FAI-2019-05

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

REPORT OF INVESTIGATION

Surface Coal Mine

Fatal Machinery Accident
March 7, 2019

HWM 61
South Fork Coal Company
Rupert, Greenbrier County, West Virginia
ID No. 33-04642

Accident Investigators

Franklin E. Stover
Mine Safety and Health Surface Inspector/Accident Investigator

John Stone
Mine Safety and Health Electrical Specialist

Larry Hedrick
Mine Safety and Health Electrical Specialist

Originating Office
Mine Safety and Health Administration
District 4
100 Bluestone Road
Mount Hope, West Virginia 25880
David S. Mandeville, District Manager

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OVERVIEW

On Thursday, March 7, 2019, at approximately 1:30 p.m., Adam P. DeBoard, a 38-year-old front-end loader operator with 10 years of mining experience received fatal injuries when he was crushed between a metal support post on a highwall mining machine and a moving push beam.

The accident occurred because the mine operator did not identify the location of the accident as a pinch area and did not train the victim to avoid the pinch area.

GENERAL INFORMATION

The highwall mining machine is owned and operated by South Fork Coal Company, LLC. It operates within the Blue Knob Surface Mine. At the time of the accident, the highwall mining machine was being operated in the Sewell A Seam, located near Rupert, Greenbrier County, West Virginia. The highwall mining machine produces 350 tons of coal daily on two 12-hour shifts, five days each week and occasionally on Saturdays.

The principal officers for the mine at the time of the accident were:

Jeff Wilson..... CEO/President
Art Hale.....Senior Director of Operation
Josh Sturgill ..... Mine Superintendent
Wade Nichols .....Foreman/Operator
Keith Smith .....Safety Director

The Mine Safety and Health Administration (MSHA) completed the last regular (E01) safety and health inspection on November 15, 2018. The non-fatal days lost (NFDL) incident rate for the mine operator in 2018 was 6.59 compared to a national NFDL rate of 0.76 for mines of this type.

DESCRIPTION OF ACCIDENT

On Thursday, March 7, 2019, the day shift began at 6:00 a.m. The hole being mined was completed between 11:30 a.m. and 12:00 p.m., after it was mined to a depth of 560 feet. Miners then began removing the underground components of the highwall mining machine. Adam P. DeBoard parked his front-end loader and came to the highwall mining machine to assist. DeBoard shoveled mud from the rails, located beside the chain, after each push beam was removed (see Appendix A). At approximately 1:30 p.m., while standing near the push beam holder (holder) on the side of the machine, DeBoard's head was caught between the 14th push beam being removed and a stationary metal support post. Wade Nichols, Foreman/Operator, witnessed DeBoard fall and he immediately pressed the emergency stop button to de-energize the machine.

Nichols instructed John Livesay, Fork Loader Operator, to get an emergency medical technician (EMT). Livesay traveled just outside the highwall mining machine pit where Josh Bragg, Electrician, and Richie Milam, Maintenance Superintendent/EMT, were servicing a gasoline welder. Livesay informed Milam that an accident had occurred at the highwall mining machine and he was needed there immediately. When Milam arrived at the accident scene, he instructed Mark Chapman, Padman, to get first-aid supplies. Nichols and Milam positioned DeBoard on his back and assessed his vital signs. Nichols and Milam did not find a pulse so they began to administer cardiopulmonary resuscitation (CPR). Livesay notified Josh Sturgill, Mine Superintendent, of the accident. Sturgill dispatched four additional EMTs from the Blue Knob Surface Mine to the accident scene. They were: Frankie Phares and Ray Kincaid, Truck Drivers; David Brown, Bulldozer Operator; and Markie Holcomb, Front-End Loader Operator.

Redi-Care Ambulance Service from Craigsville, West Virginia arrived at the accident scene at 2:02 p.m., and took control of care of DeBoard. Redi-Care personnel ruled DeBoard to be in traumatic cardiac arrest and contacted Dr. Jerry Edwards at Medbase. Dr. Edwards gave 2:44 p.m. as a time of death and DeBoard was transported to Greenbrier Valley Medical Center in Ronceverte, West Virginia.

INVESTIGATION OF THE ACCIDENT

On March 7, 2019, at 1:49 p.m., the Department of Labor National Contact Center was notified of the accident. At 2:03 p.m., the contact center notified Thomas Dulin, Mine Inspector. Dulin notified David S. Mandeville, District Manager, that there had been a

serious accident at the HWM 61 mine. At 2:05 p.m., Mandeville notified Franklin Stover, Surface Mine Inspector/Accident Investigator, and Fred Wills, Field Office Supervisor, of the accident.

Stover, along with Wills, Mandeville, and Joey Presley, Staff Assistant, traveled to the Summersville Field Office where they met with Kelly Acord, Special Investigations Supervisor/Acting Field Office Supervisor, and Joe Morris, Mine Safety and Health Inspector. The team traveled to the accident scene and arrived at 5:00 p.m. Stover issued a 103(k) order to preserve the accident scene, prevent the destruction of evidence, and ensure the safety of all persons at the mine. Stover and Morris gathered preliminary information, examined the accident scene, and took photographs.

On Friday, March 8, 2019, Stover, Robert Hatfield, Electrical Supervisor, and Larry Hedrick, Electrical Specialist, traveled to the mine site to perform function testing of the highwall mining machine. The function testing was conducted in conjunction with representatives from West Virginia Office of Miners Health Safety and Training (WVOMHST).

On March 13, 2019, MSHA and WVOMHST jointly conducted formal interviews at the WVOMHST Office in Oak Hill, West Virginia. See Appendix B for a list of persons interviewed and those participating in the accident investigation.

On March 20, 2019, Stover, Hedrick, and John Stone, Electrical Specialist, along with Patrick Retzer, Electrical Engineer with MSHA Technical Support, Ron Furrow, Owner and Electrical Engineer with Synergy Global Group, and WVOMHST, traveled to the mine site to download data from the highwall mining machine's Programmable Logic Controller (PLC), an industrial computer, and two human machine interface (HMI) touchscreen panels. They also completed function testing.

DISCUSSION

Highwall Mining Machine

The highwall mining machine is used to mine holes that are several hundred feet deep, while miners remain on the surface. The system involves a cutter module that operates like a continuous mining machine, a push beam that is connected to the cutter module, and additional push beams connected to the first push beam and each other, forming a train of push beams. The push beams allow the power head to push the cutter module deeper into the hole being mined. The coal that is mined is conveyed, via an auger system in each push beam, to a belt on the surface.

After a hole is finished, the push beams and cutter module are removed from the mined hole. The power head, controlled by the higwall mining machine operator, moves toward the highwall and connects to the push beam to be removed. Once connected,

the power head retracts, pulling the push beam and the cutter module backward so that it is under the cradle/hoist. The cradle/hoist lifts the push beam and places it in the holder. A forklift removes the push beam from the holder and places it in a storage area. This process continues until all of the push beams and cutter module are removed from the hole that was mined (see Appendix A).

The push beams being used are 20 feet 7 inches long and 6 feet 10 inches wide. They measure 1 foot 8 inches thick and weigh up to 14,000 lbs. The push beams are loaded and removed by an overhead hydraulic crane/hoist.

The highwall mining machine was manufactured in 2008 by Superior Highwall Miners S/N 61 and it was purchased from Commonwealth Mining in March 2016. Function testing was conducted on the hydraulic system of the highwall mining machine and nothing was found that contributed to the accident.

Functional testing and an inspection were conducted on the electrical system on the highwall mining machine, emergency stop system, and power generator. No defects were found that contributed to the accident.

The Industrial Computer was removed from the highwall mining machine control cab and taken to the National Mine Health and Safety Academy in Beckley, West Virginia, where the data was downloaded by Furrow and Retzer. The communication ports for the HMIs were damaged, which prevented data storage on the computer since November of 2018.

Accident Scene

When the accident investigation team arrived at the scene the temperature was 27^{o} F. Ice was present on the machine handrails. The area around the machine was wet and muddy.

The highwall mining machine was found with a push beam resting in the holder and the cradle/hoist positioned over top of this beam (see Appendix A).

Investigators determined that the victim was standing on a small section (18 inches by 12.5 inches) of metal (travelway) between the ladder leading up to the second level of the machine and the steps that lead to the ground. It was common practice for a miner to stand in this small area, to shovel the mud that accumulates on the rails, as the push beams are removed from the mined hole. The mud has to be removed after each push beam is removed, to allow the power head to extend and properly connect to the next beam.

There was mud present on the walking surfaces of the highwall mining machine from being tracked onto the machine by miners as they got on and off of the machine. Some mud and small amounts of coal were on the travelway where the victim was standing at the time of the accident.

The small section where the victim was standing was not intended to be a work area because of the proximity of the moving push beams. This area was designated for miners to step on momentarily as they got on and off the machine. Each push beam was moving approximately 12 to 18 inches in front of the victim as it was raised, moved horizontally, and lowered by the cradle/hoist to the holder. The Superior Highwall Miners Safety, Operation, and Maintenance Manual, states on page one:

> Avoid placing yourself in or near pinch areas that exist between moving parts.

Investigators determined that the victim was repeatedly standing in a pinch area. The foremen and other miners knew the victim was standing in this location and told investigators they believed the area was a safe location for him to wait for the push beam to be moved to the holder. During interviews, they stated that it was common for someone to be in this location. They stated that this area was a travelway and the support post was between the landing area and the moving push beam.

Instead of standing in this location, the victim should have waited on the platform. If positioned on the platform, each push beam removed would be moved away from the victim. After the push beam was placed in the holder, the victim could have shoveled the mud. The victim would have then returned to the platform before the highwall mining machine operator extended the power head to connect to the next beam to be removed.

Examination

An on-shift examination was conducted by Wade Nichols around 10:00 a.m., on the day of the accident with no hazards recorded. Nichols did not see the victim standing in this location during the time he conducted his on-shift examination, but he was aware that the victim stood in this location when he shoveled mud off the push beams.

Training

Adam P. DeBoard began working for the mine operator on May 30, 2017. He received task training on the highwall mining machine on May 30, 2018. This training was conducted by Rickie Milam. His last 8 hour Annual Refresher Training was September 22, 2018.

The task training provided by the mine operator was not adequate because the training did not address the small area where the victim was standing as a pinch area as stated in the Superior Highwall Miners Safety, Operation, and Maintenance Manual.

Investigators obtained this manual and learned that the mine operator did not have the section of the manual related to safety. Instead, the mine operator only had the section of the manual necessary to maintain the highwall mining machine in operating condition.

ROOT CAUSE ANALYSIS

MSHA conducted an analysis to identify the most basic causes of the accident that were correctable through reasonable management control. Root causes were identified that, if eliminated, would have either prevented the accident or mitigated its consequences.

Listed below are the root causes identified during the analysis and the corrective actions that were implemented to prevent a recurrence.

1. Root Cause: The task training provided by the mine operator was not adequate because the training did not address areas to avoid in or near pinch areas that exist between moving parts as stated in the Superior Highwall Miners Safety, Operation, and Maintenance Manual.

   Corrective Action: The mine operator provided an 8 hour training class for all miners which covered the Superior Highwall Miners Safety, Operation, and Maintenance Manual and identified the areas to avoid during operation. Additionally, the mine operator revised their training plan to include a task training check list, and all miners have been task trained in accordance with the newly approved training plan.

2. Root Cause: The mine operator did not identify the work location where the accident occurred as a pinch area that needed to be avoided.

   Corrective Action: The mine operator has identified red zone areas that exist when push beams are being installed or removed. A red zone drawing has been added to the ground control plan with the following requirement, "No persons may enter red zone areas unless the highwall mining machine is idle."

   The area where the fatal accident occurred has been brightly painted and posted with warning signs. Also, physical barriers have been installed to prevent entry. The back access steps on the holder side that provide access to this area from the ground have been removed. A handrail has been installed across the access steps at the second level so no one can enter from the top area. Cameras were installed with monitors located in the operator's compartment so the highwall mining machine operator can see if persons enter the red zone areas.

CONCLUSION

On Thursday, March 7, 2019, at approximately 1:30 p.m., Adam P. DeBoard, a 38-year-old front-end loader operator with 10 years of mining experience received fatal injuries when he was crushed between a metal support post on a highwall mining machine and a moving push beam.

The accident occurred because the mine operator did not identify the location of the accident as a pinch area and did not train the victim to avoid the pinch area.

Approved By:

_____ _____

David S. Mandeville Date
District Manager

ENFORCEMENT ACTIONS

1. A Section 103(K) Order No. 9169757 was issued to South Fork Coal Company, HWM 61, ID 33-04642.

   A fatal accident occurred at this mine site on March 7, 2019, at 13:45 when a miner was injured at the HWM 61 high wall mining machine. This 103K order is issued to assure the safety of all persons at this operation and to preserve any evidence to aid in the investigation. It prohibits all work activity except for onshift exams and water pumping until MSHA determine it is safe to resume normal mining operations. The mine operator must obtain prior approval from an authorized representative for all action in affected area.

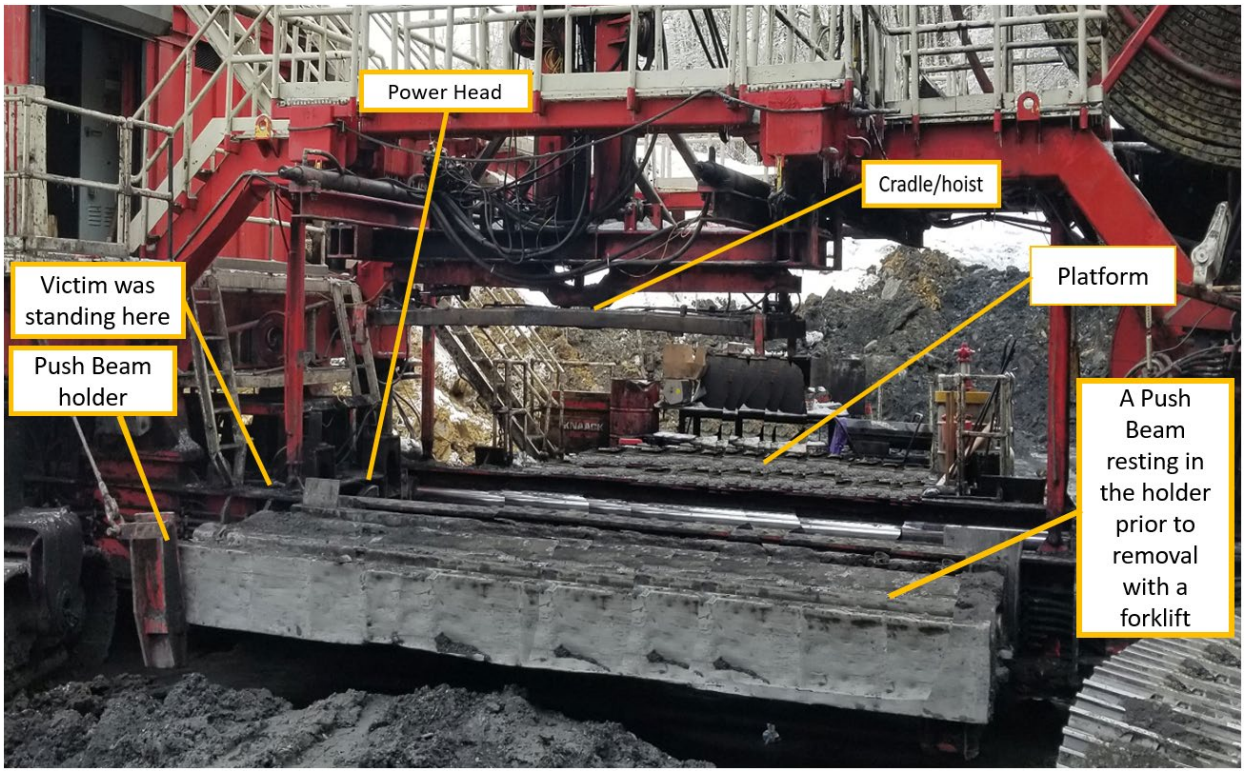
2. 104(a) Citation No. 9169768 was issued to South Fork Coal Company, HWM 61, for a violation of 30 CFR § 77.1504(b).

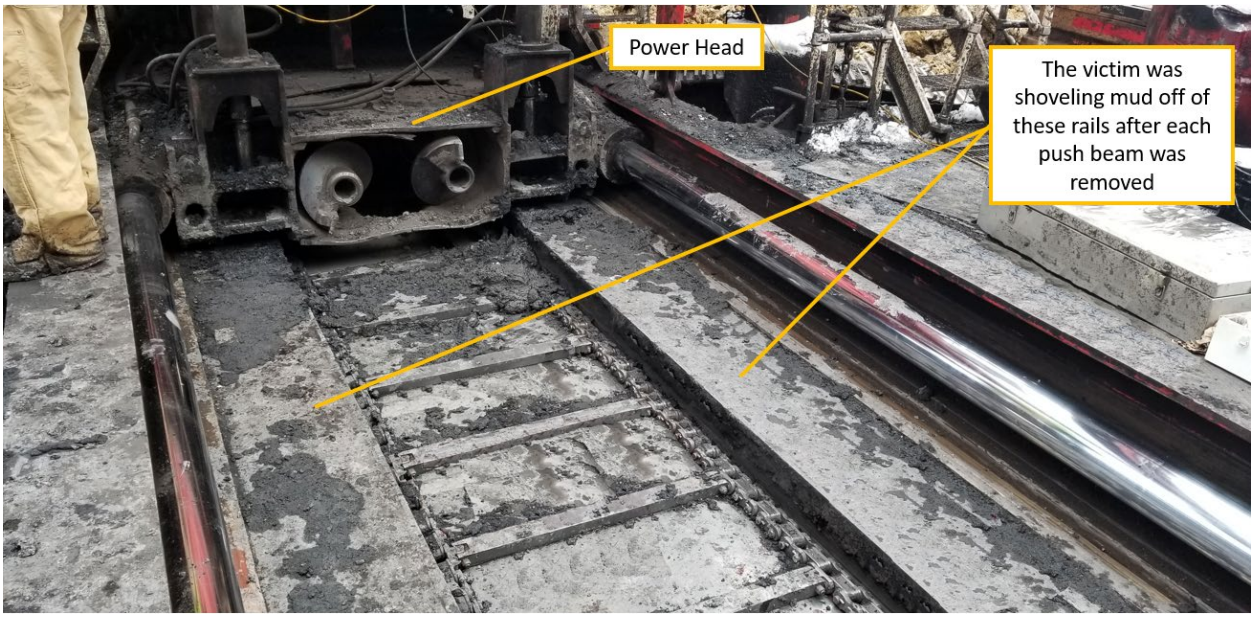
   An accident occurred at this mine on March 7, 2019, in which a miner was fatally injured when he was caught between a push beam being removed from the highwall mining machine and a vertical support post. The mine operator did not ensure that all miners were kept clear of push beams being moved into position. Mine management was aware of the hazardous location of the victim.

3. 104(a) Citation No. 9169767 was issued to South Fork Coal Company, HWM 61, for a violation of 30 CFR § 48.27.

   An accident occurred at this mine on March 7, 2019, in which a miner was fatally injured when he was caught between a push beam being removed from the highwall mining machine and a vertical support post. The mine operator did not provide adequate task training in that the training did not address the small area where the victim was standing as a pinch area. The Superior Highwall Miners Safety, Operation, and Maintenance Manual contains a warning, in the safety section of the manual, to avoid pinch areas. The mine operator did not have the safety section of this manual. Mine management only had the section of the manual necessary to maintain the highwall mining machine in operating condition. The mine operator did not recognize this violation as a hazardous condition and take corrective actions.

Appendix A
Photographs





Photos have been edited for illustration purposes

Appendix B
Persons Participating in the Investigation
(Persons interviewed are indicated by a * next to their name)

South Fork Coal Company

Jeff Wilson.....CEO/President
Art Hale..... Senior Director of Operation
Josh Sturgill.....Mine Superintendent
*Wade Nichols.....Foreman/Operator
Keith Smith.....Safety Director
*Richie Milam .....Maintenance Superintendent/EMT
*Mark Chapman.....Padman
*John Livesay.....Fork Loader Operator
*Josh Bragg.....Electrician

West Virginia Office of Miners Health Safety and Training

Eugene White.....Director
Frank Foster .....Deputy Director
John Kinder .....Deputy Director
McKennis Browning .....Inspector at Large
Kendall Smith ..... Chief Electrical Inspector
Thomas Fitzwater .....Mine Safety Specialist (Surface)

Mine Safety and Health Administration

Franklin Stover.....Surface Inspector/Accident Investigator
Joey Presley .....Staff Assistant
Robert Hatfield .....Electrical Supervisor
John Stone .....Electrical Specialist
Larry Hedrick .....Electrical Specialist
Joe Morris ..... Mine Safety and Health Inspector
Patrick Retzer..... Electrical Engineer
Kelly Acord .....Special Investigations/Acting Field Office Supervisor
Fred Wills .....Field Office Supervisor

Synergy Global Group

Ron Furrow .....Owner/Electrical Engineer