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WP 04-VU1608

Revision 17

Underground Ventilation and Filtration System Operation

Technical Procedure

EFFECTIVE DATE: 12/08/10

Jeff Neatherlin
APPROVED FOR USE

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CHANGE HISTORY SUMMARY

REVISION NUMBER	DATE ISSUED	DESCRIPTION OF CHANGES
17	12/08/10	Minor editorial changes made. Revised to update Control Panel 533 to 607, bulkhead regulator 533 to 607, and their location from S3200 to S2600.

INTRODUCTION [1]

The purpose of this procedure is to provide the instructions necessary for the operation of the Underground Ventilation and Filtration System (UVFS) at the Waste Isolation Pilot Plant (WIPP).

The scope of this procedure includes all UVFS components located in the underground (U/G) at WIPP.

No records are generated by the performance of this procedure.

REFERENCES

BASELINE DOCUMENTS

- Title 30 Code of Federal Regulations (CFR) Part 57, "Safety and Health Standards - Underground Metal and Nonmetal Mines"
- 30 CFR Part 57, Subpart G, "Ventilation"
- DOE/WIPP-07-3372, *Waste Isolation Pilot Plan Documented Safety Analysis*
- DOE/WIPP-07-3373, *Waste Isolation Pilot Plan Technical Safety Requirements*
- Hazardous Waste Facility Permit, issued to Waste Isolation Pilot Plant, Identification No. NM4890139088-TSDF, by the New Mexico Environment Department
- SDD VU00, Underground Ventilation System Design Description
- 00CD-0001, WIPP Mine Ventilation Plan
- 54-W-001-W, Underground Mine Ventilation System
- 54-W-002-W, Underground Ventilation Plan Waste Handling Mode
- 54-W-004-W, Underground Ventilation Plan Filtration Mode
- 54-W-012-W, Underground Mine Plan Bulkhead Locations & Numbers

REFERENCED DOCUMENTS

- WP 04-VU1001, Surface Underground Ventilation and Filtration System Operation

PRECAUTIONS AND LIMITATIONS

- WP 04-VU1001 contains sections corresponding to Sections 1.0 through 10.0. Operation of the UVFS within the parameters of the System Design Description (SDD) requires coordinated operation of the U/G and surface ventilation systems.

- Approval from the Facility Shift Manager (FSM) is required prior to changing ventilation modes.

- To prevent excessive negative pressure in the Waste Hoist Tower, the following safety features are provided:

  - At −2.25 in. w.g. (water gauge) in the Waste Hoist Tower, the Central Monitoring Room (CMR) receives "411 WASTE HOIST TOWER DIFFERENTIAL PRESSURE (D/P) 301" alarm, and the Auxiliary Air Intake Shaft (AAIS) pressure relief louvers open.

  - At −2.5 in. w.g. in the Waste Hoist Tower, one of the main ventilation fans will shut down if two main exhaust fans are running.

  - At −2.75 in. w.g. in the Waste Hoist Tower, the running main exhaust fan(s) will shut down.

- The UVFS is shifted to filtration when an incident has occurred in the U/G that has potential of releasing radioactive contamination.

NOTE

U/G Services coordinates with the Central Monitoring Room Operator (CMRO) prior to adjusting bulkhead doors (BHD) and bulkhead regulators (BHR) that will adversely affect required D/Ps.

- BHDs and BHRs may be adjusted to maintain airflows in active working areas of the mine as required.

- If personnel access is required to the active panel area during filtration mode, BHDs 74-B-415 and 416 may be opened and BHR 74-B-308 may be adjusted to provide airflow to the panel.

- In the event of a **LOSS** of S1300 D/P, refer to Section 11.0.

- The U/G louver control panels have a Manual and Auto setting. In Manual, the louvers can be manually adjusted locally. In Auto, the CMR has control. The control panel for 313 and 607 **SHALL** be kept in Auto.

NOTE

The 42,000 acfm (actual cubic feet per minute) requirement is directed by the WIPP Mine Ventilation Plan and the Hazardous Waste Facility Permit.

- A minimum of 42,000 acfm will be maintained in active waste disposal room(s) when workers are present.

PREREQUISITE ACTIONS

1.0 Configuration of BHDs may be changed to support work activities. If proposed changes will affect waste handling activities, obtain FSM concurrence.

PERFORMANCE

1.0 START-UP OF ALTERNATE VENTILATION

NOTE

Attachment 1, Component Lineup for Normal or Alternate Ventilation, contains the information for desired bulkhead and louver configurations.

1.1 Perform the following at BHR-308:

- Open Louver BHR-308B to 65%.
- Close louver BHR-308A.

1.2 **WHEN** directed by the CMRO,
THEN adjust BHR-308 to obtain −0.3 to −1.8 in. w.g. pressure in the Waste Hoist Tower.

1.3 **IF** Waste Hoist Tower pressure cannot be maintained at −0.3 to −1.8 in. w.g. after BHR-308 has been fully opened,
THEN perform the following:

1.3.1 Establish communications with the CMRO.

1.3.2 Adjust BHR-308B 65% Open.

1.3.3 **IF** an additional 700 fan is not available,
THEN perform the following:

[A] Request CMRO to obtain permission to cover Air Intake Shaft (AIS) from Hoisting Manager or designee.

[B] **IF** permission is granted,
THEN request Hoisting Manager or designee to cover AIS as much as possible.

[C] Adjust BHR-302, BHR-308, BHR-313, BHR-521 and BHR-607 to obtain −0.3 to −1.8 in. w.g. in the Waste Hoist Tower.

[D] **IF** AIS cannot be covered,
THEN establish communications with CMRO and adjust louvers BHR-302, BHR-308, BHR-313, BHR-521, and BHR-607 to obtain −0.3 to −1.8 in. w.g. in the Waste Hoist Tower.

1.4 I**F** Waste Hoist Tower pressure still cannot be maintained at −0.3 to −1.8 in. w.g.,
THEN notify FSM.

2.0 SHIFTING FROM ALTERNATE TO NORMAL VENTILATION

NOTE
Attachment 1 contains the information for desired bulkhead and louver configurations.

2.1 Perform the following at BHR-308:

- Set BHR-308B to 65% Open.
- Close BHR-308A.

2.2 Notify CMRO that the U/G is configured for normal ventilation.

2.3 Verify, in concurrence with AIS Hoist personnel, that second 700 fan will increase air flow in the AIS Shaft and personnel have been notified if applicable.

2.4 **WHEN** directed by the CMRO,
THEN adjust BHR-308 to obtain −0.3 to −1.8 in. w.g. pressure in the Waste Hoist Tower.

3.0 SHIFTING FROM NORMAL TO ALTERNATE VENTILATION

3.1 **WHEN** directed by the CMRO,
THEN adjust BHR-308 to obtain −0.3 to −1.8 in. w.g. pressure in the Waste Hoist Tower.

4.0 SHIFTING FROM NORMAL OR ALTERNATE VENTILATION TO FILTRATION

4.1 Verify with CMRO that AAIS Dampers are closed.

4.2 Verify BHD-336 is closed.

4.3 Verify BHR-607 is closed.

4.4 Verify BHR-313 is closed.

4.5 Notify CMRO that BHD-336, BHR-313, and BHR-607 are closed.

4.6 **WHEN** directed by the CMRO,
THEN adjust BHR-308 to obtain −0.3 to −1.8 in. w.g. pressure in the Waste Hoist Tower.

5.0 START-UP IN FILTRATION

5.1 Verify with CMRO that AAIS Dampers are closed.

5.2 Close BHD-336.

5.3 Close BHR-313.

5.4 Close BHR-607.

5.5 Notify CMRO that BHD-336, BHR-313, and BHR-607 are closed.

5.6 **WHEN** directed by the CMRO,
THEN adjust BHR-308 to obtain −0.3 to −1.8 in. w.g. pressure in the Waste Hoist Tower.

6.0 START-UP OF MINIMUM VENTILATION

6.1 Verify with CMRO that AAIS Dampers are closed.

6.2 Close BHD-336.

6.3 Close BHR-313.

6.4 Close BHR-607.

6.5 Notify CMRO that BHD-336, BHR-313 and BHR-607 are closed.

6.6 **WHEN** directed by the CMRO,
THEN adjust BHR-308 to obtain −0.3 to −1.8 in. w.g. pressure in the Waste Hoist Tower.

7.0 SHIFTING FROM MINIMUM TO REDUCED VENTILATION

7.1 Verify with CMRO that AAIS Damper is closed.

7.2 Align BHR-313 louvers as follows:

- 1 louver - 100% Open
- 3 louvers - Closed

7.3 Notify CMRO that the U/G is configured for reduced ventilation.

7.4 Adjust BHR-308 to obtain −0.3 to −1.8 in. w.g. D/P in the Waste Hoist Tower after ventilation flow has stabilized.

7.5 **IF** pressure can be obtained,
THEN GO TO Section 8.0.

7.6 Adjust BHR-313 to obtain −0.3 to −1.8 in. w.g. D/P in the Waste Hoist Tower.

8.0 SHIFTING FROM REDUCED TO MINIMUM VENTILATION

8.1 Verify with CMRO that AAIS Dampers are closed.

8.2 Close BHD-336.

8.3 Close BHR-313.

8.4 Close BHR-607.

8.5 Adjust BHR-308 to obtain −0.3 to −1.8 in. w.g. D/P in the Waste Hoist Tower after ventilation flow has stabilized.

9.0 SHIFTING FROM REDUCED OR MINIMUM VENTILATION TO FILTRATION

9.1 Verify with CMRO that AAIS Dampers are closed.

9.2 Verify BHD-336 is closed.

9.3 Verify BHR-313 is closed.

9.4 Verify BHR-607 is closed.

9.5 Adjust BHR-308 to obtain −0.3 to −1.8 In. w.g. D/P in the Waste Hoist Tower after the filtration fan has started.

10.0 SHUTDOWN FROM FILTRATION

10.1 **GO TO** Section 1.0.

11.0 LOSS OF S1300 DIFFERENTIAL PRESSURE

NOTE

Alarm set point for S1300 D/P is −0.12 in. w.g.

11.1 **IF** alarm sounds,
THEN CMRO, notify Waste Handling Operations (WHO) to suspend waste handling activities until further notice.

11.2 CMRO, notify the Underground Facility Engineer (UFE) that a LOSS of S1300 D/P has occurred.

11.3 UFE/Underground Roving Watch (UGRW), adjust regulators as required at the following regulator control panels:

- 534-CPO4/521A S80/E300
- 534-CPO4/521B S80/E300
- 534-CPO4/302A&B N150/E80
- 534-CPO4/302C&D N150/E80
- 534-CPO4/313A S1000/E20
- 534-CPO4/313B S1000/E20
- 534-CPO4/313C S1000/E20
- 534-CPO4/313D S1000/E20
- 534-CP04/607 W170/S2600

11.4 CMRO, advise UFE/UGRW when S1300 alarm clears.

11.5 **IF** alarm condition still does not clear,
THEN UFE, request CMRO to start second 700 fan (refer to Section 2.0).

11.6 **WHEN** S1300 alarm clears,
THEN CMRO, notify WHO to resume normal waste handling activities.

NOTE

The following steps **SHALL ONLY** apply if waste handling is in progress in the U/G and **ONLY** while waste is being transported.

NOTE

The Central Monitoring System point number for 534-PDI-160-536A is AG5909. There is **NO** alarm associated with this point.

11.7 **IF** S1300 D/P is out of service for maintenance,
THEN perform the following:

11.7.1 UFE/UGRW, monitor the D/P indicator 534-PDI-160-536A located at S 1000/E100.

11.7.2 UFE/UGRW, monitor continuously (approximately every 15 minutes) and log readings and time taken in the U/G narrative logbook.

11.7.3 UFE/UGRW, notify CMRO to suspend waste handling activities if pressure indication on 534-PDI-160-536A is **MORE POSITIVE** than −0.12 in. w.g.

11.7.4 **IF** pressure is **MORE POSITIVE** than −0.12 in. w.g.,
THEN GO TO Step 11.2.

Attachment 1 - Component Lineup for Normal or Alternate Ventilation

Component	Normal Ventilation Mode	Alternate Ventilation Mode
BHD-303 E140/S230	Closed	Closed
BHD-310 E140/S260	Closed	Closed
BHD-415 E140/S600	Closed	Closed
BHD-416 E140/S650	Closed	Closed
BHD-402 S90/W250	Closed	Closed
BHD-403 S90/W220	Closed	Closed
BHD-305 S90/W80	Closed	Closed
BHD-306 S90/W130	Closed	Closed
BHD-329 N150/W100	Closed	Closed
BHD-330 N150/W60	Closed	Closed
BHD-319 S700/E70	Closed	Closed
BHD-320 S700/E20	Closed	Closed
BHMD-319 S700/E70	Closed	Closed
BHMD-320 S700/E20	Closed	Closed
BHMD-326 W1300/W170	Closed	Closed
BHD-333 S1600/W110	Closed	Closed
BHD-334 S1600/W70	Closed	Closed
BHD-521 E300/S80	Closed	Closed
BHMD-521 E300/S80	Closed	Closed
BHD-527 E140/N150	Closed	Closed
BHD-528 E140/N150	Closed	Closed
BHMD-456 S1000/W155	Closed	Closed
BHMD-315 S700/W150	Closed	Closed
BHMD-320 S700/E20	Closed	Closed
BHMD-324 S1300/E130	Closed	Closed
BHMD-327 S1600/E130	Closed	Closed
BHD-524 S1950/E110	Closed	Closed
BHD-525 S1950/E20	Closed	Closed
BHMD-317 S1300/E280	Closed	Closed
BHMD-308 S400/E300	Closed	Closed
BHMD-312 S700/E280	Closed	Closed
BHMD-323 S1000/E280	Closed	Closed
BHMD-553S1600/E280	Closed	Closed

Attachment 1 - Component Lineup for Normal or Alternate Ventilation

Component	Normal Ventilation Mode	Alternate Ventilation Mode
BHMD-410 S1950/W155	Closed	Closed
BHMD-531 OE/N150	Closed	Closed
BHMD-302 N150/E60	Closed	Closed
BHR-521 Louvers E300/S80 Equipment register: 74-HD-160-521A 74-HD-160-521B	A Louver - 25% Open B Louver - Closed	A Louver - 45% Open B Louver - Closed
BHR-302 Louvers N150/E60 Equipment register: 74-HD-160-302A/B 74-HD-160-302C/D	A/B Louver - 55% Open C/D Louver - Closed	A/B Louver 40% Open C/D Louver 0% Closed
BHR-308 Louvers S400/E300 Equipment register: 74-HD-160-308A 74-HD-160-308B	B Louver 60% Open	A Louver 65% Closed B Louver 65% Open
BHD-336 E300/S350	Open	Open
BHD-401 N300 Air Intake Shaft	Open	Open
BHD-520 N200/E160	Open	Open
BHMD-520 N200/E160	Closed	Closed
BHD-504 0E N. of Salt Handling Shaft	Open	Open
BHD-503 W30 S. of Salt Handling Station	Open	Open
BHMD-313 S1000/E20	Closed	Closed
BHR-313 Louvers S100/E20 Equipment register: 74-HD-160-313A 74-HD-160-313B 74-HD-160-313C 74-HD-160-313D	1 Louver (A) - 100% 1 Louver (B) - 100% 1 Louver (C) - 100% 1 Louver (D) - 100%	1 Louver (A) - 100% 1 Louver (B) - 100% 1 Louver (C) - 100% 1 Louver (D) - 100%
BHD-515 N460/E100	Closed	Closed
BHD-339 E20/N460	Closed	Closed

Attachment 1 - Component Lineup for Normal or Alternate Ventilation

Component	Normal Ventilation Mode	Alternate Ventilation Mode
BHD-430 W125/S2180	Closed	Closed
BHD-431 W75/S2180	Closed	Closed
BHMD-304 E120/S2180	Closed	Closed
BHMD-337 E120/S2520	Closed	Closed
BHMD-338 E280/S2180	Closed	Closed
BH-442, BH-444, and/or BH-445 Exit of Active Disposal Room Where Required	Slider Open 5-1/2'	Slider Open 5-1/2'
BHMD-340 N780/E110	Closed	Closed
BHR-74-HD-160-607	1 Louver (A) - 100%	1 Louver (A) - 100%
BHR-74-HD-160-607	1 Louver (B) - 100%	1 Louver (B) - 100%