

EOP: ECA-0.0	TITLE: LOSS OF ALL AC POWER	REV: 12 PAGE 1 of 22
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ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

TECHNICAL REVIEW

PORC REVIEW DATE 8/1/91

Thomas A. Murlow
PLANT SUPERINTENDENT

8/5/91
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

9109030066 910821
PDR ADOCK 05000244
PDR

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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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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: 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 Verify Reactor Trip:

Manually trip reactor.

- o At least one train of reactor trip breakers - OPEN
- o Neutron flux - DECREASING
- o MRPI indicates - ALL CONTROL AND SHUTDOWN RODS ON BOTTOM

② Verify MSIVs - CLOSED

Manually close MSIVs.

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

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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)

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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.

IF governor valve tripped,
THEN dispatch A0 to locally
reset valve.

- 2) Manually or locally open at
least one TDAFW pump steam
supply valve.

- MOV-3505A
- MOV-3504A

b. Verify TDAFW pump flow - GREATER
THAN 200 GPMb. Verify proper TDAFW valve
alignment:

- 1) TDAFW pump discharge valve
(MOV-3996) open.

- 2) Intact S/G TDAFW pump flow
control valves open.

IF NOT, THEN manually align
valves as necessary.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p><u>NOTE:</u> o Conditions should be evaluated for Site Contingency Reporting (Refer to EPIP-1.0, GINNA STATION EVENT EVALUATION AND CLASSIFICATION).</p> <p>o A0 should increase surveillance of TDAPW pump until AC power is restored.</p>	
5	Try To Restore Power to Any Train Of AC Emergency Busses:	
	<p>a. Verify emergency D/G aligned for unit operation</p> <p>o Mode switch in UNIT</p> <p>o Voltage control selector in AUTO</p>	<p>a. Manually align switches on rear of MCB.</p>
	<p>b. Reset and start available emergency D/Gs - ANY D/G RUNNING</p>	<p>b. Dispatch A0 to locally start emergency D/Gs.</p> <p><u>IF</u> no emergency D/G available, <u>THEN</u> perform the following:</p> <p>1) Direct A0 to attempt to restore emergency D/G (Refer to ER-D/G.1, RESTORING D/G)</p> <p>2) Go to Step 6.</p>
	<p>c. Verify at least one SW pump running for each running D/G</p>	<p>c. Manually start pumps. <u>IF</u> adequate cooling can <u>NOT</u> be supplied to a running D/G, <u>THEN</u> trip affected D/G.</p>
	<p>d. Verify at least one train of AC emergency busses - ENERGIZED</p> <p>• Bus 14 and Bus 18</p> <p>• Bus 16 and Bus 17</p>	<p>d. Manually energize AC emergency busses.</p> <p><u>IF</u> at least one train of AC emergency busses can <u>NOT</u> be energized, <u>THEN</u> go to Step 6.</p>
	<p>e. Return to procedure and step in effect</p>	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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CAUTION

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

6 Establish The Following Equipment Alignment:

a. Pull stop AC emergency bus loads

- RHR pumps
- CNMT RECIRC fans
- CNMT spray pumps
- SI pumps
- CCW pumps
- Charging pumps
- MDAFW pumps

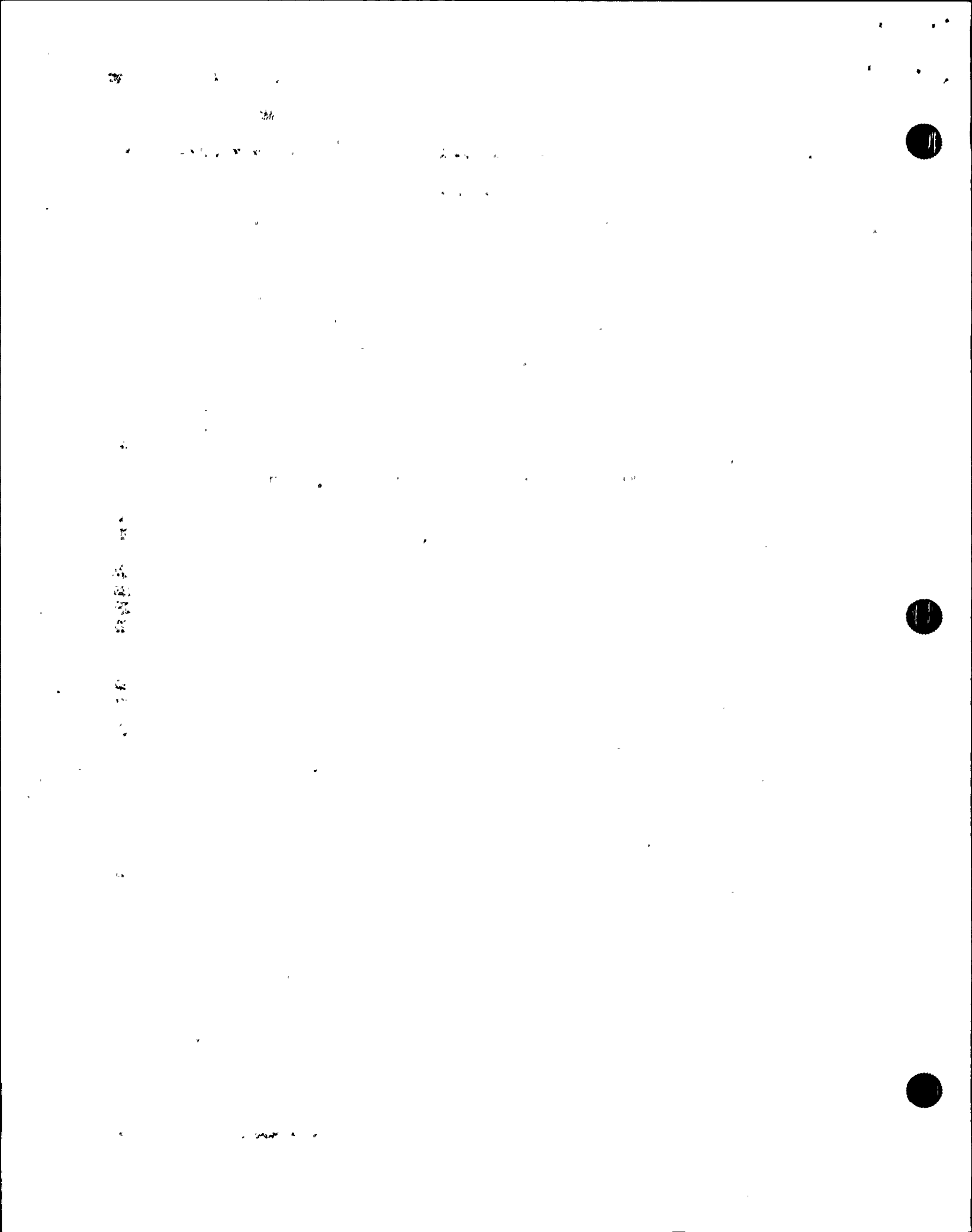
b. Evaluate non-vital loads (Refer to Attachment NON-VITAL)

c. Place SW pump switches to STOP, then return to AUTO

d. Place switches for SI pump suction from BAST to CLOSE

- MOV-826A
- MOV-826B
- MOV-826C
- MOV-826D

e. Place switch for MOV-313, RCP seal return isolation valve, to CLOSE



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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

CAUTION

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.

11 Check If S/G Secondary Side Is Intact:

- o Pressure in both S/Gs - STABLE OR INCREASING
- o Pressure in both S/Gs - GREATER THAN 100 PSIG

Perform the following:

- a. IF any S/G pressure decreasing in an uncontrolled manner OR completely depressurized, THEN isolate faulted S/G unless needed for RCS cooldown:
 - 1) Close faulted S/G MDAFW pump, discharge valve.
 - S/G A, MOV-4007
 - S/G B, MOV-4008
 - 2) Close faulted S/G TDAFW flow control valve.
 - S/G A, AOV-4297
 - S/G B, AOV-4298
 - 3) Verify faulted S/G ARV controller in MANUAL with output at 0%.
 - S/G A, AOV-3411
 - S/G B, AOV-3410
 - 4) Pull stop faulted S/G TDAFW pump steam supply valve.
 - S/G A, MOV-3505A
 - S/G B, MOV-3504A

IF valves can NOT be closed manually, THEN dispatch A0 to locally close valves, as necessary, to isolate flow.

- b. Dispatch A0 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:

- o Steamline radiation monitors (R-31 and R-32) - NORMAL
- o S/G blowdown liquid monitor (R-19) - NORMAL
- o Dispatch HP technician to locally check steamline radiation - NORMAL

Try to identify ruptured S/G. Continue with Step 13. WHEN ruptured S/G identified, THEN perform the following:

a. Isolate ruptured S/G unless needed for RCS cooldown:

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) WHEN S/G pressure less than 1050 psig, THEN 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

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

b. Dispatch AO 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:

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

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE: If the loss of power is expected to continue beyond 4 hours, then degassing of main generator should commence as soon as personnel become available (Refer to Attachment GEN DEGAS).

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. Check DC bus voltage - GREATER THAN 105 VOLTS DC

- Bus A
- Bus B

b. IF either DC bus less than 105 volts DC, THEN refer to ER-ELEC.2, RECOVERY FROM LOSS OF A or B DC BUS.

c. Direct electricians to locally monitor DC power supply

d. Dispatch personnel with DC panel key to deenergize CNMT emergency lights (DC panel turbine building basement west, switch #2)



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<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>WHEN POWER IS RESTORED TO ANY TRAIN OF AC EMERGENCY BUSSES, RECOVERY ACTIONS SHOULD CONTINUE STARTING WITH STEP 24.</p> <p>*****</p>		
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

CAUTION

- 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.

- NOTE:
- 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:

- a. Check S/G narrow range levels - GREATER THAN 17% [25% adverse CNMT] IN AT LEAST ONE S/G

- a. Perform the following:

- 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. WHEN narrow range level greater than 17% [25% adverse CNMT] in at least one S/G, THEN do Steps 16b and 17.

- b. Manually dump steam from intact S/Gs at maximum rate using S/G ARVs

- 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:

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| <p>a. Verify source range detector
N-31 - ENERGIZED</p> <p>b. Monitor Reactor power:</p> <ul style="list-style-type: none"> o Intermediate range, N-35 -
STABLE OR DECREASING o Source range, N-31 - STABLE
OR DECREASING | <p>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.</p> <p>b. Control S/G ARVs to stop S/G depressurization and allow RCS to heat up.</p> |
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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:

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| <p>a. Any SI annunciator - LIT</p> <p>b. Reset SI</p> | <p>a. Go to Step 22.</p> <p><u>WHEN</u> SI actuated, <u>THEN</u> do Steps 18b, 19, 20 and 21.</p> |
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	Verify CI And CVI:	
	a. CI and CVI annunciators - LIT <ul style="list-style-type: none"> • Annunciator A-26, CNMT ISOLATION • Annunciator A-25, CONTAINMENT VENTILATION ISOLATION 	a. Depress manual CI pushbutton.
	b. Verify CI and CVI valve status lights - BRIGHT	b. Manually close CI and CVI valves. <u>IF</u> valves can <u>NOT</u> be closed, <u>THEN</u> dispatch A0 to locally close valves (Refer to Attachment CI/CVI).
	c. CNMT RECIRC fan coolers SW outlet valve status lights - BRIGHT <ul style="list-style-type: none"> • AOV-4561 • AOV-4562 	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	a. Perform the following: <ol style="list-style-type: none"> 1) Control S/G ARVs to stop S/G depressurization. 2) Go to Step 21.
	b. Check S/G pressures - LESS THAN 300 PSIG	b. Continue with Step 21. <u>WHEN</u> S/G pressure decreases to less than 300 psig, <u>THEN</u> do Step 20c.
	c. Manually control S/G ARVs to maintain S/G pressures at 300 psig	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 A0 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 BUSES 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

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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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

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

26 Verify Following Equipment
Loaded On Available AC
Emergency Busses:

Manually load equipment as power
supply permits.

o 480 volt MCCs - ENERGIZED

- MCC C from Bus 14
- MCC D from Bus 16

o Verify instrument busses -
ENERGIZED

- 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

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

27 Select Recovery Procedure:

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| <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

<u>TITLE</u>	<u>PAGES</u>
1) FIGURE MIN SUBCOOLING	1
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



EOP:

ECA-0.0

TITLE:

LOSS OF ALL AC POWER

REV: 12

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FIGURE MIN SUBCOOLING

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

