

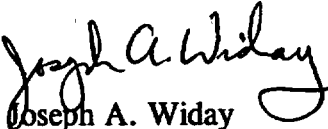
December 17, 2003

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: Emergency Operating Procedures
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

As requested, enclosed are Ginna Station Emergency Operating Procedures.

Very truly yours,


Joseph A. Widay

JAW/jdw

xc: U.S. Nuclear Regulatory Commission
Region I
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Ginna USNRC Senior Resident Inspector

Enclosure(s):

E Index
E-3, Rev 35

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Ginna Nuclear Power Plant
PROCEDURE INDEX

Wed 12/17/2003 11:09:32 am
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INPUT PARAMETERS: TYPE: PRE STATUS VALUE(S): EF, QU 5 YEARS ONLY:

PRE EMERGENCY PROCEDURE

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
E-0	REACTOR TRIP OR SAFETY INJECTION	035	10/10/2003	03/24/2003	03/24/2008	EF
E-1	LOSS OF REACTOR OR SECONDARY COOLANT	028	05/30/2003	03/24/2003	03/24/2008	EF
E-2	FAULTED STEAM GENERATOR ISOLATION	011	05/30/2003	03/24/2003	03/24/2008	EF
E-3	STEAM GENERATOR TUBE RUPTURE	035	12/17/2003	4/20/43/2	03/24/2008	EF

PRE TOTAL: 4

GRAND TOTAL: 4

EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 35 PAGE 1 of 42
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ROCHESTER GAS AND ELECTRIC CORPORATION
GINNA STATION
CONTROLLED COPY NUMBER 23

Robert L. ...
RESPONSIBLE MANAGER

12-17-2003
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 35 PAGE 2 of 42
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- A. PURPOSE - This procedure provides actions to terminate leakage of reactor coolant into the secondary system following a steam generator tube rupture (SGTR), this procedure should also be used for a SGTR in one S/G and a fault in the other S/G.
- B. ENTRY CONDITIONS/SYMPTOMS
1. ENTRY CONDITIONS - This procedure is entered from:
 - a. E-0, REACTOR TRIP OR SAFETY INJECTION, when condenser air ejector radiation or blowdown radiation is abnormal, or
 - b. E-0, REACTOR TRIP OR SAFETY INJECTION, E-1, LOSS OF REACTOR OR SECONDARY COOLANT, E-2, FAULTED STEAM GENERATOR ISOLATION, and FR-H.3, RESPONSE TO STEAM GENERATOR HIGH LEVEL, when secondary radiation is abnormal, or
 - c. E-0, REACTOR TRIP OR SAFETY INJECTION, E-1, LOSS OF REACTOR OR SECONDARY COOLANT, E-2, FAULTED STEAM GENERATOR ISOLATION, ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION, ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, when an intact S/G narrow range level increases in an uncontrolled manner.
 - d. ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, when pressurizer pressure control is restored.
 - e. Any FOLDOUT page that has E-3 transition criteria whenever either S/G level increases in an uncontrolled manner or either S/G has abnormal radiation.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

* 1 Monitor RCP Trip Criteria:

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

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

.....

CAUTION

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

.....

2 Identify Ruptured S/G(s):

Perform the following:

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

- a. Reset SI

-OR-

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

- o High radiation indication on main steamline radiation monitor

- R-31 for S/G A
- R-32 for S/G B

-OR-

- o AO reports local indication of high steamline radiation

-OR-

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

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

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

- | | |
|--|---|
| <p>a. Adjust ruptured S/G ARV controller to 1050 psig in AUTO</p> <p>b. Check ruptured S/G ARV - CLOSED</p> | <p>b. <u>WHEN</u> ruptured S/G pressure less than 1050 psig, <u>THEN</u> verify S/G ARV closed. <u>IF NOT</u> closed, <u>THEN</u> place controller in MANUAL and close S/G ARV.</p> <p><u>IF</u> S/G ARV can <u>NOT</u> be closed, <u>THEN</u> dispatch AO to locally isolate.</p> |
| <p>c. Close ruptured S/G TDAFW pump steam supply valve and place in PULL STOP</p> <ul style="list-style-type: none"> • S/G A. MOV-3505A • S/G B. MOV-3504A | <p>c. Dispatch AO with locked valve key to locally isolate steam from ruptured S/G to TDAFW pump.</p> <ul style="list-style-type: none"> • S/G A. V-3505 • S/G B. V-3504 |
| <p>d. Verify ruptured S/G blowdown valve - CLOSED</p> <ul style="list-style-type: none"> • S/G A. AOV-5738 • S/G B. AOV-5737 | <p>d. Place S/G blowdown and sample valve isolation switch to CLOSE.</p> <p><u>IF</u> blowdown can <u>NOT</u> be isolated manually, <u>THEN</u> dispatch AO to locally isolate blowdown.</p> <ul style="list-style-type: none"> • S/G A. V-5701 • S/G B. V-5702 |

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

4 Complete Ruptured S/G
Isolation:

a. Close ruptured S/G MSIV -
RUPTURED S/G MSIV CLOSED

a. Perform the following:

- 1) Close intact S/G MSIV.
- 2) Place intact S/G ARV controller at 1005 psig in AUTO.
- 3) Adjust condenser steam dump controller to 1050 psig in AUTO.
- 4) Place condenser steam dump mode selector switch to MANUAL.
- 5) Adjust reheat steam supply controller cam to close reheat steam supply valves.
- 6) Ensure turbine stop valves - CLOSED.
- 7) Dispatch AO to complete ruptured S/G isolation (Refer to ATT-16.0, ATTACHMENT RUPTURED S/G, parts A and B).
- 8) Go to step 5.

b. Dispatch AO to complete ruptured S/G isolation (Refer to ATT-16.0, ATTACHMENT RUPTURED S/G part A)

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

.....

CAUTION

.....

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

.....

5 Check Ruptured S/G Level:

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

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

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

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

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

b. Dispatch AO 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 AO 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

6 Verify Ruptured S/G Isolated:

- | | |
|--|--|
| <ul style="list-style-type: none"> a. Check ruptured MSIV - CLOSED b. Check TDAFW pump steam supply from ruptured S/G - ISOLATED c. Ruptured S/G pressure - GREATER THAN 300 PSIG | <ul style="list-style-type: none"> a. Ensure air ejector/gland steam supply and flange heating steam isolated. (Refer to ATT-16.0, ATTACHMENT RUPTURED S/G, part B). b. Continue efforts to isolate steam supply from ruptured S/G: <ul style="list-style-type: none"> • S/G A, MOV-3505A OR V-3505 • S/G B, MOV-3504A OR V-3504 c. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1. |
|--|--|

7 Establish Condenser Steam Dump Pressure Control:

- | | |
|---|---|
| <ul style="list-style-type: none"> a. Verify condenser available: <ul style="list-style-type: none"> o Intact S/G MSIV - OPEN o Annunciator G-15, STEAM DUMP ARMED - LIT b. Adjust condenser steam dump controller HC-484 to maintain intact S/G pressure and verify in AUTO c. Place steam dump mode selector switch to MANUAL | <ul style="list-style-type: none"> a. Adjust S/G ARV controllers to maintain intact S/G pressure in AUTO and go to Step 8. |
|---|---|

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

.....

CAUTION

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

.....

8 Reset SI

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

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

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

9 Initiate RCS Cooldown:

a. Determine required core exit temperature from below table

RUPTURED SG PRESSURE	REQUIRED CORE EXIT TEMPERATURE (°F)
1100 PSIG	525 [517 adverse CNMT]
1000 PSIG	512 [504 adverse CNMT]
900 PSIG	499 [490 adverse CNMT]
800 PSIG	484 [475 adverse CNMT]
700 PSIG	468 [457 adverse CNMT]
600 PSIG	449 [437 adverse CNMT]
500 PSIG	428 [413 adverse CNMT]
400 PSIG	402 [384 adverse CNMT]
300 PSIG	369 [344 adverse CNMT]

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

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

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

o Use faulted S/G.

-OR-

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

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

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

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

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

10 Monitor Intact S/G Level:

- a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]
- 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 the intact S/G continues to increase in an uncontrolled manner, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

.....

CAUTION

.....

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

.....

11 Monitor PRZR PORVs And Block Valves:

a. Power to PORV block valves - AVAILABLE

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

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

b. PORVs - CLOSED

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

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

c. Block valves - AT LEAST ONE OPEN

c. ⁵Open one block valve unless it was closed to isolate an open PORV.

EOP:

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

12 Reset CI:

- a. Depress CI reset pushbutton
- b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED

b. Perform the following:

- 1) Reset SI.
- 2) Depress CI reset pushbutton.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

13 Monitor All AC Busses -
BUSSES ENERGIZED BY OFFSITE
POWER

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

Perform the following:

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

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

14 Verify Adequate SW Flow:

a. Check at least two SW pumps -
RUNNING

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

IF less than two SW pumps
running. THEN:

1) Ensure SW isolation.

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

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

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

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

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

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

15 Establish IA to CNMT:

a. Verify non-safeguards busses energized

o Bus 13 normal feed - CLOSED

-OR-

o Bus 15 normal feed - CLOSED

b. Check SW pumps - AT LEAST TWO PUMPS RUNNING

c. Verify turbine building SW isolation valves - 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 15d.

c. Manually align valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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(Step 15 continued from previous page)

- | | |
|--|--|
| <p>d. Verify adequate air compressors
- RUNNING</p> <p>e. Check IA supply:</p> <ul style="list-style-type: none"> o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING <p>f. Reset both trains of XY relays for IA to CNMT AOV-5392</p> <p>g. Verify IA to CNMT AOV-5392 - OPEN</p> | <p>d. Manually start air compressors as power supply permits (75 kw each). <u>IF</u> air compressors can <u>NOT</u> be started, <u>THEN</u> dispatch AO to locally reset compressors as necessary.</p> <p>e. Perform the following:</p> <ol style="list-style-type: none"> 1) Continue attempts to restore IA (Refer to AP-IA.1. LOSS OF INSTRUMENT AIR). 2) Continue with Step 16. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 15f and g. |
|--|--|

.....

CAUTION

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

.....

16 Check If RHR Pumps Should Be Stopped:

- | | |
|--|--------------------------|
| <p>a. Check RCS pressure - GREATER THAN 250 psig [465 psig adverse CNMT]</p> <p>b. Stop RHR pumps and place both in AUTO</p> | <p>a. Go to Step 17.</p> |
|--|--------------------------|

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	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"> • V-300A for RCP A • V-300B for RCP B
		2) Ensure HCV-142 demand at 0%.
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.	Start charging pumps as necessary and establish 75 gpm total charging flow	
	<ul style="list-style-type: none"> • Charging line flow • Seal injection 	

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

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: SI ACCUMs may inject during RCS depressurization.

21 Depressurize RCS To Minimize
Break Flow And Refill PRZR:

- | | |
|--|--|
| <p>a. Check the following:</p> <ul style="list-style-type: none"> o Ruptured S/G level - LESS THAN 90% [80% adverse CNMT] o Any RCP - RUNNING o IA to CNMT - AVAILABLE <p>b. Spray PRZR with maximum available spray until ANY of the following conditions satisfied:</p> <ul style="list-style-type: none"> o PRZR level - GREATER THAN 75% [65% adverse CNMT] <li style="text-align: center;">-OR- o RCS pressure - LESS THAN SATURATION USING FIG-1.0. FIGURE MIN SUBCOOLING <li style="text-align: center;">-OR- o <u>BOTH</u> of the following: <ul style="list-style-type: none"> 1) RCS pressure - LESS THAN RUPTURED S/G PRESSURE 2) PRZR level - GREATER THAN 5% [30% adverse CNMT] <p>c. Close normal PRZR spray valves:</p> <ul style="list-style-type: none"> 1) Adjust normal spray valve controller to 0% DEMAND 2) Verify PRZR spray valves - CLOSED <ul style="list-style-type: none"> • PCV-431A • PCV-431B <p>d. Verify auxiliary spray valve (AOV-296) - CLOSED</p> <p>e. Go to Step 24</p> | <p>a. Go to Step 22.</p> <p>c. Stop associated RCP(s).</p> <p>d. Decrease charging speed to minimum and ensure charging valve to loop B cold leg open (AOV-294).</p> |
|--|--|

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

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

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

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

- a. Verify IA to CNMT - AVAILABLE
- b. PRZR PORVs - AT LEAST ONE AVAILABLE

- a. Refer to ATT-12.0, ATTACHMENT N2 PORVS to operate PORVs.
- b. IF auxiliary spray available. THEN return to Step 21b.

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

This Step continued on the next page.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 22 continued from previous page)

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

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

-OR-

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

-OR-

- o BOTH of the following:

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

d. Close PRZR PORVs

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

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

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

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

23 Check RCS Pressure -
INCREASING

Close block valve for the PRZR PORV
that was opened.

IF pressure continues to decrease,
THEN perform the following:

- a. Monitor the following conditions
for indication of leakage from
PRZR PORV:
 - o PORV outlet temp (TI-438) NOT
decreasing.
 - o PRT pressure, level or
temperature continue to
increase.
- b. Go to ECA-3.1, SGTR WITH LOSS OF
REACTOR COOLANT - SUBCOOLED
RECOVERY DESIRED, Step 1.



.....

CAUTION

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

.....

24 Check If SI Flow Should Be Terminated:

- | | |
|--|--|
| <ul style="list-style-type: none"> a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING b. Secondary heat sink: <ul style="list-style-type: none"> o Total feed flow to S/G(s) - GREATER THAN 200 GPM AVAILABLE <li style="text-align: center;">-OR- o Narrow range level in at least one intact S/G - GREATER THAN 5% [25% adverse CNMT] c. RCS pressure - STABLE OR INCREASING d. PRZR level - GREATER THAN 5% [30% adverse CNMT] | <ul style="list-style-type: none"> a. Do <u>NOT</u> stop SI pumps. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1. b. <u>IF</u> neither condition satisfied, <u>THEN</u> do <u>NOT</u> stop SI pumps. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1. c. Do <u>NOT</u> stop SI pumps. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1. d. Do <u>NOT</u> stop SI pumps. Return to Step 6. |
|--|--|

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	Stop SI Pumps And Place In AUTO	
26	Establish Required Charging Line Flow:	
	a. Charging pumps - ANY RUNNING	a. Perform the following:
		1) <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 isolate seal injection to affected RCP: <ul style="list-style-type: none"> • RCP A. V-300A • RCP B. V-300B
	b. Establish 20 gpm charging line flow	2) Ensure HCV-142 open. 3) Start one charging pump.
27	Monitor SI Reinitiation Criteria:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING	a. Manually start SI pumps as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT -- SUBCOOLED RECOVERY DESIRED. Step 1.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level.
		<u>IF</u> PRZR level can <u>NOT</u> be maintained, <u>THEN</u> manually start SI pumps as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED. Step 1.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

28 Check If SI ACCUMs Should Be Isolated:

a. Check the following:

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

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. Manually operate SI pumps as necessary and go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

c. Vent any unisolated ACCUMs:

1) Open vent valves for unisolated SI ACCUMs.

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

2) Open HCV-945.

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

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

29 Verify Adequate SW Flow To CCW Hx:

a. Verify at least three SW pumps - RUNNING

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

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

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

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

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

3) Go to Step 36.

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

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 29 continued from previous page)

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

c. Perform the following:

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

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

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

o IF on normal SW discharge:

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

-OR-

o IF on alternate SW discharge:

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

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

30 Check If Normal CVCS
Operation Can Be Established

a. Verify IA restored:

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

b. Verify instrument bus D -
ENERGIZED

c. CCW pumps - ANY RUNNING

d. Charging pump - ANY RUNNING

a. Continue with Step 36. WHEN IA restored, THEN do Steps 30 through 35.

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 36. WHEN any charging pump running, THEN do Steps 31 through 35.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

31 Check If Seal Return Flow Should Be Established:

- | | |
|--|---|
| <p>a. Verify RCP #1 seal outlet temperature - LESS THAN 235°F</p> <p>b. Verify RCP seal outlet valves - OPEN</p> <ul style="list-style-type: none"> • AOV-270A • AOV-270B <p>c. Reset both trains of XY relays for RCP seal return isolation valve MOV-313</p> <p>d. Open RCP seal return isolation valve MOV-313</p> <p>e. Verify RCP #1 seal leakoff flow - LESS THAN 6.0 GPM</p> <p>f. Verify RCP #1 seal leakoff flow - GREATER THAN 0.8 GPM</p> | <p>a. Go to Step 32.</p> <p>b. Manually open valves as necessary.</p> <p>d. Perform the following:</p> <ol style="list-style-type: none"> 1) Place MOV-313 switch to OPEN. 2) Dispatch AO to locally open MOV-313. <p>e. Perform the following:</p> <ol style="list-style-type: none"> 1) Trip the affected RCP 2) Allow 4 minutes for pump coast down. <u>THEN</u> close the affected RCP seal discharge valve <ul style="list-style-type: none"> • RCP A. AOV-270A • RCP B. AOV-270B <p><u>IF</u> both RCP seal discharge valves are shut. <u>THEN</u> go to Step 32.</p> <p>f. Refer to AP-RCP.1. RCP SEAL MALFUNCTION.</p> |
|--|---|

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

32 Verify PRZR Level - GREATER THAN 13% [40% adverse CNMT]

Continue with Step 34. WHEN PRZR level increases to greater than 13% [40% adverse CNMT], THEN do Step 33.

33 Establish Normal Letdown:

IF RCP seal return has been established, THEN establish excess letdown as follows:

- a. Establish charging line flow to REGEN Hx - GREATER THAN 20 GPM
- b. Place the following switches to CLOSE:
 - Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202)
 - Letdown isolation valve AOV-371
 - Loop B cold leg to REGEN Hx AOV-427
- c. Place letdown controllers in MANUAL at 40% open
 - TCV-130
 - PCV-135
- d. Reset both trains of XY relays for AOV-371 and AOV-427
- e. Open AOV-371 and AOV-427
- f. Open letdown orifice valves as necessary
- g. Place TCV-130 in AUTO at 105°F
- h. Place PCV-135 in AUTO at 250 psig
- i. Adjust charging pump speed and HCV-142 as necessary

- o Place excess letdown divert valve, AOV-312, to NORMAL.
- o Ensure CCW from excess letdown open. (AOV-745).
- o Open excess letdown isolation valve AOV-310.
- o Slowly open HCV-123 to maintain excess letdown temperature less than 195°F and pressure less than 100 psig.
- o Adjust charging pump speed as necessary.

IF RCP seal return NOT established, THEN consult TSC to determine if excess letdown should be placed in service.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

34 Check VCT Makeup System:

- | | |
|--|--|
| <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% <li style="text-align: center;">-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 and increase RMW flow. 3) Increase boric acid flow as necessary. |
|--|--|

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

35 Check Charging Pump Suction
Aligned To VCT:

a. VCT level - GREATER THAN 20%

a. IF VCT level can NOT be
maintained greater than 5%. THEN
perform the following:

1) Ensure charging pump suction
aligned to RWST

o LCV-112B open

o LCV-112C closed

2) Continue with Step 36. WHEN
VCT level greater than 40%.
THEN do Step 35b.

b. Verify charging pumps aligned to
VCT

o LCV-112C - OPEN

o LCV-112B - CLOSED

b. Manually align valves as
necessary.



.....

CAUTION

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

.....

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

a. Perform appropriate action(s) from table:

PRZR LEVEL	RUPTURED S/G NARROW RANGE LEVEL		
	INCREASING	DECREASING	OFFSCALE HIGH
LESS THAN 13% [40% ADVERSE CNMT]	<ul style="list-style-type: none"> o Increase charging flow o Depressurize RCS using Step 36b 	<ul style="list-style-type: none"> o Increase charging flow 	<ul style="list-style-type: none"> o Increase charging flow o Maintain RCS and ruptured S/G pressure equal
BETWEEN 13% [40% ADVERSE CNMT] AND 50%	<ul style="list-style-type: none"> o Depressurize RCS using Step 36b 	<ul style="list-style-type: none"> o Energize PRZR heaters 	<ul style="list-style-type: none"> o Maintain RCS and ruptured S/G pressure equal
BETWEEN 50% AND 75% [65% ADVERSE CNMT]	<ul style="list-style-type: none"> o Depressurize RCS using Step 36b o Decrease charging flow 	<ul style="list-style-type: none"> o Energize PRZR heaters 	<ul style="list-style-type: none"> o Maintain RCS and ruptured S/G pressure equal
GREATER THAN 75% [65% ADVERSE CNMT]	<ul style="list-style-type: none"> o Decrease charging flow 	<ul style="list-style-type: none"> o Energize PRZR heaters 	<ul style="list-style-type: none"> o Maintain RCS and ruptured S/G pressure equal

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

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

EOP:

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

37 Monitor If CNMT Spray Should Be Stopped:

- a. CNMT spray pumps - ANY RUNNING
- b. Verify CNMT pressure - LESS THAN 4 PSIG
- 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
 - MOV-860A
 - MOV-860B
 - MOV-860C
 - MOV-860D

- a. Go to Step 38.
- b. Continue with Step 38. WHEN CNMT pressure less than 4 psig. THEN do Steps 37c through f.
- d. Place NaOH tank outlet valve switches to CLOSE.
 - AOV-836A
 - AOV-836B

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

38 Check If Emergency D/Gs
Should Be Stopped:

- a. Verify AC emergency busses energized by offsite power:
 - o Emergency D/G output breakers - OPEN
 - o AC emergency bus voltage - GREATER THAN 420 VOLTS
 - o AC emergency bus normal feed breakers - CLOSED
- 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).

39 Minimize Secondary System
Contamination:

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

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

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

41 Check RCP Cooling:

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

a. Check CCW to RCPs:

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

b. Check RCP seal injection:

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

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

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

42 Check RCP Status

a. Both RCPs - STOPPED

b. Ensure conditions for starting an RCP.

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

a. Stop all but one RCP and go to step 43.

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

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

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

2) Go to step 43.

This Step continued on the next page.

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 42 continued from previous page)

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

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

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

IF conditions NOT met, THEN continue with step 43. WHEN conditions met, THEN do step 42d.

d. Start one RCP

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

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

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

43 Check If Source Range Detectors Should Be Energized:

- | | |
|--|--|
| <p>a. Source range channels -
DEENERGIZED</p> | <p>a. Go to Step 43e.</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 44. <u>WHEN</u> flux is LESS THAN 10⁻¹⁰ amps on any operable channel, <u>THEN</u> do Steps 43c through 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 44. <u>WHEN</u> either condition met, <u>THEN</u> do Steps 43d 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 44.</p> |
| <p>e. Transfer Rk-45 recorder to one source range and one intermediate range channel</p> | |

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

44 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

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

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

-OR-

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

-OR-

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

-END-

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E-3 APPENDIX LIST

TITLE

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

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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

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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

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

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

OR

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

3. SECONDARY INTEGRITY CRITERIA

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

4. COLD LEG RECIRCULATION SWITCHOVER CRITERION

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

5. AFW SUPPLY SWITCHOVER CRITERION

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

6. MULTIPLE S/G TUBE RUPTURE CRITERIA

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