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 RECIP. NAME RECIPIENT AFFILIATION

JOHNSON, A. Project Directorate I-3

SUBJECT: Emergency operating procedures, Rev 12 to E-3 "Steam
 Generator Tube Rupture & Rev 12 to ECA-0.0 "Loss of All AC
 Power." W/910821 ltr.

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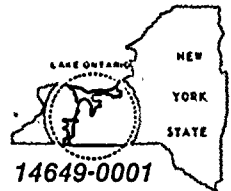
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August 21, 1991

U. S. Nuclear Regulatory Commission
Document Control Desk
Attn: Mr. Allen Johnson
Project Directorate I-3
Washington, D. C. 20555

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

Gentlemen:

As requested, enclosed are Ginna Station Emergency Operating Procedures.

Very truly yours,

Robert C. Mecredy

Enclosure

xc: Mr. Robert Gallo, USNRC, Region I
Resident Inspector, Ginna Station

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E-3, Rev. 12
ECA-0.0, Rev. 12
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ISSUED: 08/21/91

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ECA-0.2	LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED	6	90/04/09
ECA-1.1	LOSS OF EMERGENCY COOLANT RECIRCULATION	6	91/05/03
ECA-1.2	LOCA OUTSIDE CONTAINMENT	2	90/04/09
ECA-2.1	UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS	6	91/05/03
ECA-3.1	SGTR WITH LOSS OF REACTOR COOLANT-SUBCOOLED RECOVERY DESIRED	7	91/05/03
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PROCEDURE

TITLE

REV

EFFECTIVE

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ECA-3.3

SGTR WITHOUT PRESSURIZER
PRESSURE CONTROL

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91/05/03

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ISSUED: 08/21/91

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ER-ELEC.1	RESTORATION OF OFFSITE POWER	6	91/07/23
ER-ELEC.2	RECOVERY FROM LOSS OF A OR B DC BUS	4	90/03/02
ER-ELEC.3	EMERGENCY OFFSITE BACKFEED VIA UNIT AUX TRANSFORMER	1	89/10/12
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ER-NIS.1	SR MALFUNCTION	6	91/05/10
ER-NIS.2	IR MALFUNCTION	1	89/05/13
ER-NIS.3	PR MALFUNCTION	7	90/01/23
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ER-RMS.1	LOCATING SOURCE OF HIGH ACTIVITY - PLANT VENT.	2	91/07/23
ER-SFP.1	LOSS OF SPENT FUEL PIT COOLING	2	89/05/13
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ES-0.1	REACTOR TRIP RESPONSE	7	90/12/19
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ES-0.3	NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITH RVLIS)	1	90/04/30
ES-1.1	SI TERMINATION	7	91/05/03
ES-1.2	POST LOCA COOLDOWN AND DEPRESSURIZATION	8	91/06/24
ES-1.3	TRANSFER TO COLD LEG RECIRCULATION	12	91/05/10
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PROCEDURE

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ES-3.3

POST-SGTR COOLDOWN USING
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F-0.4	INTEGRITY CSFST	1	89/07/21
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F-0.6	INVENTORY CSFST	3	90/01/12

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FR-C.3	RESPONSE TO SATURATED CORE COOLING	4	90/04/09
FR-H.1	RESPONSE TO LOSS OF SECONDARY HEAT SINK	10	91/06/14
FR-H.2	RESPONSE TO STEAM GENERATOR OVERPRESSURE	2	90/04/09
FR-H.3	RESPONSE TO STEAM GENERATOR HIGH LEVEL	2	90/04/09
FR-H.4	RESPONSE TO LOSS OF NORMAL STEAM RELEASE CAPABILITIES	1	90/04/09
FR-H.5	RESPONSE TO STEAM GENERATOR LOW LEVEL	2	90/04/09
FR-I.1	RESPONSE TO HIGH PRESSURIZER		

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<u>PROCEDURE</u>	<u>TITLE</u>	<u>REV</u>	<u>EFFECTIVE DATE</u>
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FR-I.3	RESPONSE TO VOIDS IN REACTOR VESSEL	5	91/05/03
FR-P.1	RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION	6	91/05/03
FR-P.2	RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION	2	90/04/09
FR-S.1	RESPONSE TO NUCLEAR POWER GENERATION/ATWS	4	90/04/09
FR-S.2	RESPONSE TO LOSS OF CORE SHUTDOWN	2	90/04/09
FR-Z.1	RESPONSE TO HIGH CONTAINMENT PRESSURE	2	90/04/09
FR-Z.2	RESPONSE TO CONTAINMENT FLOODING	2	90/04/09

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ISSUED: 08/21/91

<u>PROCEDURE</u>	<u>TITLE</u>	<u>REV</u>	<u>EFFECTIVE DATE</u>
FR-Z.3	RESPONSE TO HIGH CONTAINMENT RADIATION LEVEL	2	90/04/09

EOP/AP ATTACHMENTS

ISSUED: 08/21/91

<u>PROCEDURE</u>	<u>TITLE</u>	<u>REV</u>	<u>EFFECTIVE DATE</u>
ATT	AUX BLDG SW	0	90/04/09
ATT	CI/CVI	1	90/04/09
ATT	CNMT RECIRC FANS	1	90/04/30
ATT	COND TO S/G	1	90/04/09
ATT	DC LOADS	2	91/05/10
ATT	D/G STOP	1	90/04/09
ATT	EXCESS L/D	1	90/04/30
ATT	FAULTED S/G	2	90/09/17
ATT	GEN DEGAS	3	91/05/10
ATT	LETDOWN	3	91/01/17

EOP/AP ATTACHMENTSISSUED: 08/21/91

<u>PROCEDURE</u>	<u>TITLE</u>	<u>REV</u>	<u>EFFECTIVE DATE</u>
ATT	N2 PORVS	1	90/04/09
ATT	NC	1	90/04/30
ATT	NONVITAL	1	90/04/09
ATT	RCP START	1	90/04/09
ATT	RCS ISOLATION	0	90/04/09
ATT	RHR COOL	1	90/04/09
ATT	RHR NPSH	0	91/05/10
ATT	RHR SYSTEM	1	90/04/30
ATT	RUPTURED S/G	2	90/09/17
ATT	SAFW	1	90/04/09

EOP/AP ATTACHMENTS

ISSUED: 08/21/91

<u>PROCEDURE</u>	<u>TITLE</u>	<u>REV</u>	<u>EFFECTIVE DATE</u>
ATT	SD-1	2	90/06/27
ATT	SD-2	2	90/06/27
ATT	SEAL COOLING	1	90/04/09
ATT	SFP-RWST	1	90/04/30
ATT	SI FLUSH	1	90/04/30
ATT	SI/UV	1	90/04/09
ATT	VENT TIME	1	90/04/30

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*Superseded Pages Per Rev To
Emergency Operating Procedures dtd*

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8/21/91 9108300185

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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

TECHNICAL REVIEW

PORC REVIEW DATE 5/1/91

Joseph A. Wisley
PLANT SUPERINTENDENT

5/3/91
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 11 PAGE 2 of 40
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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, 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. E-1 series FOLDOUT page 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: 11 PAGE 3 of 40
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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. 		
1	<p>Check If RCPs Should Be Stopped:</p> <ul style="list-style-type: none"> a. RCP status - ANY RCP RUNNING b. SI pumps - AT LEAST TWO RUNNING c. RCS pressure minus maximum S/G pressure - LESS THAN 175 psig [400 psig adverse CNMT] d. Stop both RCPs 	<ul style="list-style-type: none"> a. Go to Step 2. b. Go to Step 2. c. Go to Step 2.

EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 11 PAGE 4 of 40
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	<p>Identify Ruptured S/G(s):</p> <ul style="list-style-type: none"> o Unexpected increase in either S/G narrow range level <p>-OR-</p> <ul style="list-style-type: none"> 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 <p>-OR-</p> <ul style="list-style-type: none"> o A0 reports local indication of high steamline radiation <p>-OR-</p> <ul style="list-style-type: none"> o HP reports high radiation from S/G activity sample 	<p>Continue with Steps 5 through 10.</p> <p><u>WHEN</u> ruptured S/G(s) identified, <u>THEN</u> do Steps 3 and 4.</p>

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EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 11 PAGE 5 of 40
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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 MUST BE MAINTAINED AVAILABLE FOR RCS COOLDOWN.</p> <p>*****</p>		
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>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>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>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. <u>IF</u> at least one MDAFW pump running, <u>THEN</u> 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. 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
This Step continued on the next page.		

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 3 continued from previous page)	
	e. Close ruptured S/G MSIV	<p>e. 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) Place condenser steam dump mode selector switch to MANUAL. 4) Adjust reheat steam supply controller cam to close reheat steam supply valves. 5) Ensure turbine stop valves - CLOSED. 6) Dispatch A0 to complete ruptured S/G isolation (Refer to Attachment RUPTURED S/G, parts A and B). <p><u>IF</u> the ruptured S/G can <u>NOT</u> be isolated from the intact S/G, <u>THEN</u> go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1</p>
	f. Dispatch A0 to complete ruptured S/G isolation (Refer to appropriate sections of Attachment RUPTURED S/G)	

EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 11 PAGE 7 of 40
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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 RUPTURED S/G IS FAULTED, FEED FLOW TO THAT S/G SHOULD REMAIN ISOLATED DURING SUBSEQUENT RECOVERY ACTIONS UNLESS NEEDED FOR RCS COOLDOWN.</p> <p>*****</p>		
4	Check Ruptured S/G Level:	
	<p>a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]</p> <p>b. Close MDAFW pump discharge valve to ruptured S/G</p> <ul style="list-style-type: none"> • S/G A, MOV-4007 • S/G B, MOV-4008 <p>c. Pull stop MDAFW pump for ruptured S/G</p> <p>d. Close TDAFW pump flow control valve to ruptured S/G</p> <ul style="list-style-type: none"> • S/G A, AOV-4297 • S/G B, AOV-4298 <p>e. Verify MDAFW pump crosstie valves - CLOSED</p> <ul style="list-style-type: none"> • MOV-4000A • MOV-4000B 	<p>a. <u>IF</u> ruptured S/G <u>NOT</u> faulted, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> 1) Maintain feed flow to ruptured S/G until level greater than 5% [25% adverse CNMT]. 2) Continue with Step 5. <u>WHEN</u> ruptured S/G level greater than 5% [25% adverse CNMT], <u>THEN</u> do Steps 4b through e. <p>b. Dispatch AO to locally close valve.</p> <p>d. Dispatch AO with locked valve key to locally close TDAFW pump manual feedwater isolation valve to ruptured S/G.</p> <ul style="list-style-type: none"> • S/G A, V-4005 • S/G B, V-4006 <p>e. Manually close valves.</p>

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>IF ANY PRZR PORV OPENS BECAUSE OF HIGH PRZR PRESSURE, IT SHOULD BE CLOSED AFTER PRESSURE DECREASES TO LESS THAN 2335 PSIG (REFER TO STEP 5B).</p> <p>*****</p>		
5	Check 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 C position 6C • MOV-516, MCC D 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
6	<p>Check If S/G Secondary Side Is Intact:</p> <ul style="list-style-type: none"> o Pressure in both S/Gs - STABLE OR INCREASING o Pressure in both S/Gs - GREATER THAN 100 PSIG 	<p><u>IF</u> any S/G pressure decreasing in an uncontrolled manner <u>OR</u> completely depressurized, <u>THEN</u> verify faulted S/G isolated unless needed for RCS cooldown:</p> <ul style="list-style-type: none"> • Steamlines • Feedlines <p><u>IF NOT</u>, <u>THEN</u> go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.</p> <p>***** <u>CAUTION</u> IF CST LEVEL DECREASES TO LESS THAN 5 FEET, THEN ALTERNATE WATER SOURCES FOR AFW PUMPS WILL BE NECESSARY (REFER TO ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS). *****</p> <p><u>NOTE:</u> TDAFW pump flow control valves fail open on loss of IA.</p>
7	<p>Check Intact S/G Level:</p> <ul style="list-style-type: none"> a. Narrow range level - GREATER THAN 5% [25% adverse CNMT] b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50% 	<ul style="list-style-type: none"> a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in at least one S/G. 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.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
* * * * * <u>CAUTION</u> IF OFFSITE POWER IS LOST AFTER SI RESET, SELECTED SW PUMPS AND ONE CCW PUMP WILL AUTO START ON EMERGENCY D/G. MANUAL ACTION WILL BE REQUIRED TO RESTART SAFEGUARDS EQUIPMENT. * * * * *		
8	Reset SI	
9	Reset CI:	
	a. Depress CI reset pushbutton b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED	b. Perform the following: 1) Reset SI. 2) Depress CI reset pushbutton.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>RCS PRESSURE SHOULD BE MONITORED. IF RCS PRESSURE DECREASES TO LESS THAN 250 PSIG [465 PSIG ADVERSE CNMT] THE RHR PUMPS MUST BE MANUALLY RESTARTED TO SUPPLY WATER TO THE RCS.</p> <p>*****</p>		
10	<p>Check If RHR Pumps Should Be Stopped:</p> <ul style="list-style-type: none"> a. Check RCS pressure: <ul style="list-style-type: none"> o Pressure - GREATER THAN 250 psig [465 psig adverse CNMT] o Pressure - STABLE OR INCREASING b. Stop RHR pumps and place both in AUTO 	<p>a. Go to Step 11.</p>
<p><u>NOTE:</u> If ruptured S/G needed for cooldown, isolation is not necessary.</p>		
11	<p>Verify Ruptured S/G Isolated:</p> <ul style="list-style-type: none"> a. Check ruptured MSIV - CLOSED b. Ruptured S/G pressure - GREATER THAN 300 PSIG 	<ul style="list-style-type: none"> a. <u>IF</u> neither S/G nor intact S/G MSIV can be closed, <u>THEN</u> go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1. 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
12	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 - OPENo Annunciator G-15, STEAM DUMP - LITb. Adjust condenser steam dump controller HC-484 to maintain intact S/G pressure and verify in AUTOc. 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 13.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

13 Initiate RCS Cooldown:

- a. Determine required core exit temperature from below table

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

- b. 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 both S/Gs ruptured, 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 14. WHEN core exit T/Cs less than required, THEN do Step 13d.

- d. Stop RCS cooldown and maintain RCS temperature

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

14 Verify All AC 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 CNMT RECIRC fans as
necessary.
 - 5) 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).

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

15 Verify Adequate SW Flow:

- a. Check at least two SW pumps -
RUNNING

- a. Manually start SW pumps as power
supply permits (258 kw each).

IF less than two SW pumps
running, THEN:

- 1) Ensure SW isolation.
- 2) Dispatch A0 to establish
normal shutdown alignment
(Refer to Attachment SD-1)
- 3) Go to Step 17.

- b. Dispatch A0 to establish normal
shutdown alignment (Refer to
Attachment SD-1)

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Establish IA to CNMT:	
a.	Verify non-safeguards busses energized <ul style="list-style-type: none"> o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED 	a. Perform the following: <ol style="list-style-type: none"> 1) Close non-safeguards bus tie breakers: <ul style="list-style-type: none"> • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each). <u>IF NOT</u>, <u>THEN</u> evaluate if CNMT RECIRC fans should be stopped (Refer to Attachment CNMT RECIRC FANS).
b.	Verify turbine building SW isolation valves - OPEN <ul style="list-style-type: none"> • MOV-4613 and MOV-4670 • MOV-4614 and MOV-4664 	b. Manually align valves..
c.	Verify at least two air compressors - RUNNING	c. 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 A0 to locally reset compressors as necessary.
d.	Check IA supply: <ul style="list-style-type: none"> o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING 	d. Perform the following: <ol style="list-style-type: none"> 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR). 2) Continue with Step 17. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 16e and f.
e.	Reset both trains of XY relays for IA to CNMT AOV-5392	
f.	Verify IA to CNMT AOV-5392 - OPEN	

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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) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature offscale high, THEN dispatch A0 with RWST area key to locally close seal injection needle valves to affected RCP.

- V-300A for RCP A
- V-300B for RCP B

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

b. Align charging pump suction to RWST:

b. IF LCV-112B can NOT be opened, THEN perform the following:

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

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

- 2) Dispatch A0 to locally open manual charging pump suction from RWST (V-358 located in charging pump room).

- 3) WHEN V-358 open, THEN direct A0 to close V-268 to isolate charging pumps B and C from VCT (V-268 located in charging pump room).

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

- Charging line flow
- Seal injection

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
***** CAUTION *****		
RCS COOLDOWN IN STEP 13 SHOULD BE COMPLETED BEFORE CONTINUING TO STEP 18. *****		
18	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.
19	Check RCS Subcooling Based On Core Exit T/Cs - GREATER THAN 20°F USING FIGURE MIN SUBCOOLING	Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1 .

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: SI ACCUMs may inject during RCS depressurization.

20 Depressurize RCS To Minimize
Break Flow And Refill PRZR:

a. Check the following:

- o Ruptured S/G level - LESS
THAN 90% [85% adverse CNMT]
- o Any RCP - RUNNING
- o IA to CNMT - AVAILABLE

a. Go to Step 21.

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

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

-OR-

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

-OR-

o BOTH of the following:

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

c. Close normal PRZR spray valves:

- 1) Adjust normal spray valve
controller to 0% DEMAND
- 2) Verify RCS pressure -
INCREASING

c. Stop RCPs.

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

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

e. Go to Step 23

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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>		
21	Depressurize RCS Using PRZR PORV To Minimize Break Flow And Refill PRZR:	
	a. Verify IA to CNMT - AVAILABLE	a. Refer to Attachment N2 PORVS to operate PORVs.
	b. PRZR PORVs - AT LEAST ONE AVAILABLE	b. <u>IF</u> auxiliary spray available, <u>THEN</u> return to Step 20b.
		<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>This Step continued on the next page.</p>		

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 21 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 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

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
22	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
***** <u>CAUTION</u> SI MUST BE TERMINATED WHEN TERMINATION CRITERIA ARE SATISFIED TO PREVENT OVERFILLING OF THE RUPTURED S/G. *****		
23	Check If SI Flow Should Be Terminated: a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING b. Secondary heat sink: o Total feed flow to S/G(s) - GREATER THAN 200 GPM AVAILABLE -OR- o Narrow range level in at least one intact S/G - GREATER THAN 5% [25% adverse CNMT] c. RCS pressure - STABLE OR INCREASING d. PRZR level - GREATER THAN 5% [30% adverse CNMT]	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 11.
24	Stop SI Pumps And Place In AUTO	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>ALIGNING SI PUMP SUCTION TO RWST BEFORE ISOLATING BAST MAY RESULT IN BACKFLOW FROM RWST TO BASTS.</p> <p>*****</p>		
25	Verify SI Pump Suction Aligned To RWST:	
	<p>a. SI pump suction valves from BASTs - CLOSED</p> <ul style="list-style-type: none"> • MOV-826A • MOV-826B • MOV-826C • MOV-826D 	<p>a. Ensure at least one valve in each flow path closed.</p> <ul style="list-style-type: none"> • MOV-826A or MOV-826B • MOV-826C or MOV-826D
	<p>b. SI pump suction valves from RWST - OPEN</p> <ul style="list-style-type: none"> • MOV-825A • MOV-825B 	<p>b. Ensure at least one valve is open.</p>
	<p>c. Consult TSC to determine if SI flush is required (Refer to Attachment SI FLUSH)</p>	



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26	<p>Establish Required Charging Line Flow:</p> <p>a. Charging pumps - ANY RUNNING</p> <p>b. Establish 20 gpm charging line flow</p>	<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 with key to RWST gate to locally isolate seal injection to affected RCP: <ul style="list-style-type: none"> • RCP A, V-300A • RCP B, V-300B 2) Ensure HCV-142 open. 3) Start one charging pump.
27	<p>Verify SI Flow Not Required:</p> <p>a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING</p> <p>b. PRZR level - GREATER THAN 5% [30% adverse CNMT]</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>b. Manually operate SI pumps as necessary.</p> <p><u>IF</u> PRZR level can <u>NOT</u> be maintained, <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
28	Check If CNMT Spray Should Be Stopped:	
	a. CNMT spray pumps - ANY RUNNING	a. Go to Step 29.
	b. Verify CNMT pressure - LESS THAN 4 PSIG	b. Continue with Step 29. <u>WHEN</u> CNMT pressure less than 4 psig, <u>THEN</u> do Steps 28c through f.
	c. Reset CNMT spray	
	d. Check NaOH tank outlet valves - CLOSED <ul style="list-style-type: none"> • AOV-836A • AOV-836B 	d. Place NaOH tank outlet valve controllers to MANUAL and close valves.
	e. Stop CNMT spray pumps and place in AUTO	
	f. Close CNMT spray pump discharge valves <ul style="list-style-type: none"> • MOV-860A • MOV-860B • MOV-860C • MOV-860D 	

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

29 Check If SI ACCUMs Should Be Isolated:

a. Check the following:

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

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.

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EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 11 PAGE 28 of 40
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30	Verify Adequate SW Flow To CCW Hx:	
a.	Verify at least three SW pumps - RUNNING	a. Manually start pumps as power supply permits (258 kw each). <u>IF</u> less than two SW pumps can be operated, <u>THEN</u> go to Step 37.
b.	Verify AUX BLDG SW isolation valves - AT LEAST ONE SET OPEN • MOV-4615 and MOV-4734 • MOV-4616 and MOV-4735	b. Establish SW to AUX BLDG (Refer to Attachment AUX BLDG SW).
c.	Verify CNMT RECIRC fan annunciator C-2, HIGH TEMPERATURE ALARM - EXTINGUISHED	c. Dispatch A0 to locally throttle flow to CCW Hx to between 5000 gpm and 6000 gpm total flow.

EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 11 PAGE 29 of 40
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31	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 37. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 31 through 36.
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 37. <u>WHEN</u> any charging pump running, <u>THEN</u> do Steps 32 through 36.

EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 11 PAGE 30 of 40
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
32	Check If Seal Return Flow Should Be Established:	
	a. Verify RCP #1 seal outlet temperature - LESS THAN 235°F	a. Go to Step 33.
	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 with key to RWST gate to locally open MOV-313.
	e. Verify RCP #1 seal leakoff flow - LESS THAN 5.5 GPM	e. <u>IF</u> any RCP seal leakoff flow greater than 5.5 gpm, <u>THEN</u> : <ul style="list-style-type: none"> o Close the affected RCP seal discharge valve <ul style="list-style-type: none"> • RCP A, AOV-270A • RCP B, AOV-270B o Trip the affected RCP <u>IF</u> both RCP seal discharge valves are shut, <u>THEN</u> go to Step 33.
	f. Verify RCP #1 seal leakoff flow - GREATER THAN 0.25 GPM	f. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.
33	Verify PRZR Level - GREATER THAN 13% [40% adverse CNMT]	Continue with Step 35. <u>WHEN</u> PRZR level increases to greater than 13% [40% adverse CNMT], <u>THEN</u> do Step 34.

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EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 11 PAGE 31 of 40
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34	Establish Normal Letdown:	<u>IF</u> RCP seal return has been established, <u>THEN</u> establish excess letdown as follows:
a.	Establish charging line flow to REGEN Hx - GREATER THAN 20 GPM	o Place excess letdown divert valve, AOV-312, to NORMAL.
b.	Place the following switches to CLOSE:	o Ensure CCW from excess letdown open, (AOV-745).
	• Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202)	o Open excess letdown isolation valve AOV-310.
	• Letdown isolation valve AOV-371	o Slowly open HCV-123 to maintain excess letdown temperature less than 195°F and pressure less than 100 psig.
	• Loop B cold leg to REGEN Hx AOV-427	o Adjust charging pump speed as necessary.
c.	Place letdown controllers in MANUAL at 25% open	<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.
	• 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	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED										
35	Check VCT Makeup System:											
a.	BAST levels - ANY GREATER THAN 5%	a. Go to Step 36.										
b.	Check Annunciator B-23, BORIC ACID TANK LO LO LEVEL - EXTINGUISHED	b. Perform the following:										
		1) Adjust boric acid flow control valve to required flow from table.										
		<table border="1"> <thead> <tr> <th>BAST LEVEL</th> <th>BORIC ACID FLOW (GPM)</th> </tr> </thead> <tbody> <tr> <td><10%</td> <td>4.5</td> </tr> <tr> <td>10-15%</td> <td>6.7</td> </tr> <tr> <td>15-20%</td> <td>8.9</td> </tr> <tr> <td>>20%</td> <td>10.0</td> </tr> </tbody> </table>	BAST LEVEL	BORIC ACID FLOW (GPM)	<10%	4.5	10-15%	6.7	15-20%	8.9	>20%	10.0
BAST LEVEL	BORIC ACID FLOW (GPM)											
<10%	4.5											
10-15%	6.7											
15-20%	8.9											
>20%	10.0											
		2) Go to Step 35d.										
c.	Adjust boric acid flow control valve in AUTO to 4.5 gpm											
d.	Verify the following:	d. Adjust controls as necessary.										
	1) RMW mode selector switch in AUTO											
	2) RMW control armed - RED LIGHT LIT											
e.	Check VCT level:	e. Manually increase VCT makeup flow as follows:										
	o Level - GREATER THAN 20%	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.										
	-OR-											
	o Level - STABLE OR INCREASING	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
36	Check Charging Pump Suction Aligned To VCT:	
a.	VCT level - GREATER THAN 20%	a. <u>IF</u> VCT level can <u>NOT</u> be maintained greater than 5%, <u>THEN</u> perform the following: 1) Ensure charging pump suction aligned to RWST o LCV-112B open o LCV-112C closed 2) Continue with Step 37. <u>WHEN</u> VCT level greater than 40%, <u>THEN</u> do Step 36b.
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

CAUTION

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

37 Control RCS Pressure And
Makeup 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 RCS makeup flow o Depressurize RCS using Step 37b 	Increase RCS makeup flow	<ul style="list-style-type: none"> o Increase RCS makeup flow o Maintain RCS and ruptured S/G pressure equal
BETWEEN 13% [40% ADVERSE CNMT] AND 50%	Depressurize RCS using Step 37b	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 37b o Decrease RCS makeup flow 	Energize PRZR heaters	Maintain RCS and ruptured S/G pressure equal
GREATER THAN 75% [65% ADVERSE CNMT]	o Decrease RCS makeup 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 37a

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
38	Check If Emergency D/Gs Should Be Stopped:	
	<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 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	Minimize Secondary System Contamination:	
	<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 Attachment RUPTURED S/G) 	<ul style="list-style-type: none"> a. <u>IF</u> hotwell level increasing, <u>THEN</u> direct HP to sample hotwells for activity.
40	Energize PRZR Heaters As Necessary To Saturate PRZR Water At Ruptured S/G Pressure	

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EOP: E-3	TITLE: STEAM GENERATOR TUBE RUPTURE	REV: 11 PAGE 36 of 40
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
41	<p>Check RCP Cooling:</p> <p>a. Check CCW to RCPs:</p> <ul style="list-style-type: none"> 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 <p>b. Check RCP seal injection:</p> <ul style="list-style-type: none"> o Labyrinth seal D/Ps - GREATER THAN 15 INCHES OF WATER -OR- o RCP seal injection flow to each RCP - GREATER THAN 6 GPM 	<p>Establish normal cooling to RCPs (Refer to Attachment SEAL COOLING).</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 RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.</p> <p>*****</p>	
42	Check RCP Status:	
	a. RCPs - AT LEAST ONE RUNNING	<p>a. Perform the following:</p> <p>1) Try to start one RCP:</p> <p>a) Ensure conditions for starting an RCP.</p> <ul style="list-style-type: none"> o Bus 11A or 11B energized. o Refer to Attachment RCP START. <p>b) <u>IF</u> RVLIS level (no RCPs) less than 95%, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> o Increase PRZR level to greater than 65% [80% adverse CNMT]. o Dump steam to establish RCS subcooling based on core exit T/Cs to greater than 20°F using Figure MIN SUBCOOLING. <p>c) Start one RCP.</p> <p>2) <u>IF</u> an RCP can <u>NOT</u> be started, <u>THEN</u> verify natural circulation (Refer to Attachment NC).</p> <p><u>IF</u> natural circulation can <u>NOT</u> be verified, <u>THEN</u> increase dumping steam.</p>
	b. Stop all but one RCP	

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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	Check If Source Range Detectors Should Be Energized:	
a.	Source range channels - DEENERGIZED	a. Go to Step 43e.
b.	Check intermediate range flux - EITHER CHANNEL LESS THAN 10^{-10} AMPS	b. Perform the following: <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.
c.	Check the following: <ul style="list-style-type: none"> o Both intermediate range channels - LESS THAN 10^{-10} AMPS <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o Greater than 20 minutes since reactor trip 	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	d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2). <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) Check IA to CNMT - AVAILABLE 2) Verify at least one control rod shroud fan - RUNNING 3) Verify one Rx compartment cooling fan - RUNNING <p>d. Verify Attachment SD-1 - COMPLETE</p>	<p>a. Dispatch AO to perform Attachment SD-2.</p> <p>1) Go to Step 45.</p> <p>2) Manually start one fan as power supply permits (45 kw)</p> <p>3) Perform the following:</p> <ul style="list-style-type: none"> o Dispatch AO 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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E-3 APPENDIX LIST

<u>TITLE</u>	<u>PAGES</u>
1) RED PATH SUMMARY	1
2) FIGURE MIN SUBCOOLING	1
3) ATTACHMENT CNMT RECIRC FANS	1
4) ATTACHMENT D/G STOP	1
5) ATTACHMENT N2 PORVS	1
6) ATTACHMENT NC	1
7) ATTACHMENT SEAL COOLING	2
8) ATTACHMENT RCP START	1
9) ATTACHMENT RUPTURED S/G	2
10) ATTACHMENT SD-1	1
11) ATTACHMENT SD-2	1
12) ATTACHMENT AUX BLDG SW	1
13) ATTACHMENT SI FLUSH	1
14) FOLDOUT	1

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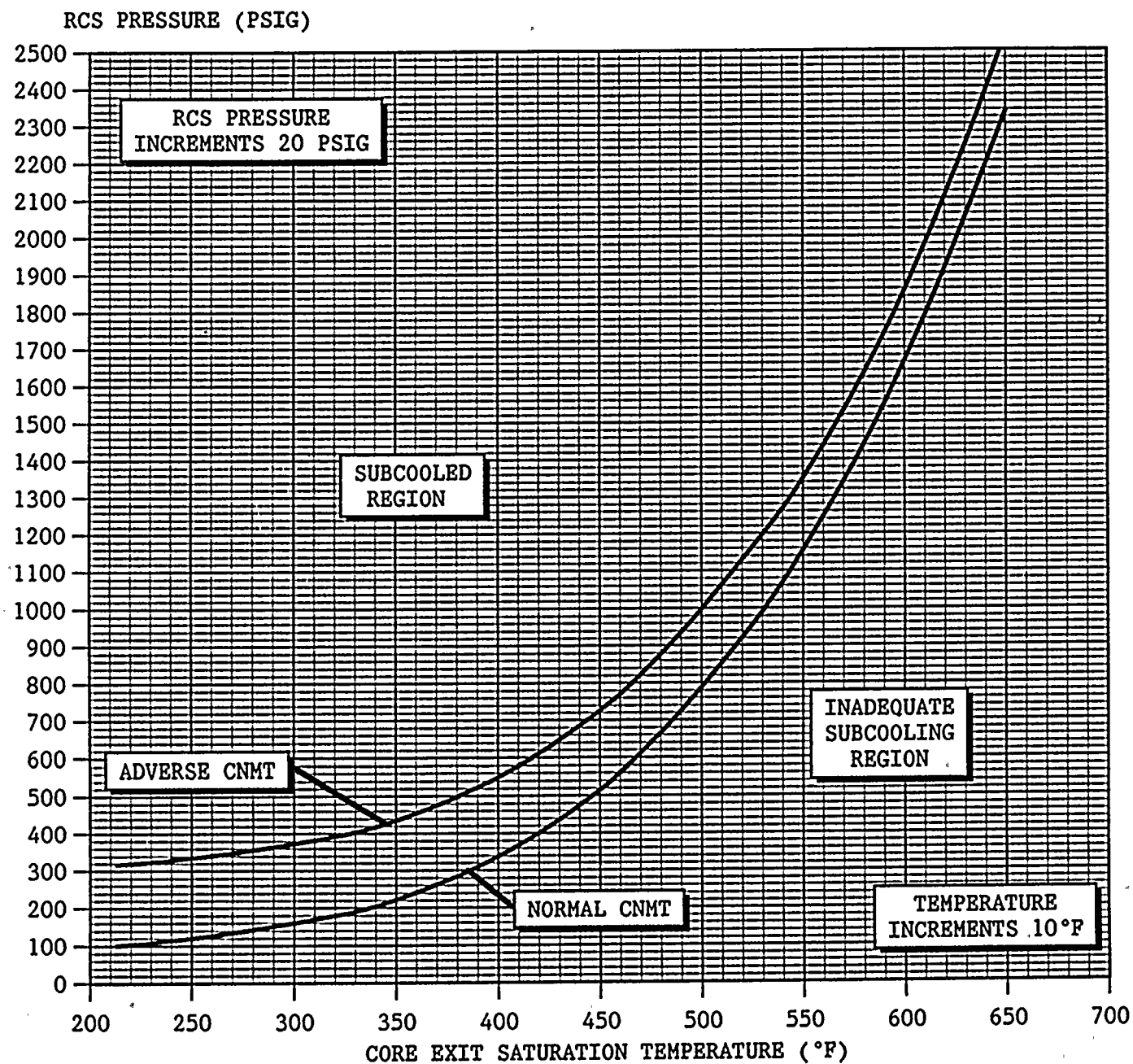
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FIGURE MIN SUBCOOLING

NOTE: Subcooling Margin = Saturation Temperature From Figure
Below [-] Core Exit T/C Indication



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FOLDOUT PAGE

1. SI REINITIATION CRITERIA

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

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

OR

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

2. SECONDARY INTEGRITY CRITERIA

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

3. COLD LEG RECIRCULATION SWITCHOVER CRITERION

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

4. AFW SUPPLY SWITCHOVER CRITERION

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

EOP: ECA-0.0	TITLE: LOSS OF ALL AC POWER	REV: 11 PAGE 1 of 22
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

TECHNICAL REVIEW

PORC REVIEW DATE 5/1/91

Joseph A. Widay
PLANT SUPERINTENDENT

5/3/91
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

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EOP: ECA-0.0	TITLE: LOSS OF ALL AC POWER	REV: 11 PAGE 2 of 22
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A. PURPOSE - This procedure provides actions to respond to a loss of all AC power.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure may be entered directly or from:

a. E-0, REACTOR TRIP OR SAFETY INJECTION, on the indication that neither train of AC emergency busses is energized.

2. SYMPTOMS - Which indicate a loss of all AC power are:

a. Neither train of 480 volt AC emergency busses available.

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EOP: ECA-0.0	TITLE: LOSS OF ALL AC POWER	REV: 11 PAGE 3 of 22
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p><u>NOTE:</u></p> <ul style="list-style-type: none"> o Steps 1 through 4 are IMMEDIATE ACTION steps. o CSFSTs should be monitored for information only. FR procedures should not be implemented. o Local actions may require portable lighting and communication devices. 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	<p>Verify Reactor Trip:</p> <ul style="list-style-type: none"> o At least one train of reactor trip breakers - OPEN o Neutron flux - DECREASING o MRPI indicates - ALL CONTROL AND SHUTDOWN RODS ON BOTTOM 	Manually trip reactor.
2	Verify MSIVs - CLOSED	Manually close MSIVs.

EOP: ECA-0.0	TITLE: LOSS OF ALL AC POWER	REV: 11 PAGE 4 of 22
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

3 Check If RCS Is Isolated:

a. PRZR PORVs - CLOSED

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

b. Verify RCS isolation valves closed:

1) Place letdown orifice valve switches to CLOSE

- AOV-200A
- AOV-200B
- AOV-202

2) Place letdown isolation valve switches to CLOSE

- AOV-371
- AOV-427

3) Place excess letdown isolation valve switch to CLOSE (AOV-310)

EOP: ECA-0.0	TITLE: LOSS OF ALL AC POWER	REV: 11 PAGE 5 of 22
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Verify Adequate TDAFW Flow:	
	a. Verify TDAFW pump - RUNNING	a. Perform the following: 1) Verify governor valve, V-3652, latched. <u>IF</u> governor valve tripped, <u>THEN</u> dispatch A0 to locally reset valve. 2) Manually or locally open TDAFW pump steam supply valves. • MOV-3505A • MOV-3504A
	b. Verify TDAFW pump flow - GREATER THAN 200 GPM	b. Verify proper TDAFW valve alignment: 1) TDAFW pump discharge valve (MOV-3996) open. 2) Intact S/G TDAFW pump flow control valves open. <u>IF NOT</u> , <u>THEN</u> manually align valves as necessary.

EOP:

ECA-0.0

TITLE:

LOSS OF ALL AC POWER

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: o Conditions should be evaluated for Site Contingency Reporting (Refer to EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION).

- o A0 should increase surveillance of TDAFW pump until AC power is restored.

5 Try To Restore Power to Any Train Of AC Emergency Busses:

- a. Verify emergency D/G aligned for unit operation

- o Mode switch in UNIT
- o Voltage control selector in AUTO

- b. Reset and start available emergency D/Gs - ANY D/G RUNNING

- a. Manually align switches on rear of MCB.

- b. Dispatch A0 to locally start emergency D/Gs.

IF no emergency D/G available, THEN perform the following:

- 1) Direct A0 to attempt to restore emergency D/G (Refer to ER-D/G.1, RESTORING D/G)

- 2) Go to Step 6.

- c. Verify at least one SW pump running for each running D/G

- c. Manually start pumps. IF adequate cooling can NOT be supplied to a running D/G, THEN trip affected D/G.

- d. Verify at least one train of AC emergency busses - ENERGIZED

- Bus 14 and Bus 18
- Bus 16 and Bus 17

- d. Manually energize AC emergency busses.

IF at least one train of AC emergency busses can NOT be energized, THEN go to Step 6.

- e. Return to procedure and step in effect

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EOP: ECA-0.0	TITLE: LOSS OF ALL AC POWER	REV: 11 PAGE 7 of 22
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>o WHEN POWER IS RESTORED TO ANY TRAIN OF AC EMERGENCY BUSES, RECOVERY ACTIONS SHOULD CONTINUE STARTING WITH STEP 24.</p> <p>o IF AN SI SIGNAL EXISTS OR IF AN SI SIGNAL IS ACTUATED DURING THIS PROCEDURE, IT SHOULD BE RESET TO PERMIT MANUAL LOADING OF EQUIPMENT ON AN AC EMERGENCY BUS.</p> <p>*****</p>		
6	<p>Establish The Following Equipment Alignment:</p> <p>a. Pull stop AC emergency bus loads</p> <ul style="list-style-type: none"> • RHR pumps • CNMT RECIRC fans • CNMT spray pumps • SI pumps • CCW pumps • Charging pumps • MDAFW pumps <p>b. Evaluate non-vital loads (Refer to Attachment NON-VITAL)</p> <p>c. Place SW pump switches to STOP, then return to AUTO</p> <p>d. Place switches for SI pump suction from BAST to CLOSE</p> <ul style="list-style-type: none"> • MOV-826A • MOV-826B • MOV-826C • MOV-826D <p>e. Place switch for MOV-313, RCP seal return isolation valve, to CLOSE</p>	

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

7 Try To Restore Offsite Power:

a. Consult Power Control to determine if either normal offsite power supply - AVAILABLE

- o 12B transformer via breaker 76702

-OR-

- o 12A transformer via breaker 75112

a. IF normal offsite power supply NOT readily available, THEN perform the following:

1) Evaluate the following temporary power supplies and direct personnel to perform desired procedures:

- o Security D/G to power an IA compressor (Refer to ER-ELEC.5, SECURITY DIESEL FEED TO BUS 13).
- o TSC D/G to power a charging pump (Refer to ER-ELEC.4, TSC D/G FEED TO BUS 16 TO SUPPLY CHARGING PUMP).
- o Main transformer backfeed for long term concerns (Refer to ER-ELEC.3, EMERGENCY OFFSITE BACKFEED VIA UNIT AUX TRANSFORMER).

2) Go to Step 8.

b. Reset SI, if necessary

c. Restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER)

8 Dispatch AO To Locally Isolate RCP Seals And BASTs (Refer to ATTACHMENT RCS ISOLATION)

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

- 9 Isolate Makeup And Reject
From Hotwell To CST By
Placing Hotwell Level
Controller (LC-107) In Manual
AT 50%

IF valves can NOT be manually
closed, THEN dispatch A0 to locally
isolate makeup and reject lines as
necessary.

- Makeup isolation V-4058
- Reject isolation V-4055

- 10 Check S/G Status:

Manually close valves.

- a. MFW flow control valves - CLOSED

IF valves can NOT be manually
closed, THEN dispatch A0 to locally
isolate the affected flow path.

- MFW regulating valves
- MFW bypass valves

- b. S/G blowdown and sample valves -
CLOSED

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>***** <u>CAUTION</u> A FAULTED OR RUPTURED S/G THAT IS ISOLATED SHOULD REMAIN ISOLATED. STEAM SUPPLY TO THE TDAFW PUMP MUST BE MAINTAINED FROM AT LEAST ONE S/G. *****</p>		
11	<p>Check If S/G Secondary Side Is Intact:</p> <ul style="list-style-type: none"> o Pressure in both S/Gs - STABLE OR INCREASING o Pressure in both S/Gs - GREATER THAN 100 PSIG 	<p>Perform the following:</p> <ul style="list-style-type: none"> a. <u>IF</u> any S/G pressure decreasing in an uncontrolled manner <u>OR</u> completely depressurized, <u>THEN</u> isolate faulted S/G unless needed for RCS cooldown: <ul style="list-style-type: none"> 1) Close faulted S/G MDAFW pump discharge valve. <ul style="list-style-type: none"> • S/G A, MOV-4007 • S/G B, MOV-4008 2) Close faulted S/G TDAFW flow control valve. <ul style="list-style-type: none"> • S/G A, AOV-4297 • S/G B, AOV-4298 3) Verify faulted S/G ARV controller in MANUAL with output at 0%. <ul style="list-style-type: none"> • S/G A, AOV-3411 • S/G B, AOV-3410 4) Pull stop faulted S/G TDAFW pump steam supply valve. <ul style="list-style-type: none"> • S/G A, MOV-3505A • S/G B, MOV-3504A <p><u>IF</u> valves can <u>NOT</u> be closed manually, <u>THEN</u> dispatch AO to locally close valves, as necessary, to isolate flow.</p> b. Dispatch AO to complete faulted S/G isolation (Refer to Attachment FAULTED S/G).



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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Check If S/G Tubes Are Intact:	Try to identify ruptured S/G. Continue with Step 13. <u>WHEN</u> ruptured S/G identified, <u>THEN</u> perform the following:
	o Steamline radiation monitors (R-31 and R-32) - NORMAL	
	o S/G blowdown liquid monitor (R-19) - NORMAL	a. Isolate ruptured S/G unless needed for RCS cooldown:
	o Dispatch HP technician to locally check steamline radiation - NORMAL	1) Close ruptured S/G MDAFW pump discharge valve. • S/G A, MOV-4007 • S/G B, MOV-4008
		2) Pull stop ruptured S/G MDAFW pump.
		3) Close ruptured S/G TDAFW flow control valve. • S/G A, AOV-4297 • S/G B, AOV-4298
		4) <u>WHEN</u> S/G pressure less than 1050 psig, <u>THEN</u> verify ruptured S/G ARV closed. • S/G A, AOV-3411 • S/G B, AOV-3410
		5) Pull stop ruptured S/G TDAFW pump steam supply valve. • S/G A, MOV-3505A • S/G B, MOV-3504A
		<u>IF</u> valves can <u>NOT</u> be closed manually, <u>THEN</u> dispatch A0 to locally close valves, as necessary, to isolate flow.
		b. Dispatch A0 to complete ruptured S/G isolation (Refer to Attachment RUPTURED S/G).

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: TDAFW pump flow control valves fail open on loss of IA.

13 Check Intact S/G Levels:

- | | |
|---|---|
| <p>a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]</p> <p>b. Dispatch AO to locally control AFW flow by throttling TDAFW flow control valves</p> <ul style="list-style-type: none"> • S/G A, AOV-4297 • S/G B, AOV-4298 <p>c. Control AFW flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%</p> | <p>a. Maintain maximum AFW flow until narrow range level greater than 5% [25% adverse CNMT] in at least one S/G.</p> <p>b. <u>IF</u> valves can <u>NOT</u> be throttled, <u>THEN</u> control AFW flow by starting and stopping TDAFW pump.</p> <p>c. <u>IF</u> narrow range level in any intact S/G continues to increase in an uncontrolled manner, <u>THEN</u> return to Step 12.</p> |
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: Degassing of main generator should commence as soon as possible to allow the air side seal oil backup pump to be stopped within 4 hours.

14 Check DC Bus Loads:

- a. Pull stop all large non-essential DC loads
 - o MPW pump DC oil pumps
 - o WHEN turbine is stopped, THEN stop turbine DC lube oil pump (within 1 hour)
 - o Evaluate other DC loads (Refer to Attachment DC LOADS)
- b. Perform the following:
 - 1) Dispatch A0 to locally degas main generator (Refer to Attachment GEN DEGAS)
 - 2) WHEN generator has been degassed, THEN stop air side seal oil backup pump (within 4 hours)
- c. Check DC bus voltage - GREATER THAN 105 VOLTS DC
 - Bus A
 - Bus B
- c. IF either DC bus less than 105 volts DC, THEN refer to ER-ELEC.2, RECOVERY FROM LOSS OF A or B DC BUS.
- d. Direct electricians to locally monitor DC power supply
- e. Dispatch personnel with DC panel key to deenergize CNMT emergency lights (DC panel turbine building basement west, switch #2)

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

WHEN POWER IS RESTORED TO ANY TRAIN OF AC EMERGENCY BUSES, RECOVERY ACTIONS SHOULD CONTINUE STARTING WITH STEP 24.

15 Check CST Level - GREATER
THAN 5 FEET

Switch to alternate AFW pump
suction supply. (Refer to ER-AFW.1,
ALTERNATE WATER SUPPLY TO AFW
PUMPS).

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>***** <u>CAUTION</u> *****</p> <ul style="list-style-type: none"> o S/G PRESSURES SHOULD BE MAINTAINED GREATER THAN 200 PSIG TO PREVENT INJECTION OF SI ACCUM NITROGEN INTO THE RCS. o S/G NARROW RANGE LEVEL SHOULD BE MAINTAINED GREATER THAN 5% [25% ADVERSE CNMT] IN AT LEAST ONE INTACT S/G. IF LEVEL CANNOT BE MAINTAINED, S/G DEPRESSURIZATION SHOULD BE STOPPED UNTIL LEVEL IS RESTORED IN AT LEAST ONE S/G. <p>*****</p> <p><u>NOTE:</u></p> <ul style="list-style-type: none"> o The S/Gs should be depressurized at maximum rate to minimize RCS inventory loss. o PRZR level may be lost and reactor vessel upper head voiding may occur due to depressurization of S/Gs. Depressurization should not be stopped to prevent these occurrences. o S/G ARV nitrogen pressure should be monitored and nitrogen supply bottles changed as necessary. 		
16	Initiate Depressurization Of Intact S/Gs To 300 PSIG:	
	<ul style="list-style-type: none"> a. Check S/G narrow range levels - GREATER THAN 17% [25% adverse CNMT] IN AT LEAST ONE S/G b. Manually dump steam from intact S/Gs at maximum rate using S/G ARVs 	<ul style="list-style-type: none"> a. Perform the following: <ul style="list-style-type: none"> 1) Maintain maximum AFW flow until narrow range level greater than 17% [25% adverse CNMT] in at least one S/G. 2) Continue with Step 17. <u>WHEN</u> narrow range level greater than 17% [25% adverse CNMT] in at least one S/G, <u>THEN</u> do Steps 16b and 17. b. Locally dump steam from intact S/Gs at maximum rate using S/G ARV.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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

17 Check Reactor Subcritical:

a. Verify source range detector
N-31 - ENERGIZED

a. Dispatch personnel with relay rack key to turn off 120 VDC power switches in REACTOR PROTECTION racks RLTR-1 and RLTR-2 to deenergize source range block relays.

b. Monitor Reactor power:

b. Control S/G ARVs to stop S/G depressurization and allow RCS to heat up.

o Intermediate range, N-35 -
STABLE OR DECREASING

o Source range, N-31 - STABLE
OR DECREASING

NOTE: Depressurization of S/Gs will result in a SI actuation. SI should be reset to permit manual loading of equipment on emergency busses.

18 Check SI Signal Status:

a. Any SI annunciator - LIT

a. Go to Step 22.

WHEN SI actuated, THEN do Steps 18b, 19, 20 and 21.

b. Reset SI

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

19 Verify CI And CVI:

a. CI and CVI annunciators - LIT

- Annunciator A-26, CNMT ISOLATION
- Annunciator A-25, CONTAINMENT VENTILATION ISOLATION

b. Verify CI and CVI valve status lights - BRIGHT

c. CNMT RECIRC fan coolers SW outlet valve status lights - BRIGHT

- AOV-4561
- AOV-4562

a. Depress manual CI pushbutton.

b. Manually close CI and CVI valves. IF valves can NOT be closed, THEN dispatch A0 to locally close valves (Refer to Attachment CI/CVI).

c. Dispatch A0 to locally fail open valves.

20 Check If S/G Depressurization Should Be Stopped:

a. Check RCS cold leg temperatures - GREATER THAN 315°F

b. Check S/G pressures - LESS THAN 300 PSIG

c. Manually control S/G ARVs to maintain S/G pressures at 300 psig

a. Perform the following:

1) Control S/G ARVs to stop S/G depressurization.

2) Go to Step 21.

b. Continue with Step 21. WHEN S/G pressure decreases to less than 300 psig, THEN do Step 20c.

c. Locally control S/G ARVs to maintain S/G pressures at 300 psig.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	<p>Check CNMT Pressure - HAS REMAINED LESS THAN 28 PSIG</p> <ul style="list-style-type: none"> o Annunciator A-27, CNMT SPRAY - EXTINGUISHED o CNMT pressure indicators - LESS THAN 28 PSIG 	<p><u>IF</u> CNMT pressure is less than 28 psig, <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> a. Reset CNMT spray. b. Place CNMT spray pump discharge valve switches to CLOSE to deenergize open contactor. <p><u>IF NOT</u>, <u>THEN</u> continue with step 22. <u>WHEN</u> CNMT pressure less than 28 psig, <u>THEN</u> place CNMT spray pump discharge valve switches to CLOSE.</p>
22	<p>Check CNMT Radiation - LESS THAN 100 R/HR</p>	<p>Dispatch AO to locally close following valves, as necessary:</p> <ul style="list-style-type: none"> • MDAFW pump discharge valves • MOV-813 and MOV-814, CCW to and from CNMT

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

23 Check If AC Emergency Power Is Restored - AT LEAST ONE TRAIN OF AC EMERGENCY BUSSES ENERGIZED

- Bus 14 and Bus 18
- Bus 16 and Bus 17

Continue to control RCS conditions and monitor plant status:

a. Check status of desired actions:

- o AC power restoration
- o ARV nitrogen pressure
- o RCP seal isolation
- o DC power supply

b. Dispatch A0 to locally check BAST temperature.

IF temperature less than 155°F, THEN dispatch personnel to dilute BASTs (Refer to ER-BA.1, BAST TEMPERATURE CONCERN - LOSS OF ALL AC).

c. Return to Step 11.

24 Manually Control S/G ARVs To Stabilize S/G Pressures

Locally control S/G ARVs.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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NOTE: SW isolation may occur when power is restored to AC emergency busses.

25 Verify SW System Operation:

a. Check normal power available to SW pumps

- o Bus 17 normal feed breaker - CLOSED

-OR-

- o Bus 18 normal feed breaker - CLOSED

b. Verify two SW pumps - RUNNING

a. IF both D/Gs operating, THEN ensure one SW pump running for each D/G.

IF only one D/G operating, THEN perform the following:

- 1) Ensure at least one SW pump running.
- 2) Manually perform SW isolation.
- 3) Go to Step 26.

b. IF normal power available, THEN manually start SW pumps as necessary.

IF adequate cooling can NOT be supplied to a running D/G, THEN trip affected D/G and refer to ER-D/G.1.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>***** <u>CAUTION</u> THE LOADS PLACED ON THE ENERGIZED AC EMERGENCY BUS SHOULD NOT EXCEED THE CAPACITY OF THE POWER SOURCE. *****</p>		
26	Verify Following Equipment Loaded On Available AC Emergency Busses: <ul style="list-style-type: none"> o 480 volt MCCs - ENERGIZED <ul style="list-style-type: none"> • MCC C from Bus 14 • MCC D from Bus 16 o Verify instrument busses - ENERGIZED <ul style="list-style-type: none"> • Bus A from MCC C (A battery) • Bus B from MCC C • Bus C from MCC D (B battery) o Dispatch personnel to verify proper operation of battery chargers 	Manually load equipment as power supply permits.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

27 Select Recovery Procedure:

- | | |
|--|--|
| <p>a. Check RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING</p> <p>b. Check PRZR level - GREATER THAN 5% [30% adverse CNMT]</p> <p>c. Check SI annunciators - EXTINGUISHED</p> <ul style="list-style-type: none">• D-19, PRESSURIZER LO PRESS 1750 PSIG• D-21, STEAM LINE LOOP A LO LO PRESS 514 PSIG• D-22, STEAM LINE LOOP B LO LO PRESS 514 PSIG• D-28, CONTAINMENT PRESSURE 4 PSIG <p>d. Go to ECA-0.1, LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED, Step 1</p> | <p>a. Go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.</p> <p>b. Go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.</p> <p>c. <u>IF</u> SI signal is present and was <u>NOT</u> previously reset, <u>THEN</u> go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.</p> |
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ECA-0.0 APPENDIX LIST

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2) ATTACHMENT DC LOADS	1
3) ATTACHMENT FAULTED S/G	1
4) ATTACHMENT RUPTURED S/G	2
5) ATTACHMENT CI/CVI	2
6) ATTACHMENT NONVITAL	1
7) ATTACHMENT GEN DEGAS	1
8) ATTACHMENT RCS ISOLATION	1

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FIGURE MIN SUBCOOLING

NOTE: Subcooling Margin = Saturation Temperature From Figure
Below [-] Core Exit T/C Indication

