

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Roof Fall Accident
February 20, 2015

Heilwood Mine
Rosebud Mining Company, Inc.
Heilwood, Indiana County, Pennsylvania
I.D. Number 36-09407

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ACCIDENT SITE



**NUMBER 2 SLOPE ENTRY, APPROXIMATELY 170 FEET INBY SURVEY STATION
NUMBER 4794 IN THE A MAINS SECTION**

OVERVIEW

On Friday, February 20, 2015, at approximately 2:05 p.m., Todd Trimble (victim), a 29-year-old roof bolter helper with 3 years and 11 months of total mining experience, was fatally injured when he was struck by a large section of roof rock. Trimble was between the last full row of permanently installed roof bolts and the automated temporary roof support (ATRS), installing wire roof screen in the number 2 slope entry of A Mains. The large roof rock fell between the last row of permanent supports and the ATRS, pinning the victim against the drill head canopy, causing fatal crushing injuries. The roof rock measured 0.25 to 1.3 feet in thickness, 3 feet in width, and 11.5 feet in length. Trimble was preparing to install permanent supports when he was struck by the rock.

GENERAL INFORMATION

The Heilwood Mine is an underground coal mine operating in the Lower Kittanning seam, located at Heilwood, Indiana County, Pennsylvania. The mine is operated by Rosebud Mining Company. Bituminous coal is mined at this operation with the room and pillar method of mining, utilizing one section. The mine operator was developing three slope headings from the Lower Kittanning Seam (B Seam) to the Brookville seam (A Seam). The mine operates two nine-hour production shifts and one maintenance shift, five to six days a week. The mine employs 40 people with 35 working underground and 5 on the surface. The average production, while mining the Lower Kittanning seam, was 625 tons of raw coal per day.

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

J. Clifford Forrest.....	President
David S. Doney.....	General Mine Manager
Scott Troutman.....	Superintendent
Barry Houser.....	Mine Foreman
Stanley Popich.....	Manager of Safety and Health

The Mine Safety and Health Administration (MSHA) completed a regular safety and health inspection (E01) at this mine on February 18, 2015. The Non-Fatal Days Lost (NFDL) injury incidence rate for this mine during the period of January through December 2014 was 3.10, compared to a national rate of 3.28 for this type of mine.

DESCRIPTION OF ACCIDENT

On Friday, February 20, 2015, the daylight shift crew for the A Mains Section (MMU 001-0) travelled underground at 6:00 a.m in a diesel-powered mantrip to the section. The section crew arrived on the A Mains Section at approximately 6:30 a.m. After they arrived, Jeremy Mumau, Section Foreman, conducted an onshift examination of the faces and the rest of the crew conducted pre-operational examinations of the mining equipment. Arron Mumau and Trimble were the normal operators for the roof bolting machine on the A Mains Section.

The roof bolting machine was located in the face area of the number 3 entry, which was not fully bolted when they arrived on the section (see Appendix A). After performing the pre-operational examination, A. Mumau and Trimble finished bolting the number 3 entry. The continuous mining machine operator, Jim Frantz, mined 10 feet in the number 4 entry, and then trammed the mining machine into the number 2 entry. A. Mumau and Trimble trammed the roof bolting machine from the number 3 entry to the number 4 entry. They began installing roof bolts in the number 4 entry while Frantz mined 10 feet from the face of number 2 entry.

Frantz finished mining in number 2 entry and trammed the mining machine into the number 3 entry to trim bottom to build and install bridges. A. Mumau and Trimble finished bolting the number 4 entry and trammed the roof bolting machine from the number 4 entry into the number 2 entry (see Appendix B).

In the number 2 entry, A. Mumau and Trimble installed one row of roof bolts as the primary roof supports and one row of cable bolts as supplemental roof supports. There was approximately 10 feet between the last full row of bolts and the face in the number 2 entry. A. Mumau trammed the roof bolting machine inby and positioned the ATRS with the inby edge of the ATRS pads 5 feet inby the last full row of roof supports.

At approximately 2:05 p.m., Trimble was positioned between the roof bolting machine drill mast and the ATRS. Witnesses stated that Trimble was attaching support wire to the previously installed wire roof screen and the piece of wire roof screen that would be installed. A large piece of roof rock that measured 0.25 to 1.3 feet in thickness, 3 feet in width, and 11.5 feet in length, fell from the roof. The rock fell in such a manner that the ATRS could not prevent the rock from hitting Trimble. The edge of the rock closest to Trimble struck and pinned him in an upright position against the roof bolting machine drill canopy.

A. Mumau was operating the left side of the roof bolting machine. He was looking toward the rear of the machine to ensure that the rear was not dragging on the bottom when he heard the rock fall. A. Mumau turned around to find Trimble pinned by a rock against the drill canopy. A. Mumau rushed outby shouting for help. J. Mumau and scoop operators Paul Polenik and Cody Engle were loading a bridge conveyor onto a scoop just outby the last open crosscut in the number 2 entry.

J. Mumau went to the roof bolting machine and returned to the last open crosscut to tell Polenik and Engle to not go to the accident scene because of the extent of the victim's injuries. He also instructed Engle to go to the intake entry and notify Barry Houser, Mine Foreman, about the

accident. Jeremiah Blake, Utility Man, was helping Frantz hang the continuous mining machine trailing cable in the number 4 entry when they heard shouting. They went to the number 2 entry, where J. Mumau stopped them and told them to go to the intake with the rest of the crew.

Engle placed the call to the surface. Paul Sieczkowski, Mine Clerk, received the call and told Houser that a man was hit by a rock. Houser took the phone and asked about the extent of Trimble's injuries. Cody responded that he believed Trimble was dead. Houser told Sieczkowski to notify MSHA and the State. Thomas (Sammy) Bassaro, Mine Examiner, had completed his preshift examination and was on the surface. He followed Houser to the section on a mantrip.

Justin Rebuck, Second Shift Section Foreman, arrived on the section. J. Mumau told him about the accident. Houser arrived, went to the accident scene, and walked outby to tell Bassaro to get a hydraulic pump jack from his mantrip. Bassaro returned and gave the pump jack to Houser. Houser boarded the roof bolting machine and set the pump jack against the roof bolting machine and the fallen rock. He used the jack to free the victim.

Houser, Rebuck, and J. Mumau transported the victim to the number 4 entry. They placed him onto a mantrip and transported him to the surface. Jerry L. Overman Jr., Coroner, and Steve Alexander, Deputy Coroner, arrived at the mine site where Overman pronounced the victim dead at 4:30 p.m.

INVESTIGATION OF ACCIDENT

At 2:19 p.m. on February 20, 2015, Sieczkowski notified the MSHA call center of the accident. The call center notified Deborah Moberg, the District Manager's Secretary, of the accident at 2:38 p.m. David Weakland, Indiana Field Office Supervisor, issued a verbal 103(j) order to the mine operator at 3:00 p.m. Richard Gray, Kittanning Field Office Supervisor; John Burda, Roof Control Specialist; James Miller, Coal Mine Inspector; Kerry Miller, Roof Control Specialist and Lead Accident Investigator; and Michael Gauna, Mining Engineer from MSHA's Approval and Certification Center (AC&C), were notified and dispatched to the mine.

Gray, Burda, and J. Miller arrived at the mine and obtained preliminary statements from persons with knowledge of the facts and circumstances concerning the accident. Gray began reviewing mine tracking information. Training records were requested and obtained from the mine operator. K. Miller, Lead accident Investigator, arrived and modified the 103(j) order to a 103(k) order to ensure the safety of all persons during the accident investigation and to preserve all evidence at the accident scene.

Witness interviews were conducted on February 20, 2015, at the Heilwood Mine training area with persons that had knowledge of the facts and circumstances of the accident. The MSHA investigators traveled underground along with inspectors from the Pennsylvania State Bureau of Mine Safety and mine officials. Investigators photographed the accident scene and took measurements of the area and the roof bolting machine.

Additional interviews were conducted on February 23, 2015, with all roof bolters. MSHA personnel also conducted second interviews with J. Mumau, Houser, and A. Mumau.

A list of the persons who participated in the investigation and those who were interviewed is contained in Appendix C.

DISCUSSION

Accident Scene

The accident occurred in the number 2 slope entry, approximately 170 feet inby survey station number 4794 in the A Mains section, MMU 001-0. The mining height at the accident scene averaged 8.3 feet and the width of the number 2 entry was 19 feet. The immediate mine floor consisted of gray shale, with pockets of shale bedding that were broken out forming undulations in the mine floor. The mine ribs were in good condition, showing no signs of sloughage and consisted of shale partings throughout the mining height.

The last section of wire roof screen installed was not square with the number 2 entry. The left side of the wire roof screen extended 20 inches inby the last row of permanent roof supports. The right side of the wire roof screen panel extended 52 inches inby the last row of permanent roof supports. Immediately outby, in the region above the roof bolting machine, steel channels with fully grouted bolts were installed where the spacing between each bolt ranged from 3.2 to 3.8 feet. Channels with the vertical cable bolts were positioned between the channels installed with fully grouted roof bolts.

The rock that struck Trimble was found leaning against the main support of the ATRS, on the right side drill canopy and the other end on the mine floor with the inby edge approximately 5 inches outby the back edge of the ATRS. The placement of the rock suggests that the rock did not contact the ATRS. The rock measured 0.25 to 1.3 feet in thickness, 3 feet in width, and 11.5 feet in length. The rock weighed approximately 4,400 pounds. The rock was shaped similar to a parallelogram.

The roof bolting machine had not been moved when accident investigators arrived at the scene. A pump jack was installed between the top of the drill canopy and the rock to free the victim. The piece of wire roof screen that the victim and A. Mumau were preparing to install measured 5 feet wide by 14 feet in length.

Geological Conditions on the A Mains Section

Overburden at the accident site was approximately 690 feet. No undermining or over mining with older workings exists in the vicinity of the slope. The number 2 entry had been developed to the top of the Brookville Seam but had not yet reached the coal. Weak bedding contacts are where layers of roof strata may separate from each other. A 15 percent downward entry slope formed ledges in the roof as a result of the relatively horizontal bedding. Because of the weak

bedding contacts, as the mining cut is advanced down slope, roof stratum can peel away from other roof stratum until the roof strata is sufficiently thick enough to remain intact and not peel away.

In this manner, ledges or brows are formed in the roof. The accident site where roof bolting was being conducted was in such a transition zone as the bolting was advancing towards a ledge in the mining cut. The mine roof where roof bolts had been installed, the mine roof was the bottom of an overlying gray shale bed. A general lack of continuous mining machine cutting bit marks in this roof for the last 8-foot distance of roof support installation indicated that the underlying gray shale bed easily peeled away from the overlying shale bed at the contact.

Inby the last installed roof support, a brow ran diagonally across the entry towards the inby right hand corner of the cut at roughly a 10° angle to the last installed roof support. After the accident, the bottom exposed portion of the brow where the roof remained intact and where it was initially cut began roughly 4.5 feet from the left side rib. The top exposed portion of the brow where it was in contact with the overlying shale bed began roughly 6 feet from the left pillar rib (see Appendix D). The exposed surface of the brow, in the right side half of the entry, dipped inby towards the end of the cut at roughly 55° from horizontal, forming a roughly 2.5-foot wide exposed face that was created by the fallen rock.

Roof Control Plan and Addendum at Time of Accident

The last fully revised and consolidated roof control plan for this mine was approved on September 18, 2013. A slope addendum was approved on September 17, 2014, for the procedures and precautions for development of three slopes from the lower Kittanning seam (B Seam) to the Brookville coal seam (A Seam). The plan permitted a maximum mining width of 20 feet and required the roof to be supported with fully-grouted roof bolts at least 48 inches long in normal mining conditions. The slope plan required the roof to be supported with fully-grouted roof bolts at least 72 inches long with stipulations that when encountering coal seams, bed separations, defective roof conditions, an obvious or predominant slip, or a visible clay vein fault, supplemental roof support will be installed.

The maximum cut depth was limited to 20 feet in the slope plan. The maximum cut depth listed in the approved roof control plan was limited to 30 feet due to adverse roof conditions in the Lower Kittanning coal seam. At the time of the accident, the mine operator had limited the cut depth to 10 feet because of adverse roof conditions and anticipated mining into the Brookville seam. The Brookville seam had been mined in 2 of the 3 entries. At the time of the accident the mine was in compliance with all measurements and distances required by the roof control plan slope addendum.

Roof Bolting Practices at this Mine

The primary roof supports on this section consisted of 6-foot long, fully grouted resin bolts, ¾ inches in diameter with a steel grade of “60” installed through a minimum T-3 channel. The roof bolts were on a bolt pattern, with a maximum of 4 feet between bolts, a minimum of 4 bolts per

