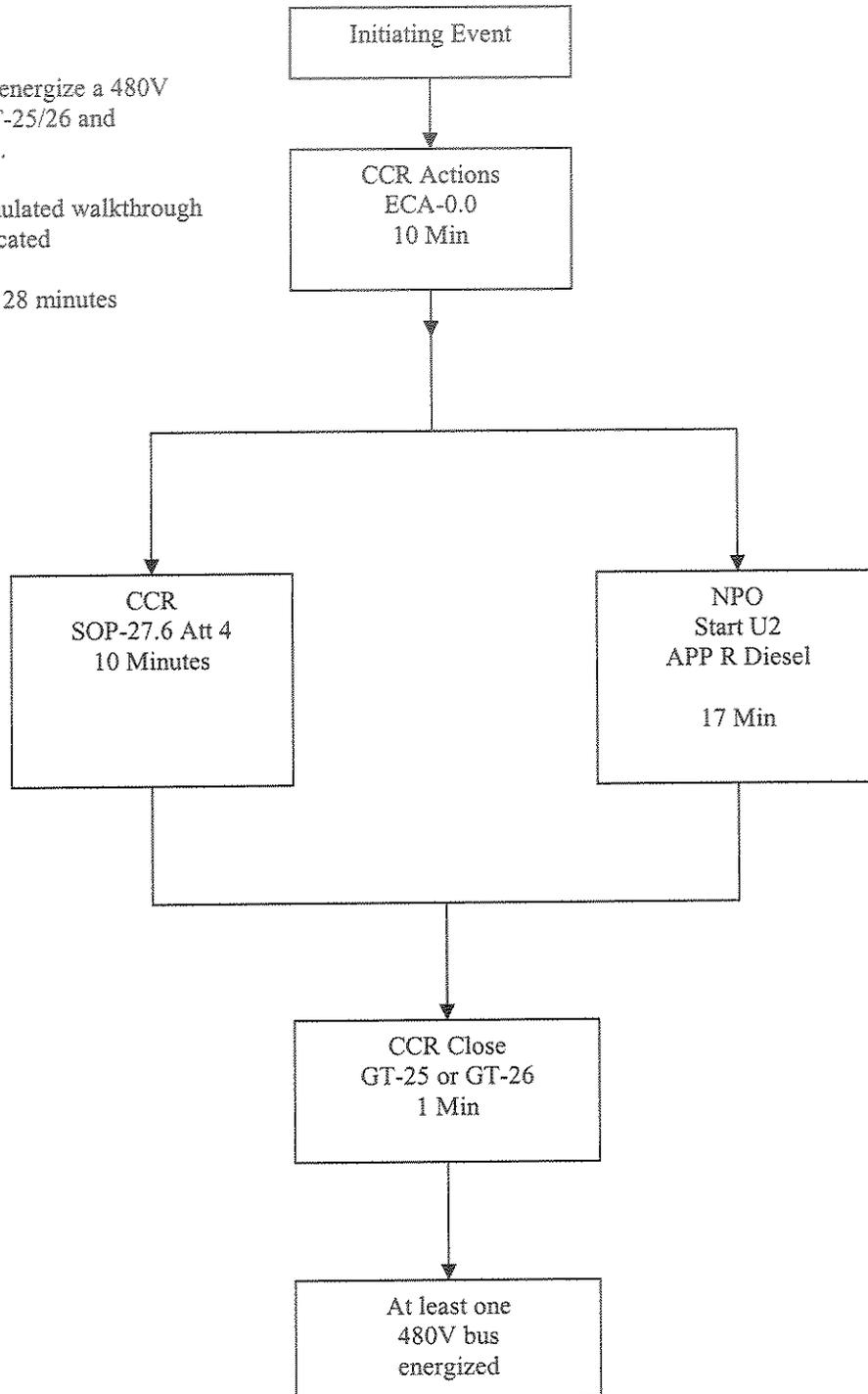


SBO Event:
Time line to energize a 480V
Bus from GT-25/26 and
App R diesel.

Operator simulated walkthrough
times as indicated

Total time is 28 minutes



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

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

NOTE

- o Steps 1 and 2 are IMMEDIATE ACTION steps.
- o CSF Status Trees should be monitored for information only. FRPs should NOT be implemented.

1

Verify Reactor Trip:

Manually trip reactor.

- o Reactor trip breakers - OPEN
- o Neutron flux - DECREASING
- o Rod bottom lights - LIT
- o Rod position indicators - AT ZERO

2

Verify Turbine Trip:

- a. All turbine stop valves - CLOSED

- a. Manually trip turbine. IF turbine will NOT trip, THEN close MSIVs.

IF MSIVs can NOT be closed, THEN manually run back turbine.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(3)	<p><u>Check If RCS Is Isolated:</u></p> <p>a. PRZR PORVs - CLOSED</p> <p>b. Letdown isolation valves - CLOSED</p> <ul style="list-style-type: none"> o LCV-459 o 200A o 200B o 200C <p>c. Excess letdown isolation valve - CLOSED</p> <ul style="list-style-type: none"> o 213 	<p>a. <u>IF</u> PRZR pressure less than 2335 psig, <u>THEN</u> manually close PORVs.</p> <p>b. Manually close valve.</p> <p>c. Manually close valve.</p>
(4)	<p><u>Verify AFW Flow - GREATER THAN 400 GPM:</u></p> <p>a. Turbine-driven AFW pump - RUNNING</p> <p>b. Manually align turbine-driven AFW pump FCVs as necessary</p> <p>c. Adjust steam supply speed control valve as necessary:</p> <ul style="list-style-type: none"> o HCV-1118 	<p>a. Manually open steam supply regulator valve:</p> <ul style="list-style-type: none"> o PCV-1139

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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

 * CAUTION *
 * 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. *
 * *****

5. Try To Restore Power to Any 480V

Bus:

Ⓟ Energize 480V bus with 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.



This Step continued on the next page.

Number: 2-ECA-0.0	Title: LOSS OF ALL AC POWER	Revision Number: REV. 2
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
		<p>IF 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"> a) Locally trip running diesel generator(s). b) Contact Con Ed DO to determine if 138KV or 13.8KV power readily available. c) IF outside power is <u>NOT</u> readily available, <u>THEN</u> perform the following: <ul style="list-style-type: none"> 1. Start Appendix R DG per: <ul style="list-style-type: none"> o 2-SOP-27.6, UNIT 2 APPENDIX R DIESEL GENERATOR OPERATION 2. Dispatch NPO to black start a GT per: <ul style="list-style-type: none"> o 2-SOP-27.5.3, BLACK START OF GAS TURBINE 1, 2, <u>OR</u> 3. 3. Go to Step 6. OBSERVE CAUTIONS PRIOR TO STEP 6. d) IF outside power is readily available, <u>THEN</u> attempt to manually energize 480V bus using the following: <ul style="list-style-type: none"> o 2-AOP-138KV-1, LOSS OF POWER TO 6.9KV BUS 5 <u>AND/OR</u> 6. o 2-AOP-480V-1, LOSS OF 480V BUS.

10 MIN

This Step continued on the next page.

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JA 4.4.15 ENSURE the Lube Oil Supply Reservoir is refilled with the proper grade of oil. (SAE 15W – 40)

JA 4.4.16 TURN the 0/MANUAL/AUTO switch to the AUTO position.

4.5 Engine Start (Loss Of AC Power/ SBO)

NOTE

- This section is written for emergency operation. If one of the steps can NOT be met the Supervisor in charge must evaluate continued action.
- If DC control power is not available for breaker operation, breakers may be operated manually using Section 4.9, Manual Breaker and Transfer Switch Operation.
- The starting of the Appendix R DG should not be delayed.
- SO Phone Number: (212) 580-6789
- DO Phone Number: (212) 580-6754

JA 4.5.1 REQUEST the CCR to initiate the performance of Attachment 4

NOTE

- Opening The Tool Room Roll up door may affect Centac operation. CCR permission is required prior to opening the Tool Room Roll-up door.
- The design maximum temperatures for the Unit 2 Appendix R DG are:
104 °F for the electrical distribution equipment
122 °F for the Diesel Generator air intake

JA 4.5.2 PERFORM the following as necessary to prevent exceeding design maximum temperatures:

JA 4.5.2.1 ENSURE the Delay Gate is Closed

JA 4.5.2.2 IF the Tool Room Roll-up door will be opened, THEN REQUEST permission from the CCR to open the Tool Room Roll-up door.

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 4.5.2.3 ENSURE one of the following is Open:

- The Maintenance Loading Bay overhead door (15' Elevation)
- Tool Room Roll-up door (15 'Elevation)

 4.5.3 ENSURE the following Appendix R Diesel Generator Fuel Oil Day Tank Indications are Illuminated:

- System Ready Yellow LED flashing
- Power Available Green LED illuminated

 4.5.3.1 CHECK NO abnormal condition exists as indicated by a LED in a flashing ON state and horn sounding.

 4.5.4 ENSURE that breaker SBO/ASS is OPEN. (SBO/APP R Diesel Generator Switchgear)

5 min 4.5.5 ENSURE that breaker ASS is OPEN. (SBO/APP. R Switchgear 13.8KV Bus)

 4.5.6 ENSURE that breaker OSP is OPEN. (SBO/APP. R Switchgear 13.8KV Bus)

 4.5.7 ENSURE that breaker SBOH is OPEN. (SBO/APP. R Switchgear 13.8KV Bus)

 4.5.8 ENSURE the following at the Appendix R DG Switch Panel (Control Panel):

 4.5.8.1 Shutdown Status indicator – Extinguished

 4.5.8.2 Warning Status indicator – Extinguished

 4.5.9 PLACE the UNIT-PARALLEL switch in UNIT. (SBO/ APP R Switchgear 6.9KV Bus)

 4.5.10 At the Appendix R DG Switch Panel (Control Panel) PRESS and HOLD the Panel Lamp/Lamp Test button for at least 3 Seconds

 4.5.10.1 CHECK all control panel LEDs illuminate

 4.5.10.2 RELEASE Panel Lamp/Lamp Test button

 4.5.11 IF City Water will be the cooling source, THEN ALIGN City Water to The Appendix R DG as follows:

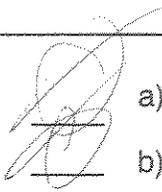
 4.5.11.1 OPEN the following:

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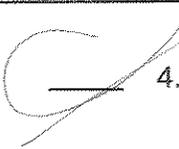
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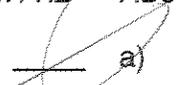
 a) UW-854

b) UW-855

NOTE

Maintaining the City Water flows specified ensures that adequate volume in the City Water Storage Tank is reserved for other plant activities.

 4.5.11.2 ADJUST Cooling Water flow as follows:

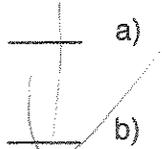
 a) THROTTLE UW-840 to achieve approximately 87 gpm as indicated by FI-7980, Aftercooler Water Flow.

 b) THROTTLE UW-836 to achieve approximately 118 gpm as indicated by FI-7979, Jacket Water Flow.

 4.5.12 IF Conventional Service Water is available AND the CRS gives permission to use it as the cooling source, THEN ALIGN Conventional Service Water to The Appendix R DG as follows:

 4.5.12.1 OPEN SWT-837

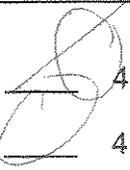
 4.5.12.2 ADJUST Cooling Water flow as follows:

 a) THROTTLE UW-840 to achieve approximately 137 gpm as indicated by FI-7980, Aftercooler Water Flow.

b) THROTTLE UW-836 to achieve approximately 160 gpm as indicated by FI-7979, Jacket Water Flow.

NOTE

- There is no time delay when starting the engine in manual mode.
- The default starting sequence is 3 start cycles, comprised of 10 seconds of cranking and 10 seconds of rest.
- When the coolant reaches operating temperature OR the warm-up at idle time is completed, the generator will ramp up to rated speed and voltage.

 4.5.13 TURN the 0/MANUAL/AUTO switch to the MANUAL position.

 4.5.14 PRESS AND HOLD the Manual Run/Stop button for a minimum of 3 seconds

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4.5.14.1 RELEASE the Manual Run/Stop button.

NOTE

- The _ momentary pushbutton on Menu A of the Operator Panel is used to close and open breaker SBO/ASS.
 - _ indicates breaker SBO/ASS is open, PUSH to close
 - - indicates breaker SBO/ASS is closed, PUSH to open
- When using the _ momentary pushbutton, breaker SBO/ASS will close only when set-up conditions allow (i.e. dead bus OR generator synchronized with bus).

4.5.15 IF Manually closing breaker SBO/ASS,
THEN PRESS the Manual Close Button on the front of the Breaker.

4.5.16 CLOSE breaker SBO/ASS as follows:

4.5.16.1 PRESS AND HOLD the _ momentary pushbutton until the symbol indicates - (breaker SBO/ASS closed).

4.5.16.2 RELEASE the momentary pushbutton.

NOTE

- A fault that could result in engine damage, causes an immediate engine shutdown.
- All other faults allow the engine to run during the cool-down sequence before engine shutdown.
- Warning alarms will not cause a shutdown but may indicate abnormal operation.

4.5.17 IF a Warning Condition occurs (Warning Status Indicator illuminates yellow), THEN PERFORM the following:

4.5.17.1 IF the Alarm Module warning horn annunciated, THEN momentarily PUSH the PUSH TO SILENCE HORN button.

4.5.17.2 REFER to the following for assistance in correcting the condition:

- ATTACHMENT 2, WARNING AND SHUTDOWN FAULT CODES
- ATTACHMENT 3, APPENDIX R DG TROUBLESHOOTING PROCEDURES

11 min

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4.5.17.3 WHEN the condition is corrected, THEN the Warning Status Indicator may be reset as follows:

- a) PRESS the front panel FAULT ACKNOWLEDGE button

NOTE

If a shutdown condition occurs the Shutdown Status Indicator will illuminate red and the engine will shutdown immediately or on a cool-down timer at any time an abnormal condition is sensed:

4.5.18 IF a shutdown condition occurs (Shutdown Status Indicator illuminates red), THEN PERFORM the following:

4.5.18.1 IF the Alarm Module warning horn annunciated, THEN momentarily PUSH the PUSH TO SILENCE HORN button.

4.5.18.2 REFER to the following for assistance in correcting the condition:

- ATTACHMENT 2, WARNING AND SHUTDOWN FAULT CODES
- ATTACHMENT 3, APPENDIX R DG TROUBLESHOOTING PROCEDURES

4.5.18.3 PERFORM the following to reset the shutdown condition:

- a) IF the EMERGENCY STOP button was pressed, THEN PULL the EMERGENCY STOP button out
- b) PLACE the 0/MANUAL/AUTO switch in 0
- c) PRESS the front panel FAULT ACKNOWLEDGE button
- d) PLACE the 0/MANUAL/AUTO switch in AUTO

4.5.19 IF desired to ALIGN the Appendix R DG Auxiliaries MCC to the Appendix R DG THEN PERFORM the following:

4.5.19.1 CHECK the generator is at rated speed and voltage as indicated by the LCD display message.

4.5.19.2 CHECK the Appendix R DG Auxiliary Transfer Switch is aligned as follows:

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 a) Source 2 Available (Yellow Light illuminated)

 4.5.19.3 ROTATE and HOLD the Appendix R DG Auxiliaries Normal/Standby Switch in the NORMAL position (Aligned to the Appendix R DG Output) (Appendix R DG Auxiliaries MCC)

 a) WHEN the CHECK Source 2 Connected (Red Light) illuminates, THEN RELEASE the switch

 4.5.20 CHECK that the DG Area Fan is running

 4.5.21 ENSURE that breaker SBO/ASS is Closed. (SBO/APP R Diesel Generator Switchgear)

 4.5.22 ADJUST cooling water throttle valves to maintain normal cooling temperatures.

 • UW-836

 • UW-840

NOTE

One set of data should be taken, even if engine is operated for less than an hour.

 4.5.23 IF time permits, THEN RECORD Appendix R DG parameters once per hour using ATTACHMENT 1, APPENDIX R DG DATA SHEETS.

NOTE

When the Appendix R DG Day Tank is operating in AUTO, the The Appendix R DG Day Tank Level should be maintained between 7/8 and Full.

 4.5.24 MONITOR Appendix R DG Day Tank Level.

 4.5.25 MONITOR Lube Oil Supply Reservoir gauge glass level.

 4.5.25.1 WHEN gauge glass level indicates less than 1/4 full, THEN REFILL Lube Oil Supply Reservoir with proper grade of oil. (SAE 15W – 40)

 4.5.26 CHECK the engine systems for leakage

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- 4.5.26.1 IF leakage is observed, THEN INITIATE a WRT as necessary:
- 4.5.27 ENSURE breaker SBO/ASS is Closed (SBO/APP R Diesel Generator Switchgear)
- 4.5.28 REQUEST the CCR to verify the following breakers are OPEN:
 - 4.5.28.1 GT25
 - 4.5.28.2 GT26
- 4.5.29 CLOSE breaker SBOH. (SBO/APP. R Switchgear 13.8KV Bus)
- 4.5.30 CLOSE breaker SBOL (SBO/APP. R Switchgear 6.9KV Bus)
 - 4.5.30.1 CLOSE breaker SBOL

NOTE

- The Appendix R Diesel Generator's maximum continuous load is 2045 kW. During an emergency, maximum generator load is 2700 kW for 25 hours/yr.
- When starting equipment, coordination with the CRS will be necessary to ensure adequate generator capacity is available.

- 4.5.31 INFORM the CCR that the Appendix R DG is energized up to GT25 and GT26 and ready to be loaded.

18
mm

ATTACHMENT 4

CCR LINEUP FOR ENERGIZATION OF 480V BUSES

(Page 1 of 5)

START

1.0 PERFORM the following in the CCR to align the 408 Volt Busses:

✓ 1.1 ENSURE the following breakers are Open:

✓ • GT25 (In Pull Out)

✓ • GT26 (In Pull Out)

CAUTION

If a fault is suspected on a bus the SM/ CRS must evaluate and authorize prior to energizing the bus.

✓ 1.2 IF desired to energize 480V Bus 6A or 3A, THEN PERFORM the following:

1.2.1 ENSURE the following Breakers are Open

✓ • ST6 (In Pull Out)

✓ • SS6 (In Pull Out)

✓ • UT3 (In Pull Out)

✓ • UT3-ST6 (In Pull Out)

✓ • UT4-ST6 (In Pull Out)

✓ • 3AT6A (In Pull Out)

✓ • 2AT3A (In Pull Out)

✓ 1.2.2 SET the flags to Green for all 6.9KV Bus 6 and 3 load breakers. 21 ND+P

1.2.3 IF Energizing 480V Bus 3A, THEN ENSURE the following breakers are Open:

✓ • SS3 (In Pull Out)

✓ • 52/3A (In Pull Out)

✓ • EG-2B (In Pull Out)

RW BUS
23 REC
22 CIRL
26 CIRL

6.9KV Bus 3

ATTACHMENT 4
CCR LINEUP FOR ENERGIZATION OF 480V BUSES

(Page 2 of 5)

CAUTION

- Proper PPE must be worn for Manual closure of Breaker
- Control Power fuses for Normal Supply Breakers to 480V Buses SHALL NOT be re-installed until the Blackout Relay Reset 480V Bus is reset.

- TOP 8 MINUTES*
- START*
- STOP 37 SEC*
- START 10 MIN*
- 21 AFW*
- 22+25 SUP*
- 24 SUP*
- 22 SIS*
- 22 CP*
- 21 B/C HTR*
- MU 26e*
- ✓ 1.2.4 PLACE all 480V Bus 3A Loads in Pullout.
- ✓ 1.2.5 REMOVE the control fuses for 52/3A Normal Supply Breaker to Bus 3A
- ↓ 1.2.6 At the local control station, manually CLOSE 52/3A. (Location??) ?
- ✓ 1.2.7 PLACE the CCR switch for 52/3A in CLOSED (red flag) position
- 1.2.8 PERFORM the following to Close UT3-ST6, Bus 3-6 Tie Breaker:
- ✓ PLACE 6900V Bus 3 synchroscope switch in BUS 3 - BUS 6.
 - ✓ CLOSE Bus 3-6 Tie Breaker UT3-ST6
 - ✓ PLACE 6900V Bus 3 synchroscope switch to OFF.
- ✓ 1.2.9 CLOSE SS3 STA. Service Trans 3 Supply Breaker.

CAUTION

The Appendix R Diesel Generator's maximum continuous load is 2045 kW. During an emergency, maximum generator load is 2700 kW for 25 hours/yr.

- 1.2.10 WHEN the Appendix R Diesel Operator has power up to GT26 and is ready to load the diesel, THEN CLOSE GT26.
- 1.2.11 IF Energizing 480V Bus 6A, THEN ENSURE the following breakers are Open:
- ✓ 52/6A (In Pull Out)
 - ✓ EG-3 (In Pull Out)

ATTACHMENT 4
CCR LINEUP FOR ENERGIZATION OF 480V BUSES
 (Page 3 of 5)

CAUTION

- Proper PPE must be worn for Manual closure of Breaker
- Control Power fuses for Normal Supply Breakers to 480V Buses **SHALL NOT** be re-installed until the Blackout Relay Reset 480V Bus is reset.

3 MIN TOP 42 SEC START

- 1.2.12 PLACE all 480V Bus 6A Loads in Pullout. *23 CCW 23 AFW 23 SIS 25 PUV 22 BEURC 23+26 MCL 26 23 CP*
- 1.2.13 REMOVE the control fuses for 52/6A, Normal Supply Breaker to Bus 6A
- 1.2.14 At the local control station, manually CLOSE 52/6A. (Location??)
- 1.2.15 PLACE the CCR switch for 52/6A in CLOSED (red flag) position
- 1.2.16 CLOSE SS6 STA Service Trans 6 Supply Breaker.

CAUTION

The Appendix R Diesel Generator's maximum continuous load is 2045 kW. During an emergency, maximum generator load is 2700 kW for 25 hours/yr.

1 min

- 1.2.17 WHEN the Appendix R Diesel Operator has power up to GT26 and is ready to load the diesel, THEN CLOSE GT26.
- 1.3 IF desired to Energize 480V Bus 5A OR 2A, THEN PERFORM the following:
 - 1.3.1 ENSURE the following breakers are Open
 - ST5 (In Pull Out)
 - SS5 (In Pull Out)
 - UT2 (In Pull Out)
 - UT1-ST5 (In Pull Out)
 - UT2-ST5 (In Pull Out)
 - 2AT5A (In Pull Out)