

Originator: Burney,Michael W

Originator Phone: 7073

Originator Group: Licensing Mgmt

Operability Required: Y

Supervisor Name: Walpole,Robert W

Reportability Required: Y

Discovered Date: 06/04/2008 19:06

Initiated Date: 06/04/2008 19:29

Condition Description:

During NRC modification inspection, the SBO App R Diesel Generator test could not be used to independently verify the Post Mod Test Plan Requirements (PMTP). The documentation within the test was not adequate to demonstrate that the PMTP requirements.

The specific sections for load, endurance and reliability testing were not sufficient to conclude that the testing was completed due to the extensive use of N/A and incomplete commenting.

The method chosen for performing the test did not demonstrate adequate controls and may not be consistent with the PMTP.

The engine operability is not an issue as much as the control methods used for the test changes with respect to the PMTP revisions required by Engineering Change Notices (ECNs).

Immediate Action Description:

Briefed management on extent of finding.

Suggested Action Description:**EQUIPMENT:**Tag NameTag Suffix Name Component Code Process System Code

ARDG

TRENDING (For Reference Purposes Only):Trend TypeTrend Code

REPORT WEIGHT

3

WU

ESPE

INPO BINNING

CM3

KEYWORDS

KW-APPENDIX R

HEP FACTOR

P

KEYWORDS

KW-MODIFICATION TESTING

KEYWORDS

KW-DIESEL GENERATOR

KEYWORDS

KW-NRC

Operability Version: 1**Operability Code:** EQUIPMENT FUNCTIONAL**Immediate Report Code:** NOT REPORTABLE**Performed By:** Santini, Philip R 06/05/2008 00:58**Approved By:** Hock, Charles E 06/05/2008 01:26**Operability Description:**

Functionality requirements for the App R diesel are specified in TRO 3.8.B. The surveillance requirements delineated in TRS 3.8.B.1 through 3.8.B.9 are met by performance of their applicable surveillance test procedures. For the initial functionality declaration, these requirements were all verified to be met during acceptance testing. This condition report describes apparent record keeping deficiencies in the the post modification testing program which was performed under work order number 51297433 task 01. Formal allowance was made in the development of this testing plan to permit changes in content and acceptance criteria.

TRS 3.8.B.8 requires demonstration of the ability to line-up and provide power from the App R diesel to the App R loads, SBO loads and unit 3 SBO loads. The bases for this surveillance requirement explicitly permits a combination of tests and simulated actions. Portions of this SR were satisfied via simulation. Activities which were simulated during the acceptance testing program were doubled in time and still satisfied the required times.

One hour time testing was completed and documented in the PMTP sections 5.13.6 and 5.13.7. Loads were supplied to alternate safe shutdown loads in 45 minutes; to unit 2 SBO loads in 37 minutes and to unit 3 SBO loads in 22 minutes.

Comments contained in the work order page 58 and validated against the SOMS narrative log provide assurance that the 20 1 hour reliability runs were completed and that the 2400Kw run and dead bus tests were in fact performed as required. In conclusion, the App R diesel is functional.

Approval Comments:

As stated all requirements to demonstrate functionality have been performed.

OperabilityVersion: 2**Operability Code:** EQUIPMENT FUNCTIONAL**Immediate Report Code:** NOT REPORTABLE**Performed By:** Dewey Jr,Donald J

06/05/2008 16:53

Approved By: Hock,Charles E

06/05/2008 20:49

Operability Description:

In addition to the first operability and CA1 justifications for functionality of this condition report we ran a simulated walk through of 2-AOP-SSD-1 from the initiating event through loading a charging pump onto the App R diesel. Total time to accomplish the task was 32 minutes which was well within the target of 60 minutes. This walk through was accomplished in segments and included transit time and parallel actions. See attached documents for flow chart and procedures used. Based on this walk through, the previous operability, and CA1, the App R diesel is considered FUNCTIONAL.

Approval Comments:

The simulation provides additional justification for functionality met.

Attachments:

Operability Description

Flow Chart

2-AOP-SSD-1

2-SOP-27.6

Attachment Header

Document Name:

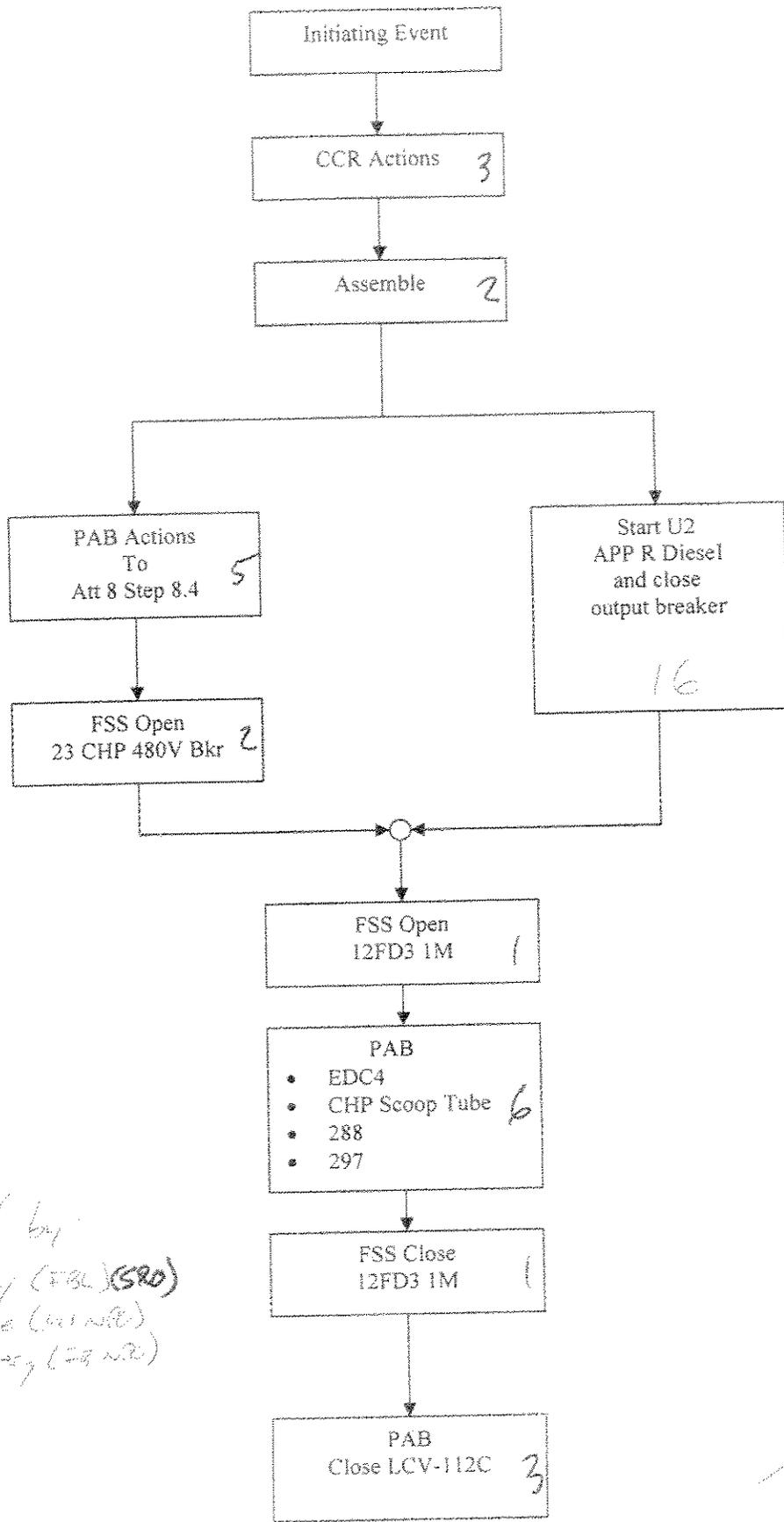
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Document Location

Operability Description

Attach Title:

Flow Chart



3

16

16

32 minutes

Performed by:
 Don Dewey (FBL) (SRD)
 Mike Chase (MWR)
 Dave Carney (FBL)

Attachment Header

Document Name:

untitled

Document Location

Operability Description

Attach Title:

2-AOP-SSD-1

4. SUBSEQUENT ACTIONS

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>NOTE</p> <ul style="list-style-type: none"> EOPs are not applicable during performance of this procedure. The following are time critical actions and should be completed as quickly as possible; AFW, Electrical Power, Charging and CCW restoration. Blowdown and Letdown line isolation. 	
<p>4.1 <input checked="" type="checkbox"/> IAAT CCR environment causes evacuation to become absolutely necessary, THEN evacuate CCR <u>and</u> GO TO Step 4.17.</p>	
<p>4.2 <input checked="" type="checkbox"/> Trip the reactor.</p>	<p>1. ___ Dispatch an operator to perform Attachment 1 (Local Manual Reactor Trip) (Page 97).</p> <p>2. ___ WHEN reactor is tripped, THEN continue in this procedure.</p>
<p>4.3 <input checked="" type="checkbox"/> Trip the turbine.</p>	<p>___ Locally trip the turbine.</p>
<p>4.4 <input checked="" type="checkbox"/> Trip <u>both</u> MBFPs.</p>	<p>___ Dispatch an operator to trip <u>both</u> MBFPs.</p>
<p>4.5 <input checked="" type="checkbox"/> Trip <u>all</u> RCPs.</p>	<p>___ Dispatch an operator to perform Attachment 7 (Manually Opening and Racking Out 6.9 KV Breakers) (Page 207) for affected RCPs.</p>
<p>4.6 <input checked="" type="checkbox"/> Start <u>(21)</u> or 22 ABFP.</p>	
<p>4.7 <input checked="" type="checkbox"/> Establish auxiliary feed flow to 21 and 22 SGs.</p>	
<p>4.8 <input checked="" type="checkbox"/> Is LCV-459 (Letdown Stop Valve) in AUTO?</p>	<p>___ Place LCV-459 in AUTO.</p>
<p>4.9 <input checked="" type="checkbox"/> Close <u>all</u> MSIVs.</p>	
<p>4.10 <input checked="" type="checkbox"/> Place RCS Makeup Control Switch to STOP</p>	
<p>4.11 <input checked="" type="checkbox"/> Place 863 (Accumulator N2 Supply Line Stop) in OPEN.</p>	
<p>4.12 <input checked="" type="checkbox"/> Is the CCR being evacuated due to <u>any</u> fire?</p>	<p>___ GO TO Step 4.15.</p>

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.13 Close both PORV block valves AND PLACE in Pullout: Q MOV-535 Q MOV-536	
4.14 Remove Control Power Fuses to isolate Letdown, secure PORVs from spurious operation, and establish charging flow path. Q 455C (Panel FB rear facing west) Q 456 (Panel FB rear facing west) Q LCV-459 (Panel SF rear facing north) Q 204A (Panel SF rear facing north) Q 204B (Panel SF rear facing north)	1. ___ Trip any running charging pumps. 2. ___ Open 125 Volt DC Distribution Panel 21 Circuit 5 on the back of Panel FD. 3. ___ Open 125 Volt DC Distribution Panel 22 Circuit 15 on the back of Panel FD.
4.15 Q Announce reactor trip and CCR evacuation over PA.	
4.16 Obtain two sets of security keys from lock box. Q One set for Conventional Side RO. Q One set for CRS.	

3 min

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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NOTE

The expectations for the use of personnel are as follows:

- The CRS, one RO and the Nuclear NPO will be present on the Nuclear Side with one copy of this procedure.
- The second RO and the Conventional NPO will be present in the Auxiliary Feed Pump Building. Each person will have one copy of this procedure.
- The FSS and Unit 1 NPO will be conducting electrical operations, etc with the last copy of this procedure.
- The Fire Brigade Leader (Unit 2 or Unit 3 SRO) and 3 NPOs will be fighting a fire IF any fire has occurred. IF a fire has NOT occurred, duties of these personnel will be directed by the SM/CRS/FSS.

4.17 Obtain the following from the Appendix R equipment locker in the CCR foyer:

CRS:

Procedure package

Logbook

Two radios

One flashlight

Keys

SM:

One radio

One flashlight

Keys

RO:

One radio

One flashlight

Keys

Zain

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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<p>NOTE</p> <p>Radio use is now permitted in all areas</p>	
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4.18 <input checked="" type="checkbox"/> INITIATE establishing communications with <u>all</u> watch personnel.	
4.19 <input checked="" type="checkbox"/> Is the reactor tripped?	<p>1. <u>IF</u> an operator has NOT been dispatched to perform Attachment 1 (Local Manual Reactor Trip) (Page 97), THEN dispatch an operator to perform Attachment 1.</p> <p>2. <u>WHEN</u> reactor is tripped, THEN continue in this procedure.</p>
4.20 <input checked="" type="checkbox"/> INITIATE Attachment 2 (Conventional Side RO Actions) (Page 99).	
4.21 <input checked="" type="checkbox"/> INITIATE Attachment 3 (Conventional Side NPO Actions) (Page 153).	
4.22 <input checked="" type="checkbox"/> Are <u>all</u> RCP breakers open?	<p>— Dispatch Unit 1 NPO to perform Attachment 7 (Manually Opening and Racking Out 6.9 KV Breakers) (Page 207) for affected RCPs.</p>

<p>NOTE</p> <p>For emergency classification purposes, control of the plant is considered to be established when control is established and reported to SM per Step 4.16 of Attachment 4 (Placing Safe Shutdown Panel in Service).</p>	
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4.23 <input checked="" type="checkbox"/> Notify SM to implement E-Plan from the Unit 3 CCR. <ul style="list-style-type: none"> • Classify event • Perform Communicator Duties utilizing Unit 3 Control Room staff. 	
4.24 <input checked="" type="checkbox"/> CRS and RO proceed to 90 ft el. PAB Fan Room, Alternate Safe Shutdown Panel.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>4.25 <input checked="" type="checkbox"/> Are all three Light & Power Bus Section 3 glow lamps illuminated?</p> <p><i>UNIT 2 operator</i></p>	<p>1. <input checked="" type="checkbox"/> IF the Unit 2 Appendix R Diesel is available, THEN GO TO <u>2-SOP-27.6</u> (Unit 2 Appendix R Diesel Generator Operation).</p> <p>2. ___ IF the Unit 3 Appendix R Diesel is available, THEN GO TO AOI 27.1.9.2 (Providing Appendix R Power From Unit 3).</p> <p>3. ___ INITIATE Attachment 6 (Gas Turbine Black Start/Unit 1 Power) (Page 195).</p>
<p>4.26 <input checked="" type="checkbox"/> INITIATE Attachment 4 (Placing Safe Shutdown Panel in Service) (Page 175).</p>	
<p>4.27 <input checked="" type="checkbox"/> INITIATE request to Unit 3 Control Room to monitor 13.8kV system voltage via the District Operator and to notify Unit 2 if 13.8kV voltage CAN NOT be maintained between 13.5kV & 14.3kV.</p>	

4.28 **PIAAT** notification is received that the District Operator **CAN NOT** provide 13.8kV voltage within 13.5kV & 14.3kV,
THEN INITIATE the following:

- A. ___**IF** the Unit 2 Appendix R Diesel is available,
THEN GO TO
2-SOP-27.6 (Unit 2 Appendix R Diesel Generator Operation).
- B. ___**IF** the Unit 3 Appendix R Diesel is available,
THEN GO TO
AOI 27.1.9.2 (Providing Appendix R Power From Unit 3).
- C. ___**INITIATE** Attachment 6
(Gas Turbine Black Start/Unit 1 Power)
(Page 195).

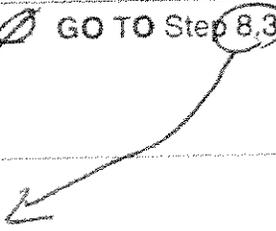


ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>4.29 IF a 480V Bus has been lost and re-energized by its EDG, THEN perform Steps 4.30 - 4.31.</p>	<p>GO TO Step 4.32</p>
<p>4.30 ___ Is at least one SW pump running on the essential header?</p>	<p>1. ___ Attempt to start at least one pump by transferring LOCAL/REMOTE switch for selected pump to LOCAL and pressing START button.</p> <p>2. ___ IF unable to start at least one pump on essential header, THEN perform the following:</p> <p>A. ___ IF power is available to a SW pump that is NOT aligned to the essential header, THEN INITIATE the <u>applicable section(s)</u> of 2-SOP-24.1 (Service Water System Operation) to transfer essential service water headers as necessary.</p> <p>B. ___ IF power is NOT available to <u>any</u> SW pumps, AND 480V Switchgear Room is accessible, THEN INITIATE Attachment 12 (Placing 23 or 24 Service Water Pump in Service On Safe Shutdown Power) (Page 233).</p> <p>C. ___ IF power is NOT available to any SW pumps, AND 480V Switchgear Room is NOT accessible, THEN place <u>all three</u> diesel generator control switches in OFF.</p>

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>4.31 Dispatch an operator to perform the following:</p> <p>___ PERFORM applicable sections of 2-SOP-27.1.5 (480 Volt System) to reset MCCs and lighting associated with re-energized buses.</p> <p>___ Periodically monitor <u>all</u> running EDGs.</p>	
<p>4.32 <u>Q</u> IAAT instrument air is lost to a running charging pump, THEN perform the following:</p> <p>A. ___ Uncouple air speed controller from scoop tube linkage (above pump).</p> <p>B. ___ Place scoop tube in position "A".</p>	
<p>4.33 <u>Q</u> Is <u>any</u> CCW pump operating?</p>	<p>1. <u>Q</u> IF NO charging pumps are operating, THEN GO TO Step <u>4.134</u></p> <p>2. ___ IF any charging pump is operating, THEN GO TO Step 4.96.</p>

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p><u>Unit Status</u></p> <p>CCW and Charging are NOT operating.</p>	
<p>4.134 <input checked="" type="checkbox"/> Were LCV-459 fuses removed prior to CCR evacuation?</p>	<p>A. ___ Remove lock and place LCV-459 (LETDOWN STOP) control switch in CLOSE.</p> <p>B. Close <u>all</u> letdown orifice stops:</p> <p>___ 200A</p> <p>___ 200B</p> <p>___ 200C</p>
<p>4.135 <input checked="" type="checkbox"/> Isolate seal injection by closing CVCS Seal Injection Filter Outlet Stops:</p> <p><input checked="" type="checkbox"/> 249A</p> <p><input checked="" type="checkbox"/> 249C</p>	<p>___ Close the following locally (PAB 67' mezzanine location of the valve operators).</p> <p>___ 250A (21 RCP Seal Wtr Injection Line Isolation)</p> <p>___ 250B (22 RCP Seal Wtr Injection Line Isolation)</p> <p>___ 250C (23 RCP Seal Wtr Injection Line Isolation)</p> <p>___ 250D (24 RCP Seal Wtr Injection Line Isolation).</p>
<p>4.136 <input checked="" type="checkbox"/> INITIATE Attachment 8 (Placing 21 OR 23 Charging Pump in Service) (Page 211).</p>	

Control Room Inaccessibility
 Safe Shutdown Control
 Attachment 8
 Placing 21 OR 23 Charging Pump in
 Service
 Page 1 of 11

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>8.1 <u>Y</u> Is 480V Switchgear Room accessible?</p> 	<p>1. <u>IF</u> all three diesel generator control switches are NOT in OFF, THEN place all three diesel generator control switches in OFF.</p> <p>2. <u>IF</u> breaker SS6 (6.9KV Breaker for Station Service Transformer No. 6) is NOT open, THEN perform the following for breaker SS6.</p> <p>A. <u>Remove</u> 51/50 Phase A relay cover.</p> <p>B. <u>Gently rotate</u> relay disc clockwise until breaker opens.</p> <p>C. <u>Replace</u> relay cover.</p> <p>D. <u>Reset</u> targets.</p> <p>E. <u>IF</u> breaker did NOT open, THEN lift trip coil plunger mechanism.</p> <p>3. <u>GO TO</u> Step 8.5.</p>
<p>8.2 <u>N</u> IAAT 21 Charging Pump available to start from the 480V Switchgear Room <u>and</u> the SM desires, THEN GO TO Step 8.19.</p>	<p>GO TO Step <u>8.3</u></p> 
<p>8.3 Perform the following for 23 Charging Pump breaker:</p> <p>A. <u>Open</u> breaker on Bus 6A using trip button, compartment 11B.</p> <p>B. <u>Remove</u> DC control power fuse block and reinstall in the OFF position (upper right corner, inside breaker).</p> <p><i>FSS 2 min</i></p>	<p><i>(Assume FSS performs actions)</i></p>

Control Room Inaccessibility
 Safe Shutdown Control
 Attachment 8
 Placing 21 OR 23 Charging Pump in
 Service

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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NOTE

- Substation 12FD3 is located at 33 ft el. Superheater Building next to Cold Water Deaerating Tank.
- Figure 1 (PAB Transfer Switch Locations) (Page 11 of this attachment) shows location of EDC4.
- Attachment 28 (Safe Shutdown Power Distribution) (Page 325) provides a simplified diagram fo Safe Shutdown Power Supplies

8.4 <input checked="" type="checkbox"/> Is 12FD3 Sub-Station energized? →	WHEN 12FD3 Sub-Station is energized, THEN continue with Step <u>8.5</u>
8.5 <input type="checkbox"/> Place "LOCAL-REMOTE Control Switch Device 69" for Substation 12FD3 Breaker 1M in LOCAL (in control panel/box directly above CHARGING PUMP 23 Breaker Control Switch).	←
8.6 <input type="checkbox"/> Is Substation 12FD3 Breaker 1M open?	Operate CLOSE/TRIP switch to open breaker.
8.7 <input checked="" type="checkbox"/> Place transfer switch EDC4 (inside cabinet) to EMERGENCY FEED position.	←
8.8 <input checked="" type="checkbox"/> Is instrument air available? →	1. <input checked="" type="checkbox"/> Uncouple air speed controller from scoop tube linkage (above pump). 2. <input checked="" type="checkbox"/> Place scoop tube in position "A".
8.9 <input checked="" type="checkbox"/> Open 288 (RWST MANUAL INLET STOP) (22 Charging Pump cell).	←
8.10 <input checked="" type="checkbox"/> Close 297 (BORIC ACID BLENDER OUTLET STOP).	←

fss
6 min

Waiting for Appr. J. J. J.

Assume fss is waiting

Control Room Inaccessibility
 Safe Shutdown Control
 Attachment 8
 Placing 21 OR 23 Charging Pump in
 Service

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8.11 ___ Unlock and place Substation 12FD3 Breaker 1M in the vertical position.	<i>Assume FSS is waiting</i>
8.12 ___ Close Substation 12FD3 Breaker 1M by operating CLOSE/TRIP switch.	
8.13 <input checked="" type="checkbox"/> Open disconnect switch 1HR on MCC-26A (LCV-112C).	
8.14 <input checked="" type="checkbox"/> Manually close LCV-112C (VCT OUTLET STOP) (VCT alleyway).	
8.15 <input checked="" type="checkbox"/> Note time LCV-112C was closed (charging pump placed on RWST suction). _____	
8.16 ___ IAAT CCW to Charging Pumps CAN NOT be established within 1 hour, THEN Initiate Attachment 10 (Backup Cooling Water Supply to Charging Pumps)	
8.17 ___ IAAT PAB ventilation is NOT available, THEN establish alternate PAB ventilation per 2-SOP-ESP-001, Local Equipment Operation and Compensatory Actions.	
8.18 ___ WHEN actions specified by IAAT Steps 8.16 <u>and</u> 8.17 are complete, OR 23 Charging Pump operation is no longer necessary, THEN EXIT this attachment.	

FSS (1 min)

3 min

*** END ***

Attachment Header

Document Name:

untitled

Document Location

Operability Description

Attach Title:

2-SOP-27.6

4.3 Engine Start Supplying Unit 2 Appendix R Loads

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 diesel should not be delayed. Requests for opening breakers F3-1 and 52GT/2F should be made by other personnel if possible.
- SO Phone Number: (212) 580-6789
- DO Phone Number: (212) 580-6754

4.3.1 INITIATE having the District Operator (DO) Open breaker F3-1.

4.3.1.1 REQUEST Notification from DO as soon as breaker F3-1 has been opened.

4.3.2 INITIATE having the Unit 3 CCR Open breaker 52GT/2F.

4.3.2.1 Request Notification from Unit 3 CCR as soon as breaker 52GT/2F has been opened.

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

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

4.3.3.1 ENSURE the Delay Gate is Closed

**UNIT 2 APPENDIX R DIESEL GENERATOR
OPERATION**

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Rev: 0

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

4.3.3.3 ENSURE one of the following is Open:

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

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

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

4.3.5 PERFORM the following at the Appendix R DG Day Tank Control Panel:

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

a) IF at any time an abnormal condition is sensed:

- 1) PRESS the Alarm Silence button to silence the alarm horn.
- 2) WHEN the abnormal condition is corrected, THEN the alarming LED is turned OFF automatically.

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

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

4.3.8 CLOSE Breaker ASS. (SBO/APP. R Switchgear 13.8KV Bus)

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

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

4.3.10.1 Shutdown Status indicator – Extinguished

4.3.10.2 Warning Status indicator – Extinguished

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~~4.3.11~~ IF City Water will be the cooling source, THEN ALIGN City Water to The Appendix R DG as follows:

~~4.3.11.1~~ OPEN the following:

- ~~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.

~~4.3.11.2~~ 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.

~~4.3.12~~ 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:

~~4.3.12.1~~ OPEN SWT-837

~~4.3.12.2~~ 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.

~~4.3.13~~ ENSURE the following breakers are OPEN:

~~4.3.13.1~~ F3-1

~~4.3.13.2~~ 52GT/2F

~~4.3.13.3~~ SB1-3

**UNIT 2 APPENDIX R DIESEL GENERATOR
OPERATION**

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NOTE

If GT-2 is out of service, the position of output breaker BGT-2 does NOT need to be verified locally. The normal COL position of breaker BGT-2 is Open.

~~4.3.14 ENSURE that GT-2 is out of service.~~

~~4.3.15 ENSURE breaker B3-3 is Closed.~~

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.
- 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.

~~4.3.16 TURN the 0/MANUAL/AUTO switch to the MANUAL position.~~

~~4.3.17 PRESS AND HOLD the Manual Run/Stop button for a minimum of 3 seconds~~

~~4.3.17.1 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).

4.3.18 CLOSE breaker SBO/ASS as follows:

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

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.

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

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

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

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

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

- a) PRESS the front panel FAULT ACKNOWLEDGE button

OperabilityVersion: 3**Operability Code:** EQUIPMENT FUNCTIONAL**Immediate Report Code:** NOT REPORTABLE**Performed By:** Dewey Jr,Donald J

06/06/2008 16:13

Approved By: Brooks,Kevin L

06/06/2008 16:15

Operability Description:

The Unit 2 SBO and Unit 3 SBO functions of the Unit 2 App R Diesel were performed in a timed simulation. Attached are the procedures and flow charts associated with these walk throughs. The Unit 2 SBO scenario was able to demonstrate a 28 minute interval from initiation of the event until 6.9 kv buses 5 and 6 were powered from the diesel. The unit 3 scenario is timed from notification from unit 3 that they require the unit 2 App R diesel until power is supplied to breaker GT/BT which was 24 minutes. Based on these timed walk throughs it is reasonably assured that the operators will be able to meet their committed times for supplying Unit 2 APP R diesel power to SBO loads with the current approved procedures as written. The Unit 2 App R Diesel remains functional.

Approval Comments:

agree and approve

Attachments:

Operability Description

APPR

U2 SBO

U3 SBO

Attachment Header

Document Name:

untitled

Document Location

Operability Description

Attach Title:

APPR

CR-IP2-2008-02917 CA1
Operability Input
SBO / Appendix R DG Testing

The additional demonstration of operability of the SBO / Appendix R DG can be determined by review of the engine / generator parameters programmed into and controlled by the PowerCommand 3200 Digital Paralleling Control. The PowerCommand 3200 is a microprocessor based generator set monitoring, metering and control system. The control provides an operator interface to the genset, digital voltage regulation, digital governing and generator set protective functions and automatic paralleling functions. Operation of the engine or generator outside the programmed parameter values generates either a warning signal that is displayed on the control panel screen or automatically initiates a controlled shutdown of the engine. Attached is a series of Parameter List Reports that are stored within the PowerCommand 3200 that are accessible by the user or Cummins via a software interface. The attached reports include the following:

1. Engine Specific Data (Page 3)
2. Generator Specific Data (Page 4)
3. Load Profile by Percent Range with Time Operated in each load range (Page 5)
4. Duty Cycle Report with Time Spent in each Cycle (Page 6)
5. Fuel Consumption Data (Page 7)
6. Power and Energy Report (Page 8)
7. Engine Protection Adjustment (Pages 9 and 10)
8. AmpSentry Settings (Page 11)

These are the parameters that the PowerCommand 3200 uses to monitor and assess engine and generator performance during operation. During the 24 hour continuous run at rated continuous load (PMTP Item 45), the twenty monitored starts / 1 hour run at rated continuous load (PMTP Item 49) and the 2 hours continuous run at approximately prime rating (2335kW – 2435kW) (PMTP Item 49) these were the parameters being monitored by the PowerCommand 3200. If any of the parameter programmed thresholds are approached a warning is initiated on the PowerCommand 3200 display and if any threshold is reached, an automatically controlled shutdown of the engine occurs. Since no alarms or shutdowns occurred during operation, it is concluded that the engine / generator operated successfully within its design parameters. Any shutdown during the continuous or reliability runs would be recorded as a failed test with the associated CR initiated to document the failed test. No CR's associated with the continuous runs or the reliability runs were initiated.

Item 7 above is the report of the engine protection settings currently programmed into and monitored by the PowerCommand 3200. The parameters are as follows:

LOP – Lube Oil Pressure
HOT – High Oil Temperature
LCL – Low Coolant level
LCP – Low Coolant Pressure
LCT – Low Coolant Temperature
HCT – High Coolant Temperature
HBF – High Blowby Flow
HFT – High Fuel Temperature
HAT – High Aftercooler Temperature
HIT – High Inlet Temperature

The parameters are provided with “warning threshold” and “shutdown threshold” as previously discussed. Some thresholds are based on rated engine RPM which for this engine is 1800 RPM based on the Engine Specific Data Report (Item 1 above).

Item 8 is the generator protection settings programmed into the PowerCommand 3200 and controlled by the AmpSentry module which is integral to the PowerCommand 3200.

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Operability Input
SBO / Appendix R DG Testing

The % load specified in Items 3 and 4 is based on the standby rating which is 2700kW.

Prepared By: Eric J Anderson
Date: 6/5/08



June 05, 2008

Parameter List Report

Capture Files\PCC 3200 [ENTERGY QSK78 rev3 12Mar2008.cap]\Monitor>About\Engine

Parameter Name	Value	Units
Engine Model Number	QSK78-G6	
Engine Rating	2790 kWm @ 1800 RPM	
Engine Serial Number	66300555	
Engine CPL Number	8241	
Engine Hour Offset	0.00000	hours
Engine Running Time (ERT)	71.25201	hours

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June 05, 2008

Parameter List Report

Capture Files\PCC 3200 [ENTERGY QSK78 rev3 12Mar2008.cap]\Monitor>About\Genset

Parameter Name	Value	Units
Connection Type	Wye	
Number of Phases	Three Phase	
Nominal Frequency	60.000	Hz
Rating Type	Standby	
Genset Model Number	2700 DQLA	
Genset Serial Number	B05K541470	
Genset Specification Number	0	
Alternator Model Number	0	
Alternator Serial Number	0	
Genset Build Date	01/31/2005 MMDDYYYY	
Power Factor Rating (3-phase)	0.80	
Controller On Time (COT)	413.1531	hours
Total kWh Delivered	127462	kWh
Application kVA Rating	3375	kVA

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Parameter List Report

Capture Files\PCC 3200 [ENTERGY QSK78 rev3 12Mar2008.caf]\Monitor\History\60Hz Standby kW Histogram

Parameter Name	Value	Units
60Hz Standby kW Load Profile	<DataTable>, 22, 2 kW Load Range, Time spent in kW Range 0-5% Load, 2.667 6-10% Load, 0.000 11-15% Load, 0.000 16-20% Load, 0.000 21-25% Load, 0.017 26-30% Load, 0.067 31-35% Load, 0.383 36-40% Load, 0.000 41-45% Load, 0.000 46-50% Load, 0.017 51-55% Load, 0.067 56-60% Load, 0.050 61-65% Load, 0.000 66-70% Load, 0.117 71-75% Load, 41.583 76-80% Load, 10.567 81-85% Load, 0.000 86-90% Load, 0.000 91-95% Load, 0.000 96-100% Load, 0.000 > 100% Load, 0.000	

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Duty Cycle Report

Capture Files\PCC 3200 [ENTERGY QSK78 rev3 12Mar2008.cap]\Monitor\History\60 Hz Duty Cycle Histogram

Load Range	Time Spent in Range
91-100% Load	57.42
11-20% Load	4.62
71-80% Load	2.87
51-60% Load	1.72
21-30% Load	1.18
0-10% Load	0.02
31-40% Load	0.67
41-50% Load	0.62
61-70% Load	0.08
81-90% Load	0.12

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Parameter List Report

Capture Files\PCC 3200 [ENTERGY QSK78 rev3 12Mar2008.cap]\Monitor\History\Fuel

Parameter Name	Value	Units
Cumulative Fuel Consumption	9025.47	gal
Fuel Consumption Since Reset	9025.47	gal
Fuel Consumption Reset Time COT	0.0000	hours
Fuel Consumption Reset Time ERT	0.00000	hours
Controller On Time (COT)	413.1531	hours
Engine Running Time (ERT)	71.25201	hours

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Parameter List Report

Capture Files\PCC 3200 [ENTERGY QSK78 rev3 12Mar2008.cap]\Monitor\History\Power and Energy

Parameter Name	Value	Units
Total kWh Delivered	127462	kWh
kWh Since Reset	127462	kWh
kWh Reset Time (COT)	0.0000	hours
kWh Reset Time (ERT)	0.00000	hours
Controller On Time (COT)	413.1531	hours
Engine Running Time (ERT)	71.25201	hours

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Parameter List Report

Capture Files\PCC 3200 [ENTERGY QSK78 rev3 12Mar2008.cap]\Adjustments\Engine Protection Adjustments

Parameter Name	Value	Units
Engine Cold Warning Threshold	65.00	degF
LOP Warning Threshold Table	<XYtable> rpm,psi#-4096.000000 #4095.875000 0.0, 0.00 800.0, 25.00 1200.0, 33.00 1700.0, 44.00 1800.0, 45.00 2200.0, 45.00	
LOP Shutdown Threshold Table	<XYtable> rpm,psi#-4096.000000 #4095.875000 0.0, 0.00 800.0, 20.00 1200.0, 28.00 1700.0, 39.00 1800.0, 40.00 2200.0, 40.00	
HOT Warning Threshold	250.00	degF
HOT Shutdown Threshold	260.00	degF
LCL Warning Threshold	15.0	seconds
LCL Shutdown Threshold	15.0	seconds
LCL Fault Response	Shutdown	
LCP Warning Threshold Table	<XYtable> rpm,psi#-4096.000000 #4095.875000 0.0, 0.00 1300.0, 6.00 1800.0, 11.00 2000.0, 14.00 2100.0, 15.00 3000.0, 22.00	
LCP Shutdown Threshold Table	<XYtable> rpm,psi#-4096.000000 #4095.875000 0.0, 0.00 1300.0, 4.00 1800.0, 9.00 2000.0, 12.00 2100.0, 13.00 3000.0, 20.00	
HCT Warning Threshold	40.00	degF
HCT Warning Threshold	215.00	degF
HCT Shutdown Threshold	220.00	degF
HBF Warning Threshold Table	<XYtable> degF,CFM#-512.000000 #511.984375 0.00, 17.50 50.00, 17.50 100.00, 17.50 150.00, 17.50 200.00, 17.50 250.00, 17.50	

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Parameter List Report

HBF Shutdown Threshold Table

<XYtable>
degF,CFM#-512.000000/#511.984375
0.00, 18.00
50.00, 18.00
100.00, 18.00
150.00, 18.00
200.00, 18.00
250.00, 18.00

HFT Warning Threshold	150.00	degF
HFT Shutdown Threshold	160.00	degF
HAT Warning Threshold	160.00	degF
HAT Shutdown Threshold	170.00	degF
HIT Warning Threshold	180.00	degF
HIT Shutdown Threshold	190.00	degF
Overspeed Shutdown Threshold (50Hz)	1725.0	rpm
Overspeed Shutdown Threshold (60Hz)	2070.0	rpm
Oil Temperature Sensor Enable	Enabled	

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**PowerCommand 3200
AmpSentry Settings**

Device / Function	Settings	Time Delay Settings	Notes
81O	Shut Down: + 3.0Hz	10 seconds	Over Frequency
81U	Shut Down: - 3.0Hz	10 seconds	Under Frequency
59	110%	10 seconds	Over Voltage
			Under Voltage
27	85%	10 seconds	AmpSentry Default
Overload (kW)	105% (of 2700kW)	60 seconds	AmpSentry Default
			Reverse Power (kW)
32	10%	3 seconds	AmpSentry Default
Synchronize. Fail	Warning	60 seconds	
Reverse kVAR	20%	10 seconds	AmpSentry Default

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Attachment Header

Document Name:

untitled

Document Location

Operability Description

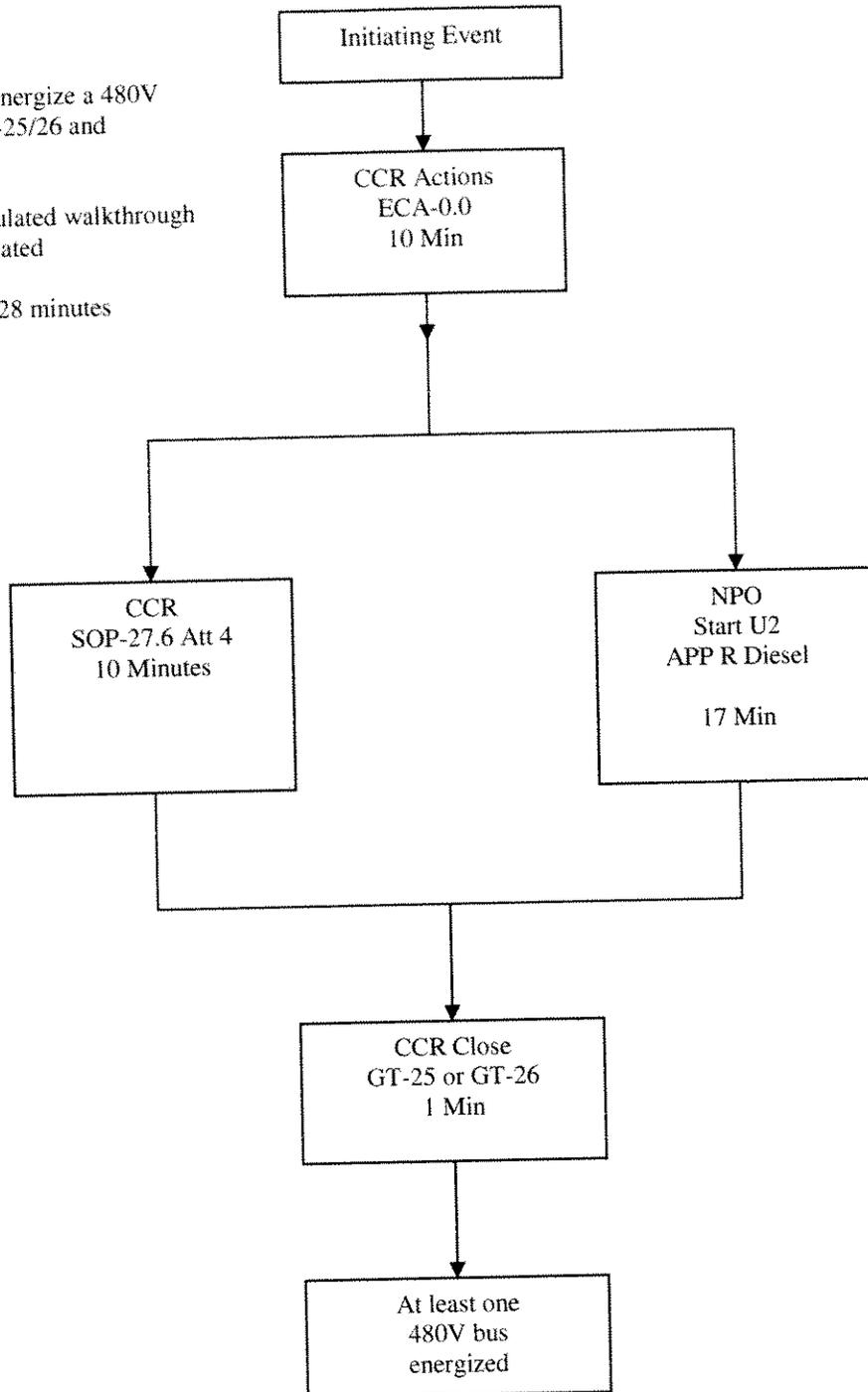
Attach Title:

U2 SBO

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



Attachment Header

Document Name:

untitled

Document Location

Operability Description

Attach Title:

U3 SBO

Unit 3 SBO Event:
Time line to energize Unit 3
Bus from App R diesel via
GT/BT

Operator simulated walkthrough
times as indicated

Total time is 24 minutes.

Unit 3 is assumed to be racking in
GT/BT in parallel to Unit 2 steps
and the breaker will be ready to
close when U2 App R power is
available.

