

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Machinery Accident
December 23, 2019

Marshall County Mine
Marshall County Coal Company
Cameron, Marshall County, West Virginia
I.D. No. 46-01437

Accident Investigators

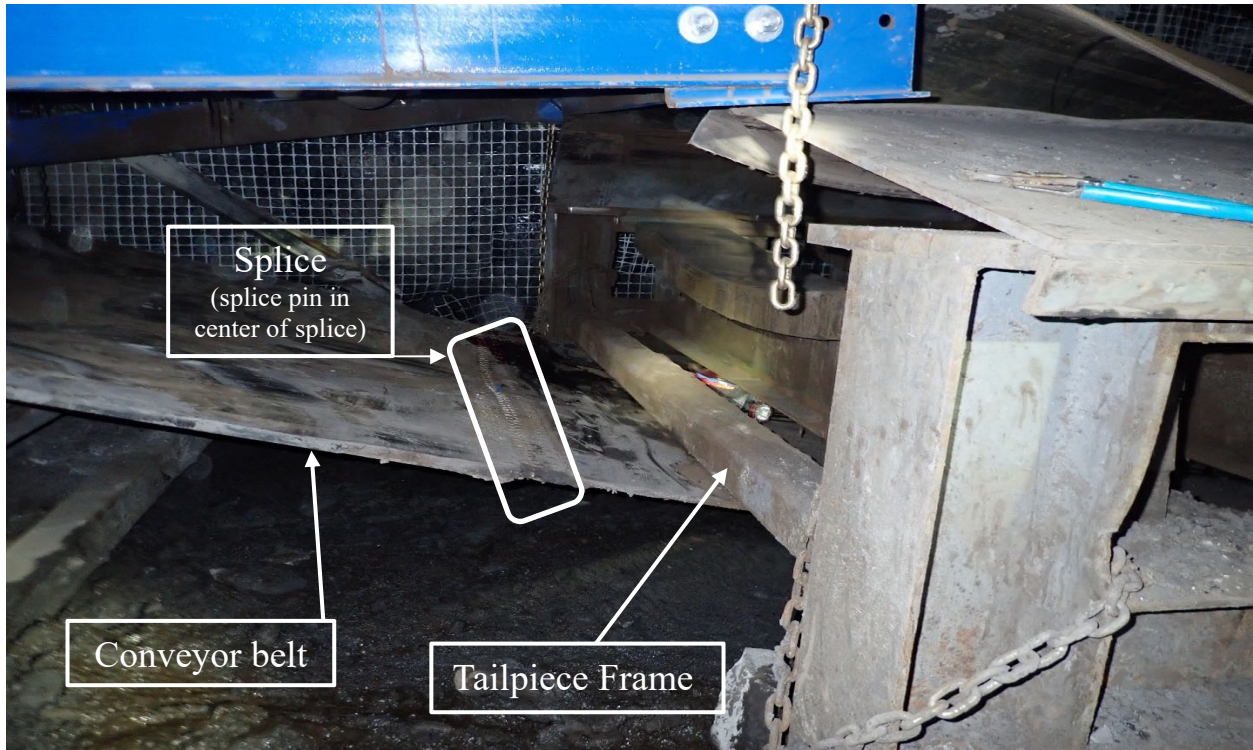
Louis Bernatowicz
Electrical Specialist

Jan Lyall
Roof Control Specialist

Originating Office
Mine Safety and Health Administration District 3
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Morgantown, West Virginia 26508
Carlos Mosley, District Manager

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OVERVIEW

On December 23, 2019, at approximately 4:15 p.m., Raymond "Ray" Starkey Jr. (Starkey), a 21-year old general inside laborer, was fatally injured when he was caught between the 72-inch wide belt and the steel frame of the belt tailpiece. The accident occurred because the assembly holding the Cameron Corridor belt in place was not strong enough to withstand tension created during the belt move. The mine operator used belt grippers, lever hoist chains, and lever hoists that were not designed to withstand the forces generated during the move.

GENERAL INFORMATION

The Marshall County Mine is an underground mine located in Marshall County, West Virginia. The mine is operated by Marshall County Coal Company, a subsidiary of Ohio Valley Resources Incorporated. The mine accesses the Pittsburgh No. 8 coal seam by two slopes and four portals: the Fish Creek Portal located near the supply and production slopes, the Blake's Ridge Portal, the Grapevine Portal, and the Cameron Portal. The Cameron Portal is used by the majority of miners. The mine is ventilated with seven main mine fans and four bleeder fans. The mine liberates 13,123,158 cubic feet of methane in a 24-hour period, and MSHA performs 103(i) spot inspections every five days. The last 103(i) spot inspection was performed on December 22, 2019.

The mine employs 688 miners underground and 92 miners on the surface. The mine typically works three shifts per day, six days per week. The average coal production is 34,677 raw tons per day, and the average mining height is 78 inches. Coal is mined by four

continuous mining machine sections and two longwall sections. Coal is transported from the working sections to the surface via conveyor belt. Battery, trolley, and diesel powered rail-mounted vehicles are used to transport supplies and mine personnel.

The principal officials for the Marshall County Mine at the time of the accident were:

Jeff Crow	General Manager
Ryan Muldrew	General Superintendent
Drew Dally	Superintendent
Mike Moore	Mine Foreman
Ryan Carman	Safety Director

A regular MSHA Health and Safety Inspection (E01) was in progress during the time of the accident. The last E01 inspection was completed September 30, 2019. The non-fatal days lost (NFDL) incidence rate for the mine during calendar year 2019 was 10.65, compared to the national average of 3.18 in 2019 for mines of this type.

DESCRIPTION OF THE ACCIDENT

On December 23, 2019, Starkey, General Inside Laborer (GIL) was assigned to help the belt crew because several regular crew members were absent. The crew traveled to the Cameron Corridor Section to move the belt. Greg Jones, Belt Foreman, and Trey Scott, Beltman, positioned the belt so that a belt splice was just outby the tailpiece, at approximately 3:30 p.m., and turned off the belt. Jones directed Justin Nething and Vincent Gillies, Beltmen, to remove the belt drive power and lock and tag it out, which they did. Nething and Gillies traveled to the 49 block track chute and clamped the bottom belt in preparation for adding belt to the Cameron Corridor belt (see Appendix A).

The next step in the process was the removal of the tailpiece anchors (see Appendix B). During normal operation, these anchors hold the tailpiece in place because there is a large amount of tension in the belt between the belt drive and tailpiece. Devan Potts, Beltman, connected the feeder to the tailpiece and trammed it toward the face, away from the belt drive which was located at 1 block. This reduced the tension on the tailpiece anchors so the belt crew could remove them, but it increased the amount of tension in the belt. Potts then trammed the feeder outby and the tension in the belt pulled the tailpiece and moved it in an outby direction. When the tailpiece moved outby, it removed some of the tension from the belt between the clamp at 49 block and the tailpiece at 67 block. This allowed the belt to sag in some areas due to the weight of the belt. However, even though the belt sagged, a significant amount of tension remained in the belt between 49 and 67 blocks.

Jones noticed that the belt was sagging between the bottom rollers rather than just outby the tailpiece where the splice was located. The crew wanted the sag in the belt to be at the splice location so they could easily remove the splice pin. The crew attached belt grippers on the bottom belt at 67 block (see Appendix C). The crew then attached lever hoist chains to the belt grippers and tightened the lever hoists to prevent additional sagging between the bottom rollers when the tailpiece was moved further outby.

Potts moved the feeder an additional distance outby to remove tension from the small section of belt between the tailpiece and the belt grippers. This caused the belt to sag to the mine floor, however, the splice was inaccessible because of the tailpiece frame. Potts moved the feeder and the tailpiece outby again to position the splice where they could access it through an opening in the side of the tailpiece. When Potts moved the tailpiece these two additional times, the remaining belt tension was transferred to the belt grippers, lever hoist chains, and lever hoists.

Brian Hammerquist, GIL, Scott, and Starkey worked from the solid side of the tailpiece and Kyle Stephenson, GIL, and Jones worked from the opposite (track) side of the tailpiece but were unable to remove the pin from the splice.

Hammerquist and Starkey made another attempt to loosen the splice pin. Hammerquist reached into the side opening of the tailpiece to hold the splice pin with channel locks. Starkey climbed on the sagged bottom belt and reached into the tailpiece to hit the channel locks with a hammer. Everyone heard two loud sequential sounds and the belt suddenly became tight, pinning Starkey between the bottom belt and the tailpiece frame.

Kevin Bradshaw, GIL, Allen Goddard, Beltman, and Terry Smitley, GIL, were inby the feeder when the accident occurred. They heard calls for help and Smitley and Goddard went to the mine phone. They called outside for help and took a backboard to the accident scene. Bradshaw went to the tailpiece to help.

Bradshaw, Scott, Hammerquist, and Jones freed Starkey by standing on the belt and using hand chain hoists to lower the belt structure to relieve the tension in the belt. Jones, who is an emergency medical technician, and Bradshaw checked for vital signs and found none.

They placed Starkey on a backboard and carried him to a personnel carrier. Leonard Pittman, Beltman, Bradshaw, Hammerquist, and Jones transported Starkey to the portal bottom and placed him on a gurney. George Miller, Motorman, and Robby Kincaid, Outby Foreman, transported Starkey to the surface via the elevator. Upon arrival at the surface, the miners transferred medical care of Starkey to Marshall County Emergency Services. Starkey was transported to Reynolds Memorial Hospital in Glen Dale, West Virginia where he was pronounced dead by Dr. Neil Aulick, M.D., Emergency Department Physician.

INVESTIGATION OF THE ACCIDENT

Ryan Carman, Safety Director, reported the accident to the Department of Labor National Contact Center (DOLNCC) at 4:35 p.m., on Monday, December 23, 2019. The DOLNCC called Larry Johnson, Field Office Supervisor, and Johnson notified the mine operator of their duty to ensure the safety and health of the miners and to preserve the accident scene. Michael Stark, Staff Assistant, dispatched Louis Bernatowicz, Electrical Specialist, and Jan Lyall, Roof Control Specialist, to the mine. A 103(k) order was issued upon arrival at the mine.

MSHA performed the accident investigation in conjunction with the West Virginia Office of Miner's Health, Safety, and Training, Ohio Valley Resources, Inc., and the United Mine Workers of America (see Appendix D). The accident investigation team was briefed and preliminary discussions were conducted with the day shift miners assigned to the belt move. The investigation team traveled to the accident scene to make observations, take measurements, and obtain photographs.

On Thursday, December 26, 2019, Nicholas Blevins, Mining Engineer - Roof Control, and Richard Show, Supervisory Roof Control Specialist, traveled to the accident site to obtain custody of the lever hoists, lever hoist chains, and belt grippers involved in the accident.

On Friday, January 3, 2020, the investigation team conducted interviews at the Murray Energy Training Center located near Moundsville, West Virginia.

DISCUSSION

General Overview of Cameron Corridor Section Belt Moves

The belt crews advance the section belt using written guidelines established by the mine operator. However, belt move crews have latitude to vary from these guidelines. The general guidelines are outlined below, as well as the procedure used when the accident occurred.

The Cameron Corridor belt is suspended by chain from the mine roof. New belt structure to be added is assembled underneath the suspended belt prior to the move.

General Belt Move Guidelines

1. A bottom belt splice is positioned at the tailpiece to start the move.
2. The belt drive power is deenergized and locked and tagged out.
3. The tailpiece is moved inby using the feeder and the tailpiece anchors are removed.
4. The feeder is then moved outby and the belt tension pulls the tailpiece outby until it stops.
5. If tension is still in the belt, belt structure may be removed and the feeder is used to push the tailpiece outby until the tension is completely removed from the belt.
6. The belt is then separated at a belt splice.
7. The belt crew connects the tailpiece to the preassembled belt structure and it is dragged into place as the feeder pulls the tailpiece inby.
8. The belt structure is raised and suspended from the mine roof.
9. The belt crew pulls the added belt in with a scoop, threads it through the tailpiece, and reconnects it with a splice.
10. The feeder is used to pull the tailpiece inby until the belt is tensioned and tailpiece anchors are installed.

Belt moves normally occur after the section advances 300 feet and require approximately 600 feet of belt to be added to the existing belt. Track spurs are installed from the track into the belt entry to facilitate handling the additional belt. The additional belt is placed on flat cars and parked under the suspended operating belt prior to the belt move.

Procedure Used at the Time of the Accident

The belt crew followed the general belt tailpiece move guidelines. They positioned the splice within 10 feet of the tailpiece. However, the other six belt crews normally positioned the splice 100 feet or greater outby the tailpiece. This crew also placed the belt grippers on the bottom belt at 67 block after the tailpiece was first moved outby. This was done to create sag where they positioned the splice. The belt grippers were not part of the guidelines, however, managers and miners stated that the crew members who normally worked together had used them in the past. The other crews did not use the belt grippers in this manner.

As previously explained, the tailpiece movement outby transferred the belt tension load to the belt grippers, lever hoist chains, and lever hoists on the bottom belt. The devices held the tension in approximately 2,760 feet of bottom belt between 67 block and 49 block. Jones and the other crew members stated they did not recognize the significant amount of tension that remained in the belt. Eventually, the stored energy from the clamped belt overcame the capacity of these devices and they failed. This sudden tension release caused the belt to become tight, pinning Starkey against the tailpiece.

Technical Support Evaluation

The MSHA Approval and Certification Center, Mechanical and Engineering Safety Division (A&CC) examined the belt grippers and the lever hoists used by the mine operator at the time of the accident. The A&CC used documentation and information from the manufacturers, obtained during the investigation, as a basis to evaluate the general condition of the devices and draw conclusions as to their use. Investigators determined that on one side of the belt, the lower jaw of one belt gripper failed. On the other side of the belt, the lever hoist chain failed. One of these failed first and caused the failure of the other.

The load limit (tension is an example of a load) for the belt grippers and lever hoist chains was 2,000 lb. pull each. The tension calculated in the belt, as configured at the time of the accident, exceeded the manufacturers' load limits for the belt grippers and lever hoist chains used.

Additionally, the documentation for the belt grippers states that their primary function is to provide a means to pull or maneuver loose belt into position for splicing or repair. Loose belt would have little to no tension.

Training and Experience

Starkey was hired at the Marshall County Mine on March 25, 2019, and received underground experienced miner training on March 27, 2019. He worked as a contractor for GMS Mine Repair and Maintenance for 6 months prior to his employment at this mine. Starkey's total mining experience was one year and four months. At the time of the accident, Jones was training Starkey to perform belt moves. Jones was performing the supervised operation portion of task training. The hazard of the tension stored in the belt was not identified and Starkey was allowed to work in a confined location inside the tailpiece structure.

ROOT CAUSE ANALYSIS

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

Listed below are the root causes identified during the investigation and the mine operator's corrective action to prevent a similar accident:

1. Root Cause: The Cameron Corridor belt was not adequately blocked against motion during the belt move.

Corrective Action: The mine operator revised and expanded their belt move procedure. The revised procedure requires the belt splice to be positioned at least 100 feet outby the tailpiece. It also requires all belt tension to be removed, which eliminates the need to clamp the belt near the tailpiece. Miners were trained in the revised procedure.

2. Root Cause: Adequate supervision was not provided while the victim was being task trained.

Corrective Action: The mine operator trained miners who perform the supervised portion of task training to ensure trainees are safe while they are being trained.

CONCLUSION

On December 23, 2019, at approximately 4:15 p.m., Raymond "Ray" Starkey Jr. (Starkey), a 21-year old general inside laborer, was fatally injured when he was caught between the 72-inch wide belt and the steel frame of the belt tailpiece. The accident occurred because the assembly holding the Cameron Corridor belt in place was not strong enough to withstand tension created during the belt move. The mine operator used belt grippers, lever hoist chains, and lever hoists that were not designed to withstand the forces generated during the move.

Carlos T. Mosley
District Manager

Date: _____

ENFORCEMENT ACTIONS

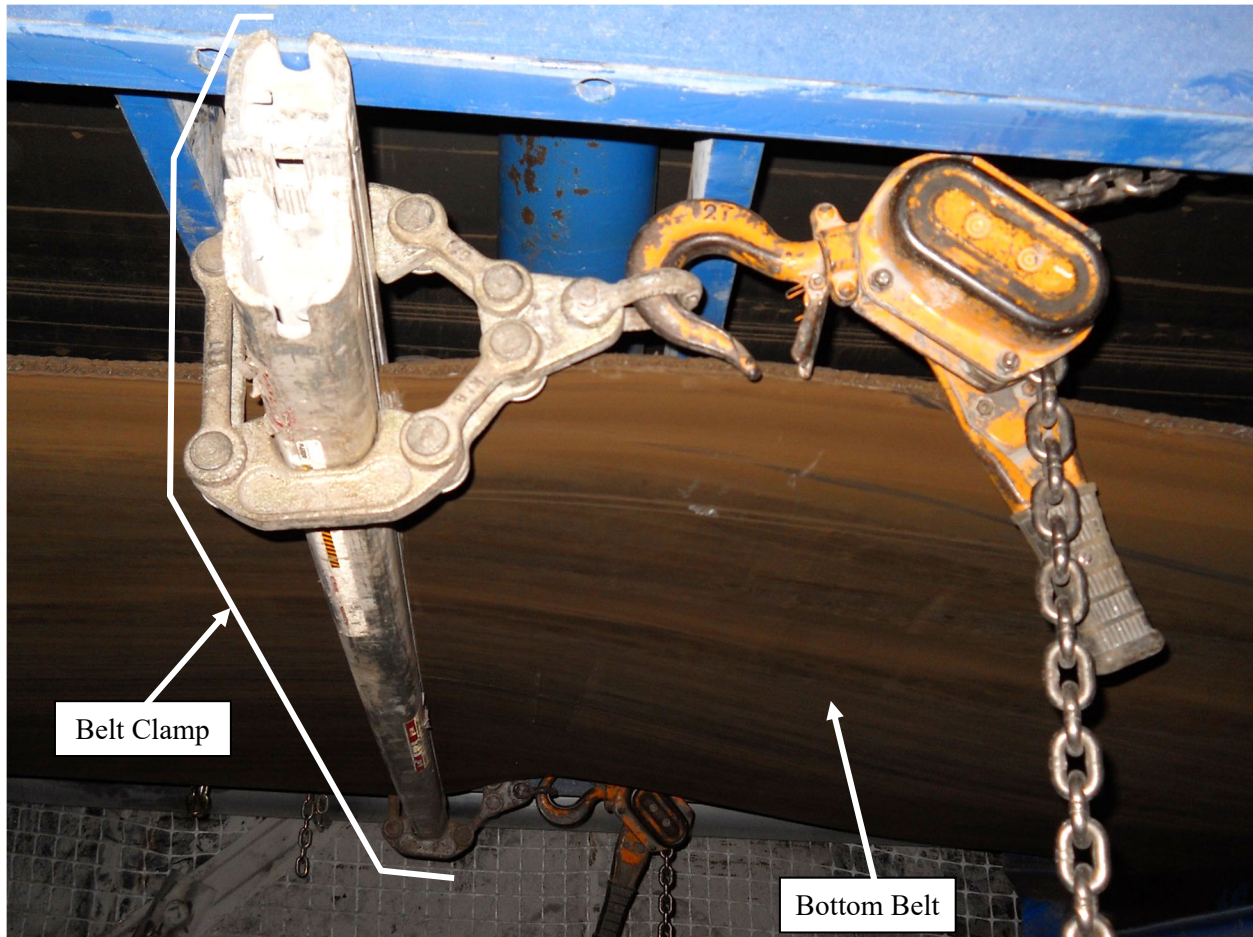
1. A 103(K) Order, Number 9126259, was issued to Marshall County Coal Company at 8:00 p.m., to ensure the safety of all persons at the operation and to prevent the destruction of any evidence which would assist in investigating the cause or causes of the accident until an investigation was completed and the area deemed safe.
2. A 104(a) citation was issued to Marshall County Coal Company for violation of 30 CFR § 75.1725(c)

On December 23, 2019, at approximately 4:15 p.m., a miner died while attempting to remove a splice pin from a belt splice. The belt was restrained with belt grippers placed on the bottom belt and tightened by lever hoists. The stored tension from the clamped belt overcame the capacity of these restraints and they failed. This sudden tension release caused the belt to become taut pinning the miner between the 72-inch belt and the steel frame of the belt tailpiece. The accident occurred because the Cameron Corridor Belt was not adequately blocked against motion.

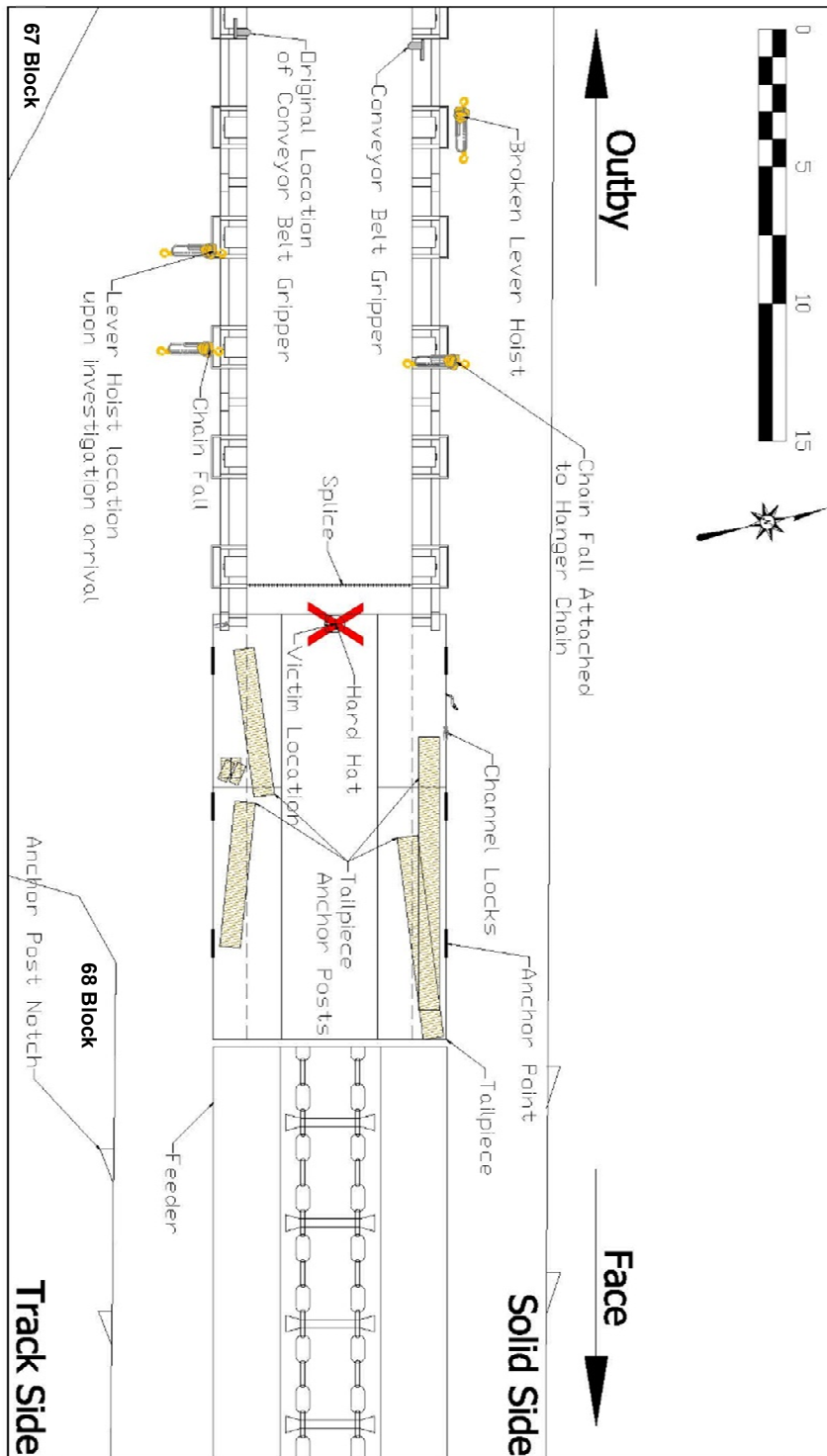
3. A 104(a) citation was issued to Marshall County Coal Company for violation of 30 CFR § 48.7(a)(2)(ii)

On December 23, 2019, a miner died during work on a belt move. At the time of the accident, the victim was in the process of being trained. The trainer was observing the miner's work to perform the supervised operation portion of task training. The trainer performed inadequate supervision because he allowed the miner to work in a confined location inside the tailpiece structure and did not identify and remove the hazard of the tension stored in the belt. The miner received fatal injuries when the belt grippers, lever hoist chains, and lever hoists holding the Cameron Corridor belt in place was not strong enough to withstand tension created during the belt move.

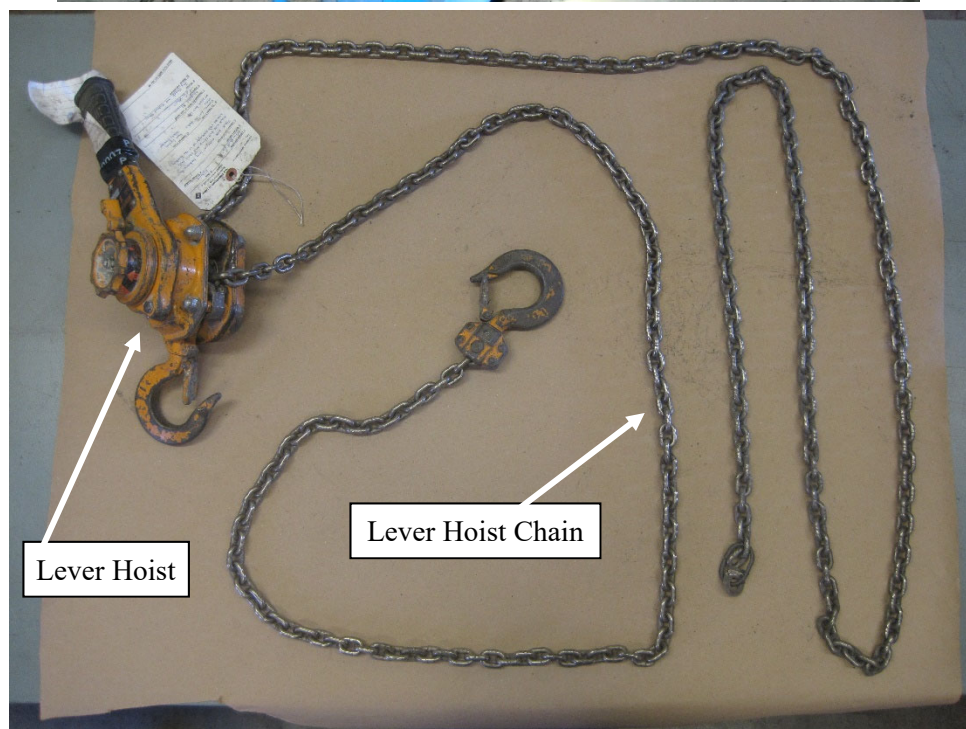
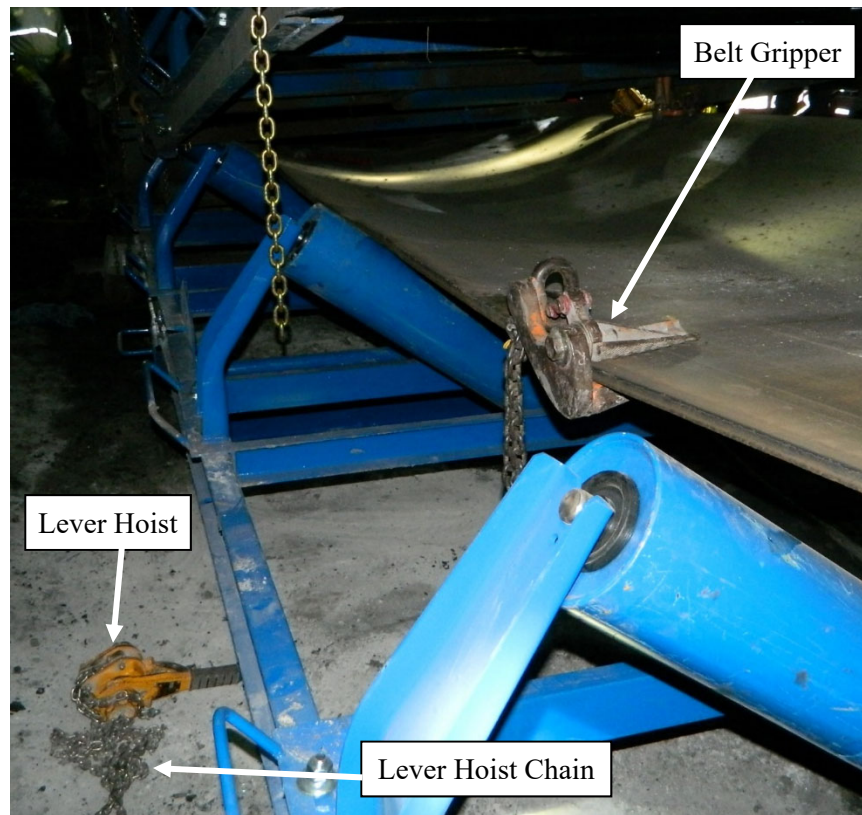
Appendix A
Photograph of Belt Clamp at 49 Block



Appendix B
Drawing of the Accident Scene at 67 Block



Appendix C
Photographs of Lever Hoist, Lever Hoist Chain, and Belt Gripper at 67 Block



Appendix D
Persons Participating in the Accident Investigation

Marshall County Coal Company

Allen McGilton	Corporate Safety
Ron Van Horne	Corporate Safety
Drew Dally	Superintendent
Ryan Carman	Safety Director
Jeremi Hossman	Safety Inspector
Mike Hummel	Belt Coordinator
Terry Smitley	General Inside Laborer
Justin Nething	Beltman
Allen Goddard	Beltman
Devan Potts	Beltman
Kevin Bradshaw	General Inside Laborer
Brian Hammerquist	General Inside Laborer
Trey Scott	Beltman
Greg Jones	Belt Foreman

United Mine Workers of America

Ron Bowersox	International
Tom McGary	International
Dan Rine	President, Local 1638
Ryan Sparks	Safety Committeeman, Local 1638
Corey Lykeski	Safety Committeeman, Local 1638

West Virginia Office of Miner's Health Safety and Training

Ed Peddicord	Inspector at Large
John Meadows	Assistant Inspector at Large
Bill Coen	District Inspector
Jeff Bennett	District Inspector
Art Wood	District Inspector

Mine Safety and Health Administration

Louis Bernatowicz	Electrical Specialist
Jan Lyall	Roof Control Specialist
Michael Stark	Staff Assistant
Richard Show	Supervisory Roof Control Specialist
Scott Chiccarello	Training Specialist
Nicholas Blevins	Mining Engineer - Roof Control
Russell Stackpole II	Mechanical Engineer - Technical Support