

April 29, 2004

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
Joseph A. Widay

JAW/jdw

xc: U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406-1415

Ginna USNRC Senior Resident Inspector

Enclosure(s):

ATT Index
E Index
ATT-16.0, Rev 12
E-3, Rev 37

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INPUT PARAMETERS: TYPE: PRATT

STATUS VALUE(S): EF, QU

5 YEARS ONLY:

PRATT EOP ATTACHMENTS

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
ATT-1.0	ATTACHMENT AT POWER CCW ALIGNMENT	003	02/12/2003	02/12/2003	02/12/2008	EF
ATT-1.1	ATTACHMENT NORMAL CCW FLOW	000	05/18/2000	05/18/2000	05/18/2005	EF
ATT-2.1	ATTACHMENT MIN SW	005	02/01/2001	02/03/2003	02/03/2008	EF
ATT-2.2	ATTACHMENT SW ISOLATION	008	03/06/2002	03/27/2003	03/27/2008	EF
ATT-2.3	ATTACHMENT SW LOADS IN CNMT	004	03/06/2002	04/06/2004	04/06/2009	EF
ATT-2.4	ATTACHMENT NO SW PUMPS	002	05/30/2003	10/31/2001	10/31/2006	EF
ATT-2.5	ATTACHMENT SPLIT SW HEADERS	000	06/26/2002	06/26/2002	06/26/2007	EF
ATT-3.0	ATTACHMENT C/CVI	007	02/17/2004	02/17/2004	02/17/2009	EF
ATT-3.1	ATTACHMENT CNMT CLOSURE	005	02/17/2004	02/17/2004	02/17/2009	EF
ATT-4.0	ATTACHMENT CNMT RECIRC FANS	003	07/26/1994	03/27/2003	03/27/2008	EF
ATT-5.0	ATTACHMENT COND TO S/G	006	10/10/2003	04/06/2004	04/06/2009	EF
ATT-5.1	ATTACHMENT SAFW	008	05/30/2002	04/06/2004	04/06/2009	EF
ATT-5.2	ATTACHMENT FIRE WATER COOLING TO TDAFW PUMP	003	01/14/1999	01/28/2004	01/28/2009	EF
ATT-6.0	ATTACHMENT COND VACUUM	003	12/18/1996	02/03/2003	02/03/2008	EF
ATT-7.0	ATTACHMENT CR EVAC	006	03/06/2002	02/03/2003	02/03/2008	EF
ATT-8.0	ATTACHMENT DC LOADS	007	02/04/2004	02/04/2004	02/04/2009	EF
ATT-8.1	ATTACHMENT D/G STOP	005	03/06/2002	02/03/2003	02/03/2008	EF
ATT-8.2	ATTACHMENT GEN DEGAS	008	06/20/2002	08/17/1999	08/17/2004	EF
ATT-8.3	ATTACHMENT NONVITAL	004	03/06/2002	02/03/2003	02/03/2008	EF
ATT-8.4	ATTACHMENT S/U/V	005	03/06/2002	02/03/2003	02/03/2008	EF
ATT-8.5	ATTACHMENT LOSS OF OFFSITE POWER	001	08/26/2003	05/02/2002	05/02/2007	EF
ATT-9.0	ATTACHMENT LETDOWN	009	01/07/2004	03/06/2002	03/06/2007	EF
ATT-9.1	ATTACHMENT EXCESS L/D	005	03/06/2002	10/31/2001	10/31/2006	EF
ATT-10.0	ATTACHMENT FAULTED S/G	006	03/06/2002	03/27/2003	03/27/2008	EF
ATT-11.0	ATTACHMENT IA CONCERNS	003	06/26/2003	03/27/2003	03/27/2008	EF
ATT-11.1	ATTACHMENT IA SUPPLY	003	03/06/2002	03/27/2003	03/27/2008	EF
ATT-11.2	ATTACHMENT DIESEL AIR COMPRESSOR	004	11/18/2002	03/10/2003	03/10/2008	EF
ATT-12.0	ATTACHMENT N2 PORVS	005	02/12/2003	02/12/2003	02/12/2008	EF
ATT-13.0	ATTACHMENT NC	003	02/12/2003	02/12/2003	02/12/2008	EF
ATT-14.0	ATTACHMENT NORMAL RHR COOLING	003	03/06/2002	04/06/2004	04/06/2009	EF

NPSP0200
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PRATT EOP ATTACHMENTS

PROCEDURE NUMBER	PROCEDURE TITLE	REV	EFFECT DATE	LAST REVIEW	NEXT REVIEW	ST
ATT-14.1	ATTACHMENT RHR COOL	006	04/30/2003	01/08/2002	01/08/2007	EF
ATT-14.2	ATTACHMENT RHR ISOL	003	02/12/2003	02/12/2003	02/12/2008	EF
ATT-14.3	ATTACHMENT RHR NPSH	003	03/06/2002	01/28/2004	01/28/2009	EF
ATT-14.5	ATTACHMENT RHR SYSTEM	003	03/20/2003	02/03/2003	02/03/2008	EF
ATT-14.6	ATTACHMENT RHR PRESS REDUCTION	002	03/06/2002	01/28/2004	01/28/2009	EF
ATT-14.7	ATTACHMENT ADJUST RHR FLOW	000	02/17/2004	02/17/2004	02/17/2009	EF
ATT-15.0	ATTACHMENT RCP START	009	03/06/2002	03/17/2000	03/17/2005	EF
ATT-15.1	ATTACHMENT RCP DIAGNOSTICS	003	04/24/1997	02/03/2003	02/03/2008	EF
ATT-15.2	ATTACHMENT SEAL COOLING	005	03/06/2002	02/03/2003	02/03/2008	EF
ATT-16.0	ATTACHMENT RUPTURED S/G	012	04/29/2004	01/11/2000	01/11/2005	EF
ATT-16.1	ATTACHMENT SGTL	002	03/06/2002	09/08/2000	09/08/2005	EF
ATT-16.2	ATTACHMENT RCS BORON FOR SGTL	003	11/26/2003	09/08/2000	09/08/2005	EF
ATT-17.0	ATTACHMENT SD-1	016	10/10/2003	02/29/2000	02/28/2005	EF
ATT-17.1	ATTACHMENT SD-2	006	03/06/2002	01/30/2001	01/30/2006	EF
ATT-18.0	ATTACHMENT SFP - RWST	005	03/06/2002	02/03/2003	02/03/2008	EF
ATT-20.0	ATTACHMENT VENT TIME	003	07/26/1994	02/03/2003	02/03/2008	EF
ATT-21.0	ATTACHMENT RCS ISOLATION	002	03/06/2002	02/03/2003	02/03/2008	EF
ATT-22.0	ATTACHMENT RESTORING FEED FLOW	003	05/02/2002	01/22/2002	01/22/2007	EF
ATT-23.0	ATTACHMENT TRANSFER 4160V LOADS	000	02/26/1999	01/28/2004	01/28/2009	EF
ATT-24.0	ATTACHMENT TRANSFER BATTERY TO TSC	000	09/08/2000	09/08/2000	09/08/2005	EF
ATT-26.0	ATTACHMENT RETURN TO NORMAL OPERATIONS	000	10/31/2001	10/31/2001	10/31/2006	EF

PRATT TOTAL: 51

GRAND TOTAL: 51

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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	036	02/17/2004	03/24/2003	03/24/2008	EF
E-1	LOSS OF REACTOR OR SECONDARY COOLANT	029	02/17/2004	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	037	04/29/2004	03/24/2003	03/24/2008	EF

PRE TOTAL: 4

GRAND TOTAL: 4

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EOP: ATT-16.0	TITLE: ATTACHMENT RUPTURED S/G	REV: 12 PAGE 1 of 4
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Responsible Manager

Residing

Date

4-29-2004

NOTE: Intermediate Building environment should be assessed for radiological and other personnel safety concerns.

PART A. Dispatch AO with locked valve key to complete local isolation of ruptured S/G as follows:

1) Check closed the ruptured S/G MSIV

o S/G A, V-3517

OR

o S/G B, V-3516

IF ruptured S/G MSIV is NOT closed, THEN perform the following to close ruptured S/G MSIV:

o S/G A

- Close IA isol to S/G A MSIV, V-5408A
- Open emerg vent valves V-5471 AND V-5473
- Notify Control Room S/G A MSIV is closed

OR

o S/G B

- Close IA isol to S/G B MSIV, V-5409B
- Open emerg vent valves V-5472 AND V-5474
- Notify Control Room S/G B MISV is closed

2) Ensure BOTH S/G MSIV bypass valves closed (INT BLDG steam header area):

o S/G A, V-3615

o S/G B, V-3614

3) IF the ruptured S/G MSIV can NOT be closed, THEN perform the following:

a) Close Air Ejector/Gland steam root valve, V-3540 (Main steam header TURB BLDG).

b) Close flange heating isolation valves, MOV-3601A and MOV-3602A.

c) Notify Control Room that main flowpaths are isolated.

EOP: ATT-16.0	TITLE: ATTACHMENT RUPTURED S/G	REV: 12 PAGE 2 of 4
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CAUTION

CONTROL ROOM SHOULD BE NOTIFIED BEFORE ISOLATING TDAFW PUMP
STEAM FLOW.

NOTE: The following steps may be done in any order for PART A.

- 4) Locally close TDAFW Pump steam root valve
 - o S/G A, V-3505
 - OR-
 - o S/G B, V-3504
- 5) Locally close the following steam valves from the ruptured S/G:
 - o Steam to sampling system valve (INT BLDG steam header area):
S/G A, close V-3413A
 - OR-
 - S/G B, close V-3412A
 - o Support heating steam valve (INT BLDG steam header area):
S/G A, close V-3669
 - OR-
 - S/G B, close V-3668
 - o Upstream trap isolation valve (TURB BLDG near MFW reg vlvs):
S/G A, close V-3521
 - OR-
 - S/G B, close V-3520

CAUTION

CONTROL ROOM SHOULD BE NOTIFIED BEFORE ISOLATING TDAFW PUMP
FEED FLOW.

- 6) Locally close TDAFW pump manual feedwater isolation valve to ruptured S/G (INT BLDG steam header area):
 - S/G A, V-4005
 - OR-
 - S/G B, V-4006

EOP:	TITLE:	REV: 12
ATT-16.0	ATTACHMENT RUPTURED S/G	PAGE 3 of 4

- 7) Bypass condensate polishing demineralizers as follows:
 - a. Place AVT bypass valve controller in MANUAL (east end of AVT panel).
 - b. Open bypass valve.
 - c. Isolate ALL inservice demineralizers as follows:
 - 1) Place the Mixed Bed Service Selector switch to override AND select the bed to be removed from service.
 - 2) Place the 4 position selector switch for the selected bed to OFF.
 - 3) Repeat steps 1 and 2 for each inservice bed.
- 8) Locally place TURB RM WALL EXH FAN switches to CLOSE.
- 9) Locally place TURB RM ROOF VENT switches to CLOSE.

EOP: ATT-16.0	TITLE: ATTACHMENT RUPTURED S/G	REV: 12 PAGE 4 of 4
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CAUTION

PART B OF THIS ATTACHMENT SHOULD ONLY BE PERFORMED IF RUPTURED S/G MSIV CANNOT BE CLOSED.

PART B. Dispatch AO to locally perform the following when ruptured S/G MSIV cannot be closed, if areas are accessible:

- 1) Complete isolation by closing the following valves:

NOTE: Substeps may be done in any order.

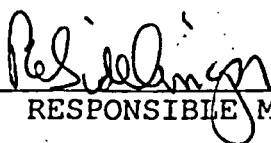
- a) MFW regulating valve and bypass valve manual isolation valves for both S/Gs:
 - o S/G A, V-3985 and V-3989
 - o S/G B, V-3984 and V-3988
- b) Reheat steam chain valves:
 - o 1A MSR, V-3551
 - o 1B MSR, V-3550
 - o 2A MSR, V-3553
 - o 2B MSR, V-3552
- c) Steam dump header isolation and bypass valves (Main steam header TURB BLDG on platform overhead)
 - o V-3532 and V-3659
 - o V-3533 and V-3658
- d) Reheat steamline warmup valves (warmup vlvs located east end of 1A and 2A MSRs TURB BLDG middle floor):
 - o V-3645
 - o V-3646
 - o V-3647
 - o V-3648
- e) Reheat steamline common vent, V-8500 (at condenser north of 1A MSR).
- f) Steam to trap header isolation valves
 - o V-8513 (Main steam header TURB BLDG)
 - o V-8529 (south side EH skid)
- g) Steam trap isolation and bypass valves
 - o V-3596 (south side of EH skid)
 - o V-3598 (south side of EH skid)

EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 37 PAGE 1 of 42
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23


RESPONSIBLE MANAGER

4-29-2004
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 37 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.

EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 37 PAGE 3 of 42
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED								
<p><u>NOTE:</u></p> <ul style="list-style-type: none">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.										
<p>* 1 Monitor RCP Trip Criteria:</p> <table><tbody><tr><td>a. RCP status - ANY RCP RUNNING</td><td>a. Go to Step 2.</td></tr><tr><td>b. SI pumps - AT LEAST TWO RUNNING</td><td>b. Go to Step 2.</td></tr><tr><td>c. RCS pressure minus maximum S/G pressure - LESS THAN 175 psig [400 psig adverse CNMT]</td><td>c. Go to Step 2.</td></tr><tr><td>d. Stop both RCPs</td><td></td></tr></tbody></table>			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	
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										

EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 37 PAGE 4 of 42
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>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>*****</p>		
2	<p>Identify Ruptured S/G(s):</p> <ul style="list-style-type: none"> o Unexpected increase in either S/G narrow range level <li style="padding-left: 40px;">-OR- o High radiation indication on main steamline radiation monitor <ul style="list-style-type: none"> • R-31 for S/G A • R-32 for S/G B <li style="padding-left: 40px;">-OR- o AO reports local indication of high steamline radiation <li style="padding-left: 40px;">-OR- o RP reports high radiation from S/G activity sample 	<p>Perform the following:</p> <ul style="list-style-type: none"> a. Reset SI b. Continue with Steps 10 through 16. <u>WHEN</u> ruptured S/G(s) identified, <u>THEN</u> do Steps 3 through 9.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>.....</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>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.</p> <p>o AT LEAST ONE S/G SHALL BE MAINTAINED AVAILABLE FOR RCS COOLDOWN.</p> <p>.....</p>		
3	Isolate Flow From Ruptured S/G(s):	
	a. Adjust ruptured S/G ARV controller to 1050 psig in AUTO	
	b. Check ruptured S/G ARV - CLOSED	<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>
	c. Close ruptured S/G TDAFW pump steam supply valve and place in PULL STOP	c. Dispatch AO with locked valve key to locally isolate steam from ruptured S/G to TDAFW pump.
	<ul style="list-style-type: none"> • S/G A. MOV-3505A • S/G B. MOV-3504A 	<ul style="list-style-type: none"> • S/G A. V-3505 • S/G B. V-3504
	d. Verify ruptured S/G blowdown valve - CLOSED	d. Place S/G blowdown and sample valve isolation switch to CLOSE.
	<ul style="list-style-type: none"> • S/G A. AOV-5738 • S/G B. AOV-5737 	<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

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p>4 Complete Ruptured S/G Isolation:</p> <p>a. Close ruptured S/G MSIV - RUPTURED S/G MSIV CLOSED.</p> <p>b. Dispatch A0 to complete ruptured S/G isolation (Refer to ATT-16.0. ATTACHMENT RUPTURED S/G part A)</p>	<p>a. Perform the following:</p> <ol style="list-style-type: none"> 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 A0 to complete ruptured S/G isolation (Refer to ATT-16.0. ATTACHMENT RUPTURED S/G, parts A and B). 8) Go to step 5.

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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.

5 Check Ruptured S/G Level:

- | | |
|--|--|
| <p>a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]</p> | <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 6. <u>WHEN</u> ruptured S/G level greater than 5% [25% adverse CNMT]. <u>THEN</u> do Steps 5b through e.</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>b. Dispatch AO to locally close valve.</p> |
| <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>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. Verify MDAFW pump crosstie valves - CLOSED</p> <ul style="list-style-type: none"> • MOV-4000A • MOV-4000B | <p>e. Manually close valves.</p> |

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Verify Ruptured S/G Isolated:	
	a. Check ruptured MSIV - CLOSED	a. Direct A0 to immediately isolate air ejector/gland steam supply and flange heating steam. (Refer to ATT-16.0, ATTACHMENT RUPTURED S/G, part A).
	b. Check TDAFW pump steam supply from ruptured S/G - ISOLATED	b. Continue efforts to isolate steam supply from ruptured S/G: • S/G A, MOV-3505A <u>OR</u> V-3505 • S/G B, MOV-3504A <u>OR</u> V-3504
	c. Ruptured S/G pressure - GREATER THAN 300 PSIG	c. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
7	Establish Condenser Steam Dump Pressure Control:	
	a. Verify condenser available: o Intact S/G MSIV - OPEN o Annunciator G-15, STEAM DUMP ARMED - LIT	a. Adjust S/G ARV controllers to maintain intact S/G pressure in AUTO and go to Step 8.
	b. Adjust condenser steam dump controller HC-484 to maintain intact S/G pressure and verify in AUTO	
	c. Place steam dump mode selector switch to MANUAL	

EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 37 PAGE 9 of 42
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>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>*****</p>		
8	Reset SI	

EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 37 PAGE 10 of 42
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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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
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NOTE: TDAFW pump flow control AOVs may drift open on loss of IA.

10 Monitor Intact S/G Level:

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

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>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).</p> <p>*****</p>		
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: <ul style="list-style-type: none"> • 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. <p><u>IF</u> any PORV can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve. <u>IF</u> block valve can <u>NOT</u> be closed. <u>THEN</u> go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED. Step 1.</p>
c.	Block valves - AT LEAST ONE OPEN	c. Open one block valve unless it was closed to isolate an open PORV.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12 Reset CI:	<ul style="list-style-type: none"> a. Depress CI reset pushbutton b. Verify annunciator A-26, CNMT 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.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	<p>Monitor All AC Busses - BUSSES ENERGIZED BY OFFSITE POWER</p> <ul style="list-style-type: none"> 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 	<p>Perform the following:</p> <ul style="list-style-type: none"> a. <u>IF</u> any AC emergency bus normal feed breaker open, <u>THEN</u> ensure associated D/G breaker closed. b. Perform the following as necessary: <ul 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) Place the following pumps in PULL STOP: <ul style="list-style-type: none"> • EH pumps • Turning gear oil pump • HP seal oil backup pump 3) Restore power to MCCs. <ul style="list-style-type: none"> • 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) <u>WHEN</u> bus 15 restored, <u>THEN</u> reset control room lighting. c. Try to restore offsite power to all AC busses (Refer to ER-ELEC.1. RESTORATION OF OFFSITE POWER).

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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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)

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

15 Establish IA to CNMT:

a. Verify non-safeguards busses energized

- o Bus 13 normal feed - CLOSED

-OR-

- o Bus 15 normal feed - CLOSED

a. Perform the following:

- 1) Close non-safeguards bus tie breakers:

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

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

IF NOT, THEN perform the following:

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

-OR-

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

b. Check SW pumps - AT LEAST TWO PUMPS RUNNING

b. Perform the following:

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

- 2) Go to step 15d.

c. Verify turbine building SW isolation valves - OPEN

c. Manually align valves.

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

This Step continued on the next page.

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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> <ul 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	<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 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: <ul style="list-style-type: none"> o LCV-112B - OPEN o LCV-112C - CLOSED 	<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).
c.	Start charging pumps as necessary and establish 75 gpm total charging flow <ul style="list-style-type: none"> • Charging line flow • Seal injection 	

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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 .

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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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] <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o RCS pressure - LESS THAN SATURATION USING FIG-1.0. FIGURE MIN SUBCOOLING <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> 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> |
|--|--|

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED				
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>o THE PRT MAY RUPTURE IF A PRZR PORV IS USED TO DEPRESSURIZE THE RCS. THIS MAY RESULT IN ABNORMAL CNMT CONDITIONS.</p> <p>o CYCLING OF THE PRZR PORV SHOULD BE MINIMIZED.</p> <p>o THE UPPER HEAD REGION MAY VOID DURING RCS DEPRESSURIZATION IF RCPS ARE NOT RUNNING. THIS MAY RESULT IN A RAPIDLY INCREASING PRZR LEVEL.</p> <p>*****</p> <p><u>NOTE:</u> o If auxiliary spray is in use, spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves.</p> <p>o When using a PRZR PORV select one with an operable block valve.</p> <p>22 Depressurize RCS Using PRZR PORV To Minimize Break Flow And Refill PRZR:</p> <table> <tr> <td>a. Verify IA to CNMT - AVAILABLE</td> <td>a. Refer to ATT-12.0. ATTACHMENT N2 PORVS to operate PORVs.</td> </tr> <tr> <td>b. PRZR PORVs - AT LEAST ONE AVAILABLE</td> <td>b. <u>IF</u> auxiliary spray available, <u>THEN</u> return to Step 21b.</td> </tr> </table> <p><u>IF</u> auxiliary spray can <u>NOT</u> be established, <u>THEN</u> go to ECA-3.3. SGTR WITHOUT PRESSURIZER PRESSURE CONTROL. Step 1.</p>			a. Verify IA to CNMT - AVAILABLE	a. Refer to ATT-12.0. ATTACHMENT N2 PORVS to operate PORVs.	b. PRZR PORVs - AT LEAST ONE AVAILABLE	b. <u>IF</u> auxiliary spray available, <u>THEN</u> return to Step 21b.
a. Verify IA to CNMT - AVAILABLE	a. Refer to ATT-12.0. ATTACHMENT N2 PORVS to operate PORVs.					
b. PRZR PORVs - AT LEAST ONE AVAILABLE	b. <u>IF</u> auxiliary spray available, <u>THEN</u> return to Step 21b.					
<p>This Step continued on the next page.</p>						

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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	<p>Close block valve for the PRZR PORV that was opened.</p> <p><u>IF</u> pressure continues to decrease. <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> a. Monitor the following conditions for indication of leakage from PRZR PORV: <ul style="list-style-type: none"> o PORV outlet temp (TI-438) <u>NOT</u> 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.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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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:

- | | |
|--|--|
| <p>a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0. FIGURE MIN SUBCOOLING</p> | <p>a. Do <u>NOT</u> stop SI pumps. Go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.</p> |
| <p>b. Secondary heat sink:</p> <ul style="list-style-type: none"> o Total feed flow to S/G(s) - GREATER THAN 200 GPM AVAILABLE <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o Narrow range level in at least one intact S/G - GREATER THAN 5% [25% adverse CNMT] | <p>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.</p> |
| <p>c. RCS pressure - STABLE OR INCREASING</p> | <p>c. Do <u>NOT</u> stop SI pumps. Go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.</p> |
| <p>d. PRZR level - GREATER THAN 5% [30% adverse CNMT]</p> | <p>d. Do <u>NOT</u> stop SI pumps. Return to Step 6.</p> |

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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: • RCP A, V-300A • RCP B, V-300B 2) Ensure HCV-142 open. 3) Start one charging pump.
	b. Establish 20 gpm charging line flow	
27	Monitor SI Reinitiation Criteria: a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIG-1.0, FIGURE MIN SUBCOOLING b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	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. 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.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28	<p>Check If SI ACCUMs Should Be Isolated:</p> <p>a. Check the following:</p> <ul style="list-style-type: none"> 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] <p>b. Dispatch AO with locked valve key to locally close breakers for SI ACCUM discharge valves</p> <ul style="list-style-type: none"> • MOV-841. MCC C position 12F • MOV-865. MCC D position 12C <p>c. Close SI ACCUM discharge valves</p> <ul style="list-style-type: none"> • MOV-841 • MOV-865 <p>d. Locally reopen breakers for MOV-841 and MOV-865</p>	<p>a. Manually operate SI pumps as necessary and go to ECA-3.1. SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED. Step 1.</p> <p>c. Vent any unisolated ACCUMs:</p> <p>1) Open vent valves for unisolated SI ACCUMs.</p> <ul style="list-style-type: none"> • ACCUM A. AOV-834A • ACCUM B. AOV-834B <p>2) Open HCV-945.</p> <p><u>IF</u> an accumulator can <u>NOT</u> be isolated or vented, <u>THEN</u> consult TSC to determine contingency actions.</p>

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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.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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(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

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30	Check If Normal CVCS Operation Can Be Established	
a.	Verify IA restored: <ul style="list-style-type: none"> o IA to CNMT (AOV-5392) - OPEN o IA pressure - GREATER THAN 60 PSIG 	a. Continue with Step 36. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 30 through 35.
b.	Verify instrument bus D - ENERGIZED	b. Energize MCC B. <u>IF</u> MCC B <u>NOT</u> available, <u>THEN</u> perform the following: <ol style="list-style-type: none"> 1) Verify MCC A energized. 2) Place instrument bus D on maintenance supply.
c.	CCW pumps - ANY RUNNING	c. Perform the following: <ol 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.
d.	Charging pump - ANY RUNNING	d. Continue with Step 36. <u>WHEN</u> any charging pump running, <u>THEN</u> do Steps 31 through 35.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31	Check If Seal Return Flow Should Be Established:	
a.	Verify RCP #1 seal outlet temperature - LESS THAN 235°F	a. Go to Step 32.
b.	Verify RCP seal outlet valves - OPEN <ul style="list-style-type: none"> • 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: <ol style="list-style-type: none"> 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: <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>
f.	Verify RCP #1 seal leakoff flow - GREATER THAN 0.8 GPM	f. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
32	Verify PRZR Level - GREATER THAN 13% [40% adverse CNMT]	Continue with Step 34. <u>WHEN</u> PRZR level increases to greater than 13% [40% adverse CNMT]. <u>THEN</u> do Step 33.
33	<p>Establish Normal Letdown:</p> <ul style="list-style-type: none"> a. Establish charging line 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) • Letdown isolation valve AOV-371 • Loop B cold leg to REGEN Hx AOV-427 c. Place letdown controllers 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 PCV-135 in AUTO at 250 psig h. Place TCV-130 in AUTO at the normal setpoint i. Adjust charging pump speed and HCV-142 as necessary 	<p><u>IF</u> RCP seal return has been established, <u>THEN</u> establish excess letdown as follows:</p> <ul style="list-style-type: none"> 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. <p><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.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34	Check VCT Makeup System:	
	a. Adjust boric acid flow control valve in AUTO to 9.5 gpm	
	b. Adjust RMW flow control valve in AUTO to 40 gpm	
	c. Verify the following:	c. Adjust controls as necessary.
	1) RMW mode selector switch in AUTO	
	2) RMW control armed - RED LIGHT LIT	
	d. Check VCT level:	d. Manually increase VCT makeup flow as follows:
	o Level - GREATER THAN 20%	
	-OR-	
	o Level - STABLE OR INCREASING	
		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.

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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.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION

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

***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 	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%	Depressurize RCS using Step 36b	Energize PRZR heaters	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 	Energize PRZR heaters	Maintain RCS and ruptured S/G pressure equal
GREATER THAN 75% [65% ADVERSE CNMT]	o Decrease charging flow	Energize PRZR heaters	Maintain RCS and ruptured S/G pressure equal

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

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

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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	a. Go to Step 38.
b.	Verify CNMT pressure - LESS THAN 4 PSIG	b. Continue with Step 38. <u>WHEN</u> CNMT pressure less than 4 psig. <u>THEN</u> do Steps 37c through f.
c.	Reset CNMT spray	
d.	Check NaOH flow (FI-930) - NO FLOW	d. Place NaOH tank outlet valve switches to CLOSE. • AOV-836A • AOV-836B
e.	Stop CNMT spray pumps and place in AUTO	
f.	Close CNMT spray pump discharge valves • MOV-860A • MOV-860B • MOV-860C • MOV-860D	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
38	<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).
39	<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 (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) 	<ul style="list-style-type: none"> a. IF hotwell level increasing. THEN direct RP to sample hotwells for activity.

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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	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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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

- | | |
|--|--|
| <p>a. Both RCPs - STOPPED</p> <p>b. Ensure conditions for starting an RCP.</p> <ul style="list-style-type: none"> o Bus 11A or 11B energized. o Refer to ATT-15.0, ATTACHMENT RCP START. | <p>a. Stop all but one RCP and go to step 43.</p> <p>b. <u>IF</u> conditions can <u>NOT</u> be met, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> 1) Verify natural circulation (Refer to ATT-13.0, ATTACHMENT NC). <u>IF</u> natural circulation can <u>NOT</u> be verified, <u>THEN</u> increase dumping steam. 2) Go to step 43. |
|--|--|

This Step continued on the next page.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 42 continued from previous page)

c. Check RVLIS level (no RCPs) -
≥ 95%

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

o Increase PRZR level to greater than 65% [82% adverse CNMT].

o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using FIG-1.0. FIGURE MIN SUBCOOLING.

o Energize PRZR heaters as necessary to saturate PRZR water

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

d. Start one RCP

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

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

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p><u>NOTE:</u> Adverse CNMT conditions or loss of forced air cooling may result in failure of NIS detectors.</p>	
43	<p>Check If Source Range Detectors Should Be Energized:</p>	
a.	Source range channels - DEENERGIZED	a. Go to Step 43e.
b.	Check intermediate range flux - EITHER CHANNEL LESS THAN 10-10 AMPS	<p>b. Perform the following:</p> <p>1) <u>IF</u> neither intermediate range channel is decreasing, <u>THEN</u> initiate boration.</p> <p>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.	<p>Check the following:</p> <p>o Both intermediate range channels - LESS THAN 10-10 AMPS</p> <p>-OR-</p> <p>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.
d.	Verify source range detectors - ENERGIZED	<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>
e.	Transfer Rk-45 recorder to one source range and one intermediate range channel	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
44	<p>Establish Normal Shutdown Alignment:</p> <p>a. Check condenser - AVAILABLE</p> <p>b. Perform the following:</p> <ul style="list-style-type: none"> o Open generator disconnects <ul style="list-style-type: none"> • 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 <p>c. Verify adequate Rx head cooling:</p> <ol style="list-style-type: none"> 1) Verify at least one control rod shroud fan - RUNNING 2) Verify one Rx compartment cooling fan - RUNNING <p>d. Verify ATT-17.0. ATTACHMENT SD-1 - COMPLETE</p>	<p>a. Dispatch A0 to perform ATT-17.1. ATTACHMENT SD-2.</p> <p>1) Manually start one fan as power supply permits (45 kw)</p> <p>2) Perform the following:</p> <ul style="list-style-type: none"> o Dispatch A0 to reset UV relays at MCC C and MCC D. o Manually start one fan as power supply permits (23 kw)

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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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.