UNITED STATES DEPARTMENT OF LABOR MINE SAFETY AND HEALTH ADMINISTRATION

REPORT OF INVESTIGATION

Underground (Coal)

Fatal Powered Haulage Accident August 5, 2024

Leer Mine ACI Tygart Valley Thornton, Taylor County, West Virginia ID No. 46-09192

Accident Investigators

Louis Bernatowicz Mine Safety and Health Specialist

> Joedy Gutta, PE Civil Engineer

Originating Office Mine Safety and Health Administration Morgantown District 604 Cheat Road Morgantown, WV 26508 Carlos Mosley, District Manager

TABLE OF CONTENTS

OVERVIEW	1
GENERAL INFORMATION	1
DESCRIPTION OF THE ACCIDENT	2
INVESTIGATION OF THE ACCIDENT	3
DISCUSSION	3
Location of the Accident	3
Longwall Electrical Power Car	4
Air Lifting Bags (Airbags)	4
Examinations	5
Training and Experience	5
ROOT CAUSE ANALYSIS	6
CONCLUSION	7
ENFORCEMENT ACTIONS	8
APPENDIX A – Map of the Accident Scene	10
APPENDIX B – Persons Participating in the Investigation	11
APPENDIX C – Longwall Electrical Power Car Components	12
APPENDIX D – Longwall Electrical Power Car Physical Evidence	13



OVERVIEW

On August 5, 2024, at 5:55 a.m., William Crandall, a 57 year-old locomotive operator with 11 years of mining experience, was seriously injured when rubber air lifting bags (airbags) suddenly dislodged while work was being performed to rerail a longwall electrical power car. The unanticipated movement of the airbags caused the power car drawbar to strike Crandall in the head. He died from his injuries on August 7, 2024.

The accident occurred because the mine operator did not: 1) properly install the track rails to accommodate all equipment that would use them, 2) properly train all miners on the use of airbags to rerail track mounted equipment, and 3) have adequate written guidance to ensure the proper use of airbags to rerail track mounted equipment.

GENERAL INFORMATION

ACI Tygart Valley owns and operates the Leer Mine, an underground coal mine located in Thornton, Taylor County, West Virginia. The mine employs 572 miners and operates two nine-hour production shifts and one maintenance shift, seven days per week. The mine extracts bituminous coal using four continuous mining machine units and one longwall mining unit in the Kittanning coal seam with an average mining height of 96 inches. Belt conveyors transport the coal from the mining units to the surface.

The principal management officials at Leer Mine at the time of the accident were:

Gaither Frazier	General Mine Manager
Ray Curry	Mine Manager
Marvin Cochran	Mine Superintendent
Josh Leichliter	Safety Director

The Mine Safety and Health Administration (MSHA) completed the last regular safety and health inspection at this mine on June 27, 2024. The 2023 non-fatal days lost injury incident rate for the Leer Mine was 0.33, compared to the national average of 3.25 for mines of this type.

DESCRIPTION OF THE ACCIDENT

On August 4, 2024, at 7:00 p.m., Crandall started his shift and participated in a safety instruction meeting given by Ryan McKinney, Weekend Shift Foreman. According to interviews, McKinney assigned Crandall and Robert Grose, Locomotive Operator, to transport the track mounted longwall pump cars and power cars to the No. 16 crosscut (No. 16) track spur on the 10 Left section and park them there. At 7:30 p.m., Crandall and Grose entered the mine to begin their assignment.

On August 5, 2024, at approximately 4:00 a.m., Michael Rorrer, Midnight Shift Supervisor, was notified that Crandall and Grose were derailed at the No. 14 crosscut on the 10 Left section track. According to interviews, Crandall and Grose rerailed the cars prior to Rorrer arriving at the No. 14 crosscut. Rorrer arrived at approximately 4:20 a.m., observed the cars back on track, and saw Crandall and Grose blocking up the low spot in the track that caused the cars to derail.

Crandall, Grose, and Rorrer traveled inby to the No. 16 track spur. Grose used the No. 17 locomotive to push the power cars into the spur. Rorrer and Crandall positioned themselves in the No. 3 entry where they could watch the power car being pushed around the curve (see Appendix A). The right-side wheels on the inby end of the power car went off track in the curve to the No. 3 entry. The miners made two attempts to rerail the car by placing wooden blocks under the wheels and pulling the car outby but were unsuccessful.

Crandall, Grose, and Rorrer retrieved three airbags, air hoses, and a controller from the No. 14 crosscut. According to interviews, the miners coupled all three air hoses together to reach from the No. 11 locomotive to the inby end of the power car. Grose placed wooden blocking between the track rails as a base for an airbag and placed the two airbags under the inby frame of the power car and the drawbar. They realized two airbags would not be high enough to lift the power car wheels over the track rails. By this time, Gary Bevins, Battery Repair Technician for Production Efficiency Corporation, had arrived at the No. 16 track spur looking for a ride to the portal bottom. Bevins offered the third airbag to Grose, and he placed it between the other two airbags.

Grose was inby the drawbar and was using the air hose to inflate the airbags. Rorrer was just outby Grose helping inflate the airbags by holding his fingers over the inflation nozzles to keep the airbags inflated. Crandall was just outby Rorrer, near the corner of the power car, and was watching for the wheels to be raised higher than the track rail. According to interviews, Crandall was going to align the wheels of the power car with the track rails once the wheels were above the rails. Crandall was heard saying, "That's high enough," moments before a loud noise occurred and dust filled the air.

Rorrer's hard hat was knocked off and broken and he received a laceration to the forehead. Crandall stood up and then fell on the ground near Bevins. Crandall was breathing but unconscious with a head injury. Rorrer called on the radio for help, and Bevins provided aid to Crandall. Grose went to retrieve the first aid supplies. Steve Bishoff, Dispatcher, called 911 at approximately 5:55 a.m.

Devan Perkins, Electrician, and Robert Clark, Forklift Operator, traveled to the accident location. Clark, Perkins, and Bevins placed Crandall onto a man door, because they could not locate the backboard, and carried him toward the personnel carrier, located at the No. 16 track spur switch. Justin Baird, Longwall Production Foreman/Emergency Medical Technician (EMT); Derek Born and Colten Walls, Electricians, brought first aid supplies to the No. 16 track spur switch where Crandall was being placed onto a personnel carrier. Crandall was transported to the surface, transferred to the care of Taylor County Emergency Medical Services, and taken to the hospital. He was pronounced dead on August 7, 2024, by Dr. Nathaniel Mohney, MD at 1:49 p.m.

INVESTIGATION OF THE ACCIDENT

On August 5, 2024, at 6:02 a.m., Josh Leichliter, Safety Director, called the Department of Labor's National Contact Center (DOLNCC) to report a serious accident. The DOLNCC notified Benjamin Hall, Supervisory Mine Safety and Health Specialist. Hall contacted Michael Stark, Staff Assistant, and James Baker, Assistant District Manager. Stark contacted Tyler Peddicord, Assistant District Manager, and Ronald Tulanowski II, Supervisory Mine Safety and Health Inspector. Tulanowski contacted Christopher Bradberry, Mine Safety and Health Inspector, who was at the mine and instructed him to begin investigating the accident. Hall assigned Louis Bernatowicz, Mine Safety and Health Specialist, to travel to the mine to investigate the accident. At 7:15 a.m., Bradberry issued an order under the provisions of Section 103(k) of the Mine Act to ensure the safety of the miners and preservation of evidence. At approximately 8:25 a.m., Bernatowicz arrived at the mine.

On August 6, 2024, Stark assigned Joedy Gutta, Civil Engineer, to investigate the accident. MSHA's accident investigation team, along with the West Virginia Office of Miners' Health, Safety, and Training, conducted an examination of the accident scene, interviewed miners, contractors, and mine management, and reviewed conditions and work practices relevant to the accident. See Appendix B for a list of persons who participated in the investigation.

DISCUSSION

Location of the Accident

The accident occurred in the 10 Left No. 16 track spur. The track installation in the spur was completed on August 1, 2024. The track was elevated above the mine floor and adequately blocked. The grade of the mine floor within the spur is relatively flat and did not contribute to the accident.

The track spur traveled through the No. 16 crosscut and curved into the No. 3 entry. The curve radius was too tight for the longwall electrical power car's length and mobility, causing it to derail. Four shorter pump cars were pushed into the spur earlier in the shift with no issue. The investigators determined that the installation of the track curve in the spur contributed to the accident.

Longwall Electrical Power Car

The equipment involved in the accident was a track mounted 3 MVA PC, longwall electrical power car. The length of the power car measured 33 feet 5 inches. Investigators inspected the inby wheel assembly and did not identify any defects. However, the rotation of the wheel assembly was limited by the power car's frame due to cross members that acted as stops and prevented unlimited rotation of the wheel assembly. As the power car traversed the tight curve, the wheel assembly contacted a cross member causing the power car to derail.

The power car was equipped with a drawbar and coupling on both ends to facilitate connections between cars. The drawbar was attached to the frame of the car with a pin inside a pocket. The pin allowed the drawbar to swing from side to side in the confines of the pocket as the car traversed track curves in the mine (see Appendix C).

Investigators identified the following physical evidence during the investigation (see Appendix D and E):

- 1. There were multiple rubber scuff marks on the underside of the power car frame and drawbar. There were also scuff marks on the side of the drawbar indicating sudden movement of the airbags.
- 2. The power car was recently painted during its electrical component modification. A distinct mark was identified on the drawbar where it contacted the edge of the pocket. The paint on the pocket was loose and flaked off with little to no effort when touched. Flakes of matching paint were present on the mine floor and on the wooden blocking that was used for the airbags.
- 3. The coupler had an area that measured 1-7/8 inches wide by nine inches high that was covered in grease. An area on Crandall's hardhat had a thin film of grease that measured 1-7/8 inches wide where the hard hat was damaged.
- 4. Two small fragments of reflective material were present on the 1-7/8-inch area of the coupler that were matched to the reflective material on Crandall's hardhat in the location where the hard hat was damaged.

Investigators concluded the sudden dislodgment of the airbags caused the power car to move and the drawbar to swing violently, striking Rorrer and Crandall.

Air Lifting Bags (Airbags)

The three airbags involved in the accident were from two different manufacturers and two different sizes. The bottom airbag was a Sava, 8 bar, SFB-K 33/17, a flat airbag that measured 36 inches square. The middle airbag was a Simplex, 8 bar, SLK 70/20, a conventional airbag that measured 36 inches square. The top airbag was a Sava, 8 bar, SLK 45, conventional airbag that measured 30-1/2 inches square. Two of the three airbags were dislodged several feet from the locations where the miners placed them to rerail the power car. The investigators visually inspected the airbags with no obvious defects observed.

Investigators reviewed the mine operator's written Safe Work Instructions (SWI). The locomotive operator SWI does not mention procedures for rerailing track mounted equipment or the use of airbags. The SWI for Sava lifting airbags states the following: 1) "Never place more than two lifting airbags one upon another" and 2) "Never avoid the controller and connect the pressure reducer directly to the lifting bag." The airbags also had labels indicating the number that could be stacked on top of each other.

Investigators also reviewed both airbag manufacturers' manuals, which contain the following requirements: 1) always use a controller with an independent air hose to each airbag to control the inflation and deflation of the airbags, 2) do not stack the air bags more than two high, 3) place the airbags on firm blocking, 4) block the airbags high enough to be within the recommended two and three quarter of an inch of the object to lift, 5) place a metal plate or fiberglass board between the airbags and distribute the load evenly, and 6) block any components on the load to be lifted to prevent movement during lifting.

Based on examination and testimony, investigators determined the mine operator was not following these requirements when the accident occurred. A controller with individual air hoses to each airbag was not used. All the air hoses were connected to make one long air hose from the No. 11 locomotive to the power car, and Rorrer was placing his fingers over the inflation nozzles of two airbags to prevent deflation because there were not enough air hoses to use the controller properly. The air bags were stacked three high. The blocking material under the power car did not provide a firm foundation for the airbags and was not placed high enough so the airbags would be within the recommended two and three quarter of an inch of the power car before lifting. The placement of the airbags under the edge of the frame and under the drawbar did not evenly distribute the airbag lifting force. The drawbar was not secured against motion.

These actions did not follow the airbag manufacturers' manuals and the mine operator's SWI. Investigators determined that these factors contributed to the accident.

Examinations

The investigation team reviewed the 10 Left section track examination records and found them compliant, with no violations noted. Investigators determined that all examinations were adequate and did not contribute to the accident.

Training and Experience

Crandall had over 11 years of mining experience, including over 11 years as a locomotive operator at the Leer Mine. Investigators reviewed training records and determined Crandall received annual refresher training in accordance with MSHA Part 48 training regulations. Crandall received task training on the use of airbags on November 5, 2013.

Grose had over 18 years of mining experience, including over 11 years as a locomotive operator at the Leer Mine. Investigators reviewed training records and determined Grose received annual refresher training in accordance with MSHA Part 48 training regulations. Grose received task training on the use of airbags on November 5, 2013, and March 16, 2024.

Rorrer had over 21 years of mining experience, including seven years as a foreman, and over two years as a midnight shift supervisor at the Leer Mine. Investigators reviewed training records and determined Rorrer received annual refresher training in accordance with MSHA Part 48 training regulations. Rorrer actively participated in the use of the airbags but had never received training on the use of airbags.

Investigators determined the task training Grose received on March 16, 2024, was conducted by McKinney. According to interviews, McKinney never received training in the use of airbags at the Leer Mine, however, he had experience in the use of airbags and had received training at mines he had worked at previously. Investigators determined that with the number of deficiencies identified, the training was inadequate on the use of airbags and contributed to the accident.

ROOT CAUSE ANALYSIS

The accident investigation team conducted an analysis to identify the underlying causes of the accident. The team identified the following root causes, and the mine operator implemented the corresponding corrective actions to prevent a recurrence.

1. <u>Root Cause</u>: The mine operator did not properly install the track rails to accommodate all equipment that would use them.

<u>Corrective Action</u>: The mine operator performed track repairs to increase the radius of the curve to accommodate all equipment that will use the track.

2. <u>Root Cause</u>: The mine operator did not provide adequate training in the use of airbags when rerailing track mounted equipment.

<u>Corrective Action</u>: The mine operator retrained all foremen, supervisors, and locomotive operators in the use of airbags.

3. <u>Root Cause</u>: The mine operator did not have adequate written guidance to ensure the proper use of airbags to rerail track mounted equipment.

<u>Corrective Action</u>: The mine operator revised their written procedures for airbag use and the airbag manufacturer retrained all foreman, supervisors, and locomotive operators in the use of airbags.

CONCLUSION

On August 5, 2024, at 5:55 a.m., William Crandall, a 57 year-old locomotive operator with 11 years of mining experience, was seriously injured when rubber air lifting bags (airbags) suddenly dislodged while work was being performed to rerail a longwall electrical power car. The unanticipated movement of the airbags caused the power car drawbar to strike Crandall in the head. He died from his injuries on August 7, 2024.

The accident occurred because the mine operator did not: 1) properly install the track rails to accommodate all equipment that would use them, 2) properly train all miners on the use of airbags to rerail track mounted equipment, and 3) have adequate written guidance to ensure the proper use of airbags to rerail track mounted equipment.

Approved by

Carlos Mosley District Manager Date

ENFORCEMENT ACTIONS

1. A 103(k) order was issued and subsequentially modified to ACI Tygart Valley.

An accident occurred on August 5, 2024, at approximately 5:55 AM, when three miners were attempting to use airbags to rerail a Longwall power car at No. 16 block spur on 10 Left headgate. This order is being issued under the authority of the Federal Mine Safety and Health Act of 1977, under Section 103(k) to insure the safety of all persons at the mine, and requires the operator to obtain the approval of an authorized representative of MSHA of any plan to recover any person in the mine or to recover the mine or affected area. This order prohibits any activity in the affected area. The operator is reminded of the obligation to preserve all evidence that would aid in investigating the cause or causes of the accident in accordance with 30 CFR 50.12.

The miner died from his injuries on August 7, 2024.

2. A 314(b) safeguard was issued to ACI Tygart Valley under the provisions of 75.1403.

On August 5, 2024, a fatal accident occurred at this mine when a rubber air lifting bag (airbags) suddenly dislodged while attempting to rerail a longwall electrical power car. The unanticipated movement caused the power car drawbar to strike a miner in the head. The miner died from his injuries on August 7, 2024. The accident occurred because the radius of the curve on the 10 Left headgate, No. 16 block spur, installed on August 1, 2024, to facilitate the setup of the 10 Left longwall mining unit, was too tight for the longwall power car to traverse which caused the car's wheels to climb the rail and derail.

This is a notice to provide a safeguard requiring all track rails to be installed, maintained, properly gauged, and aligned to prevent derailment and allow for the safe passage of all track mounted equipment.

3. A 104(d)(1) citation was issued to ACI Tygart Valley for a violation of 30 CFR 48.7(a).

On August 5, 2024, a fatal accident occurred at this mine when a rubber air lifting bag (airbags) suddenly dislodged while attempting to rerail a longwall electrical power car. The unanticipated movement caused the power car drawbar to strike a miner in the head. The miner died from his injuries on August 7, 2024. The mine operator did not provide adequate task training for the use of airbags. Miners were not using the airbag in accordance with the airbags manufacturer's instructions, mine operator's Safe Work Instructions, or the working labels on the bags.

The mine operator engaged in aggravated conduct constituting more than ordinary negligence by not task training the midnight shift supervisor and weekend shift foreman on the proper use of airbags. The midnight shift supervisor was actively participating in the use of the airbags when the accident occurred. The weekend shift foreman provided task training on the use of airbags to a locomotive operator involved in the rerailing of the longwall electrical power car. This violation is an unwarrantable failure to comply with a mandatory standard.

4. A 314(b) safeguard was issued to ACI Tygart Valley under the provisions of 75.1403.

On August 5, 2024, a fatal accident occurred at this mine when rubber air lifting bags (airbags) suddenly dislodged while attempting to rerail a longwall electrical power car. The unanticipated movement caused the drawbar to strike a miner in the head. The miner died from his injuries on August 7, 2024. The accident occurred because the mine operator did not have a policy or procedure to ensure the safe use of airbags.

This is a notice to provide a safeguard requiring:

- 1. The mine operator will ensure adequate training be provided to selected personnel on the manufacturer recommendations and the mine operator's Safe Work Instructions.
- 2. Annual retraining will be provided to personnel trained in the use of airbags.
- 3. Miners may not use airbags unless they have been properly task trained.
- 4. The dispatcher will be notified of the location where and when airbags will be used.
- 5. Airbags will not be used without the proper controller, proper number of air hoses, and hoses of the correct length as recommended by the manufacturer.
- 6. Miners will ensure that airbags are securely restrained prior to inflation.
- 7. Miners will notify the dispatcher when usage of the airbags has been completed.
- 8. This plan will be added to Leer's Comprehensive Safety Plan.
- 9. The use of the airbags will adhere to all the manufacturer's safety guidelines, instructions, and warnings.



APPENDIX A – Map of the Accident Scene

Note: The airbags are located where the investigators found them after the accident.

APPENDIX B - Persons Participating in the Investigation

ACI Tygart Valley

Douglas Conaway Gaither Frazier Ray Curry Marvin Cochran Brad Collins Josh Leichliter Justin Baird Kenneth Chidester Ryan McKinney Hutch Delaney Michael Rorrer Jacob Phillips Robert Grose Derek Born **Devan Perkins** Colten Walls Robert Clark Steve Bishoff

Vice President of Safety General Mine Manager Mine Manager Mine Superintendent Mine Foreman Safety Director Longwall Production Foreman/EMT Assistant CM Coordinator Weekend Shift Foreman Midnight Belt Foreman Midnight Shift Supervisor **Outby Examiner** Locomotive Operator Electrician Electrician Electrician Forklift Operator Dispatcher

Production Efficiency Corporation

Samuel Woods Gary Bevins President & CEO Battery Repair Technician

West Virginia Office of Miners' Health, Safety, and Training

Frank Foster Ed Peddicord Tadd Rankin Jason Adkins Nathan Sharp Adam Matlick David McCullough Director Inspector-at-Large Assistant Inspector-at-Large Assistant Attorney General Mine Inspector Mine Inspector Safety Instructor

Mine Safety and Health Administration

James Baker Michael Stark Benjamin Hall Louis Bernatowicz Joedy Gutta Christopher Bradberry Assistant District Manager Staff Assistant Supervisory Mine Safety and Health Specialist Mine Safety and Health Specialist Civil Engineer Mine Safety and Health Inspector



APPENDIX C – Longwall Electrical Power Car Components



APPENDIX D – Longwall Electrical Power Car Physical Evidence

Rubber Scuff Marks on Drawbar



Rubber Scuff Marks on Power Car Frame



APPENDIX E – Longwall Electrical Power Car Physical Evidence (cont.)

Impact Mark on Pocket with Paint Chips Below



Impact Mark on Drawbar Where it Contacted the Pocket