

WP 04-VU1611

Revision 6

Pressurization of U/G Bulkhead 74-B-309

Technical Procedure

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APPROVED FOR USE

TABLE OF CONTENTS

- INTRODUCTION 3
- REFERENCES 3
- PRECAUTIONS AND LIMITATIONS 3
- PREREQUISITE ACTIONS 4
- PERFORMANCE 4
 - 1.0 INITIAL START-UP OF CONTROL PANEL 53P-CP03/309 4
 - 2.0 START-UP ALIGNMENT FOR INVERTER "B" 5
 - 3.0 START-UP ALIGNMENT FOR INVERTER "C" 6
 - 4.0 FAN OPERATION 7
 - 5.0 INVERTER "A" FAILURE ACTIONS 8
 - 6.0 INVERTER "B" FAILURE ACTIONS 8
 - 7.0 INVERTER "C" FAILURE ACTIONS 9
 - 8.0 PANEL 53P-CP03/309 SHUTDOWN SEQUENCE 9
 - 9.0 OPERATION OF FOXBORO CONTROLLER 10

INTRODUCTION

This procedure provides instructions for the operation of the six high-pressure fans and FoxBoro Air Value Controller located in underground (U/G) Bulkhead 74-B-309. The following six high-pressure fans and FoxBoro Air Value Controller can pressurize the chamber between Bulkheads 74-B-309A and 74-B-309B located west of the Waste Shaft Station:

- 74-B-007 A, B, and C
- 74-B-008 A, B, and C
- 534-CP-003-001, FoxBoro Air Value Controller

The performance of this procedure does not generate any records.

REFERENCES

BASELINE DOCUMENTS

- 53-J-133-W1, Bulkhead #309 - Fan System Local Control Panel
53P-CP03/309 Single Line Diagram
- 53-J-133-W2, Bulkhead #309 - Fan System Local Control Panel
53P-CP03/309 Layout & Views
- 74-H-003-W, Underground Differential Pressure Control Panel and Alarm
Panel S-400 Air Lock
- SDD VU00, Underground Ventilation

REFERENCED DOCUMENTS

None

PRECAUTIONS AND LIMITATIONS

- The six high-pressure fans have **NO** automatic controls and must be manually operated from Panel 53P-CP03/309.
- At least three of the six high-pressure fans shall be operational.
- The six high-pressure fans have the following alarm setpoints:
 - Low-pressure alarm - 0.20" wg (water gauge)
 - High-pressure alarm - 2.10" wg
 - High-high pressure alarm - 2.50" wg

- If a pressure alarm occurs during system operation, manual adjustments must be made to return system pressure to the normal operating range of >0.20" wg to <2.00" wg.
- If the high-high pressure alarm actuates, any operating fan will automatically shutdown.
- Electrical switches are operated during performance of this procedure. The performer must use caution and stand as far as possible to the right of the switch when changing switch position.
- Prior to power outages, Switch 53P-SW03/58 must be opened to prevent damage to charger.

PREREQUISITE ACTIONS

Only personnel qualified on U/G ventilation may perform this procedure. These personnel normally include the underground roving watch (UGRW) and U/G facility engineer (UFE).

PERFORMANCE

NOTE

The Central Monitoring Room (CMR) has remote capabilities for E-STOP (emergency stop) and for alarm acknowledgments.

1.0 INITIAL START-UP OF CONTROL PANEL 53P-CP03/309

NOTE

The battery charger alternating current (AC) input circuit breaker (CB) is located on the front panel of the battery charger.

- [] 1.1 Verify Normal/Alternate switch is in NORMAL.
- [] 1.2 Verify battery charger AC input CB is OPEN.
- [] 1.3 Verify Switch 53P-SW03/58 is OPEN.
- [] 1.4 Verify CB-3 in 53P-DP03/28 is OPEN.
- [] 1.5 Verify CB-15 in 53P-DP04/28 is CLOSED.
- [] 1.6 Verify CB-6 in 53P-DP03/28 is CLOSED.
- [] 1.7 CLOSE battery charger AC input CB.

1.8 Wait one minute before performing the following:

1.8.1 **IF** Panel 53P-CP03/309 has **NOT** been operating on battery power, **THEN** position battery charger switch to FLOAT and **GO TO** Step 1.9.

NOTE

If Panel 53P-CP03/309 has been operating on battery power, the battery charger will have to operate in the equalize mode for about six hours to fully recharge the batteries.

- [] 1.8.2 **IF** Panel 53P-CP03/309 has been operating on battery power, **THEN** position battery charger switch to EQUALIZE.
- [] 1.9 OPEN battery charger AC input CB.

CAUTION

Steps 1.10 and 1.11 need to be performed as rapidly as possible. Failure to perform Steps 1.10 and 1.11 in sequence could cause the battery charger AC input fuse to blow.

- [] 1.10 CLOSE Safety Switch 53P-SW03/58.
- [] 1.11 CLOSE battery charger AC input CB.
- 2.0 START-UP ALIGNMENT FOR INVERTER "B"
- [] 2.1 CLOSE AC input CB for Inverter B.
- [] 2.2 CLOSE DC CB-102.
- [] 2.3 CLOSE DC CB-103.
- [] 2.4 CLOSE AC input CB for Inverter A.
- [] 2.5 Verify AC CB-202 is locked in the OPEN position.
- [] 2.6 CLOSE AC CB-201.
- [] 2.7 CLOSE AC CB-200.

[] 2.8 CLOSE the following switches for fan power:

SW-007A	SW-007B	SW-007C
SW-008A	SW-008B	SW-008C

[] 2.9 CLOSE AC CB at 74-BS-007.

[] 2.10 CLOSE AC CB at 74-BS-008.

[] 2.11 CLOSE the following CBs at TB-1:

CB-1	CB-3	CB-4	CB-5
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2.12 **GO TO** Section 4.0 for high-pressure fan operation.

3.0 START-UP ALIGNMENT FOR INVERTER "C"

[] 3.1 CLOSE AC input CB for Inverter C.

[] 3.2 CLOSE DC CB-102.

[] 3.3 CLOSE DC CB-103.

[] 3.4 CLOSE AC input CB for Inverter A.

[] 3.5 CLOSE AC CB-201.

[] 3.6 Verify AC CB-200 is locked in the OPEN position.

[] 3.7 Unlock **AND** CLOSE AC CB-202.

[] 3.8 CLOSE the following switches for fan power:

SW-007A	SW-007B	SW-007C
SW-008A	SW-008B	SW-008C

[] 3.9 CLOSE 74-BS-007 AC CB.

[] 3.10 CLOSE 74-BS-008 AC CB.

[] 3.11 CLOSE the following CBs at TB-1:

CB-1	CB-3	CB-4	CB-5
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3.12 **GO TO** Section 4.0 for high-pressure fan operation.

4.0 FAN OPERATION

CAUTION

Only three of the six high-pressure fans are to be operated at any one time. The Master Stop Switch (53P-PB03/309A) on Panel 53P-CP03/309 will shutdown any operating high-pressure fan(s).

NOTE

Pressure shall be established at >0.20 " wg in Bulkhead 74-B-309 before establishing Waste Handling mode in the U/G.¹

NOTE

When there are **NO** Waste Handling activities in the U/G, Panel 53P-CP03/309 **MAY** be DISABLED at the option of the UFE.

- [] 4.1 Central Monitoring Room Operator (CMRO), **IF** pressure in Bulkhead 74-B-309 is <0.20 " wg, **THEN** contact UFE to start high-pressure fan(s) to maintain pressure >0.20 " wg.
- 4.2 UFE/UGRW, perform the following:
 - [] 4.2.1 Verify Master Switch is out.
 - [] 4.2.2 Verify system enable switch is in ENABLE.
 - [] 4.2.3 Push INITIATE (53P-PB03/309B) button.
 - [] 4.2.4 Verify amber system initiate light is ON.
 - [] 4.2.5 Verify green indicator lights are ON.
 - [] 4.2.6 Verify pressure on 534-PIC-003-001B is >0.20 " wg and <2.00 " wg.
 - [] 4.2.7 If pressure is within acceptable ranges, inform CMRO that Waste Handling may start.
 - [] 4.2.8 If for any reason pressure should drop below required parameters, UFE/UGRW attempt to correct pressure problems.
 - 4.2.9 If pressure is **NOT** within acceptable ranges, **GO TO** Step 4.3.
- [] 4.3 Place up to three fans in service to maintain pressure >0.20 " wg.

- [] 4.4 **IF** 0.20" wg pressure **CANNOT** be achieved, **THEN** notify Facility Shift Manager (FSM).
- 4.5 UFE/UGRW, secure high-pressure fans after Waste Handling is complete by performing the following:
 - 4.5.1 Place fan(s) switch(es) to OFF position.
 - 4.5.2 Place ENABLE/DISABLE switch to DISABLE.
 - 4.5.3 ENGAGE Master Switch.
- 5.0 INVERTER "A" FAILURE ACTIONS
 - [] 5.1 OPEN CB-1 at TB-1 (120 Vac power/control).
 - [] 5.2 OPEN AC input CB at Inverter A.
 - [] 5.3 Select ALTERNATE at the bypass switch (53P-HS03/309).
 - [] 5.4 CLOSE CB-2 at TB-1.
 - [] 5.5 CLOSE CB-3 (alternate control power for 53P-CP03/309) at Panel 53P-DP03/28.
- 6.0 INVERTER "B" FAILURE ACTIONS
 - [] 6.1 OPEN CB-1 at TB-1.
 - [] 6.2 OPEN AC input CB at Inverter A.
 - [] 6.3 OPEN CB-201 at AC panel.
 - [] 6.4 OPEN and lock CB-200 at AC panel.
 - [] 6.5 OPEN AC input CB at Inverter B.
 - [] 6.6 CLOSE AC input CB at Inverter C.
 - [] 6.7 Unlock **AND** CLOSE CB-202 at AC panel.
 - [] 6.8 CLOSE CB-201 at AC panel.
 - [] 6.9 CLOSE AC input CB at Inverter A.
 - [] 6.10 CLOSE CB-1 at TB-1.

7.0 INVERTER "C" FAILURE ACTIONS

- [] 7.1 OPEN CB-1 at TB-1.
- [] 7.2 OPEN AC input CB at Inverter A.
- [] 7.3 OPEN CB-201 at AC panel.
- [] 7.4 OPEN and lock CB-202 at AC panel.
- [] 7.5 OPEN AC input CB at Inverter C.
- [] 7.6 CLOSE AC input CB at Inverter B.
- [] 7.7 CLOSE CB-200 at AC panel.
- [] 7.8 CLOSE CB-201 at AC panel.
- [] 7.9 CLOSE AC input CB at Inverter A.
- [] 7.10 CLOSE CB-1 at TB-1.

NOTE

In the event of a planned weekend power outage, power should be secured to Panel 53P-CP03/309 by performing Section 8.0.

8.0 PANEL 53P-CP03/309 SHUTDOWN SEQUENCE

- [] 8.1 Place fan(s) switch(es) to OFF position.
- [] 8.2 Place ENABLE/DISABLE switch to DISABLE.
- [] 8.3 ENGAGE Master Switch.
- [] 8.4 Verify amber initiate light is OFF.
- [] 8.5 OPEN the following CBs at TB-1:

CB-1	CB-2	CB-3	CB-4	CB-5
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- [] 8.6 OPEN the following CBs at AC panel:

74-BS-007	74-BS-008	CB-200	CB-201	CB-202
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- [] 8.7 Verify either CB-202 or CB-200 is OPEN and locked at AC panel.

- [] 8.8 OPEN AC input CB at Inverter A.
- [] 8.9 OPEN the following CBs at the DC CB panel:
 - CB-102
 - CB-103
- [] 8.10 OPEN AC input CB at Inverter B **OR** C.
- [] 8.11 OPEN AC input CB at the battery charger.
- [] 8.12 OPEN Safety Switch 53P-SW03/58.
- [] 8.13 Open CB-13/15 (power for 53P-CP03/309) at 53P-PD04/28.

9.0 OPERATION OF FOXBORO CONTROLLER

NOTE

The FoxBoro controller and compressed air system will only be used as a redundant supply for Bulkhead 74-B-309 pressure chamber, upon failure of the fan system at Bulkhead 74-B-309.

- 9.1 Notify CMRO that Bulkhead 74-B-309 will be pressurized with compressed air. CMRO will then contact Facility Operations to start a second compressor, if needed.
- 9.2 Configuration of high-pressure fans at Bulkhead 74-B-309.
 - 9.2.1 Install blank fan covers at each high-pressure fan at Bulkhead 74-B-309.
- 9.3 Configuration of FoxBoro Controller
 - 9.3.1 UFE/UGRW at Control Panel 534-CP-003-001
 - [A] If Control Panel 53P-CP03/309 is operable, place hand switch 534-HS-003-001 to the NORMAL position.
 - [B] Perform Steps 4.2.1 through 4.2.4 and continue with Step 9.3.3.
 - 9.3.2 **IF** Control Panel 53P-CP 03/309 is inoperable, **THEN** CLOSE CB-1 at 53P-DP03/28, **AND** place Hand Switch 534-HS-003-001 to the ALTERNATE position, and continue.
 - 9.3.3 Verify Controller 534-CP-003-001 is ON.

- 9.3.4 Verify pressure at 534-PIC-003-001 is between >0.20" wg and <2.00" wg.
- 9.3.5 Notify CMR that Waste Handling may start U/G.
- 9.3.6 If pressure is not within acceptable ranges, **GO TO** Step 9.3.7.
- 9.3.7 Verify that pressure relief valve VU-534-V-001 is CLOSED.
- 9.3.8 Verify that PA-534-V-264 is CLOSED.
- 9.3.9 Verify that PA-534-V-263 is OPEN.
- 9.4 Operation of FoxBoro Controller
 - 9.4.1 Place Pressure Indicator Controller 534-PIC-003-001 in MANUAL operation mode, by pressing the A/M on the key pad until the M appears on the Controller.
 - 9.4.2 Vary input pressure by pressing the UP or DOWN arrow on the key pad to acquire adequate pressure.
 - 9.4.3 Set the chamber pressure to 0.70" wg.
 - 9.4.4 Allow the pressure to stabilize for approximately one minute.
 - 9.4.5 Place Pressure Indicator Controller 534-PIC-003-001 in AUTO operation mode, by pressing the A/M on the key pad until the A appears on the Controller.
 - 9.4.6 Notify CMRO that Waste Handling may begin.
- 9.5 Shut Down of FoxBoro Controller
 - 9.5.1 Place Hand Switch 534-HS-003-001 to the OFF position.
 - 9.5.2 Open Valve VU-534-V-001.
 - 9.5.3 Close Valve PA-534-V-263.
 - 9.5.4 Verify Valve PA-534-V-264 is CLOSED.
 - 9.5.5 Remove blank fan covers at each of the high-pressure fans at Bulkhead 74-B-309.

- 9.6 **IF** S-400 D/P is out of service for maintenance
THEN perform the following:
- 9.6.1 UFE/UGRW place covers on each high-pressure fan at Bulkhead 74-B-309.
 - 9.6.2 Open valve 534-V-264 as needed to regulate the U/G compressed air so that pressure on D/P indicator 534-PDI-003-001A is maintained above 0.2" positive.
 - 9.6.3 Contact Waste Handling Engineer after pressure is adequate.
 - 9.6.4 Monitor D/P continuously until the waste is out of the Waste Shaft Air Split.