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Effective Date: 4/29/2011

## 2-ECA-0.0, Revision: 7

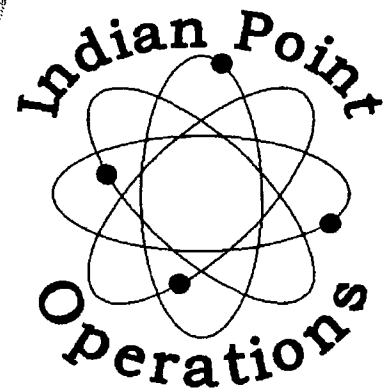
### LOSS OF ALL AC POWER

2

**Approved By:**

John Ballestra 4-21-11  
Procedure Sponsor, RPO/Designee Date

**Team P**  
Procedure Owner



**EDITORIAL REVISION**

Number:	Title:	Revision Number:
2-ECA-0.0	LOSS OF ALL AC POWER	REV. 7

A. PURPOSE

This procedure provides actions to respond to a loss of all AC power.

B. SYMPTOMS OR ENTRY CONDITIONS

- 1) The symptom of a loss of all AC power is the indication that all 480V busses are de-energized.
- 2) This procedure is entered from 2-E-0, REACTOR TRIP OR SAFETY INJECTION, Step 3, on the indication that all 480V busses are de-energized.

C. ADVERSE CONTAINMENT CONDITIONS

EOP values for adverse containment should be used if either of the following conditions exist:

o Containment radiation levels greater than 1E5 R/hr.

- OR -

o Containment pressure greater than 4 psig.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p style="text-align: center;"><u>NOTE</u></p> <ul style="list-style-type: none"> <li>o Steps 1 and 2 are IMMEDIATE ACTION steps.</li> <li>o CSF Status Trees should be monitored for information only. FRPs should <u>NOT</u> be implemented.</li> </ul>		
1.	<u>Verify Reactor Trip:</u> <ul style="list-style-type: none"> <li>o Reactor trip breakers - OPEN</li> <li>o Neutron flux - DECREASING</li> <li>o Rod bottom lights - LIT</li> <li>o Rod position indicators - ALL RODS LESS THAN 12.5 INCHES</li> </ul>	Manually trip reactor.
2.	<u>Verify Turbine Trip:</u> <ul style="list-style-type: none"> <li>a. All turbine stop valves - CLOSED</li> </ul>	<ul style="list-style-type: none"> <li>a. Manually trip turbine. <u>IF</u> turbine will <u>NOT</u> trip, <u>THEN</u> close MSIVs.</li> <li><u>IF</u> MSIVs can <u>NOT</u> be closed, <u>THEN</u> manually run back turbine.</li> </ul>

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3.	<u>Check If RCS Is Isolated:</u>	
	a. Letdown isolation valves - CLOSED	a. Manually close valve.
	o LCV-459	
	o 200A	
	o 200B	
	o 200C	
	b. PRZR PORVs - CLOSED	b. <u>IF</u> PRZR pressure less than 2335 psig, <u>THEN</u> manually close PORVs.
	c. Excess letdown isolation valve - CLOSED	c. Manually close valve.
	o 213	
4.	<u>Verify AFW Flow - GREATER THAN 400 GPM:</u>	
	a. Turbine-driven AFW pump - RUNNING	a. Manually open steam supply regulator valve:
		o PCV-1139
	b. Manually align turbine-driven AFW pump FCVs as necessary	
	c. Adjust steam supply speed control valve as necessary:	
	o HCV-1118	

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	<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>*****</p> <p>* The load on the diesel generators should remain less than 1650 KW but may *  * be increased to 2000 KW for a maximum of 2 hrs in any 24 hr period. *  *****</p>					
5.	<p><u>Try To Restore Power to Any 480V Bus:</u></p> <p>a. Energize 480V bus with diesel generator:</p> <table border="0"> <tr> <td>1) Check diesel generator(s) - RUNNING</td> <td>1) Emergency start diesel generator(s):  a) Manually actuate SI.</td> </tr> <tr> <td>2) Verify 480V bus - AUTOMATICALLY ENERGIZED</td> <td>2) Manually energize 480V bus from running diesel generator.</td> </tr> </table>		1) Check diesel generator(s) - RUNNING	1) Emergency start diesel generator(s):  a) Manually actuate SI.	2) Verify 480V bus - AUTOMATICALLY ENERGIZED	2) Manually energize 480V bus from running diesel generator.
1) Check diesel generator(s) - RUNNING	1) Emergency start diesel generator(s):  a) Manually actuate SI.					
2) Verify 480V bus - AUTOMATICALLY ENERGIZED	2) Manually energize 480V bus from running diesel generator.					
<p>This Step continued on the next page.</p>						

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
		<p><u>IF</u> 480V bus can <u>NOT</u> be energized from diesel generator(s), <u>THEN</u> perform the following:</p> <ul style="list-style-type: none"> <li>a) Locally trip running diesel generator(s).</li> <li>b) Contact Con Ed D0 to determine if 138KV or 13.8KV power readily available.</li> <li>c) <u>IF</u> outside power is <u>NOT</u> readily available, <u>THEN</u> perform the following: <ul style="list-style-type: none"> <li>1. Dispatch NPO to start IP2 Appendix R DG per: <ul style="list-style-type: none"> <li>o 2-SOP-27.6, UNIT 2 APPENDIX R DIESEL GENERATOR OPERATION</li> </ul> </li> <li>2. <u>IF</u> IP2 Appendix R DG is <u>NOT</u> available, <u>THEN</u> CONTACT IP3 CCR to START IP3 Appendix R DG per 3-SOP-EL-013, APPENDIX R DIESEL GENERATOR OPERATION.</li> </ul> </li> <li>d) <u>IF</u> outside power is readily available, <u>THEN</u> attempt to manually energize 480V bus using the following: <ul style="list-style-type: none"> <li>o 2-AOP-138KV-1, LOSS OF POWER TO 6.9KV BUS 5 <u>AND/OR</u> 6.</li> <li>o 2-AOP-480V-1, LOSS OF 480V BUS.</li> </ul> </li> </ul>
This Step continued on the next page.		

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p>b. Check 480V busses - AT LEAST ONE ENERGIZED:</p> <ul style="list-style-type: none"> <li>o 2A <u>AND</u> 3A</li> <li style="padding-left: 40px;">- OR -</li> <li>o 5A</li> <li style="padding-left: 40px;">- OR -</li> <li>o 6A</li> </ul> <p>c. Start one service water pump on the essential header to support running diesel generator</p> <p>d. Check CCR &amp; AFW pump room ventilation - RUNNING</p> <p>e. Return to procedure and step in effect and implement FRPs</p>	<p>b. Perform the following:</p> <ul style="list-style-type: none"> <li>1) Open doors on all control room cabinets.</li> <li>2) Dispatch NPO to open AFW pump room roll-up door.</li> <li>3) Go to Step 6. OBSERVE CAUTION PRIOR TO STEP 6.</li> </ul> <p>d. Perform the following as required:</p> <ul style="list-style-type: none"> <li>1) Open doors on all control room cabinets.</li> <li>2) Dispatch NPO to open AFW pump room roll-up door.</li> </ul>

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	<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>o When power is restored to any 480V bus, 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 (refer to Step 18b) to permit manual loading of equipment on a 480V bus.</p> <p>o If a diesel generator is started, a service water pump should be started on the essential header to provide diesel generator cooling.</p> <p>o If a partial train (bus 2A or bus 3A) is energized, safeguards equipment on the energized bus including RCP seal cooling should <u>NOT</u> be placed in PULLOUT or isolated.</p> <p>*****</p> <p>6. <u>Place Following Equipment</u> <u>Switches In PULLOUT Position:</u></p> <ul style="list-style-type: none"> <li>o Containment spray pumps</li> <li>o SI pumps</li> <li>o FCUs</li> <li>o Motor-driven AFW pumps</li> <li>o Turning gear oil pump</li> <li>o Bearing oil pump</li> <li>o Turbine auxiliary oil pump</li> <li>o CCW pumps</li> <li>o RHR pumps</li> </ul>	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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 \* CAUTION \*  
 \* Radiation levels and harsh environment conditions should be evaluated \*  
 \* prior to performing local actions. \*  
 \* \*\*\*\*\*

- ⊛ 7. Dispatch Personnel To Locally Restore AC Power:
- a. Emergency diesel generator(s) per:
    - o 2-SOP-27.3.1.1, 21 EMERGENCY DIESEL GENERATOR MANUAL OPERATION
    - o 2-SOP-27.3.1.2, 22 EMERGENCY DIESEL GENERATOR MANUAL OPERATION
    - o 2-SOP-27.3.1.3, 23 EMERGENCY DIESEL GENERATOR MANUAL OPERATION

This Step continued on the next page.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	b. Check 13.8KV feeder 13W92 - ENERGIZED	<p>b. <u>IF</u> 13.8KV feeder 13W92 can <u>NOT</u> be energized, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> <li>1) Contact Con Ed DO to determine if IP3 13.8KV feeder 13W93 is available.</li> <li>2) <u>IF</u> IP3 13.8KV 13W93 is available, <u>THEN</u> attempt to restore power to 6.9KV via 52GT/BT per: <ul style="list-style-type: none"> <li>o 2-SOP-ESP-001. LOCAL EQUIPMENT OPERATION <u>AND</u> COMPENSATORY ACTIONS</li> </ul> </li> <li>3) <u>IF</u> 13.8KV feeder 13W93 is <u>NOT</u> available <u>OR</u> 52GT/BT can <u>NOT</u> be closed, <u>THEN</u> start Appendix R DG per: <ul style="list-style-type: none"> <li>o 2-SOP-27.6, UNIT 2 APPENDIX R DIESEL GENERATOR OPERATION</li> </ul> </li> <li>4) <u>IF</u> Appendix R DG can <u>NOT</u> be started, <u>THEN</u> perform the following as required: <ol style="list-style-type: none"> <li>a) Restore power to ASSS via IP3 Appendix R DG per: <ul style="list-style-type: none"> <li>o 2-AOI-27.1.9.2, PROVIDING APPENDIX R POWER FROM UNIT 3</li> </ul> </li> <li>b) Contact Con Ed DO for available power alignment.</li> </ol> </li> <li>5) Continue with Step 8. <u>WHEN</u> power source is available, <u>THEN</u> do Step 7c.</li> </ol>
This Step continued on the next page.		

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p>c. Attempt to restore power to busses per the following while continuing with Step 8:</p> <ul style="list-style-type: none"> <li>o 2-SOP-27.1.3, OPERATION OF 13.8KV SYSTEM</li> <li>o 2-SOP-27.1.4, 6900 VOLT SYSTEM.</li> <li>o 2-AOP-138KV-1, LOSS OF POWER TO 6.9KV BUS 5 AND/OR 6.</li> <li>o 2-AOP-13.8KV-1, LOSS OF POWER TO ANY 13.8KV BUS</li> <li>o 2-AOP-480V-1, LOSS OF 480V BUS.</li> </ul> <p>8. <u>Dispatch Personnel To Locally Close Valves To Isolate RCP Seals:</u></p> <ul style="list-style-type: none"> <li>o RCP seal return isolation valve outside containment: <ul style="list-style-type: none"> <li>o MOV-222</li> </ul> </li> <li>o RCP seal injection isolation valves outside containment: <ul style="list-style-type: none"> <li>o MOV-250A</li> <li>o MOV-250B</li> <li>o MOV-250C</li> <li>o MOV-250D</li> </ul> </li> <li>o RCP thermal barrier CCW return isolation valve outside containment: <ul style="list-style-type: none"> <li>o MOV-789</li> </ul> </li> </ul>	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9.	<u>Check If CST Is Isolated From Hotwell:</u>  a. Verify condenser hotwell isolation valves - CLOSED: o LCV-1128 o LCV-1128A o LCV-1129 o CD-6 o CT-8  b. Place condenser hotwell isolation valve controllers in MANUAL: o LCV-1128 o LCV-1128A o LCV-1129	a. <u>IF</u> valve(s) open or position not known, <u>THEN</u> dispatch personnel to locally close valve(s). <u>IF</u> valve(s) can <u>NOT</u> be closed, <u>THEN</u> locally close associated isolation valve(s):  o CT-7 for LCV-1128 and LCV-1128A. o CD-5 for LCV-1129.
10.	<u>Check SG Status:</u>  a. MSIVs - CLOSED  b. Main FW regulating and bypass valves - CLOSED  c. Blowdown isolation valves - CLOSED	Manually close valves. <u>IF</u> valves can <u>NOT</u> be manually closed, <u>THEN</u> locally close valves.  Locally close MSIVs as necessary per 2-SOP-ESP-001, LOCAL EQUIPMENT OPERATION <u>AND</u> COMPENSATORY ACTIONS.

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	<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>*****</p> <p>* A faulted or ruptured SG that is isolated should remain isolated. Steam *  * supply to the turbine-driven AFW pump must be maintained from at least *  * one SG. *</p> <p>*****</p>	
11.	<u>Check If Any SG Is Faulted:</u>	
	a. Check pressures in all SGs - <ul style="list-style-type: none"> <li>o ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER</li> <li>- OR -</li> <li>o ANY SG COMPLETELY DEPRESSURIZED</li> </ul>	a. Go to Step 12.
	b. Isolate faulted SG(s): <ul style="list-style-type: none"> <li>o Isolate AFW flow</li> <li>o Dispatch NPO to close steam supply header valves to turbine-driven AFW pump from faulted SG(s): <ul style="list-style-type: none"> <li>o MS-41 (SG 22)</li> <li>o MS-42 (SG 23)</li> </ul> </li> <li>o Verify SG atmospheric steam dumps - CLOSED</li> </ul>	b. Manually close valves. <u>IF</u> valves can <u>NOT</u> be closed, <u>THEN</u> dispatch NPO to attempt to locally close valves or associated block valves.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12.	<u>Check If SG Tubes Are Intact:</u> <ul style="list-style-type: none"> <li>o Main steamline radiation recorder (R-28, R-29, R-30 and R-31) - NORMAL</li> <li>o Condenser air ejector radiation recorder (R-45)- NORMAL</li> <li>o SG blowdown radiation recorder (R-49) - NORMAL</li> <li>o NO SG LEVEL INCREASING IN AN UNCONTROLLED MANNER</li> </ul>	<p>Try to identify ruptured SG(s). Continue with Step 13. OBSERVE CAUTION PRIOR TO STEP 13. <u>WHEN</u> ruptured SG(s) identified, <u>THEN</u> isolate ruptured SG(s):</p> <ul style="list-style-type: none"> <li>o Isolate AFW flow.</li> <li>o Dispatch NPO to close steam supply header valves to turbine-driven AFW pump from ruptured SG(s): <ul style="list-style-type: none"> <li>o MS-41 (SG 22)</li> <li>o MS-42 (SG 23)</li> </ul> </li> <li>o Adjust ruptured SG(s) atmospheric steam dump controller setpoint to 74%, 1030 psig.</li> </ul> <p><u>WHEN</u> ruptured SG pressure less than 1030 psig, <u>THEN</u> verify ruptured SG atmospheric steam dump closed. <u>IF NOT</u> closed, <u>THEN</u> place controller in manual and close valve. <u>IF</u> valve can <u>NOT</u> be closed, <u>THEN</u> locally isolate open valve.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>City water for AFW pumps will be necessary if CST level decreases to less than 2 ft.</p> <p>*****</p>	
⊛13.	<u>Check Intact SG Levels:</u>	
	<p>a. Narrow range level - GREATER THAN 10% (27% FOR ADVERSE CONTAINMENT)</p> <p>b. Control AFW flow to maintain narrow range level between 10% (27% FOR ADVERSE CONTAINMENT) and 50%</p> <p>o Preferentially RESTORE level to 22 OR 23 SG</p>	<p>a. Maintain maximum AFW flow until narrow range level greater than 10% (27% FOR ADVERSE CONTAINMENT) in at least one SG.</p> <p>o Preferentially RESTORE level to 22 <u>OR</u> 23 SG</p> <p>b. <u>IF</u> narrow range level in any SG continues to increase in an uncontrolled manner, <u>THEN</u> isolate ruptured SG(s):</p> <p>o Isolate AFW flow.</p> <p>o Dispatch NPO to close steam supply header valves to turbine-driven AFW pump from ruptured SG(s):</p> <p>o MS-41 (SG 22)</p> <p>o MS-42 (SG 23)</p> <p>o Adjust ruptured SG(s) atmospheric steam dump controller setpoint to 74%, 1030 psig.</p> <p><u>WHEN</u> ruptured SG pressure less than 1030 psig, <u>THEN</u> verify ruptured SG atmospheric steam dump closed. <u>IF NOT</u> closed, <u>THEN</u> place controller in manual and close valve. <u>IF</u> valve can <u>NOT</u> be closed, <u>THEN</u> locally isolate open valve.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14.	<u>Check DC Bus Loads:</u> a. Monitor DC power supply: o Consult TSC and shed selected DC loads if necessary to extend battery life	
15.	<u>Check CST Level - GREATER THAN 2 FT</u>	Switch to city water supply: a. Open city water header isolation valve: o FCV-1205A b. Open AFW pump suction valves as necessary: o PCV-1187 o PCV-1188 o PCV-1189

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED		
	<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>*****</p> <ul style="list-style-type: none"> <li>* o SG pressures should <u>NOT</u> be decreased to less than 200 psig to prevent</li> <li>* injection of accumulator nitrogen into the RCS.</li> <li>* o SG narrow range level should be maintained greater than 10% (27% FOR</li> <li>* ADVERSE CONTAINMENT) in at least one intact SG. If level can <u>NOT</u> be</li> <li>* maintained, SG depressurization should be stopped until level is</li> <li>* restored in at least one SG.</li> </ul> <p>*****</p>			
	<p style="text-align: center;"><u>NOTE</u></p> <ul style="list-style-type: none"> <li>o The SGs should be depressurized at a rate sufficient to maintain a</li> <li>cooldown rate in the RCS cold legs near 100°F/Hr. This will minimize</li> <li>RCS inventory loss while cooling the RCP seals in a controlled manner.</li> <li>o PRZR level may be lost and reactor vessel upper head voiding may occur</li> <li>due to depressurization of SGs. Depressurization should <u>NOT</u> be stopped</li> <li>to prevent these occurrences.</li> </ul>			
16.	<p><u>Depressurize Intact SGs To 300 psig:</u></p> <table border="0"> <tr> <td style="vertical-align: top;"> <p>a. Check SG narrow range levels - GREATER THAN 10% (27% FOR ADVERSE CONTAINMENT) in at least one SG</p> </td> <td style="vertical-align: top;"> <p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Maintain maximum AFW flow until narrow range level greater than 10% (27% FOR ADVERSE CONTAINMENT) in at least one SG.</li> <li>o Preferentially RESTORE level to 22 <u>OR</u> 23 SG</li> <li>2) Continue with Step 17. <u>WHEN</u> narrow range level greater than 10% (27% FOR ADVERSE CONTAINMENT) in at least one SG, <u>THEN</u> do Steps 16b through 16e.</li> </ol> </td> </tr> </table>		<p>a. Check SG narrow range levels - GREATER THAN 10% (27% FOR ADVERSE CONTAINMENT) in at least one SG</p>	<p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Maintain maximum AFW flow until narrow range level greater than 10% (27% FOR ADVERSE CONTAINMENT) in at least one SG.</li> <li>o Preferentially RESTORE level to 22 <u>OR</u> 23 SG</li> <li>2) Continue with Step 17. <u>WHEN</u> narrow range level greater than 10% (27% FOR ADVERSE CONTAINMENT) in at least one SG, <u>THEN</u> do Steps 16b through 16e.</li> </ol>
<p>a. Check SG narrow range levels - GREATER THAN 10% (27% FOR ADVERSE CONTAINMENT) in at least one SG</p>	<p>a. Perform the following:</p> <ol style="list-style-type: none"> <li>1) Maintain maximum AFW flow until narrow range level greater than 10% (27% FOR ADVERSE CONTAINMENT) in at least one SG.</li> <li>o Preferentially RESTORE level to 22 <u>OR</u> 23 SG</li> <li>2) Continue with Step 17. <u>WHEN</u> narrow range level greater than 10% (27% FOR ADVERSE CONTAINMENT) in at least one SG, <u>THEN</u> do Steps 16b through 16e.</li> </ol>			
<p>This Step continued on the next page.</p>				

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p>b. Manually dump steam using SG atmospheric steam dumps to maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR</p> <p>c. Check RCS cold leg temperatures - GREATER THAN 325°F</p> <p>d. Check SG pressures - LESS THAN 300 PSIG</p> <p>e. Manually control SG atmospheric steam dumps to maintain SG pressures at 300 psig</p>	<p>b. Locally dump steam using SG atmospheric steam dumps:</p> <ul style="list-style-type: none"> <li>o Refer to 2-SOP-ESP-001, LOCAL EQUIPMENT OPERATION <u>AND</u> COMPENSATORY ACTIONS for local operation as necessary.</li> </ul> <p>c. Perform the following:</p> <ul style="list-style-type: none"> <li>1) Control SG atmospheric steam dumps to stop SG depressurization.</li> <li>2) Go to Step 17.</li> </ul> <p>d. Continue with Step 17. <u>WHEN</u> SG pressures decrease to less than 300 psig, <u>THEN</u> do Step 16e.</p> <p>e. Locally control SG atmospheric steam dumps to maintain SG pressures at 300 psig:</p> <ul style="list-style-type: none"> <li>o Refer to 2-SOP-ESP-001, LOCAL EQUIPMENT OPERATION <u>AND</u> COMPENSATORY ACTIONS for local operation as necessary.</li> </ul>
17.	<p><u>Check Reactor Subcritical:</u></p> <ul style="list-style-type: none"> <li>o Intermediate range channels - 0 OR NEGATIVE STARTUP RATE</li> <li>o Source range channels - 0 OR NEGATIVE STARTUP RATE</li> </ul>	<p>Control SG atmospheric steam dumps to stop SG depressurization and allow RCS to heat up.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED		
	<p style="text-align: center;">*****  <u>CAUTION</u>            *****</p> <p>Placing key switches to DEFEAT will prevent auto SI actuation.</p> <p style="text-align: center;">*****</p>			
	<p style="text-align: center;"><u>NOTE</u></p> <p>Depressurization of SGs will result in SI actuation. SI should be reset to permit manual loading of equipment on 480V bus.</p>			
18.	<p><u>Check SI Signal Status:</u></p> <table border="0"> <tr> <td style="vertical-align: top;"> <p>a. SI - HAS BEEN ACTUATED</p>   <p>b. Reset SI:</p> <p>1) Check all CCW pumps - RUNNING</p> <p>2) Place controls for main AND bypass feedwater regulating valves to CLOSE</p> <p>3) Verify Automatic Safeguards Actuation key switches on Panel SB-2 in DEFEAT position:</p> <p style="margin-left: 40px;">o Train A SIA-1</p> <p style="margin-left: 80px;">- AND -</p> <p style="margin-left: 40px;">o Train B SIA-2</p> <p>4) One at a time, depress Safety Injection reset buttons (Panel SB-2):</p> <p style="margin-left: 40px;">o Train A</p> <p style="margin-left: 40px;">o Train B</p> <p>5) Verify Train A AND B - RESET</p> </td> <td style="vertical-align: top;"> <p>a. Go to Step 22. <u>WHEN</u> SI is actuated, <u>THEN</u> do Steps 18b, 19, 20 and 21.</p>   <p>1) Place non-running CCW pumps CCR control switches in PULLOUT.</p>   <p>5) Verify Relays reset (Top of Safeguards Initiation Racks 1-1 <u>AND</u> 2-1):</p> <p style="margin-left: 40px;">o SIA-1</p> <p style="margin-left: 40px;">o SIM-1</p> <p style="margin-left: 40px;">o SIA-2</p> <p style="margin-left: 40px;">o SIM-2</p> </td> </tr> </table>		<p>a. SI - HAS BEEN ACTUATED</p> <p>b. Reset SI:</p> <p>1) Check all CCW pumps - RUNNING</p> <p>2) Place controls for main AND bypass feedwater regulating valves to CLOSE</p> <p>3) Verify Automatic Safeguards Actuation key switches on Panel SB-2 in DEFEAT position:</p> <p style="margin-left: 40px;">o Train A SIA-1</p> <p style="margin-left: 80px;">- AND -</p> <p style="margin-left: 40px;">o Train B SIA-2</p> <p>4) One at a time, depress Safety Injection reset buttons (Panel SB-2):</p> <p style="margin-left: 40px;">o Train A</p> <p style="margin-left: 40px;">o Train B</p> <p>5) Verify Train A AND B - RESET</p>	<p>a. Go to Step 22. <u>WHEN</u> SI is actuated, <u>THEN</u> do Steps 18b, 19, 20 and 21.</p> <p>1) Place non-running CCW pumps CCR control switches in PULLOUT.</p> <p>5) Verify Relays reset (Top of Safeguards Initiation Racks 1-1 <u>AND</u> 2-1):</p> <p style="margin-left: 40px;">o SIA-1</p> <p style="margin-left: 40px;">o SIM-1</p> <p style="margin-left: 40px;">o SIA-2</p> <p style="margin-left: 40px;">o SIM-2</p>
<p>a. SI - HAS BEEN ACTUATED</p> <p>b. Reset SI:</p> <p>1) Check all CCW pumps - RUNNING</p> <p>2) Place controls for main AND bypass feedwater regulating valves to CLOSE</p> <p>3) Verify Automatic Safeguards Actuation key switches on Panel SB-2 in DEFEAT position:</p> <p style="margin-left: 40px;">o Train A SIA-1</p> <p style="margin-left: 80px;">- AND -</p> <p style="margin-left: 40px;">o Train B SIA-2</p> <p>4) One at a time, depress Safety Injection reset buttons (Panel SB-2):</p> <p style="margin-left: 40px;">o Train A</p> <p style="margin-left: 40px;">o Train B</p> <p>5) Verify Train A AND B - RESET</p>	<p>a. Go to Step 22. <u>WHEN</u> SI is actuated, <u>THEN</u> do Steps 18b, 19, 20 and 21.</p> <p>1) Place non-running CCW pumps CCR control switches in PULLOUT.</p> <p>5) Verify Relays reset (Top of Safeguards Initiation Racks 1-1 <u>AND</u> 2-1):</p> <p style="margin-left: 40px;">o SIA-1</p> <p style="margin-left: 40px;">o SIM-1</p> <p style="margin-left: 40px;">o SIA-2</p> <p style="margin-left: 40px;">o SIM-2</p>			

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p style="text-align: center;"><u>NOTE</u></p> <p>ATTACHMENT 1 provides a list of Phase A valves.</p>		
19.	<p><u>Verify Containment Isolation</u> <u>Phase A:</u></p> <p>a. Phase A - ACTUATED</p> <ul style="list-style-type: none"> <li>o Train A master relay CA1 (above rack E)</li> <li>o Train B master relay CA2 (above rack F)</li> </ul> <p>b. Phase A valves - CLOSED</p> <p>c. IVSW valves - OPEN:</p> <ul style="list-style-type: none"> <li>o 1410</li> <li>o 1413</li> <li>o SOV-3518</li> <li>o SOV-3519</li> </ul> <p>d. WCP valves - OPEN:</p> <ul style="list-style-type: none"> <li>o PCV 1238</li> <li>o PCV 1239</li> <li>o PCV 1240</li> <li>o PCV 1241</li> </ul> <p>e. Place personnel AND equipment hatch solenoid control switches to INCIDENT on SM panel</p>	<p>a. Manually actuate phase A.</p> <p>b. Manually close valves. <u>IF</u> valves can <u>NOT</u> be manually closed, <u>THEN</u> locally close valves.</p> <p>c. Manually open valves.</p> <p>d. Manually open valves.</p>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20.	<u>Verify Containment Ventilation Isolation:</u>	
	a. Containment purge valves - CLOSED:	a. Manually close valves.
	o FCV-1170	<u>IF</u> valves can <u>NOT</u> be closed, <u>THEN</u> close valves from fan room.
	o FCV-1171	
	o FCV-1172	<u>IF</u> valves can <u>NOT</u> be closed, <u>THEN</u> dispatch operator and HP personnel to close outside valves by isolating instrument air:
	o FCV-1173	o FCV-1171, IA-780
		o FCV-1173, IA-779
	b. Containment pressure relief valves - CLOSED:	b. Manually close valves.
	o PCV-1190	<u>IF</u> valves can <u>NOT</u> be closed, <u>THEN</u> close valves from fan room.
	o PCV-1191	
	o PCV-1192	<u>IF</u> valves can <u>NOT</u> be closed, <u>THEN</u> dispatch operator <u>AND</u> HP personnel to close outside valves by isolating instrument air:
		o PCV-1191, IA-777
		o PCV-1192, IA-778
		<u>IF</u> containment pressure relief can <u>NOT</u> be isolated, <u>THEN</u> locally close the following valves (Fan House 88'elev., inside Pressure Relief Fan Plenum):
		o UH-1013, Pressure Relief Fan Inlet Stop
		o UH-1014, Pressure Relief Fan Outlet stop

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE

ATTACHMENT 1 provides a list of Phase B valves.

21. Check Containment Pressure - HAS  
REMAINED LESS THAN 24 PSIG

Perform the following:

a. Verify containment spray  
signal actuated. IF NOT, THEN  
manually actuate.

b. Verify containment isolation  
Phase B valves closed.

IF NOT, THEN manually close  
valves.

IF valves can NOT be manually  
closed, THEN locally close  
valves.

c. Verify IVSW isolation valves  
open (98'PAB MCC26AA/BB Room):

- o SOV-7864
- o SOV-7865
- o SOV-7866
- o SOV-7867

d. One at a time, depress  
Containment Spray Reset  
Pushbuttons:

- o Spray SYS Reset Train A
- o Spray SYS Reset Train B

22. Check Core Exit TCs - LESS THAN  
1200°F

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

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23.	<p><u>Check If AC Power Is Restored:</u></p> <p>a. Check 480V busses - AT LEAST ONE ENERGIZED</p> <ul style="list-style-type: none"> <li>o 2A <u>AND</u> 3A</li> <li>- OR -</li> <li>o 5A</li> <li>- OR -</li> <li>o 6A</li> </ul>	<p>a. Continue to control RCS conditions and monitor plant status:</p> <ol style="list-style-type: none"> <li>1) Check status of local actions: <ul style="list-style-type: none"> <li>o AC power restoration.</li> <li>o RCP seal isolation.</li> <li>o DC power supply.</li> </ul> </li> <li>2) Check status of auxiliary boration systems: <ul style="list-style-type: none"> <li>o BAST temperature greater than 155°F.</li> </ul> <p><u>IF</u> temperature less than 155°F, request TSC to provide emergency power supply for boric acid heat trace to prevent crystallization.</p> </li> <li>3) Check status of spent fuel cooling: <ul style="list-style-type: none"> <li>o Spent fuel pit level greater than low level alarm.</li> </ul> <p><u>IF</u> level less than low level alarm, <u>THEN</u> dispatch NPO to makeup to the spent fuel pit as necessary.</p> </li> <li>4) Return to Step 11. OBSERVE CAUTION PRIOR TO STEP 11.</li> </ol>

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24.	<u>Stabilize SG Pressures:</u>  a. Manually control SG atmospheric steam dumps	a. Locally control SG atmospheric steam dumps:  o Refer to 2-SOP-ESP-001, LOCAL EQUIPMENT OPERATION <u>AND</u> COMPENSATORY ACTIONS for local operation as necessary.
* * * * * * <u>CAUTION</u> * * * The loads placed on the energized 480V bus should <u>NOT</u> exceed the capacity * * of the power source. * * * * * *		
<div style="border: 1px solid black; padding: 10px; text-align: center;"> <u>NOTE</u>             ATTACHMENT 2 provides a list of 480V equipment load ratings.         </div>		
25.	<u>Verify Service Water System Operation:</u>  a. Verify at least one pump - RUNNING ON ESSENTIAL HEADER  b. Service water valves from diesel generator - OPEN	a. Manually start pump.  b. Locally open valves as necessary.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26.	<u>Verify Following Equipment Loaded On Energized 480V Bus:</u> <ul style="list-style-type: none"> <li>o Bus 5A: <ul style="list-style-type: none"> <li>a. MCCs: <ul style="list-style-type: none"> <li>o MCC 26A</li> <li>o MCC 29A</li> </ul> </li> <li>b. 21 Battery Charger in service</li> <li>c. 21 Static Inverter on alternate power supply per 2-SOP-27.1.6, INSTRUMENT BUS, DC DISTRIBUTION SYSTEM AND PA SYSTEM INVERTER</li> <li>d. 23 Static Inverter on alternate power supply per 2-SOP-27.1.6</li> </ul> </li> <li>o Bus 2A: <ul style="list-style-type: none"> <li>a. MCCs: <ul style="list-style-type: none"> <li>o MCC 24</li> <li>o MCC 24A</li> </ul> </li> <li>b. 22 Battery Charger in service</li> <li>c. 22 Static Inverter on alternate power supply per 2-SOP-27.1.6</li> <li>d. PA System Inverter on alternate power supply per 2-SOP-27.1.6</li> </ul> </li> </ul>	Manually load equipment as necessary.
This Step continued on the next page.		

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<ul style="list-style-type: none"> <li>o Bus 3A: <ul style="list-style-type: none"> <li>a. MCCs: <ul style="list-style-type: none"> <li>o MCC 26C</li> <li>o MCC 211</li> </ul> </li> <li>b. 23 Battery Charger in service</li> </ul> </li> <li>o Bus 6A: <ul style="list-style-type: none"> <li>a. MCCs: <ul style="list-style-type: none"> <li>o MCC 26B</li> <li>o MCC 27A</li> </ul> </li> <li>b. 24 Battery Charger in service</li> <li>c. 24 Static Inverter on alternate power supply per 2-SOP-27.1.6</li> </ul> </li> </ul>	

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE

If RCP seal cooling was previously isolated, further cooling of the RCP seals will be established by natural circulation cooldown as directed in subsequent procedures.

27. Select Recovery Procedure:

- a. Check RCS subcooling based on core exit TCs - GREATER THAN VALUE OBTAINED FROM TABLE:

- a. Go to 2-ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.

WR RCS PRESSURE (PSIG)	RCS SUBCOOLING °F (ADVERSE CONTAINMENT)
0 - 400	52 (83)
401 - 800	36 (49)
801 - 1200	23 (30)
1201 - 2500	19 (26)

- b. Check PRZR level - GREATER THAN 14% (33% FOR ADVERSE CONTAINMENT)

- b. Go to 2-ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.

- c. Check if SI equipment - ACTUATED WITH RESULTANT INJECTION FLOW UPON AC POWER RESTORATION

- c. Go to 2-ECA-0.1, LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED, Step 1.

- d. Go to 2-ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1

-END-

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ATTACHMENT 1  
CONTAINMENT ISOLATION VALVES

(Attachment page 1 of 1)

1. The following valves will close on Phase A isolation:

<u>VALVE NAME</u>	<u>VALVE NUMBER(s)</u>
CCW from excess letdown Hx	796, 793
CCW to excess letdown Hx	798, 791
Vent header from RCDT	1786, 1787
Gas analyzer PRT	548, 549
Gas analyzer RCDT	1788, 1789
Letdown from regenerative HX	201, 202
Letdown orifice control stop valves	200A, 200B, 200C
Make-up to PRT	519, 552
Containment sump pumps to WDS - hold-up tank	1723, 1728
Instrument air to containment	PCV-1228
RCDT to WDS - hold-up tank	1702, 1705
SG blowdown and sampling system	PCV-1214, 1214A
	PCV-1215, 1215A
	PCV-1216, 1216A
	PCV-1217, 1217A
Radiation monitor return to containment	PCV-1234, 1235
	PCV-1236, 1237
Accumulator samples	956G, 956H
Sample - pressurizer steam	956A, 956B
Sample - pressurizer liquid	956C, 956D
Sample - RCS loops	21, 22, 23
	MOV-956E, 956F
SJAE to containment	1229, 1230
Hi-Rad sample system return to containment sump	MOV-4399, 5132
Recirculation pump discharge sample line	MOV-990A, 990B
Accumulator N2 Supply Line Stop	863

2. The following valves will close on Phase B isolation:

<u>VALVE NAME</u>	<u>VALVE NUMBER(s)</u>
Component cooling to RCS pumps	MOV-769, 797
Component cooling from RCS thermal barrier return	MOV-789, FCV-625
Component cooling from RCS motor bearing return	MOV-786, 784
Seal water return containment isolation valve	MOV-222

-END-

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ATTACHMENT 2  
480V EQUIPMENT LOAD RATINGS

(Attachment page 1 of 1)

1. Use the following table to determine 480V equipment load ratings:

EQUIPMENT	21 DG BUS 5A	22 DG BUS 2A    BUS 3A	23 DG BUS 6A
21 SERVICE WATER PUMP	282 KW		
22 SERVICE WATER PUMP		282 KW OR 282 KW	
23 SERVICE WATER PUMP			282 KW
24 SERVICE WATER PUMP	282 KW		
25 SERVICE WATER PUMP		282 KW OR 282 KW	
26 SERVICE WATER PUMP			282 KW
PRZR CONTROL HEATERS			277 KW
21 PRZR BU HEATERS		554 KW	
22 PRZR BU HEATERS		485 KW	
23 PRZR BU HEATERS	485 KW		
21 AFW PUMP		384 KW	
23 AFW PUMP			384 KW
21 FAN COOLER UNIT	250 KW		
22 FAN COOLER UNIT	250 KW		
23 FAN COOLER UNIT		250 KW	
24 FAN COOLER UNIT		250 KW	
25 FAN COOLER UNIT			250 KW
21 SI PUMP	316 KW		
22 SI PUMP		316 KW	
23 SI PUMP			345 KW
21 SPRAY PUMP	350 KW		
22 SPRAY PUMP			350 KW
21 RHR PUMP		303 KW	
22 RHR PUMP			303 KW
21 CHARGING PUMP	150 KW		
22 CHARGING PUMP		150 KW	
23 CHARGING PUMP			150 KW
21 RECIRC PUMP	299 KW		
22 RECIRC PUMP			299 KW
21 CCW PUMP	228 KW		
22 CCW PUMP		228 KW	
23 CCW PUMP			228 KW
21 LIGHTING TRANSFORMER		150 KW (N)	150 KW (E)
22 LIGHTING TRANSFORMER		225 KW	
23 LIGHTING TRANSFORMER	225 KW		
TURBINE AUX OIL PUMP			112 KW
STATION AIR COMPRESSOR	93 KW		

- END -