

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Fall of Roof Accident
April 20, 2006

No. 1
Tri Star Coal L.L.C.
Phelps, Pike County, Kentucky
ID No. 15-18102

Accident Investigators

Robert J. Newberry
Mining Engineer

Darrell E. Hurley
Roof Control Specialist

Originating Office
Mine Safety and Health Administration
District 6
100 Fae Ramsey Lane
Pikeville, KY 41501
Kenneth A. Murray, District Manager

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LEGEND

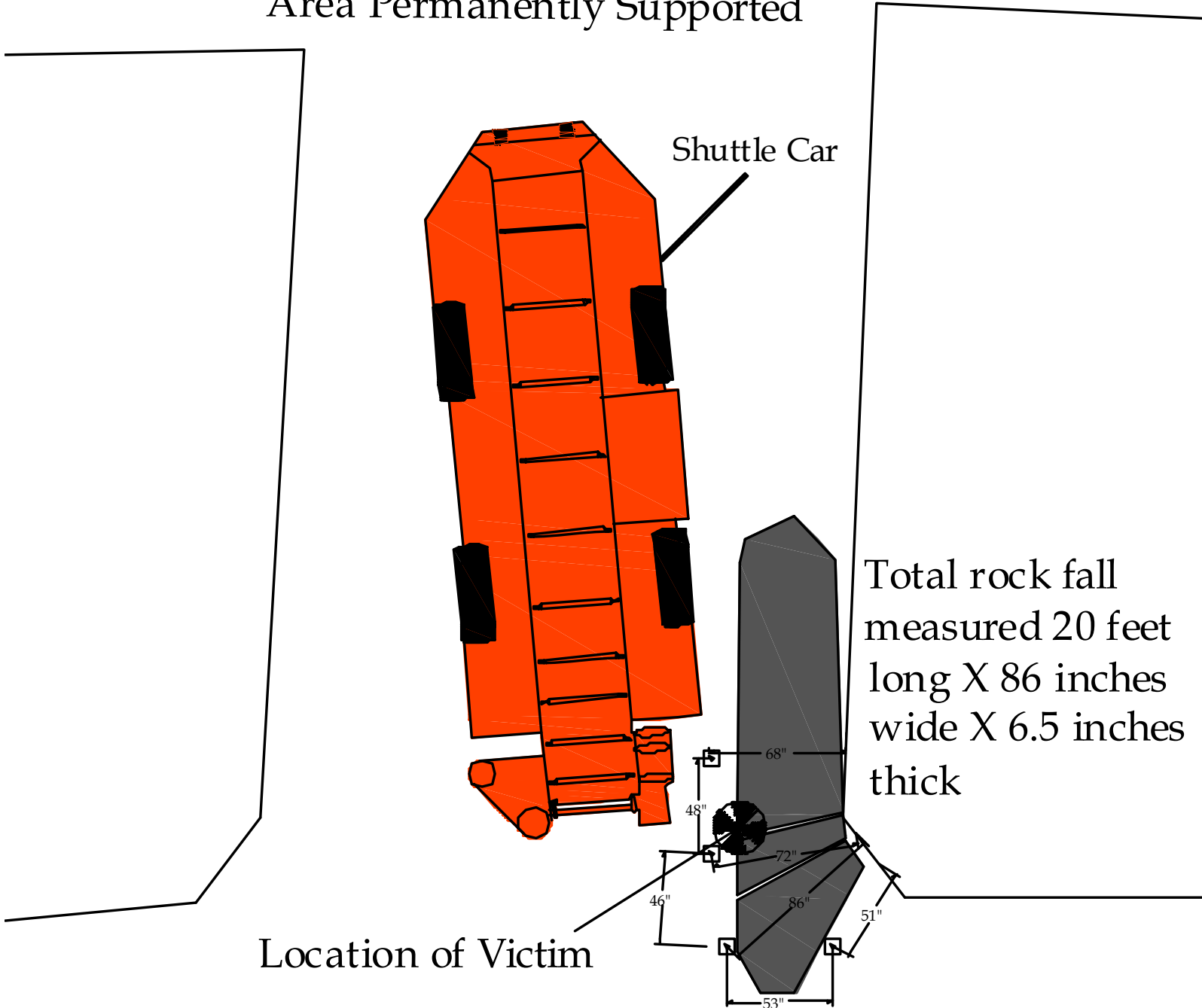


60" Resin Bolt
NOT TO SCALE



Spad #338

Area Permanently Supported



Location of Victim

Sketch of Accident Scene
Fatal Fall of Roof Accident
Tri Star Coal, LLC.
Mine #1
MSHA ID No. 15-18102
April 20, 2006



Photograph of Accident Scene

OVERVIEW

On April 20, 2006, David Bolen, a 28-year-old shuttle car operator, was fatally injured in a roof fall accident on the 002-0 MMU Section. Bolen had 2 years of total mining experience and had worked nine weeks at this mine.

The accident occurred as Bolen was returning to his shuttle car after moving the cable anchor location and scouting his route of travel to the continuous mining machine. A section of roof rock measuring approximately 20 feet by 86 inches by 6.5 inches thick fell from between the roof bolts and the coal rib. The rock struck Bolen pinning him against the mine floor, causing fatal crushing injuries.

The accident occurred because mine management failed to ensure adequate examinations were being conducted to identify and correct hazardous roof conditions.

GENERAL INFORMATION

Tri Star Coal L.L.C., No. 1 Mine, is located 0.27 miles east of the intersection of Routes 194 and 319 near, Freeburn, Pike County, Kentucky. Tri Star Coal L.L.C., No. 1 Mine is opened into the Alma coal seam, which averages 96 inches in height. The mine has been in active status since October 21, 2005.

The principal officials for Tri Star Coal L.L.C., at the time of the accident were:

Robert Stump	Member
Eddie Delong	Member
Jerry Maggard	Superintendent
Danny Ratliff	Section Foreman

Coal is produced on one active retreat section using a remote control continuous mining machine and shuttle cars. Underground conveyor belts are utilized to transport the coal to the surface. The mine produces an average of 1000 tons of raw coal per day and employs 9 persons. Coal is produced during one 8-hour shift, five days per week. A regular safety and health inspection by the Mine Safety and Health Administration (MSHA) was ongoing at the time of the accident.

DESCRIPTION OF ACCIDENT

On Thursday, April 20, 2006, at approximately 6:00 a.m., Danny Ratliff, Section Foreman, entered the mine and walked approximately 1400 feet to the 002 Mechanized Mining Unit (MMU). Ratliff was accompanied by Gerald Robinette, Timberman/Roof Bolting Machine Operator, Barry Smith, Shuttle Car Operator, and David Bolen, Shuttle Car Operator.

The day shift normally begins at 7:00 a.m., but they had arrived early to help complete a section move that had begun during the previous shift. The belt feeder and power center were moved back and the continuous miner was moved from the No. 1 heading across the section to the No. 8 heading. The section move continued throughout the shift.

Bolen had hung the cable anchor for the shuttle car he operated and had walked to the continuous mining machine to examine his route of travel. As he was returning to his shuttle car at approximately 2:30 p.m., a section of roof rock measuring 20 feet by 86 inches by 6.5 inches thick fell from between the rib and the roof bolts pinning Bolen against the mine floor causing fatal injuries.

INVESTIGATION OF ACCIDENT

Jerry Maggard, Superintendent for Tri Star Coal L.L.C., No. 1, notified MSHA of the accident at 2:45 p.m. on April 20, 2006. A 103(k) order was issued to secure the accident scene while the investigation was conducted and to ensure the safety of any persons in the mine. An investigation was conducted in cooperation with State officials.

Interviews were conducted with nine miners and management officials deemed to have knowledge of the facts regarding the accident. The interviews were conducted at the State Office of Mine Safety and Licensing office on April 21, 2006, and at the MSHA District 6 office on April 26, 2006, in Pikeville, Kentucky.

DISCUSSION

Geologic Conditions

The immediate roof at Tri Star Coal L.L.C., No. 1 is comprised of laminated gray sandy shale. The Alma coal seam thickness averages 96 inches.

Maximum overburden depth over the active section was approximately 220 feet, with overburden at the accident site estimated to be 150 feet. The mining height just outby the accident site was typically 96 inches across the section and the entry width was typically 20 feet.

Roof Control

The maximum cut depth permitted by the roof control plan was 30 feet. The roof was supported with 5-foot long, fully grouted, grade 60, No. 5 rebar and 6-inch by 6-inch plates. Bolts were installed on 4-foot centers.

Roof Fall Conditions

The fatal roof fall occurred in the No. 6 entry, approximately 68 feet from the pillar line breaker posts. The fall was approximately 20 feet in length, 86 inches in width, and 6.5 inches in thickness. The fall area was located on the right side of the No. 6 entry between the roof bolts and the coal rib. A rib roll had occurred at least several days earlier and had been cleaned up to provide clearance for the belt conveyor/travelway. This rib roll created an area of excessive roof bolt spacing measuring from 56 inches to 86 inches and excessive entry widths ranging from 22 feet 4 inches to 23 feet 6 inches beginning at the outby corner of the pillar block and extending approximately 12 feet inby. The approved roof control plan specifies that roof bolts be maintained within 4 feet of the coal rib and 20 feet maximum entry width.

Mine Examinations

The roof fall area where the accident occurred was part of the active working section for several days. The section dumping point had been at this location and was part of the area where preshift and on-shift examinations were required. Information obtained in interviews of persons working in the area revealed that the rib roll had existed for some time as evidenced by the location of two one-gallon containers setting on a ledge on the coal and rock rib. Hazardous conditions related to the excessive roof bolt to rib spacing at this location were not reported in the operator's records of examinations.

ROOT CAUSE ANALYSIS

An analysis was conducted to identify the most basic causes of the accident. Root causes were identified that, if eliminated, would have either prevented the accident or mitigated its consequences.

Listed below are causal factors identified during the analysis and their corresponding corrective actions implemented to prevent a recurrence of the accident:

Root Cause: Mine management did not ensure that the approved roof control plan was being complied with on the 002-0 MMU working section. Obvious excessive entry width and bolt spacing were present in the No. 6 heading of the 002-0 MMU working section. This condition was present for at least 3 days at the section dumping point. The entry width was approximately 22 to 23 feet and the distance between the coal rib and the roof bolts ranged between 51 inches and 86 inches over a distance of approximately 12 feet in the No. 6 heading. The approved roof control plan specifies a maximum entry width of 20 feet and maximum bolt spacing of 4 feet between the roof bolts and the coal rib. No additional support was installed to correct this obvious hazardous condition.

Corrective Action: All persons working at this mine were given additional training covering the roof control plan and identification and correction of roof hazards. Additionally the roof control plan was revised to reduce the entry widths to 18 feet and reduce the distance between the roof bolts and the rib to 3 feet. All mine equipment was removed from the area inby survey station 336 where the accident occurred, breaker timbers were set across each entry and the area was posted with danger signs.

Root Cause: Mine management did not ensure that adequate pre-shift examinations were being conducted to identify hazardous conditions and to implement corrective measures. The pre-shift examination conducted on each working shift between April 16, 2006 and April 20, 2006, in the haulage way of the 002-0 MMU working section failed to detect and subsequently correct the hazardous roof condition created by the excessive entry width and wide roof bolt spacing which existed in the No. 6 heading. This condition had existed for at least 3 days at the section dumping point.

Corrective Actions: The certified examiners conducting examinations at this mine received additional training relative to identifying hazards associated with changing roof conditions and the specifications contained in the roof control plan.

Root Cause: Mine management did not ensure that adequate on-shift examinations were being conducted to identify hazardous conditions and to implement corrective measures. The on-shift examinations conducted on each working shift between April 16, 2006 and April 20, 2006, in the haulage way of the 002-0 MMU working section failed to detect and subsequently correct the hazardous roof conditions created by the excessive entry width and wide roof bolt spacing which existed in the No. 6 heading.

Corrective Actions: The operator had all working places and work areas examined and hazardous conditions were recorded. All underground personnel were trained in workplace examination and recognizing hazardous roof conditions.

CONCLUSION

The accident occurred when the victim was walking through an area where wide bolt spacing and excessive entry widths existed. The combination of the laminated strata coupled with the area of unsupported roof created by the rib roll clearly constituted a hazardous roof condition. The accident resulted from failure to identify hazards associated with wide bolt spacing and laminated strata, inadequate examinations and failure to take additional measures to install roof support as defined in the approved roof control plan.

APPROVED BY:

Kenneth A. Murray
District Manager

Date

ENFORCEMENT ACTIONS

1. A 103(k) Order, No. 7415703, was issued on April 20, 2006.

Condition or Practice: "This mine has experienced a fatal roof fall accident on the 002 Section. This order is issued to assure the safety of all persons at the mine. It prohibits all activity at the mine until MSHA has determined that it is safe to resume normal mining operations. The mine operator shall obtain prior approval from an authorized representative for all actions to recover and/or restore operations to the affected area."

2. A 104(d)(1) Order, No. 7425542, was issued to Tri Star Coal L.L.C. for a violation of 30 CFR 75.220(a)(1)

Condition or Practice: On April 20, 2006, a shuttle car operator was fatally injured when was struck by draw rock as he was traveling up the No. 5 heading to enter the operator's compartment of a Joy 10SC Shuttle Car on the 002-0 MMU working section.

The approved roof control plan was not being complied with on the 002-0 MMU working section. Obvious excessive entry width and bolt spacing were present in the No. 5 heading of the 002-0 MMU working section. This condition was present for at least 3 days at the section dumping point. The entry width was approximately 22 to 23 feet and the distance between the coal rib and the roof bolts ranged between 51 inches and 86 inches over a distance of approximately 16 feet in the No. 5 heading. The approved roof control plan specifies a maximum entry width of 20 feet and maximum bolt spacing of 4 feet between the roof bolts and the coal rib. No additional roof support was installed to correct this obvious hazardous condition.

This area was required to be examined as part of the pre-shift and on-shift examinations made on each working shift for at least 3 days. No hazards related to this area were recorded in the pre-shift or on-shift examination records.

3. A 104(d)(1) Order, No. 7425433, was issued to Tri Star Coal L.L.C. for a violation of 30 CFR 75.362.

Condition or practice: "On April 20, 2006, a shuttle car operator was fatally injured when he was struck by draw rock as he was traveling up the No. 5 heading to enter the operator's compartment of a Joy 10SC Shuttle Car on the 002-0 MMU working section.

The certified persons conducting on-shift examinations on each working shift between April 18, 2006 and April 20, 2006 in the haulage way of the 002-0 MMU working section failed to detect and subsequently correct the hazardous roof

condition created by the excessive entry width and wide roof bolt spacing which existed in the No. 5 heading. This condition had existed for at least 3 days at the section dumping point. The entry width was approximately 22 to 23 feet and the distance between the coal rib and the roof bolts ranged between 51 inches and 86 inches over a distance of approximately 16 feet in the No. 5 heading. The approved roof control plan specifies a maximum entry width of 20 feet and maximum bolt spacing of 4 feet between the roof bolts and the coal rib. No additional roof support was installed to correct this obvious hazardous condition.

This area was required to be examined as part of the on-shift examinations made on each working shift for at least 3 days. No hazards related to this area were recorded in the on-shift examination records.”

4. A 104(d)(1) Order, No. 7425433, was issued to Tri Star Coal L.L.C. for a violation of 30 CFR 75.360.

Condition or Practice: “On April 20, 2006, a shuttle car operator was fatally injured when he was struck by draw rock as he was traveling up the No. 5 heading to enter the operator's compartment of a Joy 10SC Shuttle Car on the 002-0 MMU working section.

The certified persons conducting pre-shift examinations on each working shift between April 18, 2006, and April 20, 2006, in the haulage way of the 002-0 MMU working section failed to detect and subsequently correct the hazardous roof condition created by the excessive entry width and wide roof bolt spacing which existed in the No. 5 heading. This condition had existed for at least 3 days at the section dumping point. The entry width was approximately 22 to 23 feet and the distance between the coal rib and the roof bolts ranged between 51 inches and 86 inches over a distance of approximately 16 feet in the No. 5 heading. The approved roof control plan specifies a maximum entry width of 20 feet and maximum bolt spacing of 4 feet between the roof bolts and the coal rib. No additional roof support was installed to correct this obvious hazardous condition.

This area was required to be examined as part of the pre-shift examinations made prior to each working shift for at least 3 days. No hazards related to this area were recorded in the on-shift examination records.”

APPENDIX A

List of Persons Participating in the Investigation

Tri Star Coal L.L.C. Officials

Jerry Maggard	Superintendent
Danny Ratliff	Day Shift Section Foreman
Barry Smith	Shuttle Car Operator
Christopher Smith	Continuous Mining Machine Operator
David Luke	3 rd Shift Section Foreman
Gerald Robinette	Timberman
Larry Akers, Jr.	Belt Man
John Gregory Harlow	Scoop Operator
Quincy Deal Harvey	Belt Man

Kentucky Office of Mine Safety and Licensing

Mike Elswick	District Supervisor
Greg Goins	Accident Investigator
Chester Flint	Safety Inspector
Tracy Stumbo	Chief Accident Investigator
Worley Taylor	Safety Inspector

Mine Safety and Health Administration

Darrell E. Hurley	Mine Safety and Health Specialist
Robert G. Hardman	Acting District Manager
Robert Newberry	Mining Engineer
Benny Freeman	Assistant District Manager - Enforcement
Michael Wolford	Supervisory Mine Health and Safety Inspector
Chester Slone	Mine Safety and Health Inspector