CAI-2015-09

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Machinery Accident
September 16, 2015

Onton #9 Mine
Sebree Mining LLC
Sebree, Webster County, Kentucky
ID No. 15-18547

Accident Investigators

Charles Ramsey
Mine Safety and Health Inspector

Louis Adams
Mine Safety and Health Inspector/Electrical

Originating Office
Mine Safety and Health Administration
District 10
100 YMCA Drive
Madisonville, KY 42431
Mary Jo Bishop, Acting District Manager

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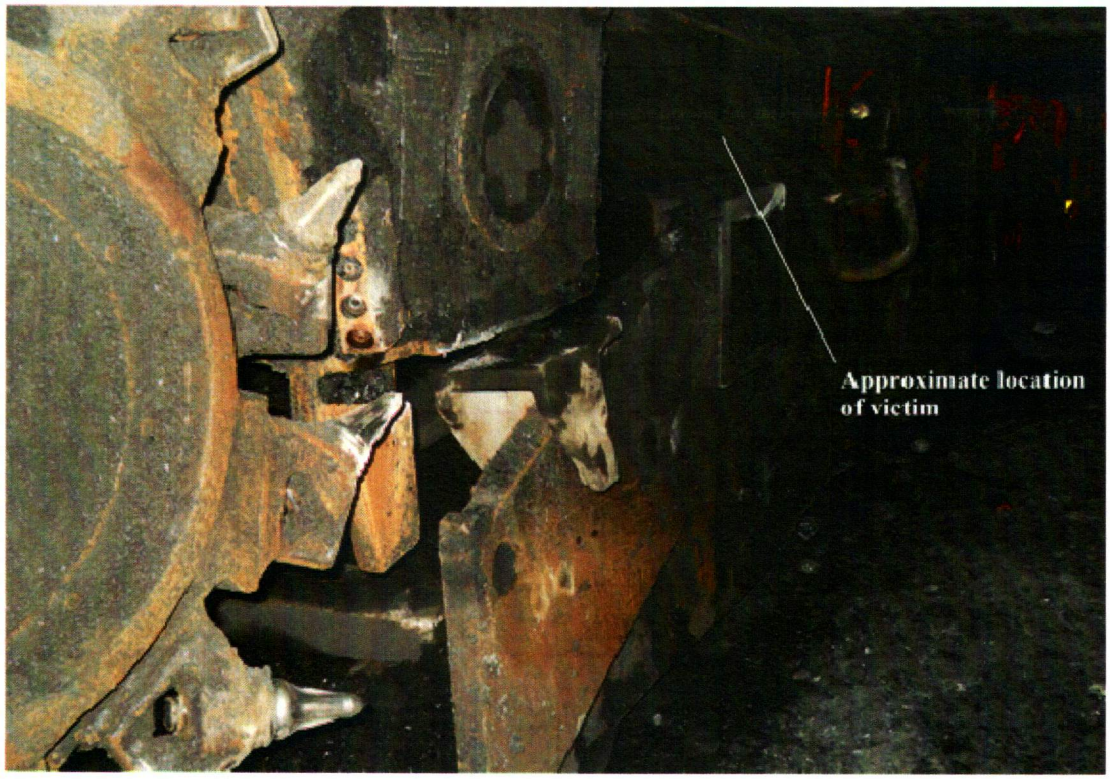


OVERVIEW

On Wednesday, September 16, 2015, at approximately 2:00 a.m., a 29-year-old electrician with approximately nine years of mining experience was fatally injured while replacing a load locking valve on a cutting head support jack on a continuous mining machine. The victim had removed the load locking valve on the operator's side of the cutting head support jack. When the victim leaned under the cutter head boom, the blocking material under the continuous mining machine's cutting head failed, allowing the cutter head boom to collapse into the pan causing crushing injuries to the victim.

The accident occurred because management failed to establish adequate blocking protocols to be used when working under suspended components of machinery.

GENERAL INFORMATION

The Onton #9 Mine is owned and operated by Sebree Mining LLC, a subsidiary of Alliance Resource Partners, LP. The mine is located at 3603 State Route 370 E in Sebree, Kentucky and is developed in the Kentucky No. 9 coal seam. The seam averages about 5 feet in height. At the time of the accident, the mine employed 288 personnel, of which 234 worked underground.

The mine is accessed by a dual purpose slope. A conveyor belt is installed in the upper portion of the slope. The bottom portion of the slope is used to transport miners and materials into and out of the mine. The mine has one return and two intake air shafts. The mine is ventilated by one exhausting main fan connected to the mine via a vertical shaft opening from the coal seam to the surface.

Miners work five days per week. There are two production shifts and one maintenance shift each day. The mine produces an average of 10,900 raw tons of coal each day and operates four mechanized mining units (MMU), utilizing the room and pillar method of mining. Coal is then transported to the surface via a conveyor belt system.

This mine liberates 1,834,261 cubic feet of methane in a 24-hour period and is on a 5-day spot inspection for excessive methane in accordance with Section 103(i) of the Mine Act.

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

Dan Durham ..... General Mine Manager
Chris Williams ..... Safety Manager
Mark Ramage ..... Mine Manager

At the time of the accident, a regular (E01) safety and health inspection was in progress by the Mine Safety and Health Administration (MSHA). The previous regular safety and health inspection of the mine was completed on June 29, 2015. The Non-Fatal Days Lost (NFDL) rate for this mine in 2014 was 4.19. The national NFDL rate for mines of this type in 2014 was 3.31.

DESCRIPTION OF ACCIDENT

On Tuesday, September 15, 2015, Rickey A. Thorpe, Jr. (victim), Electrician, started his maintenance shift at approximately 11 p.m. at the Onton # 9 Mine. Thorpe left the surface at 11:13 p.m., traveling underground on a mantrip with No. 3 unit miners to be dropped off at his golf cart. A layout of the No. 1 Unit is shown in APPENDIX A. Thorpe arrived on No. 1 unit at 12:33 a.m. Lead electrician Nicky Stevens assigned maintenance responsibilities to electricians James Maynard and Rickey Thorpe. The third shift maintenance crew waited until approximately 1:00 a.m. for the second shift crew to conclude production before beginning their normal activities.

Stevens began his activities by changing a throat water spray located above the conveyor on the right side of the continuous mining machine. To gain access to the throat spray from underneath the cutter drums, Stevens stacked eight to ten wooden boards measuring 2" x 8" x 24" with an approximate 1.75 inch diameter hole in the center of each board (pin boards) in a single column under the cutter head of the continuous mining machine.

Thorpe and Maynard began performing maintenance on the left side of the continuous mining machine. After changing cutting bits on the cutter head, checking water pressure and water sprays on the left side of the continuous mining machine, Thorpe and Maynard traveled to the right side of the continuous mining machine at approximately 1:40 a.m. to assist Stevens with changing a load locking valve on the cutter head jack located on the left side (operator's side) of the machine. Stevens noticed the cutter head was still slowly falling after he changed the load locking valve on the right side of the head jack the previous night.

Thorpe leaned in from the operator's side of the continuous mining machine between the raised cutter head boom and the pan and removed the load locking valve . A sketch of the accident scene is shown in APPENDIX B. Thorpe then waited beside the continuous mining machine while Stevens retrieved a new load locking valve. With the replacement valve in hand, Thorpe leaned back underneath the cutter head boom into the pan of the continuous mining machine at approximately 2:00 a.m. to install the new device. At that time, Stevens was standing next to Thorpe on the operator's side of the continuous mining machine and Maynard was standing in front of the cutter head of the machine. Both miners stated there was a loud popping noise and then the cutter head boom dropped onto the victim, crushing him between the pan and cutter head boom of the continuous mining machine.

Stevens tried to pull Thorpe out from under the cutter head boom but was unable to retrieve him. Stevens then started the continuous mining machine and tried to lift the cutter head boom off of the pan with the remote box, but was unsuccessful because the hydraulic fluid needed to raise the cutter head boom was exiting through the port where the load locking valve was to be installed. Stevens then sent Maynard to get help. Maynard went to Kyle Smith, No. 1 unit Lead Man, and told him of the accident. Smith was operating a battery-powered scoop in No. 3 Entry at the time. Smith took the battery-powered scoop to the continuous mining machine and attempted to lift the cutter head boom in order to free the victim. The battery-powered scoop could not lift the cutter head boom because it was too heavy. Smith then went and retrieved a battery-powered ram car and attempted to lift the cutter head boom, but this too was unsuccessful.

In the meantime, Chris Woodall, Third Shift Mine Examiner and Mine Emergency Technician, was informed by Steve Edmonds, Carbon Monoxide Monitor Technician, of the accident. Woodall then contacted Larry Offutt, Third Shift Mine Foreman, at 2:20 a.m. to inform him of the accident and to request an ambulance. Offutt informed Charles Campbell, Outside Dispatcher, of the accident at 2:25 a.m. and instructed him to get an ambulance in route and to call MSHA and the Kentucky Division of Mine Safety (KDMS). Chad Locke, Belt Mechanic, heard on the radio that someone was hurt and needed the diesel scoop on the No. 1 unit. Locke trammed the Dapco Diesel Scoop to the No.1 unit to assist in raising the cutter head boom. The Dapco Diesel Scoop was unsuccessful because the cutter head boom was too heavy. Offutt then contacted Jacob Johnson, Outby Utility Worker, who was hauling rock dust and instructed him to go to the 3rd 54 Belt Header and get the Eimco Diesel Scoop and take it to the No. 1 unit.

Offutt then informed Campbell to contact Air Evac Life Services for assistance and the Webster County Coroner.

Johnson arrived on the No. 1 unit at around 3:00 a.m. He attempted to lift the cutter head boom with the Eimco Duckbill, but was unsuccessful. It was then decided to apply down pressure on the Duckbill and block under the wheels of the scoop for extra leverage. The Eimco Scoop was able to reach farther under the cutter head boom to allow more lifting leverage, by wedging between the ripper head and the continuous mining machine's pan line. When the operator pushed the scoop bucket down and articulated the scoop, it pushed the continuous mining machine's pan down into the soft mine floor and raised the cutter head boom allowing enough clearance to retrieve Thorpe at 3:24 a.m.

The victim was placed on a back board by Offutt, Woodall, Willis Jerrell, Outby Utility Man; Robert Alvey, Belt Mechanic; and Kolten Cullen, Member of Belt Crew, to be transported out of the mine by Offutt and James Poe, (MET). At 4:01 a.m., Thorpe arrived on the surface and was moved to the Webster County Emergency Medical Services Ambulance. The Webster County Coroner, who was on site, determined that the victim died instantly when the accident occurred at 2:00 a.m.

INVESTIGATION OF THE ACCIDENT

On Wednesday, September 16, 2015 at 2:50 a.m., Campbell notified the MSHA National Call Center that an employee was pinned under a continuous mining machine. The location of the incident was on the No. 1 unit and life flight was currently on site. Campbell also reported the incident took place at 2:00 a.m. The MSHA Call Center then contacted David Winebarger, MSHA emergency contact person, at 3:00 a.m. to report the accident. A citation which did not contribute to the accident was issued for a violation of 30 CFR § 50.10, because MSHA was not notified immediately, at once, without delay, and within 15 minutes.

Winebarger called Brian Kelly, Engineering Manager, and issued a 103(j) order for the entire No. 1 working section at 3:23 a.m. Curtis R. Hardison, District Staff Assistant, called Charles D. Ramsey, Accident Investigator, and directed him to investigate the accident. Ramsey traveled to the mine to begin the investigation.

Louis Adams, District Electrical Specialist; Alan Frederick, Field Office Supervisor; and Brian Dotson, Assistant District Manager for Enforcement traveled to the mine to assist Ramsey with the investigation. Ramsey, Adams, and Frederick along with Kentucky Division of Mine Safety (KDMS) conducted initial interviews of the miners (see Appendix C). Representatives of MSHA, KDMS, and the operator traveled underground to the accident site on the day of the accident to examine the scene, take photographs, and take measurements for sketches of the existing physical conditions.

On Thursday, September 17, 2015, Ramsey, Adams, and Tim Fugate, Chief Accident Investigator of the Kentucky Division of Mine Safety, conducted formal interviews of all

witnesses at the Kentucky State Office building in Madisonville, Kentucky. Also present during the formal interviews were representatives of Sebree Mining LLC, and Tom Motzny, Solicitor for MSHA (see Appendix D).

On Thursday, September 17, 2015, Justin Gatlin, MSHA Electrical Specialist accompanied Johnathan Hall, Engineer, of MSHA's Approval and Certification Center to the mine to perform a physical inspection of the Joy Continuous Mining Machine involved in the accident.

DISCUSSION

Accident Scene

The accident occurred on the right side of the No. 1unit, (MMU 005-0) 1st South East Parallel Mains, between the No. 7 entry and the No. 8 entry at survey station 18+90, crosscut No. 27. The accident site was in an area where draw rock had been removed from the mine roof. The actual height in the area where the cutter head of the continuous mining machine was located was approximately 6 feet. The entry width was 17.6 feet and the offside of the continuous mining machine where the accident took place was 4.4 feet from the left rib.

The cutter head of the machine was facing towards the No. 8 entry and approximately 10 feet of the tail of the machine was in the intersection of the No. 7 entry. Also located at the accident scene were 51 pin boards. There were 16 pin boards located under the cutter head on the operator's side (left side) of the machine, 10 pin boards located under the right side of the cutter head , and an additional 25 pin boards scattered in front of the continuous mining machine. These pin boards were used in the recovery efforts of the victim.

Equipment

The machine involved in the accident was a Joy Global Industries continuous mining machine, model number 14CM15-11BX, serial number JM5595B, MSHA Approval Number 2G-4159A. It was rebuilt at the Joy Global factory in 2014 and put into service at the Onton #9 Mine in January 2015. The cutter head boom is an assembly consisting of two shear (lift) cylinders, the cutter frame, the cutter motor, the cutter drum sections, and the cutter gear case. According to the "Cutter" section of the operations and maintenance manual, the complete cutter boom assembly weighed 35,300 lbs. A load locking valve is mounted on both of the shear cylinders.

Testing and Examination

On September 15, 2015, maintenance personnel replaced the opposite operator side load locking valve, on the machine. On September 16, 2015, the victim was in the process of replacing the operator's side load lock. A load locking valve is a pilot operated check valve that prevents movement of a suspended load in the event of hydraulic system failure or damage.

The load locking valve that had been removed was a Joy Global part and had no visual defects or damage. No evidence was found that the shear cylinders or design of the machine contributed to the accident.

Blocking

This particular continuous mining machine uses inverted cylinders, where the barrel of the cylinder is at the upper end and the rod extends downward. Due to this use of inverted cylinders, the cylinder safety collars normally provided by Joy to be used as supplemental support for the cutter head boom could not be used. Joy Manufacturing states that these chocks are supplemental supports only, and must be used with other suitable blocking materials.

For this machine, Joy provided a pair of steel safety chocks called "Cutter Boom Stops" that fit between the cutter frame and the gathering head pan of the machine. These chocks were not in use at the time of the accident. The opposite operator's load locking device was changed out the previous night by Stevens. The onsite investigation revealed that the safety chocks were also not used for that repair work. During the investigation, mine personnel located one chock on the continuous mining machine covered with loose rock and mud or fire clay indicating that this chock had not been used for several shifts. The location of the other safety chock that was provided by the manufacturer for this machine is unknown. The mine operator informed the accident investigation team that they regularly keep these safety chocks on the mechanic's personal golf carts, but they could not produce it during the course of the investigation. Another safety chock was retrieved from the left side of the continuous mining machine and it did not properly fit the machine that was involved in the fatality.

The operations/maintenance manual and parts manual have numerous warnings against working under unsupported loads and the proper use of appropriate blocking. The manufacturer's manual warns:

> Never stand or work under an elevated cutter head supported by only hydraulic pressure. Do not remove the load lock cartridges from the cylinders unless the conveyor or cutter boom is completely lowered or securely supported with blocking. Always support the cutter head with blocking or the safety collars and relieve any hydraulic pressure before removing the load locking system block or either valve. Never work under any part of this machine that is supported by hydraulic jack or cylinder, regardless of safety features such as load lock valves, safety props, or cylinder collar locks. Always install enough blocking to safely support the machine or component, or lower the component to the ground. Failure to do so could result in serious injury or death from crushing if the machine or component falls.

Stevens reported the cutter head boom was resting on a single stack of pin boards. Due to the design of this continuous mining machine, the only available support point was the

cutter head drum itself. During the recovery, chains were attached between the cutter head drum and cutter head boom to limit cutter head rotation.

The pin boards were stacked as single boards on top of one another. The single stacked wooden boards were not stable or sturdy enough to support the weight on the cutter head boom, approximately 18 tons. The boards used as support gave way, allowing the victim to be crushed between the pan and cutter head boom of the continuous mining machine causing fatal crushing injuries. Stevens knowingly allowed and visibly observed a miner working in an unsafe condition.

During the recovery process miners, stated they had problems with the cutter head rotating, so they chained it to prevent rolling.

Experience and Training

Thorpe had nine years of mining experience, all at this mine site, and he had five years and 48 weeks experience as an electrician and a mechanic. Thorpe was not task trained in the safety aspects and safe work procedures concerning blocking equipment against motion when maintenance is performed on or under mining equipment, a job that is often performed by a third shift electrician.

A representative of MSHA's Educational Field and Small Mine Services examined training records for various miners. No other deficiencies were found in the training records that were reviewed.

ROOT CAUSE ANALYSIS

The accident investigation team conducted an analysis to identify the most basic causes of the accident that were correctable through reasonable management controls. The team identified root causes 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:

1. *Root Cause:* The mine operator failed to adequately block and secure the cutter head and cutter head boom against motion and allowed a miner to work under the cutter head and cutter head boom. A substantially built crib was not used nor was the manufacturer's approved safety chocks installed between the cutter boom and the continuous mining machine's gathering head pan.

   Corrective Action: Management has developed and implemented a written "Plan of Action for Blocking Equipment from Motion". All underground miners will be re-instructed regarding proper blocking procedures while performing repairs or maintenance under machinery.

2. *Root Cause:* The mine operator failed to task train the victim with regard to the hazards associated with the working under suspended loads and the appropriate use of blocking against motion.

   Corrective Action: All underground miners have received task training on the hazards of working under suspended loads and the appropriate use of blocking against motion.

CONCLUSION

This accident occurred because the mine operator failed to ensure that adequate blocking was placed under the cutter head of the continuous mining machine, in conjunction with manufacturer's provided blocking devices, prior to performing maintenance under the cutter boom assembly. The mine operator had not established and task trained miners on safe blocking procedures for working under heavy suspended loads.

Approved By:

Mary Jo Bishop
Mary Jo Bishop
Acting District Manager

3/15/2016
Date

ENFORCEMENT ACTIONS

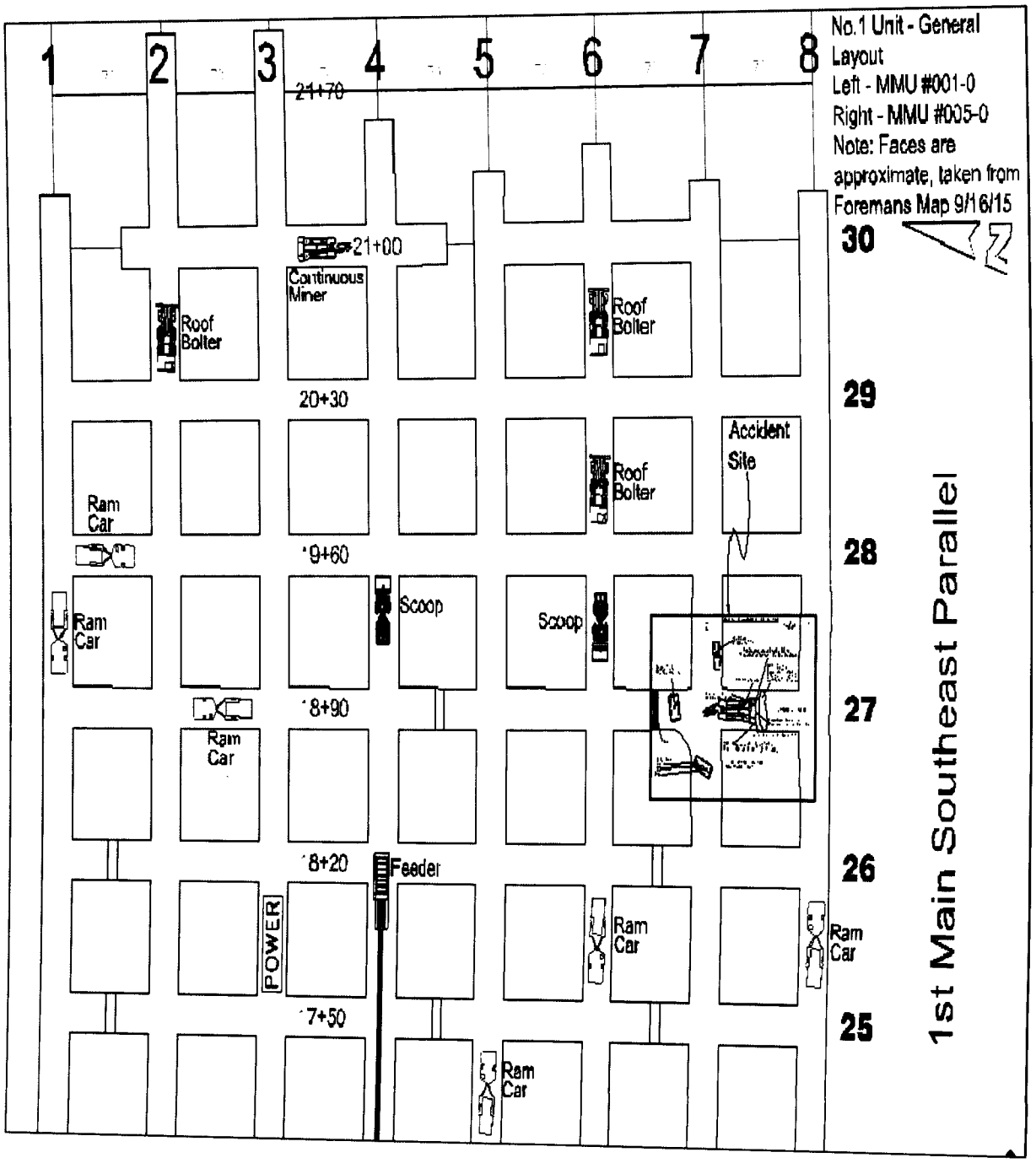
1. A 103(j) Order, No.9045823, was issued to protect the miners and help preserve the accident scene. It affected all underground areas of the mine. Ramsey modified the 103(j) Order to a 103(k) Order upon arrival at the mine site.

2. 104(d) (1) Citation No. 9045825, was issued citing 30 CFR § 75.1725(c). The mine operator failed to adequately block the cutter head of a Joy 14CM-15 continuous mining machine (S/N JM5595B) against motion. A fatality occurred on September 16, 2015, on the No. 1 unit when an electrician was replacing a load locking valve in the cutter head boom cylinder on the left side of the miner. The only blocking action taken was with approximately 8 to 10 pin boards measuring approximately 2" thick x 8" wide x 24" long with a hole in the center measuring approximately 1 3/4" in diameter under the center of the cutter drums. The boards were stacked as single boards on top of one another instead of in the form of a crib. The pin boards were not able to support the weight on the cutter head boom which weighs approximately 18 tons. The boards used as support gave way, allowing the victim to be crushed between the pan and cutter head boom of the continuous miner causing fatal crushing injuries. The operator engaged in aggravated conduct constituting more than ordinary negligence in that an agent of the operator knowingly allowed and visibly observed a miner working in an unsafe condition. This violation is an unwarrantable failure to comply with a mandatory standard.

3. 104(d)(1) Order No. 9047236, was issued citing 30 CFR § 48.7(c). The mine operator failed to provide adequate task training in the safety aspects and safe work procedures concerning blocking procedures when maintenance is performed on or under mining equipment. A fatal crushing accident took place on September 16, 2015, when an electrician was working under the cutter head boom of the continuous mining machine on the No.1 unit to change a load locking device without proper or adequate blocking procedures being followed. Approximately 8 to10 pin boards measuring 2" x 8" x 24" were stacked individually on one another to support the cutter head of the continuous mining machine which weighs approximately 18 tons. The manufacturer, Joy Machinery Company, provides steel "Cutter Boom Stops" to be used when working under this machine in this manner, and the mine operator failed to provide training in these provisions or other adequate means.

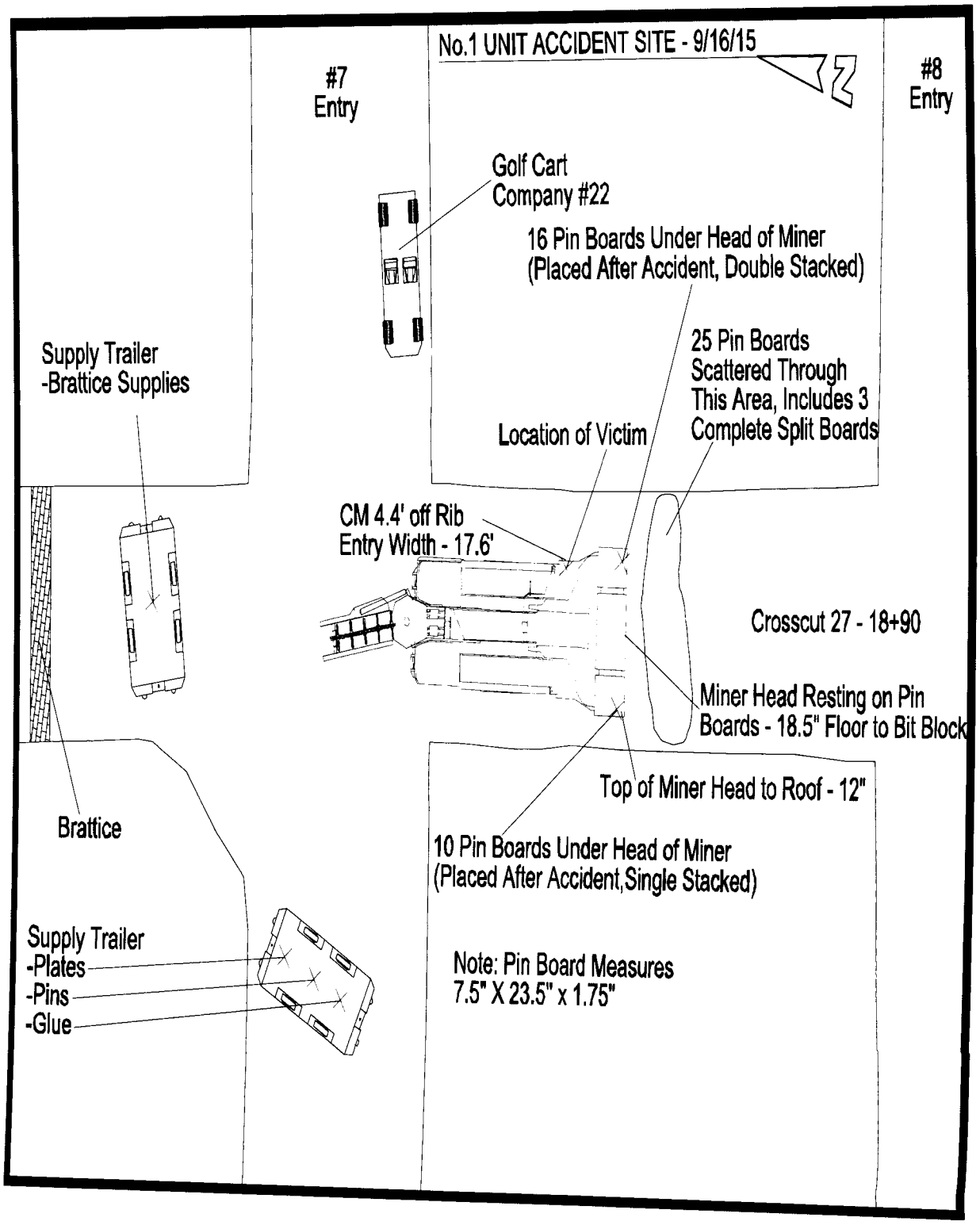
Appendix A

Sketch of the No. 1 unit
(Not to scale)



Appendix B

Sketch of the Accident Scene
(Not to scale)



Appendix C

Persons Participating in the Investigation

Mine Safety and Health Administration

Mary Jo Bishop.....Acting District Manager
Brian Dotson.....Assistant District Manager
Curtis R. Hardison..... Staff Assistant
Charles D. Ramsey..... Accident Investigator
Louis Adams.....Electrical Specialist
Charles L. Jones..... Family Liaison
Alan Frederick.....Field Office Supervisor
Justin Gatlin..... Electrical Specialist
Joe Fritz.....Education Field Services
Jonathan Hall..... Engineer, MSHA Approval and Certification Center
Tom Motzny..... Office of Solicitor

Kentucky Division of Mine Safety

Tim Fugate..... Deputy Chief Accident Investigator
Lee Vincent.....Inspector
Eric Nichols.....Inspector
Brad Thomas.....Inspector
Kenny Mitchell..... District Supervisor

Mine Company Officials

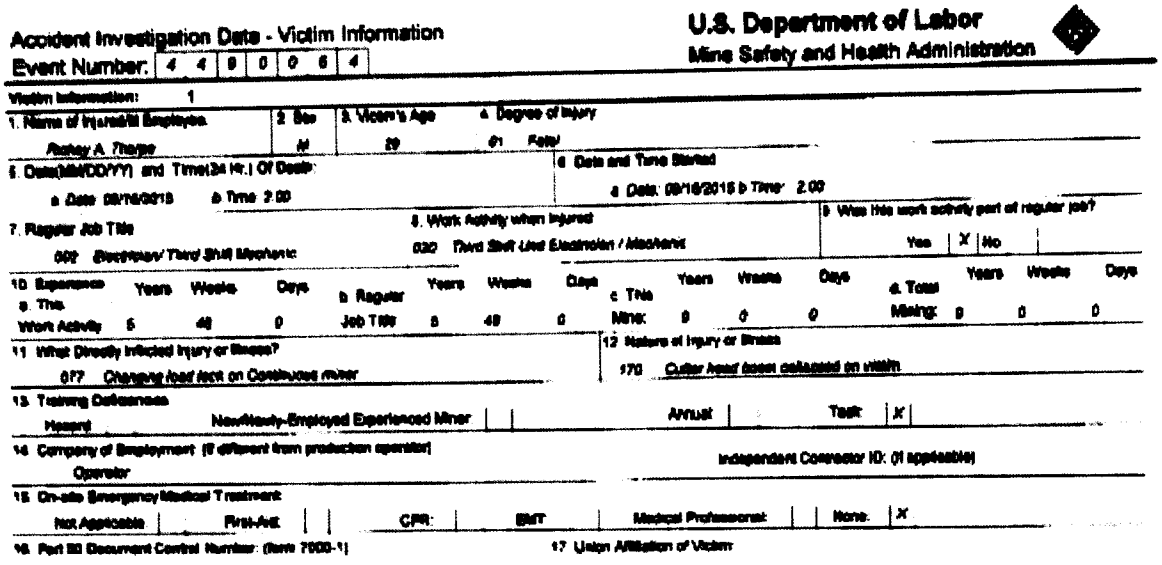
Dan Durham..... General Mine Manager
Chris Williams..... Safety Manager
Mark Ramage.....Mine Manager
Brian Kelly.....Engineering Manager
Chris Rodgers.....Safety Department
Sean Dame.....Safety Department
Walter (Woody) Wood.....Maintenance Foreman
Brendan Mackellar..... Engineer
Kenny Murray.....VP of Operations
Gary McCollum..... Attorney

Appendix D

Interview List

Nicky Stevens ..... Electrician Lead Man
James Maynard ..... Electrician
Chris Woodall ..... Mine Emergency Technician
Kyle Smith ..... No.1 unit Lead Man
James Poe ..... Mine Emergency Technician
Doug Wilson ..... Outby Mechanic
Kolton Cullen ..... Belt Crew
David Cherry ..... Mine Monitoring Technician
Robert Alvey ..... Belt Crew
Charles Campbell ..... Outside Dispatcher

Appendix E



Accident Investigation Data - Victim Information

U.S. Department of Labor
Mine Safety and Health Administration

Event Number: 4 4 9 0 0 6 4

Victim Information: 1

1. Name of Injured/Ill Employee: Rickey A. Thorpe | 2. Sex: M | 3. Victim's Age: 39 | 4. Degree of Injury: 01 Fatal

5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: a. Date: 09/16/2015 b. Time: 2:00

6. Date and Time Started: a. Date: 09/16/2015 b. Time: 2:00

7. Regular Job Title: 002 Electrician/ Third Shift Mechanic

8. Work Activity when Injured: 030 Third Shift Line Electrician / Mechanic

9. Was this work activity part of regular job? Yes: X | No:

10. Experience	a. This Work Activity			b. Regular Job Title				c. This Mine:				d. Total Mining:			
	Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days
	5	48	0		5	48	0		9	0	0		9	0	0

11. What Directly Inflicted Injury or Illness? 077 Changing head deck on Continuous miner

12. Nature of Injury or Illness: 170 Cutter head boom collapsed on victim

13. Training Deficiencies: Hazard: | Newly/Newly-Employed Experienced Miner: | Annual: | Task: X

14. Company of Employment (If different from production operator): Operator | Independent Contractor ID: (If applicable)

15. On-site Emergency Medical Treatment: Not Applicable: | First-Aid: | CPR: | EMT: | Medical Professional: | None: X

16. Part 50 Document Control Number: (form 7000-1)

17. Union Affiliation of Victim