

Working Copy

WP 04-ED1021

Revision 9

Surface Electrical Distribution

Technical Procedure

EFFECTIVE DATE: 02/10/11

Dale Parrish

APPROVED FOR USE

TABLE OF CONTENTS

CHANGE HISTORY SUMMARY	3
INTRODUCTION.....	4
REFERENCES.....	4
PRECAUTIONS AND LIMITATIONS	5
PERFORMANCE	6
1.0 RESTORATION OF NORMAL UTILITY POWER.....	6
2.0 SHIFTING TO PS PARALLEL BUS OPERATION FROM SPLIT BUS OPERATION	8
3.0 RETURN TO PS SPLIT BUS OPERATION.....	8
4.0 AREA SUB 3 HOT BUS TRANSFER - SEQUENCE OF EVENTS.....	9
5.0 RECOVER FROM SUB 3 HOT BUS TRANSFER - SEQUENCE OF EVENTS .	10
6.0 TIE-FEEDING SUB 3 FROM SUB 1 OR SUPPORT BUILDING SUB.....	11
7.0 RETURNING SUB 3 TO NORMAL LINEUP.....	12
8.0 OPENING UTILITY SUB BREAKERS FOR OUTAGE	12
9.0 CLOSING UTILITY SUB BREAKERS AFTER OUTAGE	12
10.0 ABNORMAL OPERATION OF PS LOSS OF PS A OR B BUS	13
Attachment 1 – Loss of Plant Sub A or B Bus.....	14

CHANGE HISTORY SUMMARY

REVISION NUMBER	DATE ISSUED	DESCRIPTION OF CHANGES
7	06/28/2010	Added Precaution and Limitation about breaker interlock system
8	09/28/10	Added information for realignment of Plant SUB A or B if a loss of power occurs.
9	02/10/11	Added JHA statement. Added Section 10 for Abnormal Operation of PS Loss of PS A or B Bus Added Attachment 1

INTRODUCTION

This procedure provides instructions for performing normal and alternate surface electrical distribution lineups at the Waste Isolation Pilot Plant (WIPP), as directed by the Facility Shift Manager (FSM).

No records are generated by the performance of this procedure.

REFERENCES

BASELINE DOCUMENTS

- Drawing 25-J-015-W1, Yard Electrical Area Sub No. 3 & On-Site Power 480V Switchgear 25P-SWG04/3 Electrical Diagrams & Details
- Drawing 25-J-015-W3, Yard Electrical Area Sub No. 3 & On-Site Power 480V Switchgear 25P-SWG04/3 Electrical Diagrams & Details
- Drawing 25-J-020-W1, WIPP Site Primary Power Distribution - One Line Reference Sheet
- Drawing 25-J-020-W2, WIPP Site Primary Power Distribution - One Line Diagram, Located in Facility Operations and Central Monitoring Room (CMR)
- Drawing 25-J-020-W3, WIPP Site Primary Power Distribution - One Line Diagram Normal Interrupters Lineup
- Drawing 25-J-020-W4, WIPP Site Primary Power One Line Diagram with Surface Low Voltage Interrupter Lineup
- Drawing 25-J-020-W5, WIPP Site Primary Power One Line Diagram with Underground Low Voltage Interrupter Lineup
- Drawing 25-J-020-W6, WIPP Site Primary Power Distribution - One Line Selected Load System Interrupter Lineup Surface & Underground
- Drawing 25-J-040-W, Plant Substation (25P-SWG15/1) CB No. 9 Unit No. 6 Three Line Schematic
- Drawing 25-J-060-W1, Area Substation No. 3 480V Switchgear 25P-SWG04/3 Schematic Diagram
- Drawing 25-J-060-W2, Area Substation No. 3 480V Switchgear 25P-SWG04/3 Schematic Diagram
- Drawing 25-J-072-W1, Backup Diesel Generator #2 - 25P-E-504 Reference Sheet

- Drawing 25-J-072-W2, Backup Diesel Generator #2 - 25P-E-504 Panel Layout & Details
- Drawing 25-J-072-W7, Backup Generator #2 - 25P-E-504 Engine Control Schematic
- Drawing 25-J-065-W1, Surface Electrical Utility WIPP Utility Substation Single Line Diagram
- Drawing 25-J-066-W1, Surface Electrical Utility Plant Substation 25P-SWG15/1 Single Line Diagram

PRECAUTIONS AND LIMITATIONS

- Central Monitoring Room Operator (CMRO) will contact XCEL Energy when Utility SUB Circuit Breakers (CB) 3340 and 3355 operation (open or close) is required. Utility SUB CBs 3340 and 3355 will be opened by CMRO in emergency situations only.
- If loss of Plant Sub (PS) A or B Bus has occurred, SUB's to alternate feed must be realigned, as required, or PS aligned to parallel operations.
- Load Interrupter Switches (LIS) SHALL NOT be operated from CLOSED to OPEN with a connected load.
- Protective relays limit operation as follows:
 - A CB that has a flag displayed SHALL NOT be closed.
 - Equipment being served by the tripped CB SHALL NOT be energized.
 - More than one attempt to reset an 86 (lockout) relay SHALL NOT be made.
 - Relay flags may be reset only after Maintenance and Engineering concur, except when an 81 (Under Frequency) or 95 (Ground Check) relay flag is present, due to a known power outage.
- SUB 1 and the Support Building SUB Tie-Feeders should be in the OPEN/DISCONNECT position until using for tie-feeding operations.
- Substation 3 Tie-Feeders, CB-1 and CB-18, should be in the OPEN/TEST Position. This will ensure that the closing spring is charged during power outages. If the spring is not charged one of the diesel generators must be started to provide control power to "charge" the closing spring. The diesel generator **SHALL NOT** be running when the Tie-Feeder power is brought online.

- If the breaker interlock system (BIS) is inoperable, it must be DISABLED in Sub #3 before operating the diesel generators. This will enable CBG-1 and CBG-2 to open and close remotely.
- 480V Tie-Feeder CB locations in area SUB's 1, 3, and Support Building are not interlocked with their respective SUB's Main CB. When utilizing 480V Tie-Feeders, the following shall be ensured:
 - Main breaker in substation being fed via Tie-Feeder must be open and racked to disconnect position prior to closing its respective Tie-Feeder.
 - Only one Tie-Feeder may be used at a time when tie-feeding from SUB 1 or the Support Building SUB to Substation 3.
 - A steady state current of 600 amps, as indicated on local amperage meter, **SHALL NOT** be exceeded while using Tie-Feeder.
- SUB 3/Plant SUB recommended lockout precautions:
 - If Plant SUB CB-4 is locked out, SUB 3 25P-SW15/3A also should be locked out.
 - If Plant SUB CB-7 is locked out, SUB 325P-SW15/3B also should be locked out.
- XCEL district operations should be informed at least two working days prior to the planned outage.
- AJHA PROD-417, Circuit Breakers, has been identified for this procedure. All personnel performing this procedure should be familiar with this AJHA.

PERFORMANCE

1.0 RESTORATION OF NORMAL UTILITY POWER

- 1.1 Verify all PS CBs are open.
- 1.2 Verify all SUB 3 CBs are open.
- 1.3 Lineup Utility SUB, as required:
 - Verify Utility SUB CB-3340 is closed.
 - Verify Utility SUB CB-3355 is closed.
- 1.4 Verify area substation lineup in accordance with 25-J-020-W4, modified as necessary by plant conditions.

1.5 Energize loads by performing the following:

1.5.1 Close the following PS CBs, as required:

- CB-12 (BUS A Main Breaker)
- CB-13 (BUS B Main Breaker)
- CB-9 (Tie Breaker [parallel bus operation only, with either CB-12 or CB-13 open])
- CB-10 (25P-SW15/9A)
- CB-1 (Salt Hoist SUB)
- CB-2 (SH Shaft Feeder)
- CB-3 (SUB 2 25P-SW15/2A, SUB 4 25P-SW15/4A, SUB 6 25P-SW15/6A)
- CB-4 (SUB 3 25P-SW15/3A)
- CB-5 (WH Shaft Feeder)
- CB-6 (SUB 1 25P-SW15/1B2)
- CB-7 (SUB 3 25P-SW15/3B, SB SUB 45P-SW15-1B, WB SUB 31P-SW15/2B)
- CB-8 (SUB 5-25P-SW15/5 and 25P-SW15/9B)

1.5.2 Close the following SUB 3 CBs, as required:

- CB-8 (Main Breaker)
- CB-10 (Main Breaker)
- CB-5 (EFB, 41P-MCCO4/7)
- CB-6 (Safety Building, 45P-DP04/25A and 45P-DP04/25B)

1.6 Restore site loads, as required.

NOTE

If loss of A or B BUS is due to utility SUB CB's 3340 (A BUS) or 3355 (B BUS), or 3341 (A BUS) or 3356 (B BUS), the next section must be performed.

2.0 SHIFTING TO PS PARALLEL BUS OPERATION FROM SPLIT BUS OPERATION

- 2.1 On Unit 6 door (CB-9), place the Sync Enable/Disable switch to SYNC ENABLE position.
- 2.2 Verify the Sync Enable light illuminates.
- 2.3 Close PS CB-9.
- 2.4 Open PS CB-12 or -13, as required.
- 2.5 Place the Sync Enable/Disable switch to SYNC DISABLE position.

3.0 RETURN TO PS SPLIT BUS OPERATION

- 3.1 On Unit 6 door (CB-9), place the Sync Enable/Disable switch to SYNC ENABLE position.
- 3.2 Verify the Sync Enable light illuminates.
- 3.3 Close PS CB-12, or -13, as required.
- 3.4 Open PS CB-9.
- 3.5 Place the Sync Enable/Disable switch to SYNC DISABLE position.

NOTE

Hot Bus Transfer at SUB 3 shall not be used on Backup Power Supply Mode.

NOTE

Hot Bus Transfer shall only be attempted for special operating conditions.

NOTE

SUB 3 CB-9 is electrically interlocked with SUB 3 CB-8 and CB-10.

NOTE

Hot bus transfer at SUB 3 shall not be used while 860 fans are in operation.

4.0 AREA SUB 3 HOT BUS TRANSFER - SEQUENCE OF EVENTS

4.1 At PS (25P-SWG15/1):

4.1.1 At Unit 6, place selector switch (Sync Enable/Disable) to the SYNC ENABLE position.

4.1.2 Verify Yellow Pilot Light (Sync Enable) is lit.

4.2 At Area Substation 3 (25P-SWG04/3):

4.2.1 At Section 4, Compartment A, place selector switch (SS-1 Synchronizing System DG's Isolation/Disable DG#2) to the ENABLE position.

4.2.2 At Section 4, Compartment B, place the Key Operated Selector Switch (BIS-CMS Breaker Interlock System) to the DISABLE position.

4.2.3 Verify BIS-CMS Yellow Pilot Light (Disable) is lit.

4.3 At Backup Diesel Generator #2 (25P-E-504):

4.3.1 At Generator Control Panel, internals left-hand side, locate the SPM Synchronizer (Woodward Model #8272-383) Unit.

4.3.2 Verify Green Pilot Light (Enable) is lit.

4.4 At Area Substation 3 (25P-SWG04/3):

4.4.1 **IF** conditions (Steps 4.1.2 and 4.3.2) have been met, **THEN** manually CLOSE Tie-Breaker CB-9 by pressing down at the breaker hood.

4.4.2 Electrically OPEN Main Breaker CB-8 or CB-10, as applicable, by using the related breaker control switch.

- 4.4.3 At SUB 3, restore Selector Switch (SS-1 Synchronizing System DG's Isolation/Disable DG#2) to the DISABLE position.
- 4.4.4 At SUB 3, restore Selector Switch (BIS-CMS Breaker Interlock System) to the ENABLE position.
- 4.4.5 At PS, restore Selector Switch (Sync Enable/Disable) to the DISABLE position.

NOTE

Hot Bus Transfer at SUB 3 shall not be used on Backup Power Supply Mode.

NOTE

Hot Bus Transfer shall only be attempted for special operating conditions.

NOTE

SUB 3 CB-9 is electrically interlocked with SUB 3 CB-8 and CB-10.

NOTE

Hot bus transfer at SUB 3 shall not be used while 860 fans are in operation.

5.0 RECOVER FROM SUB 3 HOT BUS TRANSFER - SEQUENCE OF EVENTS

- 5.1 At PS (25P-SWG15/1):
 - 5.1.1 At Unit 6, place Selector Switch (Sync Enable/Disable) to the ENABLE position.
 - 5.1.2 Verify Yellow Pilot Light (Sync Enable Light) is lit.
- 5.2 At Area Substation 3 (25P-SWG04/3):
 - 5.2.1 At Section 4, Compartment A, place Selector Switch (SS-1 Synchronizing System DG's Isolation/Disable DG#2) to the ENABLE position.
 - 5.2.2 At Section 4, Compartment B, place the Key Operated Selected Switch (BIS-CMS Breaker Interlock System) to the DISABLE position.
 - 5.2.3 Verify BIS-CMS Yellow Pilot Light (Disable) is lit.
- 5.3 At Backup Diesel Generator #2 (25P-E-504):
 - 5.3.1 At Generator Control Panel, internals left-hand side, locate the SPM Synchronizer (Woodward Model #8272-383) Unit.

5.3.2 Verify Green Pilot Light (Enable) is lit.

5.4 At Area Substation 3 (25P-SWG04/3):

5.4.1 **IF** conditions (Steps 5.1.2 and 5.3.2) have been met, **THEN** manually CLOSE Main Breaker CB-8 or CB-10, as applicable, by pressing down at the related breaker hood.

5.4.2 Electrically OPEN Tie-Breaker CB-9 by using the breaker control switch.

5.4.3 At SUB 3, restore Selector Switch (SS-1 Synchronizing System DG's Isolation/Disable DG#2) to the DISABLE position.

5.4.4 At SUB 3, restore Selector Switch (BIS-CMS Breaker Interlock System) to the ENABLE position.

5.4.5 At PS, restore Selector Switch (Sync Enable/Disable) to the DISABLE position.

6.0 TIE-FEEDING SUB 3 FROM SUB 1 OR SUPPORT BUILDING SUB

NOTE

Tie-Feeder operations in this section do not support 860 fan operation. If the closing spring is not charged prior to loss of power, a diesel generator may be started temporarily to obtain control power for charging the closing spring.

CAUTION

When tie-feeding from SUB 1 or the Support Building SUB the diesel generator shall not be operating when Tie-Feeder power is brought on-line.

6.1 Verify the following:

- LISs 25P-SW15/3A and 25P-SW15/3B are OPEN.
- Main Breakers CB-8 and CB-10 are in OPEN/DISCONNECT.
- Backup Diesel Generators breakers CB-G1 and CB-G2 are OPEN.

6.2 Rack the required Tie-Feeder at SUB 1 or Support Building SUB to CONNECT.

6.3 CLOSE required Tie-Feeder at SUB 1 or Support Building SUB.

- 6.4 Place Manual Transfer Switch 25P-SW04/68 in the ALTERNATE/E position.
- 6.5 Place the required Substation 3 Tie-Feeder Breaker into CONNECT position.
- 6.6 Manually close the required Substation 3 Tie-Feeder Breaker.
- 6.7 Align Substation 3 loads as required per FSM.

7.0 RETURNING SUB 3 TO NORMAL LINEUP

- 7.1 Verify all loads are removed from Substation 3.
- 7.2 Open Tie-Feeder Circuit Breaker.
- 7.3 Rack Tie-Feeder Circuit Breaker to TEST.
- 7.4 Open the corresponding Tie-Feeder at SUB 1 or Support Building SUB.
- 7.5 Rack the corresponding Tie-Feeder at SUB 1 or Support Building SUB to DISCONNECT.
- 7.6 Place Manual Transfer Switch 25P-SW04/68 in the NORMAL/N position.
- 7.7 Energize and align Substation 3 as required per FSM.

8.0 OPENING UTILITY SUB BREAKERS FOR OUTAGE

- 8.1 Verify all loads are removed from Utility SUB.
- 8.2 Contact XCEL Operator and verify RFO #(Request For Outage number).
- 8.3 Request the XCEL Operator OPEN CBs 3340 AND 3355.
- 8.4 Verify 3340 and 3355 are OPEN.
- 8.5 OPEN GOABs (Gang Operated Air Break) 3341 and 3356.
- 8.6 Place LO/TO (Lockout/Tagout) as directed by FSM.

9.0 CLOSING UTILITY SUB BREAKERS AFTER OUTAGE

- 9.1 Verify all grounding clusters are removed, as applicable.

- 9.2 Verify that LO/TO has been removed from GOABs 3341 and 3356.
 - 9.3 Contact XCEL Operator and verify RFO # and release time.
 - 9.4 CLOSE GOABs 3341 and 3356.
 - 9.5 Request XCEL Operator to close CBs 3340 and 3355.
 - 9.6 Verify power is restored at the Utility SUB.
 - 9.7 Go to Section 1.0 and restore Site Power per FSM.
- 10.0 ABNORMAL OPERATION OF PS LOSS OF PS A OR B BUS

CAUTION

To prevent damage to equipment, if a bus fault is suspected, all breakers on the affected bus must be in the OPEN position and power to the affected substations must be realigned to the non-affected bus using load interrupter switches.

- 10.1 Ensure all notification and/or plant required LCOs have been address per Attachment 1.
- 10.2 Check breakers on the affected bus for flags.
- 10.3 Open all breakers on the affected bus and CB-12 or CB-13, as applicable, if not already open.
- 10.4 On Unit 6 door (CB-9), place the Sync Enable/Disable switch to SYNC ENABLE position.
- 10.5 Verify the SYNC ENABLE light illuminates.
- 10.6 Close PS CB-9.
- 10.7 Place the Sync Enable/Disable switch to SYNC DISABLE position.
- 10.8 Close breakers on affected bus that do not have any flags.
- 10.9 Realign the affected bus in Substation 3.
- 10.10 After the problem has been found and corrected, realign PS per Section 3.0.

Attachment 1 – Loss of Plant Sub A or B Bus

Loss of Plant Sub A or B Bus, actions required for notification or plant impactive(LCO's)

Plant Sub Loss of PS A Bus, go to step 2.0			LCO/IMP	Notification	Impact
CB#	Sub Station	Equipment			
CB10	Sub 7	U/G Ventilation	N/A	U/G services	MSHA
	Sub 8	030A Comp	N/A	Hoisting	
CB1	Salt Hoist		N/A	Hoisting	MSHA
CB2	U/G SS#1	U/G Critical loads(normal)	N/A	U/G services	
CB3	Sub 2	CH HVAC	YES	WH manager	LCO
		WH Equipment	N/A		MSHA
		411 Lighting	N/A		
		I/G Cooling System	N/A		
CB3	Sub 4	Electric Fire Pump	YES		LCO
		Jockey Pump			
		Diesel Fire Pump Controller	YES		LCO
		Domestic Water Pump House	N/A		
CB3	Sub 6	AIS Hoist	N/A	Hoisting	MSHA
CB4	Sub 3	U/G Ventilation Controls		U/G services	NMED
		860 fan - A			
		LPU's shift to filtration/Sta A B/U Power from DG1		Rad Con	

Plant Sub Loss of Plant Sub B Bus, go to step 2.0					
CB#	Sub Station	Equipment			
CB5	U/G SS#4	U/G critical loads (alternate)	N/A	U/G services	
CB6	Sub 1	Central UPS Alt	N/A	WH manager	LCO
		RH Equipment			
		CH Equipment			
		RH HVAC			
		Alt Feed for Sub 2,4,6			
	I/G Power	N/A			
CB7	Waste Hoist Sub Supp Sub Sub 3 B Bus B/U Power from DG2 Alt Power to Sub 1	Central UPS	N/A	Hoisting	MSHA
		860 B,C	N/A		
			N/A		
			N/A		
		WH Equipment	N/A	WH manager	
CB8	Sub 5	030B	N/A		MSHA
		Salt Hoist Sub	N/A	Hoisting	
	Alt to Sub 7		N/A		