 - S/G B, MOV-3504A
 - OR-
 - o Locally perform the following:
 - o Open intact S/G MSIV bypass valve.
 - o Open priming air ejector steam isolation valves.
 - V-3580
 - V-3581
- c. Return to Step 11.
- d. Return to Step 11.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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.....
CAUTION
RHR PUMPS SHOULD NOT BE RUN LONGER THAN 1 HOUR WITHOUT CCW TO THE RHR HEAT EXCHANGERS.
.....

14 Check RHR Pumps - RUNNING Manually start pumps as necessary.

EOP:

FR-C.2

TITLE:

RESPONSE TO DEGRADED CORE COOLING

REV: 17

PAGE 12 of 14

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

15 Isolate Both SI ACCUMs

a. Dispatch A0 with locked valve key to locally close breakers for SI ACCUM discharge valves if necessary

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

b. Reset SI

c. Close SI ACCUM discharge valves

- MOV-841
- MOV-865

c. Perform the following to vent an unisolated accumulator:

- 1) Reset CI
- 2) Ensure adequate air compressor(s) running
- 3) Establish IA to CNMT
- 4) Open vent valves for unisolated SI ACCUMs.
 - ACCUM A, AOV-834A
 - ACCUM B, AOV-834B
- 5) Open HCV-945.

IF an accumulator can NOT be isolated or vented, THEN consult TSC to determine contingency actions.

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION
 SYMPTOMS FOR FR-C.1, RESPONSE TO INADEQUATE CORE COOLING, SHOULD BE CLOSELY MONITORED DURING SUBSEQUENT STEPS.

16 Stop All RCPs

17 Depressurize All Intact S/Gs To Atmospheric Pressure:

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

b. Dump steam to condenser

b. Manually or locally dump steam from intact S/Gs:

1) Use S/G ARVs.

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

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

3) Locally perform the following:

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

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

18 Verify SI Flow:

- o SI line loop A and B flow indicators - CHECK FOR FLOW
- OR-
- o RHR loop flow indicator - CHECK FOR FLOW

Perform the following:

- a. Continue efforts to establish SI or RHR flow.
- b. Try to establish maximum charging flow.
- c. Return to Step 17.

19 Check Core Cooling:

- o RVLIS level (no RCPs) - GREATER THAN 77% [82% adverse CNMT]
- o Both RCS hot leg temperatures - LESS THAN 320°F

Return to Step 17.

20 Go to Appropriate Plant Procedure

- a. Check RWST level - GREATER THAN 28%
- b. Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 17

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

-END-

EOP: FR-C.2	TITLE: RESPONSE TO DEGRADED CORE COOLING	REV: 17 PAGE 1 of 1
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FR-C.2 APPENDIX LIST

TITLE

- 1) ATTACHMENT RCP START (ATT-15.0)
- 2) ATTACHMENT NO SW PUMPS (ATT-2.4) |
- 3) FOLDOUT |

EOP: FR-C.2	TITLE: RESPONSE TO DEGRADED CORE COOLING	REV: 17 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-C series procedures.

1. LOSS OF SW CRITERIA

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

- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

EOP: FR-C.3	TITLE: RESPONSE TO SATURATED CORE COOLING	REV: 9 PAGE 1 of 5
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

Richard M. ...
RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: FR-C.3	TITLE: RESPONSE TO SATURATED CORE COOLING	REV: 9 PAGE 2 of 5
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A. PURPOSE - This procedure provides actions to restore subcooled core cooling.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

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

EOP: FR-C.3	TITLE: RESPONSE TO SATURATED CORE COOLING	REV: 9 PAGE 3 of 5
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE:</u>	<ul style="list-style-type: none"> o If either ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED or ES-1.3, TRANSFER TO COLD LEG RECIRCULATION is in effect, this procedure should not be performed. o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr. o Foldout Page should be open and monitored periodically. 	
1	Check RHR Normal Cooling - NOT IN SERVICE	Refer to AP-RHR.1, LOSS OF RHR.
* 2	Monitor RWST Level - GREATER THAN 28%	Ensure SI system aligned for cold leg recirculation using Steps 1 through 13 of ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.
3	Verify SI Flow:	
	a. SI line loop A and B flow indicators - CHECK FOR FLOW	a. Manually start SI pumps and align valves.
	b. RCS pressure - LESS THAN 250 psig [465 psig adverse CNMT]	b. Go to Step 4.
	c. RHR loop flow indicator - CHECK FOR FLOW	c. Manually start RHR pumps and align valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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.....

CAUTION

IF ANY PRZR PORV OPENS BECAUSE OF HIGH PRZR PRESSURE, IT SHOULD BE CLOSED AFTER PRESSURE DECREASES TO LESS THAN 2335 PSIG (REFER TO STEP 4B).

.....

4 Check PRZR PORVs And Block Valves:

- | | |
|---|--|
| <p>a. Power to PORV block valves - AVAILABLE</p> <p>b. PORVs - CLOSED</p> <p>c. Block valves - AT LEAST ONE OPEN</p> <p>d. Rx vessel head vent valves - CLOSED</p> <ul style="list-style-type: none"> • SOV-590 • SOV-591 • SOV-592 • SOV-593 | <p>a. Restore power to block valves unless block valve was closed to isolate an open PORV:</p> <ul style="list-style-type: none"> • MOV-515, MCC D position 6C • MOV-516, MCC C position 6C <p>b. <u>IF</u> PRZR pressure less than 2335 psig. <u>THEN</u> manually close PORVs.</p> <p><u>IF</u> any PORV can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve.</p> <p>c. Open one block valve unless it was closed to isolate an open PORV.</p> <p>d. Manually close valves.</p> |
|---|--|

EOP:

FR-C.3

TITLE:

RESPONSE TO SATURATED CORE COOLING

REV: 9

PAGE 5 of 5

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

5 Return To Procedure And Step
In Effect

-END-

EOP: FR-C.3	TITLE: RESPONSE TO SATURATED CORE COOLING	REV: 9 PAGE 1 of 1
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FR-C.3 APPENDIX LIST

- 1) ATTACHMENT NO SW PUMPS (ATT-2.4) |
- 2) FOLDOUT |

EOP: FR-C.3	TITLE: RESPONSE TO SATURATED CORE COOLING	REV: 9 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-C series procedures.

1. LOSS OF SW CRITERIA

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

- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 1 of 31
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

Patricia M. ...

RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 2 of 31
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A. PURPOSE - This procedure provides actions for responding to a loss of secondary heat sink in both S/Gs.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. E-0, REACTOR TRIP OR SAFETY INJECTION, when minimum AFW flow is not verified AND normal range level in both S/Gs is less than 5% [25% adverse CNMT]
- b. F-0.3, HEAT SINK Critical Safety Function Status Tree on a RED condition.

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 3 of 31
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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.....

CAUTION

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

.....

- NOTE:
- o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr.
 - o Foldout Page should be open and monitored periodically.

1 Check If Secondary Heat Sink Is Required:

- | | |
|---|--|
| <ul style="list-style-type: none"> a. RCS pressure - GREATER THAN ANY NON-FAULTED S/G PRESSURE | <ul style="list-style-type: none"> a. <u>IF</u> RWST level greater than 28%. <u>THEN</u> return to procedure and step in effect. <u>IF</u> RWST level less than 28%. <u>THEN</u> go to ES-1.3. TRANSFER TO COLD LEG RECIRCULATION, Step 1. |
|---|--|

This Step continued on the next page.

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 4 of 31
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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(Step 1 continued from previous page)

- | | |
|---|--|
| <p>b. Check RCS cold leg temperature -
GREATER THAN 350°F</p> | <p>b. <u>IF</u> RCS pressure less than 400 psig [300 psig adverse CNMT], <u>THEN</u> try to place RHR System in service while continuing with this procedure:</p> <ol style="list-style-type: none"> 1) Reset SI. 2) Place letdown pressure controller in MANUAL CLOSED. 3) Open the following valves (reset xy relays): <ul style="list-style-type: none"> • AOV-371, letdown isolation valve • AOV-427, loop B cold leg to REGEN Hx • At least one letdown orifice valve (AOV-200A, AOV-200B, or AOV-202) 4) <u>IF</u> pressure on PI-135 less than 400 psig, <u>THEN</u> establish RHR normal cooling (Refer to ATT-14.1, ATTACHMENT RHR COOL). 5) <u>IF</u> adequate cooling with RHR system established, <u>THEN</u> return to procedure and step in effect. |
|---|--|

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 5 of 31
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* 2	Monitor Secondary Heat Sink: <ul style="list-style-type: none"> o Verify either S/G level - WIDE RANGE GREATER THAN 50 inches [100 inches adverse CNMT] o Verify PRZR pressure - LESS THAN 2335 PSIG 	<p><u>IF</u> a loss of heat sink is indicated, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> a. Trip both RCPs. b. Go to Step 13 to initiate bleed and feed cooling.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

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

- a. Check S/G blowdown and samples valves - CLOSED
- b. Check MCB indications for cause of AFW failure:
 - 1) Verify CST level - GREATER THAN 5 FEET
 - 2) Verify busses supplying power to MDAFW pumps - ENERGIZED
 - Bus 14
 - Bus 16
 - 3) Determine AFW flow requirements per ATT-22.0, ATTACHMENT RESTORING FEED FLOW
 - 4) Check AFW valve alignment
 - o AFW pump discharge valves - OPEN
 - MOV-4007
 - MOV-4008
 - MOV-3996
 - o TDAFW pump flow control valves - OPEN
 - AOV-4297
 - AOV-4298

- a. Place S/G blowdown and sample valve isolation switch to CLOSE.
- 1) Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS.
- 2) Continue attempts to restore power to MDAFW pumps.
- 4) Dispatch AO to locally align valves.

This Step continued on the next page.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 3 continued from previous page)

c. Check AFW pumps - ALL RUNNING

c. Perform the following:

- 1) Manually start MDAFW pumps.
- 2) Check TDAFW pump steam supply valves OPEN.
 - MOV-3504A
 - MOV-3505A
- 3) If necessary dispatch AO to locally reset TDAFW pump governor valve.
- 4) IF NO AFW pumps operable. THEN go to Step 4.

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

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

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

f. Return to procedure and step in effect

4 Stop Both RCPs

.....

CAUTION

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

.....

5 Reset SI If Actuated

EOP:

FR-H.1

TITLE:

RESPONSE TO LOSS OF SECONDARY HEAT SINK

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

6 Try To Establish MFW Flow To At Least One S/G:

- a. Check any MFW pump - AVAILABLE
- b. Check condensate system:
 - o Condensate pump - ANY RUNNING
 - o MFW pump suction pressure - GREATER THAN 185 PSIG

c. Establish MFW flow:

- 1) Check MFW pump discharge valves - CLOSED
- 2) Verify MFW regulating or bypass valves - OPERABLE
- 3) Place A and B MFW regulating valve and bypass valve controllers in MANUAL at 0% demand.
- 4) Dispatch AO to restore MFW pump SW cooling
- 5) Verify S/G blowdown key switches in NORMAL
- 6) Ensure Annunciator H-4.MAIN FEED PUMP OIL SYSTEM - EXTINGUISHED
- 7) Close Condensate Bypass valve. AOV-3959.
- 8) Ensure Annunciator H-11. FEED PUMP SEAL WATER LO DIFF PRESS 15 PSI - EXTINGUISHED
- 9) Ensure one MFW pump recirc valve - OPEN.

10) Start selected MFW pump
This Step continued on the next page.

a. Go to Step 7.

b. IF offsite power available, THEN try to place condensate system in service.

IF NOT, THEN go to Step 7.

c. IF MFW flow can NOT be established, THEN go to Step 7.

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 9 of 31
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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(Step 6 continued from previous page)

- 11) Open MFW pump discharge valve
- 12) Adjust MFW regulating or bypass valves to control MFW flow per requirements of ATT-22.0, ATTACHMENT RESTORING FEED FLOW
- d. Go to Step 11

7 Establish SAFW Flow:

- a. Perform the following:
 - 1) Align SAFW system for operation (Refer to ATT-5.1, ATTACHMENT SAFW)
 - 2) Determine SAFW flow requirements per ATT-22.0, ATTACHMENT RESTORING FEED FLOW
 - 3) Start both SAFW pumps
 - 4) Control SAFW flow per requirements of ATT-22.0, ATTACHMENT RESTORING FEED FLOW
 - 5) Verify SAFW total flow - GREATER THAN 200 GPM
 - b. Go to Step 11
- a. IF greater than 200 gpm total SAFW flow can NOT be established, THEN go to Step 8.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION

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

.....

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

- | | |
|---|--|
| <ul style="list-style-type: none"> a. Check condensate pumps - ANY RUNNING b. Establish condensate flowpath (Refer to ATT-5.0, ATTACHMENT COND TO S/G) c. De-energize PRZR heaters | <ul style="list-style-type: none"> a. <u>IF</u> offsite power available, <u>THEN</u> manually start at least one condensate pump. <u>IF</u> a condensate pump can <u>NOT</u> be started, <u>THEN</u> go to Step 12. |
|---|--|

9 Establish Condenser Steam Dump Pressure Control:

- | | |
|---|---|
| <ul style="list-style-type: none"> a. Verify condenser available: <ul style="list-style-type: none"> o Any MSIV - OPEN o Annunciator G-15, STEAM DUMP ARMED - LIT b. Adjust condenser steam dump controller HC-484 to highest S/G pressure c. Verify condenser steam dump controller HC-484 in AUTO d. Place steam dump mode selector switch to MANUAL | <ul style="list-style-type: none"> a. Place S/G ARV controllers in AUTO at desired pressure and go to Step 10. |
|---|---|

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION
.....

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

.....

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

10 Establish Condensate Flow to S/G:

- | | |
|--|--|
| <ul style="list-style-type: none"> a. Check RCS pressure - GREATER THAN 1950 PSIG b. Depressurize RCS to less than 1950 psig: <ul style="list-style-type: none"> 1) Check letdown - IN SERVICE 2) Depressurize using auxiliary spray valve (AOV-296) c. WHEN PRZR pressure less than 1950 psig. THEN place SI block switches to BLOCK <ul style="list-style-type: none"> • Train A • Train B d. Verify SAFETY INJECTION BLOCKED status light - LIT | <ul style="list-style-type: none"> a. Go to Step 10c. 1) Use one PRZR PORV. <u>IF</u> IA to CNMT, AOV-5392, <u>NOT</u> open. <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS. <ul style="list-style-type: none"> a) <u>IF</u> PORV <u>NOT</u> available, <u>THEN</u> use auxiliary spray valve, AOV-296 and go to step 10c. 2) Use one PRZR PORV. <u>IF</u> IA to CNMT, AOV-5392, <u>NOT</u> open. <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS. |
|--|--|

This Step continued on the next page.

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 12 of 31
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(Step 10 continued from previous page)

- | | |
|--|---|
| <ul style="list-style-type: none"> e. Stop depressurizing RCS and maintain RCS pressure less than 1950 psig f. Manually adjust MFW regulating or bypass valves to control feed flow per requirements of ATT-22.0, ATTACHMENT RESTORING FEED FLOW g. Dump steam to condenser at maximum rate to depressurize at least one S/G to less than 380 psig h. Verify condensate flow to S/Gs | <ul style="list-style-type: none"> g. Manually or locally dump steam using intact S/G ARV at maximum rate to depressurize at least one S/G to less than 380 psig. h. Go to Step 12. |
|--|---|

11 Check S/G Levels:

- | | |
|---|--|
| <ul style="list-style-type: none"> a. Narrow range level in at least one S/G - GREATER THAN 5% [25% adverse CNMT] b. Return to procedure and step in effect | <ul style="list-style-type: none"> a. <u>IF</u> feed flow verified and level increasing in at least one S/G, <u>THEN</u> maintain flow to restore narrow range level greater than 5% [25% adverse CNMT]. <u>IF NOT</u> verified, <u>THEN</u> go to Step 12. |
|---|--|

12 Verify Secondary Heat Sink:

- | | |
|---|---|
| <ul style="list-style-type: none"> a. Check the following: <ul style="list-style-type: none"> o Either S/G level - WIDE RANGE GREATER THAN 50 inches [100 inches adverse CNMT] o PRZR pressure - LESS THAN 2335 PSIG b. Return to Step 1 | <ul style="list-style-type: none"> a. <u>IF</u> loss of heat sink is indicated, <u>THEN</u> perform the following: <ul style="list-style-type: none"> 1) Go to Step 13 to initiate bleed and feed cooling. |
|---|---|

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>.....</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>STEPS 13 THROUGH 15 MUST BE PERFORMED QUICKLY IN ORDER TO ESTABLISH RCS HEAT REMOVAL BY RCS BLEED AND FEED.</p> <p>.....</p>		
13	Actuate SI and CI	
14	<p>Verify RCS Feed Path:</p> <p>a. Check SI pumps - AT LEAST ONE RUNNING</p> <p>b. Check valve alignment for operating SI pumps - PROPER EMERGENCY ALIGNMENT</p>	<p>Manually start pumps and align valves as necessary to establish RCS feed path.</p> <p><u>IF</u> a feed path can <u>NOT</u> be established, <u>THEN</u> continue attempts to establish feed flow. Return to Step 3.</p>

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 14 of 31
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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15 Establish RCS Bleed Path:

- | | |
|---|--|
| <p>a. Open both PRZR PORV block valves</p> <p>b. Place both PRZR PORV switches to OPEN</p> <p>c. Align RCS overpressure protection system to open both PRZR PORVs (Refer to ATT-12.0, ATTACHMENT N2 PORVS)</p> <p>d. Verify PORVs - BOTH OPEN</p> | <p>a. Ensure power to MCCs supplying block valves.</p> <ul style="list-style-type: none"> • MCC D for MOV-515 • MCC C for MOV-516 <p><u>IF</u> any block valve can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to locally check breaker:</p> <ul style="list-style-type: none"> • MOV-515, MCC D position 6C • MOV-516, MCC C position 6C <p>d. <u>IF</u> BOTH PRZR PORVs can <u>NOT</u> be opened, <u>THEN</u> ensure both PORV switches in OPEN.</p> |
|---|--|

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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.....

CAUTION

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

.....

16 Check If SI Can Be Reset:

- | | |
|--|---|
| <ul style="list-style-type: none"> a. Check SI blocked status light - EXTINGUISHED b. Check the following: <ul style="list-style-type: none"> o PRZR pressure - LESS THAN 1750 PSIG <li style="text-align: center;">-OR- o Either steamline pressure - LESS THAN 514 PSIG c. Reset SI | <ul style="list-style-type: none"> a. Place SI block switches to UNBLOCK b. <u>IF</u> PRZR pressure stable or increasing, <u>THEN</u> reset SI and go to Step 17.

<u>IF</u> PRZR pressure decreasing, <u>THEN</u> perform the following: <ul style="list-style-type: none"> 1) <u>WHEN</u> PRZR pressure less than 1750 psig, <u>THEN</u> reset SI. 2) Go to Step 17. |
|--|---|

17 Reset CI:

- | | |
|--|---|
| <ul style="list-style-type: none"> a. Depress CI reset pushbutton b. Verify annunciator A-26. CONTAINMENT ISOLATION - EXTINGUISHED | <ul style="list-style-type: none"> b. Perform the following: <ul style="list-style-type: none"> 1) Reset SI. 2) Depress CI reset pushbutton |
|--|---|

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

18 Verify Adequate SW Flow:

a. Verify at least two SW pumps -
RUNNING

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

1) IF NO SW pumps running, THEN perform the following:

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

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

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

3) Go to Step 19.

b. Verify AUX BLDG SW isolation valves - AT LEAST ONE SET OPEN

b. Manually align valves.

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

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 17 of 31
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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19 Establish IA to CNMT:

- a. Verify non-safeguards busses energized from offsite power
 - o Bus 13 normal feed - CLOSED
 - OR-
 - o Bus 15 normal feed - CLOSED

- b. Check SW pumps - AT LEAST TWO PUMPS RUNNING

- a. Perform the following:
 - 1) Close non-safeguards bus tie breakers:
 - Bus 13 to Bus 14 tie
 - Bus 15 to Bus 16 tie
 - 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each).
IF NOT, THEN perform the following:
 - o Start diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).
 - OR-
 - o Evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS).
 - 3) Start HP seal oil backup pump.
 - 4) WHEN bus 15 restored, THEN reset control room lighting.

- b. Perform the following:
 - 1) Restore IA using service air compressor OR diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).
 - 2) Go to Step 19d.

This Step continued on the next page.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 19 continued from previous page)	
c.	Verify turbine building SW isolation valves - OPEN • MOV-4613 and MOV-4670 • MOV-4614 and MOV-4664	c. Perform the following: 1) Manually align valves. 2) Dispatch AO to locally reset compressors as necessary.
d.	Verify adequate air compressor(s) - RUNNING	d. Manually start electric air compressors as power supply permits (75 kw each). <u>IF</u> electric air compressors can <u>NOT</u> be started, <u>THEN</u> start diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).
e.	Check IA supply: o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING	e. Perform the following: 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR). 2) Continue with Step 21. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 19f, g and 20.
f.	Reset both trains of XY relays for IA to CNMT AOV-5392	
g.	Verify IA to CNMT AOV-5392 - OPEN	g. Continue with Step 21. <u>WHEN</u> IA restored to CNMT. <u>THEN</u> do Step 20.

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 19 of 31
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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NOTE: PRZR PORVs may close temporarily until adequate IA pressure is restored in CNMT.

20 Restore RCS Overpressure Protection System To Standby:

a. Verify instrument bus D -
ENERGIZED

a. Perform the following:

1) Ensure steam dump mode control in MANUAL.

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

b. Place PORV PCV-430 and PCV-431C N₂ arming switches to BLOCK

- SOV-8619A
- SOV-8619B

c. Close PORV PCV-430 and PCV-431C N₂ SURGE TK VLVs

- SOV-8616A
- SOV-8616B

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

21 Verify Adequate RCS Bleed Path:

- o Core exit T/Cs - STABLE OR DECREASING
- o RVLIS Level (no RCPs) - GREATER THAN 77% [82% adverse CNMT]

Perform the following:

- a. Open Rx head vent valves.
 - SOV-590
 - SOV-591
 - SOV-592
 - SOV-593
- b. Align any available low pressure water source to intact S/Gs.

 IF no low pressure water source can be aligned, THEN go to Step 22.
- c. Depressurize at least one intact S/G to atmospheric pressure using S/G ARV.

.....

CAUTION

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

.....

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION
 THE RCS BLEED PATH MUST BE MAINTAINED EVEN IF RCS PRESSURE REMAINS GREATER THAN SI PUMP SHUTOFF HEAD.

23 Maintain RCS Heat Removal:

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

24 Check Normal Power Available To Charging Pumps:

- o Bus 14 normal feed breaker - CLOSED
- o Bus 16 normal feed breaker - CLOSED

Verify adequate emergency D/G capacity to run charging pumps (75 kw each).

IF NOT, THEN evaluate if CNMT RECIRC fans can be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS).

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 22 of 31
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

25 Check If Charging Flow Has Been Established:

a. Charging pumps - ANY RUNNING

a. Perform the following:

- 1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN dispatch AO to locally close seal injection needle valve(s) to affected RCP:

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

- 2) Ensure HCV-142 open, demand at 0%.

b. Align charging pump suction to RWST:

b. IF LCV-112B can NOT be opened, THEN dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room).

- o LCV-112B - OPEN
- o LCV-112C - CLOSED

IF LCV-112C can NOT be closed, THEN perform the following:

- 1) Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room).

- 2) Verify charging pump A NOT running and place in PULL STOP.

- 3) WHEN V-358 open, THEN direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).

c. Start charging pumps as necessary to establish maximum charging flow

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION

- o IF RWST LEVEL DECREASES TO LESS THAN 28%. THEN THE SI SYSTEM SHOULD BE ALIGNED FOR COLD LEG RECIRCULATION USING STEPS 1 THROUGH 14 OF ES-1.3. TRANSFER TO COLD LEG RECIRCULATION.
- o IF CONTAINMENT PRESSURE INCREASES TO GREATER THAN 28 PSIG, CONTAINMENT SPRAY SHOULD BE VERIFIED.
- o RHR PUMPS SHOULD NOT BE RUN LONGER THAN 1 HOUR WITHOUT CCW TO THE RHR HEAT EXCHANGERS.

.....

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

- | | |
|--|---|
| <ul style="list-style-type: none"> a. CNMT spray pumps - RUNNING b. Check the following: <ul style="list-style-type: none"> o CNMT pressure - LESS THAN 4 PSIG o Sodium hydroxide tank level - LESS than 55% c. Reset CNMT spray d. Check NaOH flow (FI-930) - NO FLOW e. Stop CNMT spray pumps and place in AUTO f. Close CNMT spray pump discharge valves <ul style="list-style-type: none"> • MOV-860A • MOV-860B • MOV-860C • MOV-860D | <ul style="list-style-type: none"> a. Go to Step 27. b. Continue with Step 27. <u>WHEN</u> BOTH conditions satisfied, <u>THEN</u> do Steps 26c through 26f. <ul style="list-style-type: none"> • AOV-836A • AOV-836B d. Place NaOH tank outlet valve switches to CLOSE. |
|--|---|

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

27 Continue Attempts To Establish Secondary Heat Sink In At Least One S/G:

- a. Attempt to restore one or more of the following:
 - AFW flow
 - Main FW flow
 - Standby AFW flow
 - Condensate flow
- b. WHEN a feed source is available, THEN control feed flow per requirements of ATT-22.0, ATTACHMENT RESTORING FEED FLOW

28 Check For Adequate Secondary Heat Sink:

- a. Check narrow range level in at least one S/G - GREATER THAN 5% [25% adverse CNMT]
- a. Return to Step 27.
- b. Adjust S/G ARV controllers to existing S/G pressure

.....
CAUTION
.....

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

29 Monitor RCS Temperatures:

Perform the following:

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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30 Check CCW Pumps - ANY RUNNING

Perform the following:

- a. IF any RCP #1 seal outlet temperature offscale high, THEN isolate CCW to thermal barrier of affected RCP(s).
 - RCP A, MOV-749A and MOV-759A
 - RCP B, MOV-749B and MOV-759B
- b. Manually start one CCW pump (122 kw).

.....

CAUTION

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

.....

31 Verify Reactor Head Vent Valves - CLOSED

Manually close valves.

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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.....
CAUTION

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

32 Check If One Of Three SI Pumps Should Be Stopped:

- | | |
|---|--|
| <ul style="list-style-type: none"> a. Three SI pumps - RUNNING b. RCS subcooling based on core exit T/Cs - GREATER THAN 35°F [90°F adverse CNMT] USING FIG-1.0. FIGURE MIN SUBCOOLING c. Check PRZR level - GREATER THAN 13% [40% adverse CNMT] d. Stop one SI pump | <ul style="list-style-type: none"> a. Go to Step 33. b. Check the following: <ul style="list-style-type: none"> o RCS pressure greater than 1625 psig [1825 psig adverse CNMT] o RCS subcooling based on core exit T/Cs greater than 0°F using FIG-1.0. FIGURE MIN SUBCOOLING <p><u>IF NOT. THEN</u> go to Step 35.</p> c. Do <u>NOT</u> stop SI pump. Go to Step 35. |
|---|--|

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 27 of 31
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33 Check If One Of Two SI Pumps Should Be Stopped:

- a. Two SI pumps - RUNNING a. Go to Step 34.
- b. Determine required RCS subcooling from table:

Charging Pump Availability	RCS Subcooling Criteria
NONE	120°F [200°F adverse CNMT]
ONE	115°F [190°F adverse CNMT]
TWO	105°F [180°F adverse CNMT]
THREE	100°F [175°F adverse CNMT]

- c. RCS subcooling based on core exit T/Cs - GREATER THAN VALUE FROM TABLE ABOVE USING FIG-1.0, FIGURE MIN SUBCOOLING c. Check the following:
 - o RCS pressure greater than 1625 psig [1825 psig adverse CNMT]
 - o RCS subcooling based on core exit T/Cs greater than 0°F using FIG-1.0, FIGURE MIN SUBCOOLING

IF NOT. THEN go to Step 35.
- d. PRZR level - GREATER THAN 13% [40% adverse CNMT] d. Do NOT stop SI pump. Go to Step 35.
- e. Stop one SI pump

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 28 of 31
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

34 Check If Last SI Pump Should Be Stopped:

- a. One SI pump - RUNNING
- b. Check the following:
 - o RCS subcooling based on core exit T/Cs greater than 0°F using FIG-1.0, FIGURE MIN SUBCOOLING
 - o RCS pressure greater than 1625 psig [1825 psig adverse CNMT]
- c. PRZR level - GREATER THAN 13% [40% adverse CNMT]
- d. Stop running SI pump
- e. Go to Step 37

- a. Go to Step 37.
- b. Go to Step 35.
- c. Do NOT stop SI pump. Go to Step 35.

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

35 Check PRZR PORVs And Associated Block Valves - ANY BLEED PATH OPEN

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

-OR-

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

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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.....

CAUTION

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

.....

36 Isolate PRZR Bleed Paths:

a. PRZR PORVs - BOTH OPEN

a. Perform the following:

- 1) Stop all but one charging pump.
- 2) Control charging flow as necessary to maintain RCS pressure and PRZR level.
- 3) Establish excess letdown as follows:
 - a) Place AOV-312 to NORMAL.
 - b) Ensure CCW pump running.
 - c) Manually open CCW from excess letdown Hx open (AOV-745).
 - d) Ensure excess letdown flow control valve, HCV-123 is closed, demand at 0.
 - e) Reset both trains of XY relays for MOV-313.
 - f) Open MOV-313.
 - g) Open excess letdown isolation valve AOV-310.
 - h) Slowly open HCV-123.

This Step continued on the next page.

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 30 of 31
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 36 continued from previous page)

b. Close one open PRZR PORV

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

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

-OR-

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

c. Return to Step 32

37 Check PRZR PORVs - BOTH CLOSED

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

38 Check If RHR Pumps Should Be Stopped:

a. RHR pumps - ANY RUNNING IN INJECTION MODE

a. Go to Step 39.

b. Check RCS pressure:

b. Go to appropriate plant procedure:

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

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

2) Pressure - STABLE OR INCREASING

-OR-

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

c. Stop RHR pumps and place in AUTO

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 31 of 31
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
39	Start Charging Pumps As Necessary And Control Charging Flow To Maintain PRZR Level	
40	Go To ES-1.1, SI TERMINATION, Step 8	
		-END-

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 1 of 1
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FR-H.1 APPENDIX LIST

TITLE

- 1) FIGURE MIN SUBCOOLING (FIG-1.0)
- 2) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
- 3) ATTACHMENT COND TO S/G (ATT-5.0)
- 4) ATTACHMENT N2 PORVS (ATT-12.0)
- 5) ATTACHMENT RHR COOL (ATT-14.1)
- 6) ATTACHMENT SAFW (ATT-5.1)
- 7) ATTACHMENT RESTORING FEED FLOW (ATT-22.0)
- 8) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 9) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
- 10) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2)
- 11) FOLDOUT

EOP: FR-H.1	TITLE: RESPONSE TO LOSS OF SECONDARY HEAT SINK	REV: 29 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-H series procedures.

1. LOSS OF SW CRITERIA

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

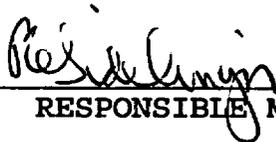
- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

EOP: FR-H.2	TITLE: RESPONSE TO STEAM GENERATOR OVERPRESSURE	REV: 5 PAGE 1 of 6
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23


RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: FR-H.2	TITLE: RESPONSE TO STEAM GENERATOR OVERPRESSURE	REV: 5 PAGE 2 of 6
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- A. PURPOSE - This procedure provides actions for an overpressure condition affecting any S/G where pressure has increased above the highest steamline safety valve setpoint.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS - This procedure is entered from:
 - a. F-0.3, HEAT SINK Critical Safety Function Status Tree on a YELLOW condition.

EOP: FR-H.2	TITLE: RESPONSE TO STEAM GENERATOR OVERPRESSURE	REV: 5 PAGE 3 of 6
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<u>NOTE:</u>	<ul style="list-style-type: none"> o Throughout this procedure, "affected" refers to any S/G in which pressure is greater than 1140 psig. o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr. o Foldout Page should be open and monitored periodically. 	
1 Identify Affected S/G(s):	<ul style="list-style-type: none"> a. Any S/G pressure - GREATER THAN 1140 PSIG 	<ul style="list-style-type: none"> a. Return to procedure and step in effect.
2 Verify FW Isolation To Affected S/G(s):	<ul style="list-style-type: none"> a. MFW pumps - TRIPPED b. MFW flow control valve(s) - CLOSED <ul style="list-style-type: none"> • MFW regulating valve(s) • MFW bypass valve(s) c. MFW pump discharge valve(s) - CLOSED 	<ul style="list-style-type: none"> a. Trip MFW pumps. b. Manually close valves. c. Manually close valves.
3 Check Affected S/G(s) Narrow Range Level - LESS THAN 90% [80% adverse CNMT]	Go to FR-H.3, RESPONSE TO STEAM GENERATOR HIGH LEVEL, Step 1.	

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION
 IF AFFECTED S/G NARROW RANGE LEVEL INCREASES TO GREATER THAN 90% [80% ADVERSE CNMT]. THEN AN EVALUATION SHOULD BE MADE FOR S/G OVERFILL CONSIDERATIONS. STEAM SHOULD NOT BE RELEASED FROM ANY S/G WITH LEVEL GREATER THAN 90% [80% ADVERSE CNMT) PRIOR TO OVERFILL EVALUATION.

4 Try To Dump Steam From The Affected S/G(s) :

Go to Step 6.

- o Open S/G ARVs
-OR-
- o Open MSIV bypass valves
-OR-
- o Open steam supply valves to TDAFW pump

5 Check Affected S/G(s) Pressure:

- a. Pressure - DECREASING
- b. Pressure - LESS THAN 1140 PSIG
- c. Control steam release to maintain S/G pressure less than 1140 psig
- d. Return to procedure and step in effect

- a. Go to Step 6.
- b. Return to Step 3.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

.....
CAUTION
 AFW FLOW SHOULD REMAIN ISOLATED TO AFFECTED S/G(S) UNTIL A STEAM RELEASE PATH IS ESTABLISHED.

6 Close AFW And SAFW Flow Control Valves To Affected S/G(s)

Stop pumps feeding affected S/G(s).

- o S/G A
 - MOV-4007 and AOV-4480, MDAFW pump
 - AOV-4297, TDAFW pump
 - MOV-9701A, SAFW pump
- o S/G B
 - MOV-4008 and AOV-4481, MDAFW pump
 - AOV-4298, TDAFW pump
 - MOV-9701B, SAFW pump

7 Check RCS Hot Leg Temperatures - LESS THAN 530°F

Cool down RCS to less than 530°F by dumping steam from the unaffected S/G.

EOP: FR-H.2	TITLE: RESPONSE TO STEAM GENERATOR OVERPRESSURE	REV: 5 PAGE 6 of 6
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**8 Continue Attempts To Manually
Or Locally Dump Steam From
Affected S/G(s):**

- o Open S/G ARVs
-OR-
- o Open steam supply valves to
TDAFW pump
-OR-
- o Dispatch AO to perform the
following:
 - a. Open affected S/G MSIV bypass
valve
 - b. Open both priming air ejector
steam isolation valves
 - V-3580
 - V-3581

**9 Return To Procedure And Step
In Effect**

-END-

EOP: FR-H.2	TITLE: RESPONSE TO STEAM GENERATOR OVERPRESSURE	REV: 5 PAGE 1 of 1
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FR-H.2 APPENDIX LIST

- 1) ATTACHMENT NO SW PUMPS (ATT-2.4) |
- 2) FOLDOUT |

EOP: FR-H.2	TITLE: RESPONSE TO STEAM GENERATOR OVERPRESSURE	REV: 5 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-H series procedures. |

1. LOSS OF SW CRITERIA |

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

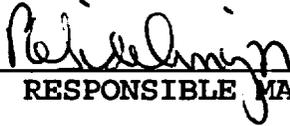
- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. |
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. |

EOP: FR-H.3	TITLE: RESPONSE TO STEAM GENERATOR HIGH LEVEL	REV: 6 PAGE 1 of 7
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GINNA STATION

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5-30-2003
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EOP: FR-H.3	TITLE: RESPONSE TO STEAM GENERATOR HIGH LEVEL	REV: 6 PAGE 2 of 7
--------------------	--	---------------------------

- A. PURPOSE - This procedure provides actions to respond to a S/G high level condition and to address the S/G overfill concern.
- B. ENTRY CONDITIONS/SYMPTOMS
1. ENTRY CONDITIONS - This procedure is entered from:
 - a. F-0.3, HEAT SINK Critical Safety Function Status Tree on a YELLOW condition, and
 - b. FR-H.2, RESPONSE TO STEAM GENERATOR OVERPRESSURE, if the affected S/G narrow range level is high.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

.....

CAUTION

- o IF S/G NARROW RANGE LEVEL HAS INCREASED TO GREATER THAN 90% [80% ADVERSE CNMT], THEN AN EVALUATION SHOULD BE MADE FOR S/G OVERFILL CONSIDERATIONS. STEAM SHOULD NOT BE RELEASED FROM ANY S/G WITH LEVEL GREATER THAN 90% [80% ADVERSE CNMT] PRIOR TO OVERFILL EVALUATION.
- o IF S/G OVERFILL IS EXPECTED AN ATTEMPT SHOULD BE MADE TO DISPATCH PERSONNEL TO PIN MAIN STEAMLINES.

.....

NOTE:

- o Throughout this procedure, "affected" refers to any S/G in which narrow range level is greater than 80%.
- o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr.
- o Foldout Page should be open and monitored periodically.

- | | |
|---|--|
| 1 Check Affected S/G(s) Narrow Range Level - GREATER THAN 80% | <u>IF</u> less than 80% in all S/Gs, <u>THEN</u> return to procedure and step in effect. |
| 2 Verify FW Isolation To Affected S/G(s): | |
| <ul style="list-style-type: none"> a. MFW pumps - TRIPPED b. MFW flow control valve(s) - CLOSED <ul style="list-style-type: none"> • MFW regulating valve(s) • MFW bypass valve(s) c. Verify both S/G pressures - GREATER THAN CONDENSATE HEADER PRESSURE | <ul style="list-style-type: none"> a. Trip MFW pumps. b. Manually close valves. c. Stop any running condensate pumps. |

EOP: FR-H.3	TITLE: RESPONSE TO STEAM GENERATOR HIGH LEVEL	REV: 6 PAGE 4 of 7
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Close AFW And SAFW Flow Control Valves To Affected S/G(s): <ul style="list-style-type: none">o S/G A<ul style="list-style-type: none">• MOV-4007 and AOV-4480, MDAFW pump• AOV-4297, TDAFW pump• MOV-9701A, SAFW pumpo S/G B<ul style="list-style-type: none">• MOV-4008 and AOV-4481, MDAFW pump• AOV-4298, TDAFW pump• MOV-9701B, SAFW pump	Stop pumps feeding affected S/G(s).

EOP:

FR-H.3

TITLE:

RESPONSE TO STEAM GENERATOR HIGH LEVEL

REV: 6

PAGE 5 of 7

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

4 Check Affected S/G(s) Level:

a. Narrow range level - LESS THAN
90% [80% adverse CNMT]

b. Narrow range level - DECREASING

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

d. Return to procedure and step in
effect

a. Go to Step 5.

b. IF affected S/G level continues
to increase, THEN perform the
following:

1) Dispatch A0 to locally
isolate affected S/G:

- o For S/G A, close MFW
regulating and bypass
valve outlet isolation
valves, V-3987 and V-3991

-OR-

- o For S/G B, close MFW
regulating and bypass
valve outlet isolation
valves, V-3986 and V-3990

2) Go to Step 5.

EOP:

FR-H.3

TITLE:

RESPONSE TO STEAM GENERATOR HIGH LEVEL

REV: 6

PAGE 6 of 7

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

5 Adjust Affected S/G(s) ARV
Setpoint To 1050 PSIG

.....

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.

.....

6 Close Affected S/G TDAFW Pump
Steam Supply Valve And Place
In PULL STOP

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

7 Close Affected S/G(s) MSIV
And Bypass Valves

8 Check Affected S/G(s)
Radiation Levels - NORMAL

- S/G blowdown, R-19
- S/G A, R-31
- S/G B, R-32

IF an E-3 or ECA-3 series procedure
is in effect, THEN return to
procedure and step in effect. IF
NOT, THEN go to E-3, STEAM
GENERATOR TUBE RUPTURE, Step 1.

EOP: FR-H.3	TITLE: RESPONSE TO STEAM GENERATOR HIGH LEVEL	REV: 6 PAGE 7 of 7
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

9 Establish Blowdown From Affected S/G(s) :

- a. Reset SI and CI
- b. Reset XY relays for affected S/G blowdown valves
- c. Place blowdown key switch for affected S/G to defeat
- d. Verify S/G blowdown valves - OPEN
- e. Dispatch A0 to establish blowdown to condenser or flash tank, as desired (Refer to T-14F, STEAM GENERATOR BLOWDOWN SYSTEM STARTUP)

10 Return To Procedure And Step In Effect

-END-

EOP: FR-H.3	TITLE: RESPONSE TO STEAM GENERATOR HIGH LEVEL	REV: 6 PAGE 1 of 1
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FR-H.3 APPENDIX LIST

- 1) ATTACHMENT NO SW PUMPS (ATT-2.4) |
- 2) FOLDOUT |

EOP: FR-H.3	TITLE: RESPONSE TO STEAM GENERATOR HIGH LEVEL	REV: 6 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-H series procedures.

1. LOSS OF SW CRITERIA

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

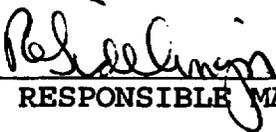
- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

EOP: FR-H.4	TITLE: RESPONSE TO LOSS OF NORMAL STEAM RELEASE CAPABILITIES	REV: 5 PAGE 1 of 5
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EOP: FR-H.4	TITLE: RESPONSE TO LOSS OF NORMAL STEAM RELEASE CAPABILITIES	REV: 5 PAGE 2 of 5
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A. PURPOSE - This procedure provides actions to respond to a failure of the S/G ARVs and Condenser Dump Valves.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from F-0.3, HEAT SINK Critical Safety Function Status Tree on a YELLOW condition.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

.....

CAUTION

IF AFFECTED S/G(S) NARROW RANGE LEVEL INCREASES TO GREATER THAN 90% [80% ADVERSE CNMT], THEN AN EVALUATION SHOULD BE MADE FOR S/G OVERFILL CONSIDERATIONS. STEAM SHOULD NOT BE RELEASED FROM ANY S/G WITH LEVEL GREATER THAN 90% [80% ADVERSE CNMT] PRIOR TO OVERFILL EVALUATION.

.....

- NOTE:
- o Throughout this procedure, "affected" refers to any S/G in which pressure is greater than 1085 psig.
 - o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10⁺⁰⁵ R/hr.
 - o Foldout Page should be open and monitored periodically.

1 Try To Restore Normal Steam Release Capability Of Affected S/G(s):

- a. Check if condenser available
 - o Affected S/G MSIV(s) - OPEN
 - o Either CW pump - RUNNING
 - o Condenser vacuum - GREATER THAN 20 INCHES HG

- a. Perform the following:
 - 1) Place affected S/G(s) ARV controller to manual and attempt to open ARV.

IF S/G ARV(s) can NOT be opened, THEN dispatch AO to check nitrogen supply to ARVs.
 - 2) Go to Step 2.

- b. Operate condenser steam dump manually:
 - 1) Place steam dump mode selector to MANUAL
 - 2) Place condenser steam dump controller to MANUAL
 - 3) Open steam dump valves as required

EOP: FR-H.4	TITLE: RESPONSE TO LOSS OF NORMAL STEAM RELEASE CAPABILITIES	REV: 5 PAGE 4 of 5
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2 Check RCP Status:	a. RCPs - BOTH RUNNING b. Stop RCP in affected loop	a. Go to Step 3.
3 Check S/G Pressures - LESS THAN 1085 PSIG		Perform the following: a. Manually open affected S/G(s) TDAFW pump steam supply valves <ul style="list-style-type: none"> • S/G A. MOV-3505A • S/G B. MOV-3504A b. Dispatch AO to perform the following: <ol style="list-style-type: none"> 1) Open affected S/G MSIV bypass valve. 2) Open priming air ejector steam isolation valves. <ul style="list-style-type: none"> • V-3580 • V-3581 c. Local operation of affected S/G ARV may be attempted. (Establish communications with control room.)

EOP: FR-H.4	TITLE: RESPONSE TO LOSS OF NORMAL STEAM RELEASE CAPABILITIES	REV: 5 PAGE 5 of 5
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Return To Procedure And Step In Effect	-END-

EOP: FR-H.4	TITLE: RESPONSE TO LOSS OF NORMAL STEAM RELEASE CAPABILITIES	REV: 5 PAGE 1 of 1
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FR-H.4 APPENDIX LIST

- 1) ATTACHMENT NO SW PUMPS (ATT-2.4) |
- 2) FOLDOUT |

EOP: FR-H.4	TITLE: RESPONSE TO LOSS OF NORMAL STEAM RELEASE CAPABILITIES	REV: 5 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-H series procedures. |

1. LOSS OF SW CRITERIA |

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

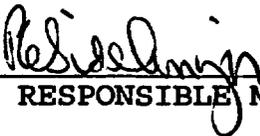
- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. |
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. |

EOP: FR-H.5	TITLE: RESPONSE TO STEAM GENERATOR LOW LEVEL	REV: 9 PAGE 1 of 5
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EOP: FR-H.5	TITLE: RESPONSE TO STEAM GENERATOR LOW LEVEL	REV: 9 PAGE 2 of 5
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A. PURPOSE - This procedure provides actions to respond to a S/G low level condition.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

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

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

.....
CAUTION
 STEAM RELEASES FROM AFFECTED S/G(S) SHOULD BE MINIMIZED.

- NOTE:
- o Throughout this procedure "affected" refers to any S/G in which narrow range level is less than 5% [25% adverse CNMT].
 - o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10⁺⁰⁵ R/hr.
 - o Foldout Page should be open and monitored periodically.

1 Identify Affected S/G(s) :

- | | |
|---|--|
| <ul style="list-style-type: none"> a. Narrow range level - LESS THAN 5% [25% adverse CNMT] | <ul style="list-style-type: none"> a. Return to procedure and step in effect. |
|---|--|

2 Verify S/G Blowdown Isolation Valves From Affected S/G(s) - CLOSED

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

Place S/G blowdown valves master switch to CLOSE.

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

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

EOP: FR-H.5	TITLE: RESPONSE TO STEAM GENERATOR LOW LEVEL	REV: 9 PAGE 4 of 5
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3 Check If Affected S/G(s) Secondary Side Is Intact:	<ul style="list-style-type: none"> o Pressure in affected S/G(s) - STABLE OR INCREASING o Pressure in affected S/G(s) - GREATER THAN 110 PSIG 	<p><u>IF</u> affected S/G(s) previously identified as faulted, <u>THEN</u> return to procedure and step in effect.</p> <p><u>IF</u> affected S/G pressure decreasing in an uncontrolled manner or completely depressurized and has not been previously isolated, <u>THEN</u> go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.</p>
4 Check AFW Flow To Affected S/G(s) - GREATER THAN 50 GPM		<p><u>IF</u> affected S/G(s) wide range level greater than 50 inches [100 inches adverse CNMT], <u>THEN</u> establish AFW flow as necessary to refill affected S/G(s).</p> <p><u>IF</u> affected S/G(s) wide range level less than 50 inches [100 inches adverse CNMT], <u>THEN</u> do not establish AFW flow to affected S/G(s). Consult the plant engineering staff to evaluate refilling the affected S/G(s) as part of long-term plant recovery and go to Step 6.</p>
5 Continue Filling Affected S/G(s) Until Narrow Range Level Greater Than 5% [25% adverse CNMT]		

EOP: FR-H.5	TITLE: RESPONSE TO STEAM GENERATOR LOW LEVEL	REV: 9 PAGE 5 of 5
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

6 Return To Procedure And Step
In Effect

-END-

EOP: FR-H.5	TITLE: RESPONSE TO STEAM GENERATOR LOW LEVEL	REV: 9 PAGE 1 of 1
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FR-H.5 APPENDIX LIST

- 1) ATTACHMENT NO SW PUMPS (ATT-2.4) |
- 2) FOLDOUT |

EOP: FR-H.5	TITLE: RESPONSE TO STEAM GENERATOR LOW LEVEL	REV: 9 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-H series procedures. |

1. LOSS OF SW CRITERIA |

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

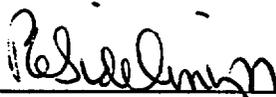
- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. |
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. |

EOP: FR-P.1	TITLE: RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION	REV: 26 PAGE 1 of 23
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5-30-2003

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EOP: FR-P.1	TITLE: RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION	REV: 26 PAGE 2 of 23
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A. PURPOSE - This procedure provides actions to avoid, or limit, thermal shock or pressurized thermal shock to the reactor pressure vessel, or overpressure conditions at low temperature.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. F-0.4, INTEGRITY Critical Safety Function Status Tree, on either a RED or ORANGE condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
------	--------------------------	-----------------------

.....

CAUTION

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 THE AFW PUMPS).

.....

- NOTE:
- o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr.
 - o Foldout Page should be open and monitored periodically.

1 Check RCS Pressure - GREATER THAN 250 PSIG [465 PSIG adverse CNMT]

IF RHR flow greater than 475 gpm. THEN return to procedure and step in effect.

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.

.....

2 Check RCS Cold Leg
Temperatures - STABLE OR
INCREASING

Try to stop RCS cooldown:

- a. Ensure S/G ARVs closed.
- b. Close both S/G MSIVs.
- c. Ensure MFW flow control valves closed.
 - MFW regulating valves
 - MFW bypass valves
- d. Ensure MFW pumps tripped.
- e. Ensure reheater steam supply valves are closed.
- f. IF S/G pressure less than condensate pressure, THEN stop all condensate pumps.
- g. IF RHR system in service, THEN stop any cooldown from RHR system.
- h. Control total feed flow to non-faulted S/G(s) greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in at least one non-faulted S/G. WHEN S/G level greater than 5% [25% adverse CNMT] in one non-faulted S/G, THEN limit feed flow to stop RCS cooldown.

EOP: FR-P.1	TITLE: RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION	REV: 26 PAGE 5 of 23
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: A faulted S/G is any S/G that is depressurizing in an uncontrolled manner or is completely depressurized.

3 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

Minimize cooldown from faulted S/G(s):

- a. Close faulted S/G(s) TDAFW pump steam supply valve(s).
 - S/G A, MOV-3505A
 - S/G B, MOV-3504A
- b. IF both S/G(s) faulted, THEN control feed flow at 50 gpm to each S/G.
- c. IF any S/G NOT faulted, THEN isolate all feedwater to faulted S/G unless necessary for RCS temperature control. IF a faulted S/G is necessary for RCS temperature control, THEN control feed flow at 50 gpm to that S/G.

4 Check PRZR PORV Block Valves:

- a. Power to PORV block valves - AVAILABLE
- b. Block valves - AT LEAST ONE OPEN

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

IF at least one block valve can NOT be opened, THEN dispatch A0 to locally check breaker.

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

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

.....
CAUTION
 IF ANY PRZR PORV OPENS BECAUSE OF HIGH PRZR PRESSURE, THEN STEP 5 SHOULD BE PERFORMED AFTER PRESSURE DECREASES TO LESS THAN THE APPLICABLE PORV SETPOINT.

5 Check PRZR PORV Status:

- | | |
|---|--|
| a. Check Reactor Vessel Overpressure Protection System - IN SERVICE | a. Go to Step 5d. |
| b. Check RCS pressure - LESS THAN 410 PSIG | b. Perform the following:
1) Ensure at least one PRZR PORV open.
2) Continue with Step 6. <u>WHEN</u> pressure less than setpoint, <u>THEN</u> do Step 5e. |
| c. Go to Step 5e | |
| d. PRZR pressure - LESS THAN 2335 PSIG | d. Perform the following:
1) Ensure at least one PRZR PORV open.
2) Continue with Step 6. <u>WHEN</u> pressure less than setpoint, <u>THEN</u> do Step 5e. |
| e. Verify PRZR PORVs - CLOSED | e. Manually close valve.

<u>IF</u> any valve can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve. |

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

6 Check SI Pumps - ANY RUNNING

Go to Step 14.

7 Check If SI Can Be Terminated:

Perform the following:

- o RCS subcooling based on core exit T/Cs - GREATER THAN 50°F USING FIG-1.0, FIGURE MIN SUBCOOLING
 - o Check RVLIS indication:
 - o Level (no RCPs) - GREATER THAN 77% [82% adverse CNMT]
- OR-
- o Fluid fraction (any RCP running) - GREATER THAN 84%

- a. IF RCS subcooling based on core exit T/Cs greater than 0°F using FIG-1.0, FIGURE MIN SUBCOOLING and no RCP running. THEN attempt 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) IF conditions established, THEN start one RCP.
- b. Go to Step 28.

.....

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

9 Stop SI And RHR Pumps And
Place In AUTO

10 Reset CI:

- a. Depress CI reset pushbutton
- b. Verify annunciator A-26, CNMT
ISOLATION - EXTINGUISHED

b. Perform the following:

- 1) Reset SI.
- 2) Depress CI reset pushbutton.

11 Verify Adequate SW Flow:

- a. Check at least two SW pumps -
RUNNING

a. Manually start SW pumps as power
supply permits (257 kw each).

IF less than two SW pumps
running, THEN perform the
following:

- 1) Ensure SW isolation.
- 2) IF NO SW pumps running, THEN
perform the following:
 - a) Pull stop any D/G that is
NOT supplied by alternate
cooling. AND immediately
depress associated VOLTAGE
SHUTDOWN pushbutton.
 - b) Refer to ATT-2.4,
ATTACHMENT NO SW PUMPS.
- 3) IF only one SW pump running,
THEN refer to AP-SW.2. LOSS
OF SERVICE WATER.

- b. Dispatch AO to establish normal
shutdown alignment (Refer to
ATT-17.0, ATTACHMENT SD-1)

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

12 Establish IA to CNMT:

a. Verify non-safeguards busses energized from offsite power

- o Bus 13 normal feed - CLOSED

-OR-

- o Bus 15 normal feed - CLOSED

b. Check SW pumps - AT LEAST TWO PUMPS RUNNING

a. Perform the following:

- 1) Close non-safeguards bus tie breakers:

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

- 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each).

IF NOT, THEN perform the following:

- o Start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR)

-OR-

- o Evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS).

- 3) WHEN bus 15 restored, THEN reset control room lighting.

b. Perform the following:

- 1) Restore IA using service air compressor OR diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).

- 2) Go to Step 12d.

This Step continued on the next page.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 12 continued from previous page)

c. Verify SW isolation valves to turbine building - OPEN

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

d. Verify adequate air compressor(s) - RUNNING

e. Check IA supply:

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

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

g. Verify IA to CNMT AOV-5392 - OPEN

c. Perform the following:

- 1) Manually align valves.
- 2) Dispatch AO to locally reset compressors as necessary.

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

e. Perform the following:

- 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR).
- 2) Continue with Step 13. WHEN IA restored, THEN do Steps 12f and g.

EOP: FR-P.1	TITLE: RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION	REV: 26 PAGE 11 of 23
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13 Check If Charging Flow Has Been Established:	a. Charging pumps - ANY RUNNING	<p>a. Perform the following:</p> <ol style="list-style-type: none"> 1) <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high. <u>THEN</u> dispatch AO to locally close seal injection needle valve(s) to affected RCP: <ul style="list-style-type: none"> • RCP A, V-300A • RCP B, V-300B 2) Ensure HCV-142 open. demand at 0%. <p>b. <u>IF</u> LCV-112B can <u>NOT</u> be opened. <u>THEN</u> dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room).</p> <p><u>IF</u> LCV-112C can <u>NOT</u> be closed. <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> 1) Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room). 2) Verify charging pump A <u>NOT</u> running and place in PULL STOP. 3) <u>WHEN</u> V-358 open. <u>THEN</u> direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
	<p>b. Align charging pump suction to RWST:</p> <ul style="list-style-type: none"> o LCV-112B - OPEN o LCV-112C - CLOSED 	
	<p>c. Start charging pumps as necessary to establish charging line flow to REGEN HX - GREATER THAN 20 GPM</p>	

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

***14 Monitor SI Reinitiation Criteria:**

- o RCS subcooling based on core exit T/Cs - GREATER THAN FIG-1.0, FIGURE MIN SUBCOOLING
 - o RVLIS indication:
 - o Level - GREATER THAN 77% [82% adverse CNMT]
- OR-
- o Fluid fraction (any RCP running) - GREATER THAN 84%

Manually start SI pumps as necessary and perform the following:

- a. IF RCS subcooling based on core exit T/Cs greater than FIG-1.0, FIGURE MIN SUBCOOLING and no RCP running, THEN attempt to start a RCP:
 - 1) Establish conditions for starting an RCP:
 - o Bus 11A or 11B energized
 - o Refer to ATT-15.0, ATTACHMENT RCP START
 - 2) IF conditions established, THEN start one RCP.
- b. Go to Step 28.

15 Check RCS Hot Leg Temperatures - STABLE

IF increasing, THEN control feed flow and dump steam to stabilize RCS hot leg temperatures.

IF decreasing, THEN verify that actions of Step 2 and 3 have been performed before continuing with procedure.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

16 Check If SI ACCUMs Should Be Isolated:

- a. Check the following:
 - o RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING
 - o RVLIS indication:
 - o Level - GREATER THAN 77% [82% adverse CNMT]
 - OR-
 - o Fluid fraction (any RCP running) - GREATER THAN 84%
- 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
- d. Locally reopen breakers for MOV-841 and MOV-865

a. Return to Step 14.

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.
 - 3) Continue with Step 17. Do NOT decrease RCS pressure to less than unisolated ACCUM pressure.
- IF an accumulator can NOT be isolated or vented, THEN consult TSC to determine contingency actions.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

.....

CAUTION

- o THE RCS SHOULD NOT BE DEPRESSURIZED TO LESS THAN SI ACCUM PRESSURE UNTIL SI ACCUMS ISOLATED.
- o THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION IF RCPS ARE NOT RUNNING. THIS WILL RESULT IN A RAPIDLY INCREASING PRZR LEVEL.

.....

- NOTE:
- o 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.

17 Depressurize RCS To Decrease RCS Subcooling:

- a. Depressurize using normal PRZR spray if available
 - a. IF normal spray NOT available. THEN use one PRZR PORV. IF IA NOT available. THEN refer to ATT-12.0, ATTACHMENT N2 PORVS.
 - IF no PRZR PORV available. THEN use auxiliary spray valve (AOV-296).
- b. Depressurize RCS until one 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]
 - OR-
 - o RCS pressure - LESS THAN 160 psig [200 psig adverse CNMT]
- c. Stop RCS depressurization

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
------	--------------------------	-----------------------

***18 Monitor RCP Operation:**

- | | |
|--|---|
| <ul style="list-style-type: none"> a. RCPs - ANY RUNNING b. Check the following: <ul style="list-style-type: none"> o RCP #1 seal D/P - GREATER THAN 220 PSID o RCP #1 seal leakoff - WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0, FIGURE RCP SEAL LEAKOFF | <ul style="list-style-type: none"> a. Go to Step 19. b. Stop affected RCP(s). |
|--|---|

.....

CAUTION

AN INCREASE IN RCS PRESSURE MAY RESULT IN EXCESSIVE REACTOR VESSEL STRESS. RCS PRESSURE AND TEMPERATURE SHOULD BE MAINTAINED STABLE WHILE PERFORMING SUBSEQUENT STEPS IN THIS PROCEDURE.

.....

- | | |
|---|---|
| <p>19 Check PRZR Level - GREATER THAN 13% [40% adverse CNMT]</p> | <p>Try to restore level with charging while maintaining stable RCS pressure. <u>IF</u> level can <u>NOT</u> be restored, <u>THEN</u> go to Step 27.</p> |
|---|---|



20 Verify Adequate SW Flow To CCW Hx:

a. Verify at least two SW pumps - RUNNING

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

1) IF NO SW pumps running, THEN perform the following:

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

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

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

3) Go to Step 25.

WHEN two SW pumps can be operated THEN do Steps 21 through 24.

b. Verify AUX BLDG SW isolation valves - OPEN

b. Manually align valves.

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

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

c. Manually start an additional SW pump as power supply permits (257 kw each).

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

21 Check If Normal CVCS
Operation Can Be Established

a. Verify IA restored:

- o IA to CNMT (AOV-5392) - OPEN
- o IA pressure - GREATER THAN
60 PSIG

b. Verify instrument bus D -
ENERGIZED

c. CCW pumps - ANY RUNNING

d. Charging pump - ANY RUNNING

a. Continue with Step 25. WHEN IA restored, THEN do Steps 21 through 24.

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. 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. Continue with Step 26. WHEN any charging pump running, THEN do Steps 22 through 26.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

.....

CAUTION

IF RCS PRESSURE LESS THAN 250 PSIG, THEN PCV-135 SHOULD BE ADJUSTED TO ESTABLISH DESIRED LETDOWN FLOW, NOT TO INCREASE PRESSURE.

.....

22 Establish Normal Letdown:

- a. Establish charging line flow to REGEN Hx - GREATER THAN 20 GPM
- b. Place the following switches to CLOSE:
 - Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202)
 - AOV-371, letdown isolation valve
 - AOV-427, loop B cold leg to REGEN Hx
- c. Place letdown controllers in MANUAL at 40% open
 - TCV-130
 - PCV-135
- d. Reset both trains of XY relays for AOV-371 and AOV-427
- e. Open AOV-371 and AOV-427
- f. Open letdown orifice valves as necessary
- g. Place TCV-130 in AUTO at 105°F
- h. Place PCV-135 in AUTO at 250 psig
- i. Adjust charging pump speed and HCV-142 as necessary

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

23 Check VCT Makeup System:

- | | |
|---|---|
| <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 1) RMW mode selector switch in AUTO 2) RMW control armed - RED LIGHT LIT d. Check VCT level: <ul style="list-style-type: none"> o Level - GREATER THAN 20%
-OR- o Level - STABLE OR INCREASING | <ul style="list-style-type: none"> c. Adjust controls as necessary. d. Manually increase VCT makeup flow as follows: <ul style="list-style-type: none"> 1) Ensure BA transfer pumps and RMW pumps running. <u>IF NOT, THEN</u> 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

24 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 25. WHEN VCT level greater than 40%, THEN do Step 24b.

b. Verify charging pumps aligned to VCT

b. Manually align valves as necessary.

o LCV-112C - OPEN

o LCV-112B - CLOSED

25 Check PRZR Level - LESS THAN
75% [65% adverse CNMT]

Control charging and letdown as necessary to reduce PRZR level to less than 75% [65% adverse CNMT]. If necessary establish excess letdown.

IF no letdown available AND CCW to RCPs established, THEN cycle charging pumps as necessary to control PRZR level.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: For optimum long term pressure control, saturated conditions should be restored in the PRZR.

26 Verify PRZR Liquid Temperature (TI-424) - AT SATURATION FOR DESIRED PRESSURE

IF PRZR liquid temperature low, THEN energize PRZR heaters as necessary to establish desired temperature.

27 Check RCS Subcooling Based On Core Exit T/Cs - LESS THAN 10°F USING FIG-1.0, FIGURE MIN SUBCOOLING

IF RCS pressure less than 160 psig [200 psig adverse CNMT], THEN go to Step 28. IF NOT, THEN depressurize using normal spray. Return to step 17b.

IF normal spray NOT available and letdown is in service, THEN use auxiliary spray for any further depressurization. Return to Step 17b.

IF auxiliary spray NOT available, THEN return to Step 17a.

28 Check Cool Down Rate In RCS Cold Legs - GREATER THAN 100°F IN ANY 60 MINUTES PERIOD

Return to procedure and step in effect.

29 Maintain RCS Pressure And Temperature Stable For At Least 1 Hour

- a. Control steam dump and feed flow as necessary
- b. Perform actions of other procedures in effect which do not cool down the RCS or increase RCS pressure until the RCS temperature soak has been completed

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: The following pressure, temperature and cooldown rate limits remain applicable in subsequent procedures.

30 WHEN 1 HOUR Soak Is Complete, THEN Continue RCS Cooldown And Depressurization As Necessary

- a. Maintain RCS pressure and cold leg temperature within the limits of FIG-11.0, FIGURE SOAK LIMITS
- b. Establish and maintain cooldown rate in RCS cold legs - LESS THAN 50°F IN ANY 60 MINUTES PERIOD

31 Verify SI Flow Not Required:

- o RCS subcooling based on core exit T/Cs - GREATER THAN FIG-1.0, FIGURE MIN SUBCOOLING
- o RVLIS indication:
 - o Level - GREATER THAN 77% [82% adverse CNMT]
 - OR-
 - o Fluid fraction (any RCP running) - GREATER THAN 84%

Manually start SI pumps as necessary.

IF RCS subcooling based on core exit T/Cs greater than FIG-1.0, FIGURE MIN SUBCOOLING and no RCP running, THEN perform the following:

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

EOP: FR-P.1	TITLE: RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION	REV: 26 PAGE 23 of 23
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

32 Return To Procedure And Step
In Effect

-END-

EOP: FR-P.1	TITLE: RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION	REV: 26 PAGE 1 of 1
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FR-P.1 APPENDIX LIST

TITLE

- 1) FIGURE MIN SUBCOOLING (FIG-1.0)
- 2) FIGURE SOAK LIMITS (FIG-11.0)
- 3) FIGURE RCP SEAL LEAKOFF (FIG-4.0)
- 4) ATTACHMENT RCP START (ATT-15.0)
- 5) ATTACHMENT SD-1 (ATT-17.0)
- 6) ATTACHMENT CNMT RECIRC FANS (ATT-4.0)
- 7) ATTACHMENT N2 PORVS (ATT-12.0)
- 8) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 9) ATTACHMENT LOSS OF OFFSITE POWER (ATT-8.5)
- 10) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2) |
- 10) FOLDOUT |

EOP: FR-P.1	TITLE: RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION	REV: 26 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-P series procedures. |

1. LOSS OF SW CRITERIA |

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

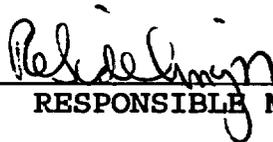
- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. |
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. |

EOP: FR-P.2	TITLE: RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION	REV: 8 PAGE 1 of 6
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23


RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: FR-P.2	TITLE: RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION	REV: 8 PAGE 2 of 6
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- A. PURPOSE - This procedure provides actions to respond to a limited overcooling condition or to an overpressure condition at low temperature.

- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS - This procedure is entered from:
 - a. F-0.4, INTEGRITY Critical Safety Function Status Tree, on either branch YELLOW condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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.....

CAUTION

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

.....

NOTE:

- o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr.
- o Foldout Page should be open and monitored periodically.

1 Check RCS Cold Leg
Temperatures - STABLE OR
INCREASING

- Try to stop RCS cooldown:
- a. Ensure S/G ARVs closed.
 - b. Close both S/G MSIVs.
 - c. Ensure MFW flow control valves closed.
 - MFW regulating valves
 - MFW bypass valves
 - d. Ensure MFW pumps tripped.
 - e. IF S/G pressure less than condensate pressure, THEN stop all condensate pumps.
 - f. IF RHR system in service, THEN stop any cooldown from RHR system.
 - g. Control total feed flow to non-faulted S/G(s) greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in at least one non-faulted S/G. WHEN S/G level greater than 5% [25% adverse CNMT] in one non-faulted S/G, THEN limit feed flow to stop RCS cooldown.

EOP: FR-P.2	TITLE: RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION	REV: 8 PAGE 4 of 6
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: A faulted S/G is any S/G that is depressurizing in an uncontrolled manner or is completely depressurized.

2 Check If SG Secondary Side Is Intact:

- o Pressure in both S/Gs - STABLE OR INCREASING
- o Pressure in both S/Gs - GREATER THAN 110 PSIG

Minimize cooldown from faulted S/G(s):

- a. Close faulted S/G(s) TDAFW pump steam supply valve(s).
 - S/G A, MOV-3505A
 - S/G B, MOV-3504A
- b. IF both S/G(s) faulted, THEN control feed flow at 50 gpm to each S/G.
- c. IF any S/G NOT faulted, THEN isolate all feedwater to faulted S/G(s) unless necessary for RCS temperature control. IF a faulted S/G is necessary for RCS temperature control, THEN control feed flow at 50 gpm to that S/G.

3 Check If SI Has Been Terminated - NO SI PUMPS RUNNING

Go to Step 7.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION
 IF RHR NORMAL COOLING IN SERVICE, THEN RCS PRESSURE SHOULD BE MAINTAINED LESS THAN THE RCS OVERPRESSURE PROTECTION SETPOINT (410 PSIG).

4 Check RCS Cold Leg Temperature - GREATER THAN 330° F

IF normal RHR cooling NOT in service, THEN verify the following:

- o MOV-700 or MOV-701 closed
- o MOV-720 or MOV-721 closed

IF normal RHR cooling in service, THEN perform the following:

- a. Reduce RCS pressure to less than 410 psig.
- b. Place RCS overpressure protection system in service (Refer to 0-7, ALIGNMENT AND OPERATION OF THE REACTOR VESSEL OVERPRESSURE PROTECTION SYSTEM)

5 Check RCS Pressure - WITHIN LIMITS OF FIG-9.0, FIGURE TECH SPEC C/D FOR 100° F/HR

Decrease RCS pressure to within limits of FIG-9.0, FIGURE TECH SPEC C/D using normal PRZR spray. IF normal spray NOT available and letdown is in service, THEN use auxiliary spray. IF auxiliary spray NOT available, THEN use one PRZR PORV. IF IA NOT available for PORV, THEN refer to ATT-12.0, ATTACHMENT N2 PORVS.

EOP: FR-P.2	TITLE: RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION	REV: 8 PAGE 6 of 6
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**6 Determine If Additional RCS
Cooldown Restrictions Are
Required:**

- | | |
|--|---|
| <p>a. Cooldown rate in RCS cold legs -
GREATER THAN 100°F IN ANY
60 MINUTES PERIOD</p> <p>b. RCS cooldown is permitted with
the following restrictions:</p> <p>1) Maintain RCS pressure and
cold leg temperatures within
the limits of FIG-9.1. FIGURE
C/D LIMITS</p> <p>2) Maintain cooldown rate in RCS
cold legs less than 100°F in
any 60 minutes period</p> | <p>a. Additional restrictions are not
required. Go to Step 7.</p> |
|--|---|

**7 Return To Procedure And Step
In Effect**

-END-

EOP: FR-P.2	TITLE: RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION	REV: 8 PAGE 1 of 1
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FR-P.2 APPENDIX LIST

TITLE

- 1) FIGURE TECH SPEC C/D (FIG-9.0)
- 2) FIGURE C/D LIMITS (FIG-9.1)
- 3) ATTACHMENT N2 PORVS (ATT-12.0)
- 4) ATTACHMENT NO SW PUMPS (ATT-2.4) |
- 5) FOLDOUT | |

EOP: FR-P.2	TITLE: RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION	REV: 8 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-P series procedures. |

1. LOSS OF SW CRITERIA |

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

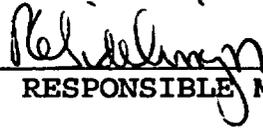
- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. |
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. |

EOP: FR-Z.1	TITLE: RESPONSE TO HIGH CONTAINMENT PRESSURE	REV: 7 PAGE 1 of 7
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23



RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: FR-Z.1	TITLE: RESPONSE TO HIGH CONTAINMENT PRESSURE	REV: 7 PAGE 2 of 7
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- A. PURPOSE - This procedure provides actions to respond to a high CNMT pressure.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS - This procedure is entered from:
 - a. F-0.5, CONTAINMENT Critical Safety Function Status Tree, on a RED or ORANGE condition.

EOP: FR-Z.1	TITLE: RESPONSE TO HIGH CONTAINMENT PRESSURE	REV: 7 PAGE 3 of 7
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: FOLDOUT Page should be open and monitored periodically.

1 Verify All CI And CVI Valve
Status Lights - BRIGHT

IF flow path NOT required, THEN
manually close CI and CVI valves.
IF valves can NOT be verified
closed by MCB indication, THEN
dispatch AO to locally close
valves. (Refer to ATT-3.0,
ATTACHMENT CI/CVI).

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION
 IF ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, IS IN EFFECT, THEN CNMT SPRAY SHOULD BE OPERATED AS DIRECTED IN ECA-1.1, RATHER THAN STEP 2 BELOW.

2 Verify CNMT Spray Actuated:

- | | |
|---|---|
| <p>a. Verify RWST outlet to SI and CNMT spray pumps - OPEN</p> <ul style="list-style-type: none"> • MOV-896A • MOV-896B <p>b. Verify CNMT spray pumps - RUNNING</p> <p>c. Verify NaOH flow (FI-930)</p> <p>d. Verify CNMT spray pump discharge valves - OPEN</p> <ul style="list-style-type: none"> • MOV-860A • MOV-860B • MOV-860C • MOV-860D | <p>a. <u>IF</u> in RHR recirculation mode, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> 1) Operate SI pumps and one CNMT spray pump as directed in ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 14. 2) Go to Step 3. <p>b. Manually start pumps.</p> <p>c. <u>IF</u> NaOH flow <u>NOT</u> indicated, <u>THEN</u> place switches for NaOH tank outlet valves to OPEN.</p> <ul style="list-style-type: none"> • AOV-836A • AOV-836B <p>d. Ensure at least one in each set open.</p> <ul style="list-style-type: none"> • MOV-860A or MOV-860B • MOV-860C or MOV-860D |
|---|---|

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

3 Verify CNMT RECIRC Fans Running:

- a. All fans - RUNNING
- b. Charcoal filter dampers green status lights - EXTINGUISHED

- a. Manually start fans.
- b. Dispatch personnel to relay room with relay rack key to locally open dampers by pushing in trip relay plungers.
 - AUX RELAY RACK RA-2 for fan A
 - AUX RELAY RACK RA-3 for fan C

4 Verify MSIVs - CLOSED

Manually close valves.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

.....

CAUTION

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

.....

5 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

Isolate feed flow to faulted S/G:

- a. Ensure faulted S/G MDAFW pump discharge valve closed.
 - S/G A, MOV-4007
 - S/G B, MOV-4008
- b. Ensure faulted S/G TDAFW flow control valve closed.
 - S/G A, AOV-4297
 - S/G B, AOV-4298
- c. Ensure 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
- d. Ensure MFW pump discharge valves closed.

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

EOP: FR-Z.1	TITLE: RESPONSE TO HIGH CONTAINMENT PRESSURE	REV: 7 PAGE 7 of 7
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

6 Return To Procedure And Step
In Effect

-END-

EOP: FR-Z.1	TITLE: RESPONSE TO HIGH CONTAINMENT PRESSURE	REV: 7 PAGE 1 of 1
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FR-Z.1 APPENDIX LIST

TITLE

- 1) ATTACHMENT CI/CVI (ATT-3.0)
- 2) ATTACHMENT NO SW PUMPS (ATT-2.4) |
- 3) FOLDOUT |

EOP: FR-Z.1	TITLE: RESPONSE TO HIGH CONTAINMENT PRESSURE	REV: 7 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-Z series procedures. |

1. LOSS OF SW CRITERIA |

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

- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. |
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. |

EOP: FR-Z.2	TITLE: RESPONSE TO CONTAINMENT FLOODING	REV: 5 PAGE 1 of 4
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EOP: FR-Z.2	TITLE: RESPONSE TO CONTAINMENT FLOODING	REV: 5 PAGE 2 of 4
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A. PURPOSE - This procedure provides actions to respond to CNMT flooding.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

a. F-0.5, CONTAINMENT Critical Safety Function Status Tree, on an ORANGE condition.

EOP: FR-Z.2	TITLE: RESPONSE TO CONTAINMENT FLOODING	REV: 5 PAGE 3 of 4
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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NOTE: Foldout Page should be open and monitored periodically.

1 Try To Identify Unexpected Source Of Water To Sump:

Isolate suspect flow paths if possible.

- o Service water indications
 - o Annunciator C-10, CONTAINMENT RECIRC CLRS WATER OUTLET LO FLOW 1050 GPM - EXTINGUISHED
 - o Both SW header pressures - APPROXIMATELY EQUAL
- o Check CNMT fire system isolation valve (AOV-9227) - CLOSED
- o Check CCW surge tank level - STABLE
- o Check reactor makeup water tank level - STABLE
- o Check AFW pump discharge pressure - GREATER THAN S/G PRESSURE
- o Verify MFW pumps - TRIPPED

2 Direct RP To Sample CNMT Sump For The Following:

- Activity
- Boron
- Chromates

EOP:

FR-Z.2

TITLE:

RESPONSE TO CONTAINMENT FLOODING

REV: 5

PAGE 4 of 4

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

3 Notify Plant Staff Of Sump
Level And Activity Level To
Obtain Recommended Action

4 Return To Procedure And Step
In Effect

-END-

EOP: FR-Z.2	TITLE: RESPONSE TO CONTAINMENT FLOODING	REV: 5 PAGE 1 of 1
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FR-Z.2 APPENDIX LIST

- 1) ATTACHMENT NO SW PUMPS (ATT-2.4) |
- 2) FOLDOUT |

EOP: FR-Z.2	TITLE: RESPONSE TO CONTAINMENT FLOODING	REV: 5 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-Z series procedures. |

1. LOSS OF SW CRITERIA |

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

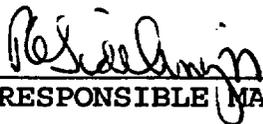
- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. |
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. |

EOP: FR-Z.3	TITLE: RESPONSE TO HIGH CONTAINMENT RADIATION LEVEL	REV: 5 PAGE 1 of 3
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REVIEWED BY: _____

EOP: FR-Z.3	TITLE: RESPONSE TO HIGH CONTAINMENT RADIATION LEVEL	REV: 5 PAGE 2 of 3
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- A. PURPOSE - This procedure provides actions to respond to high containment radiation levels.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS - This procedure is entered from:
 - a. F-0.5, CONTAINMENT Critical Safety Function Status Tree, on a YELLOW condition.

EOP: FR-Z.3	TITLE: RESPONSE TO HIGH CONTAINMENT RADIATION LEVEL	REV: 5 PAGE 3 of 3
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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NOTE: Foldout Page should be open and monitored periodically. |

1 Verify CVI Valve Status
Lights - BRIGHT

Manually close CVI dampers and valves.

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

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

3 Notify TSC Of CNMT Radiation
Level To Obtain Recommended
Actions

4 Return To Procedure and Step
In Effect

-END-

EOP: FR-Z.3	TITLE: RESPONSE TO HIGH CONTAINMENT RADIATION LEVEL	REV: 5 PAGE 1 of 1
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FR-Z.3 APPENDIX LIST

- 1) ATTACHMENT NO SW PUMPS (ATT-2.4) |
- 2) FOLDOUT |

EOP: FR-Z.3	TITLE: RESPONSE TO HIGH CONTAINMENT RADIATION LEVEL	REV: 5 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-Z series procedures.

1. LOSS OF SW CRITERIA

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

- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 16 PAGE 1 of 15
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Richard [Signature]
RESPONSIBLE MANAGER

5-30-2003
EFFECTIVE DATE

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REVIEWED BY: _____

EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 16 PAGE 2 of 15
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- A. PURPOSE - This procedure provides actions to respond to a high PRZR level.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS - This procedure is entered from:
 - a. F-0.6, INVENTORY Critical Safety Function Status Tree on a YELLOW condition.

EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 16 PAGE 3 of 15
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: Foldout Page should be open and monitored periodically.

1 Check RCS Hot Leg Temperature
- STABLE OR DECREASING

Dump steam from intact S/G(s) to
stabilize RCS temperature.

EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 16 PAGE 4 of 15
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

2 Verify Adequate SW Flow:

- | | |
|--|---|
| <p>a. At least three SW pumps - RUNNING</p> | <p>a. Manually start pumps as power supply permits (257 kw each). <u>IF</u> less than two SW pumps can be operated, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> 1) Ensure SW isolation 2) <u>IF NO</u> SW pumps running, <u>THEN</u> perform the following: <ol style="list-style-type: none"> a) Pull stop any D/G that is <u>NOT</u> supplied by alternate cooling, <u>AND</u> immediately depress associated VOLTAGE SHUTDOWN pushbutton. b) Refer to ATT-2.4. ATTACHMENT NO SW PUMPS. 3) <u>IF</u> only one SW pump running, <u>THEN</u> refer to AP-SW.2, LOSS OF SERVICE WATER. 4) Go to Step 3. |
| <p>b. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1)</p> | |
| <p>c. Verify AUX BLDG SW isolation valves - AT LEAST ONE SET OPEN</p> <ul style="list-style-type: none"> • MOV-4615 and MOV-4734 • MOV-4616 and MOV-4735 | <p>c. Manually align valves.</p> |

This Step continued on the next page.



(Step 2 continued from previous page)

d. Verify CNMT RECIRC fans annunciator C-2, HIGH TEMPERATURE ALARM - EXTINGUISHED

d. 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
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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

- b. Check SW pumps - AT LEAST TWO PUMPS RUNNING

- a. Perform the following:
 - 1) Close non-safeguards bus tie breakers:
 - Bus 13 to Bus 14 tie
 - Bus 15 to Bus 16 tie
 - 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each).
IF NOT, THEN perform the following:
 - o Start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR)
 - OR-
 - o Evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS)
 - 3) WHEN bus 15 restored, THEN reset control room lighting.

- b. Perform the following:
 - 1) Restore IA using service air compressor OR diesel air compressor (refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).
 - 2) Go to Step 3d.

This Step continued on the next page.

EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 16 PAGE 7 of 15
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(Step 3 continued from previous page)		
c. Verify SW isolation valves to turbine building - OPEN <ul style="list-style-type: none"> • MOV-4613 and MOV-4670 • MOV-4614 and MOV-4664 	c. Perform the following: <ol style="list-style-type: none"> 1) Manually align valves. 2) Dispatch AO to locally reset compressors as necessary. 	
d. Verify adequate air compressor(s) - RUNNING	d. Manually start electric air compressors as power supply permits (75 kw each). <u>IF</u> electric air compressors can <u>NOT</u> be started, <u>THEN</u> start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).	
e. Check IA supply: <ul style="list-style-type: none"> o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING 	e. Perform the following: <ol style="list-style-type: none"> 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR). 2) Continue with Step 7. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 3f and g. 	
f. Reset both trains of XY relays for IA to CNMT AOV-5392		
g. Verify IA to CNMT AOV-5392 - OPEN		

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION
 CHARGING AND LETDOWN FLOW SHOULD BE CAREFULLY CONTROLLED TO AVOID SUDDEN RCS PRESSURE CHANGES SINCE THE PRZR MAY BE WATER SOLID.

4 Check If Normal CVCS Operation Can Be Established

- | | |
|--|--|
| <p>a. Verify IA restored:</p> <ul style="list-style-type: none"> o IA to CNMT (AOV-5392) - OPEN o IA pressure - GREATER THAN 60 PSIG <p>b. Verify instrument bus D - ENERGIZED</p> <p>c. Check SW pumps - AT LEAST TWO PUMPS RUNNING</p> <p>d. CCW pumps - ANY RUNNING</p> | <p>a. Continue with Step 7. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 4 through 6.</p> <p>b. Energize MCC B. <u>IF</u> MCC B <u>NOT</u> available, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> 1) Verify MCC A energized. 2) Place instrument bus D on maintenance supply. <p>c. Go to Step 7.</p> <p>d. Perform the following:</p> <ul style="list-style-type: none"> 1) <u>IF</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> isolate CCW to thermal barrier of affected RCP(s). <ul style="list-style-type: none"> • RCP A, MOV-749A and MOV-759A • RCP B, MOV-749B and MOV-759B 2) Manually start one CCW pump. |
|--|--|

EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 16 PAGE 9 of 15
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5 Check If Seal Return Flow Should Be Established:		
a. Verify RCP #1 seal outlet temperature - LESS THAN 235°F		a. Go to Step 7.
b. Verify RCP seal outlet valves - OPEN • AOV-270A • AOV-270B		b. Manually open valves as necessary.
c. Reset both trains of XY relays for RCP seal return isolation valve MOV-313		
d. Open RCP seal return isolation valve MOV-313		d. Perform the following: 1) Place MOV-313 switch to OPEN. 2) Dispatch AO to locally open MOV-313.
e. Verify RCP #1 seal leakoff flow - LESS THAN 6.0 GPM		e. Perform the following: 1) Trip the affected RCP 2) Allow 4 minutes for pump coast down, <u>THEN</u> close the affected RCP seal discharge valve • RCP A. AOV-270A • RCP B. AOV-270B
f. Verify RCP #1 seal leakoff flow - GREATER THAN 0.8 GPM		IF both RCP seal discharge valves are shut, <u>THEN</u> go to Step 7. f. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.

EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 16 PAGE 10 of 15
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6 Check Normal Letdown - IN SERVICE	Establish excess letdown as follows:	<ul style="list-style-type: none"> o Place AOV-312 to NORMAL o Ensure open CCW from excess letdown, 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.

EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 16 PAGE 11 of 15
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7 Check If Charging Flow Has Been Established:	<p>a. Charging pumps - ANY RUNNING</p> <p>b. Charging pump suction aligned to RWST:</p> <ul style="list-style-type: none"> o LCV-112B - OPEN o LCV-112C - CLOSED 	<p>a. Perform the following:</p> <ol style="list-style-type: none"> 1) <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> dispatch AO to locally close seal injection needle valve(s) to affected RCP: <ul style="list-style-type: none"> • RCP A, V-300A • RCP B, V-300B 2) Ensure HCV-142 open, demand at 0%. <p>b. Manually align valves as necessary.</p> <p><u>IF</u> LCV-112B can <u>NOT</u> be opened, <u>THEN</u> dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room).</p> <p><u>IF</u> LCV-112C can <u>NOT</u> be closed, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> 1) Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room). 2) Verify charging pump A <u>NOT</u> running and place in PULL STOP. 3) <u>WHEN</u> V-358 open, <u>THEN</u> direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
	<p>c. Start charging pumps as necessary and adjust charging flow to restore PRZR level</p>	

EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 16 PAGE 12 of 15
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8 Check Normal Letdown - IN SERVICE	<p>Establish Normal Letdown:</p> <ol style="list-style-type: none"> a. Establish charging flow to REGEN Hx greater than 20 gpm. b. Place the following switches to CLOSE: <ul style="list-style-type: none"> • Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202) • AOV-427, loop B cold leg to REGEN Hx • AOV-371, letdown isolation valves c. Place letdown controllers TCV-130 and PCV-135 in MANUAL at 40% open <ul style="list-style-type: none"> • 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 j. <u>WHEN</u> normal letdown in service, <u>THEN</u> secure excess letdown. <ul style="list-style-type: none"> o Close excess letdown flow control valve, HCV-123. o Close excess letdown isolation valve, AOV-310. 	

EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 16 PAGE 13 of 15
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9 Check PRZR Pressure:	<ul style="list-style-type: none"> a. Pressure - LESS THAN 2335 PSIG b. Pressure - LESS THAN 2260 PSIG 	<ul style="list-style-type: none"> a. Verify at least one PRZR PORV and block valve open. <u>IF NOT</u>, <u>THEN</u> open one PORV and block valve as necessary until pressure less than 2335 psig. <u>IF IA NOT</u> available, <u>THEN</u> refer to ATT-12.0, ATTACHMENT N2 PORVS to operate PORVs. b. Control charging and letdown flow as necessary to decrease PRZR pressure to less than 2260 psig.
10 Verify PRZR PORVs - CLOSED		Manually close PORVs. <u>IF</u> any valve can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve.
11 Restore PRZR To Saturation Conditions:	<ul style="list-style-type: none"> a. Verify letdown - IN SERVICE b. Energize PRZR heaters 	<ul style="list-style-type: none"> a. Do <u>NOT</u> energize PRZR heaters. Continue with Step 13. <u>WHEN</u> letdown established, <u>THEN</u> energize PRZR heaters.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

12 Check PRZR Spray Valves:

a. Auxiliary spray valve (AOV-296)
- CLOSED

a. Manually close auxiliary spray valve. IF valve can NOT be closed, THEN perform the following:

1) Establish excess letdown (Refer to Step 6).

2) Close loop B cold leg to REGEN Hx (AOV-427).

3) Ensure HCV-142 demand at 0%.

b. Verify normal PRZR spray valves
- CLOSED

b. Place controllers in manual at 0% demand. IF valves can NOT be closed, THEN stop associated RCP(s).

- PCV-431A
- PCV-431B

NOTE: PRZR temperature at which bubble should form may be determined from steam table.

13 Control Charging And Letdown Flow As Necessary To Maintain RCS Pressure Stable

14 Check PRZR level - LESS THAN 87%

Return to Step 13.

EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 16 PAGE 15 of 15
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

15 Return To Procedure And Step
In Effect

-END-

EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 16 PAGE 1 of 1
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FR-I.1 APPENDIX LIST

TITLE

- 1) ATTACHMENT N2 PORVS (ATT-12.0)
- 2) ATTACHMENT SD-1 (ATT-17.0)
- 3) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 4) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2) |
- 5) ATTACHMENT CNMT RECIRC FANS (ATT-4.0) |
- 6) FOLDOUT |

EOP: FR-I.1	TITLE: RESPONSE TO HIGH PRESSURIZER LEVEL	REV: 16 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-I series procedures. |

1. LOSS OF SW CRITERIA |

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

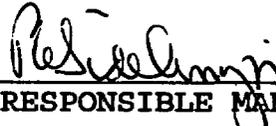
- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton. |
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS. |

EOP: FR-I.2	TITLE: RESPONSE TO LOW PRESSURIZER LEVEL	REV: 11 PAGE 1 of 8
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REVIEWED BY: _____

EOP: FR-I.2	TITLE: RESPONSE TO LOW PRESSURIZER LEVEL	REV: 11 PAGE 2 of 8
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- A. PURPOSE - This procedure provides actions to respond to a low PRZR level.
- B. ENTRY CONDITIONS/SYMPTOMS
 - 1. ENTRY CONDITIONS - This procedure is entered from:
 - a. F-0.6, INVENTORY Critical Safety Function Status Tree, on a YELLOW condition.

EOP: FR-I.2	TITLE: RESPONSE TO LOW PRESSURIZER LEVEL	REV: 11 PAGE 4 of 8
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

4 Verify Adequate SW Flow:

a. Check at least two SW pumps -
RUNNING

a. Manually start SW pumps as power
supply permits (257 kw each).

IF less than two SW pumps
running, THEN perform the
following:

1) Ensure SW isolation.

2) IF NO SW pumps running, THEN
perform the following:

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

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

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

b. Dispatch AO to establish normal
shutdown alignment (Refer to
ATT-17.0, ATTACHMENT SD-1)

EOP: FR-I.2	TITLE: RESPONSE TO LOW PRESSURIZER LEVEL	REV: 11 PAGE 5 of 8
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5 Establish IA to CNMT:	<p>a. Verify non-safeguards busses energized from offsite power</p> <ul style="list-style-type: none"> o Bus 13 normal feed - CLOSED <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o Bus 15 normal feed - CLOSED 	<p>a. Perform the following:</p> <ol style="list-style-type: none"> 1) Close non-safeguards bus tie breakers: <ul style="list-style-type: none"> • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each) <p><u>IF NOT. THEN</u> perform the following:</p> <ul style="list-style-type: none"> o Start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR) <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o Evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS. <ol style="list-style-type: none"> 3) <u>WHEN</u> bus 15 restored, <u>THEN</u> reset control room lighting.
b. Check SW pumps - AT LEAST TWO PUMPS RUNNING	<p>b. Perform the following:</p> <ol style="list-style-type: none"> 1) Restore IA using service air compressor <u>OR</u> diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR). 2) Go to Step 5d. 	

This Step continued on the next page.

EOP: FR-I.2	TITLE: RESPONSE TO LOW PRESSURIZER LEVEL	REV: 11 PAGE 6 of 8
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 5 continued from previous page)

c. Verify SW isolation valves to turbine building - OPEN

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

d. Verify adequate air compressor(s) - RUNNING

e. Check IA supply:

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

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

g. Verify IA to CNMT AOV-5392 - OPEN

c. Perform the following:

- 1) Manually align valves.
- 2) Dispatch AO to locally reset compressors as necessary.

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

e. Perform the following:

- 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR).
- 2) Continue with Step 6. WHEN IA restored, THEN do Steps 5f and g.

EOP: FR-I.2	TITLE: RESPONSE TO LOW PRESSURIZER LEVEL	REV: 11 PAGE 7 of 8
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6 Establish Charging Flow:		
a. Charging pumps - ANY RUNNING		a. Perform the following:
		1) <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high. <u>THEN</u> dispatch AO to locally close seal injection needle valves to affected RCP.
		<ul style="list-style-type: none"> • RCP A, V-300A • RCP B, V-300B
		2) Ensure HCV-142 demand at 0%.
		3) Start one charging pump.
b. Align charging pump suction to RWST:		b. <u>IF</u> LCV-112B can <u>NOT</u> be opened. <u>THEN</u> dispatch AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
o LCV-112B - OPEN		
o LCV-112C - CLOSED		
		<u>IF</u> LCV-112C can <u>NOT</u> be closed. <u>THEN</u> perform the following:
		1) Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
		2) Verify charging pump A <u>NOT</u> running and place in PULL STOP.
		3) <u>WHEN</u> V-358 open. <u>THEN</u> direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
c. Charging flow - ESTABLISHED		c. Start additional charging pumps as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Increase Charging Flow To Restore PRZR Level	
8	Check PRZR Level:	
	a. Level - GREATER THAN 5% (30% adverse CNMT)	a. Go to step 9.
	b. Level - STABLE OR INCREASING	b. Go to step 9.
	c. Level - GREATER THAN 13% (40% adverse CNMT)	c. Return to step 7.
9	Return To Procedure And Step In Effect	

-END-

EOP: FR-I.2	TITLE: RESPONSE TO LOW PRESSURIZER LEVEL	REV: 11 PAGE 1 of 1
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FR-I.2 APPENDIX LIST

TITLE

- 1) ATTACHMENT SD-1 (ATT-17.0)
- 2) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 3) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2) |
- 4) ATTACHMENT CNMT RECIRC FANS (ATT-4.0) |
- 5) FOLDOUT |

EOP: FR-I.2	TITLE: RESPONSE TO LOW PRESSURIZER LEVEL	REV: 11 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-I series procedures.

1. LOSS OF SW CRITERIA

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

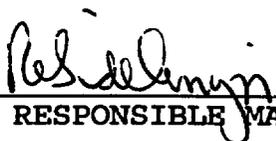
- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.

EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 18 PAGE 1 of 19
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23



RESPONSIBLE MANAGER

5-30-2003

EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 18 PAGE 2 of 19
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A. PURPOSE - This procedure provides actions to respond to voids in the reactor vessel head.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

a. F-0.6, INVENTORY Critical Safety Function Status Tree on a YELLOW condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION
 IF A CONTROLLED NATURAL CIRCULATION COOLDOWN IS IN PROGRESS AND A VOID IN THE REACTOR VESSEL UPPER HEAD IS EXPECTED, THIS PROCEDURE SHOULD NOT BE PERFORMED.

NOTE: o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{+05} R/hr.
 o Foldout Page should be open and monitored periodically. |

1 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.

EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 18 PAGE 4 of 19
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

2 Verify Adequate SW Flow To
CCW Hx:

a. Verify at least two SW pumps -
RUNNING

a. Perform the following:

1) Verify adequate power to
operate two SW pumps (257 kw
per pump).

IF NOT, THEN shed sufficient
non-essential loads.

- CNMT RECIRC fans
- Charging pumps
- IA compressors
- PRZR heaters
- Rx compartment cooling fans
- Control rod shroud fans

2) Ensure two SW pumps running.

3) IF less than two SW pumps can
be operated, THEN perform the
following:

a) IF NO SW pumps running,
THEN perform the following:

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

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

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

c) Go to Step 3.

This Step continued on the next page.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 2 continued from previous page)

b. Verify AUX BLDG SW isolation valves - OPEN

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

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

b. Manually align valves.

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

EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 18 PAGE 6 of 19
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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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

- b. Check SW pumps - AT LEAST TWO PUMPS RUNNING

- a. Perform the following:
 - 1) Close non-safeguards bus tie breakers:
 - Bus 13 to Bus 14 tie
 - Bus 15 to Bus 16 tie
 - 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each).
IF NOT, THEN perform the following:
 - o Start diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR)
 - OR-
 - o Evaluate if CNMT RECIRC fans should be stopped (Refer to ATT-4.0, ATTACHMENT CNMT RECIRC FANS).
 - 3) WHEN bus 15 restored. THEN reset control room lighting.

- b. Perform the following:
 - 1) Restore IA using service air compressor OR diesel air compressor (Refer to ATT-11.2, ATTACHMENT DIESEL AIR COMPRESSOR).
 - 2) Go to Step 3d.

This Step continued on the next page.

EOP:

FR-I.3

TITLE:

RESPONSE TO VOIDS IN REACTOR VESSEL

REV: 18

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 3 continued from previous page)

c. Verify SW isolation valves to turbine building - OPEN

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

d. Verify adequate air compressor(s) - RUNNING

e. Check IA supply:

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

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

g. Open IA AOV-5392

c. Perform the following:

- 1) Manually align valves.
- 2) Dispatch AO to locally reset air compressors as necessary.

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

e. Perform the following:

- 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR).
- 2) Continue with Step 4. WHEN IA restored, THEN do Steps 3f and g.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Check If Charging Flow Has Been Established:	
	a. Charging pumps - ANY RUNNING	a. Perform the following:
		1) <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high. <u>THEN</u> dispatch AO to close seal injection needle valve(s) to affected RCP:
		<ul style="list-style-type: none"> • RCP A, V-300A • RCP B, V-300B
		2) Ensure HCV-142 open, demand at 0%.
	b. Charging pump suction aligned to RWST:	b. Manually align valves as necessary.
	o LCV-112B - OPEN	<u>IF</u> LCV-112B can <u>NOT</u> be opened. <u>THEN</u> dispatch AO to locally open V-358, manual charging pump suction from RWST (in charging pump room).
	o LCV-112C - CLOSED	<u>IF</u> LCV-112C can <u>NOT</u> be closed. <u>THEN</u> perform the following:
		1) Direct AO to locally open V-358, manual charging pump suction from RWST (charging pump room).
		2) Verify charging pump A <u>NOT</u> running and place in PULL STOP.
		3) <u>WHEN</u> V-358 open. <u>THEN</u> direct AO to close V-268 to isolate charging pumps B and C from VCT (charging pump room).
	c. Start charging pumps as necessary and adjust charging flow to control PRZR level	c. <u>IF</u> at least 20 gpm charging flow can <u>NOT</u> be established. <u>THEN</u> return to procedure and step in effect.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

5 Check If Normal CVCS
Operation Can Be Established

- a. Verify IA restored:
- o IA to CNMT (AOV-5392) - OPEN
 - o IA pressure - GREATER THAN 60 PSIG
- b. Verify instrument bus D - ENERGIZED
- c. CCW pumps - ANY RUNNING

a. Continue with Step 8. WHEN IA restored, THEN do Steps 5 through 7.

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. 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.

6 Verify PRZR Level - GREATER THAN 13% [40% adverse CNMT]

Continue with Step 8. WHEN PRZR level increases to greater than 13% [40% adverse CNMT], THEN do Step 7.

EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 18 PAGE 10 of 19
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Establish Normal Letdown:	<u>IF</u> RCP seal return has been established, <u>THEN</u> establish excess letdown as follows:
a.	Establish charging line flow to REGEN Hx - GREATER THAN 20 GPM	o Place excess letdown divert valve, AOV-312, to NORMAL.
b.	Place the following switches to CLOSE:	o Ensure CCW from excess letdown open, (AOV-745).
<ul style="list-style-type: none"> • 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	o Open excess letdown isolation valve AOV-310.
<ul style="list-style-type: none"> • TCV-130 • PCV-135 	d. Reset both trains of XY relays for AOV-371 and AOV-427	o Slowly open HCV-123 to maintain excess letdown temperature less than 195°F and pressure less than 100 psig.
e.	Open AOV-371 and AOV-427	o Adjust charging pump speed as necessary.
f.	Open letdown orifice valves as necessary	<u>IF</u> RCP seal return <u>NOT</u> established, <u>THEN</u> consult TSC to determine if excess letdown should be placed in service.
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	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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8 Establish Stable RCS Conditions:

- | | |
|--|--|
| <p>a. PRZR level - GREATER THAN 65% [82% adverse CNMT]</p> <p>b. RCS pressure - STABLE</p> <p>c. RCS hot leg temperatures - STABLE</p> | <p>a. Control charging and letdown as necessary to establish the required PRZR level. <u>WHEN</u> PRZR level is greater than 65% [82% adverse CNMT]. <u>THEN</u> continue with step 8b.</p> <p>b. Energize PRZR heaters and use normal PRZR spray as necessary. <u>IF</u> normal spray <u>NOT</u> available and letdown in service, <u>THEN</u> use auxiliary spray valve (AOV-296).</p> <p>c. Control steam dump and total feed flow as necessary to stabilize RCS temperature.</p> |
|--|--|

9 Check RCPs - BOTH STOPPED Go to Step 16.

.....

CAUTION

IF RHR NORMAL COOLING IN SERVICE, THEN RCS PRESSURE SHOULD BE MAINTAINED LESS THAN THE RCS OVERPRESSURE PROTECTION SETPOINT (410 PSIG).

.....

10 Check If RCS Pressure Should Be Increased:

- | | |
|--|--------------------------|
| <p>a. Pressure - AT LEAST 100 PSI BELOW LIMIT ON FIG-9.0, FIGURE TECH SPEC C/D (100°F/HR)</p> <p>b. Energize PRZR heaters to increase RCS pressure by 50 psi</p> | <p>a. Go to Step 13.</p> |
|--|--------------------------|

EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 18 PAGE 12 of 19
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Control Charging And Letdown As Necessary To Maintain PRZR Level Greater Than 13% [40% adverse CNMT]	
12	Check RVLIS Indication: a. Level (no RCPs) - INCREASING b. Level (no RCPs) - GREATER THAN 95% c. Turn off PRZR heaters to stabilize RCS pressure d. Return to procedure and step in effect	a. Go to Step 13. b. Return to Step 10.

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.

.....

13 Try To Start One RCP:

- | | |
|--|---|
| <ul style="list-style-type: none"> a. Establish the following conditions prior to RCP start: <ul style="list-style-type: none"> o PRZR level - GREATER THAN 65% [82% adverse CNMT] o RCS subcooling based on core exit T/Cs - GREATER THAN 20°F USING FIG-1.0, FIGURE MIN SUBCOOLING o Energize PRZR heaters as necessary to saturate PRZR water o Bus 11A or 11B - ENERGIZED o Refer to ATT-15.0, ATTACHMENT RCP START b. Start one RCP | <ul style="list-style-type: none"> a. <u>IF</u> conditions can <u>NOT</u> be established, <u>THEN</u> go to Step 16. |
|--|---|

EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 18 PAGE 14 of 19
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Check RVLIS Indication <ul style="list-style-type: none"> o Level (no RCPs) - GREATER THAN 95% <li style="text-align: center;">-OR- o Fluid fraction (any RCP running) - GREATER THAN 97% 	Go to Step 16.
15	Go To Step 24	
16	Direct RP To Start CNMT Hydrogen Monitors	
17	Check If SI Should Be Blocked:	
	a. PRZR pressure - GREATER THAN 1750 PSIG	a. Go to Step 18.
	b. PRZR pressure - LESS THAN 1950 PSIG	b. Decrease PRZR pressure to less than 1950 psig using normal PRZR spray. <p style="margin-left: 40px;"><u>IF</u> normal spray <u>NOT</u> available and letdown in service, <u>THEN</u> use auxiliary spray (AOV-296). <u>IF</u> <u>NOT</u>, <u>THEN</u> use one PRZR PORV.</p>
	c. Block SI	

EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 18 PAGE 15 of 19
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Record RCS Pressure and CNMT Hydrogen Concentration on ATT-20.0, ATTACHMENT VENT TIME	
19	Establish Following RCS Conditions: a. PRZR level - GREATER THAN 65% [82% adverse CNMT] b. RCS pressure - STABLE c. RCS subcooling based on core exit T/Cs - GREATER THAN 50°F USING FIG-1.0, FIGURE MIN SUBCOOLING d. RCS hot leg temperatures - STABLE	a. Control charging and letdown as necessary to establish the required PRZR level. <u>WHEN</u> PRZR level is greater than 65% [82% adverse], <u>THEN</u> continue with step 19b. b. Energize PRZR heaters and use normal PRZR spray as necessary. <u>IF</u> normal spray <u>NOT</u> available and letdown in service, <u>THEN</u> use auxiliary spray (AOV-296). c. Dump steam as necessary. d. Control steam dump and total feed flow as necessary to stabilize RCS temperature.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20 Prepare CNMT For Reactor Vessel Venting:	<p>a. Verify CNMT ventilation isolation valves - CLOSED</p> <ul style="list-style-type: none"> • CNMT MINI PURGE EXH VLVs (AOV-7970, AOV-7971) • CNMT MINI PURGE SPLY VLVs (AOV-7445, AOV-7448) • CNMT AIR SAMPLE ISO VLVs (AOV-1597, AOV-1598, AOV-1599) <p>b. Verify the following CNMT ventilation equipment in service:</p> <ul style="list-style-type: none"> • All CNMT RECIRC fans • One reactor compartment cooling fan • One control rod shroud fan 	<p>a. Manually close valves.</p> <p>b. Manually start fans as power supply permits.</p>
21 Determine Maximum Allowable Venting Time:	<p>a. CNMT hydrogen concentration - LESS THAN 3%</p> <p>b. Determine maximum venting time (Refer to ATT-20.0, ATTACHMENT VENT TIME)</p>	<p>a. Consult TSC to evaluate methods to reduce hydrogen concentration to less than 3%.</p>

EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 18 PAGE 17 of 19
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

22 Review Reactor Vessel Venting Termination Criteria:

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

-OR-

- o PRZR level - LESS THAN 13% [40% adverse CNMT]

-OR-

- o RCS pressure - DECREASES BY 200 PSI

-OR-

- o Venting time - GREATER THAN MAXIMUM TIME CALCULATED IN STEP 21

-OR-

- o RVLIS level (no RCPs) - GREATER THAN 95%

-OR-

- o RVLIS fluid fraction (any RCP running) - GREATER THAN 97%

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
------	--------------------------	-----------------------

CAUTION
 VENTING SHOULD BE STOPPED IF ANY VENTING TERMINATION CRITERION IN STEP 22 IS EXCEEDED.

NOTE: The reactor vessel head vents should not be opened unless specifically directed by PORC.

23 Vent Reactor Vessel:

- | | |
|---|---|
| <p>a. Open train A Rx vessel head vent valves</p> <ul style="list-style-type: none"> • SOV-590 • SOV-592 <p>b. Any venting termination criterion - EXCEEDED</p> <p>c. Close all vent valves</p> | <p>a. <u>IF</u> either valve fails to open, <u>THEN</u> close both valves and open train B valves.</p> <ul style="list-style-type: none"> • SOV-591 • SOV-593 <p>b. Continue venting. <u>WHEN</u> any venting termination criterion is exceeded, <u>THEN</u> do Steps 23c, 24, 25 and 26.</p> |
|---|---|

24 Check RVLIS Indication -

- o Level (no RCPs) - GREATER THAN 95%

Increase RCS pressure to value recorded in Step 18. Return to Step 16.

-OR-

- o Fluid fraction (any RCP running) - GREATER THAN 97%

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

25 Check PRZR Level - STABLE

Control charging and letdown as necessary to stabilize PRZR level.

26 Return To Procedure And Step In Effect

-END-

EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 18 PAGE 1 of 1
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FR-I.3 APPENDIX LIST

TITLE

- 1) FIGURE MIN SUBCOOLING (FIG-1.0)
- 2) FIGURE TECH SPEC C/D (FIG-9.0)
- 3) FIGURE CNMT HYDROGEN (FIG-12.0)
- 4) ATTACHMENT VENT TIME (ATT-20.0)
- 5) ATTACHMENT RCP START (ATT-15.0)
- 6) ATTACHMENT NO SW PUMPS (ATT-2.4)
- 7) ATTACHMENT DIESEL AIR COMPRESSOR (ATT-11.2) |
- 8) ATTACHMENT CNMT RECIRC FANS (ATT-4.0) |
- 9) FOLDOUT |

EOP: FR-I.3	TITLE: RESPONSE TO VOIDS IN REACTOR VESSEL	REV: 18 PAGE 1 of 1
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FOLDOUT PAGE

NOTE: This Foldout Page applies to all FR-I series procedures.

1. LOSS OF SW CRITERIA

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

- a. Pull stop any D/G that is NOT supplied by alternate cooling, AND immediately depress associated VOLTAGE SHUTDOWN pushbutton.
- b. Refer to ATT-2.4, ATTACHMENT NO SW PUMPS.