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UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Machinery Accident
November 23, 2013

Century Mine
American Energy Corporation
Beallsville, Belmont County, Ohio
I.D. No. 33-01070

Accident Investigators

Jim Preece
Coal Mine Safety & Health inspector

Franklin Thomas
Coal Mine Safety & Health Specialist (Electrical)

Andy Wilt
Coal Mine Safety & Health inspector

Originating Office
Mine Safety and Health Administration
District 3
604 Cheat Road
Morgantown, West Virginia 26508

Carlos T. Mosley, Acting District Manager

TABLE OF CONTENTS

PHOTOGRAPH of Broken Tee Connector and High Pressure Hose (LADDER LINE)

OVERVIEW

On Saturday, November 23, 2013, at approximately 4:00 p.m., Ryan Lashley (victim), a 32-year-old longwall shieldman, was struck by hydraulic fluid resulting in fatal injuries. Lashley was executing a "push" of the panline toward the face as he followed the shearer towards the headgate. Lashley activated the panline push inby the No. 144 shield. A high pressure hydraulic hose that connects the shield hydraulic circuit to the ring main circuit (ladder line) was in the walkway in front of the shield pontoon. The No. 144 shield tailgate pontoon advanced on top of the ladder line and pressurized against the roof, pinching the hose between the pontoon and mine floor. As Lashley passed the No. 144 shield, the pinched hose ruptured. Fluid from the hose struck the victim, resulting in fatal injuries.

The primary cause of the accident was the mine operator's failure to adequately secure the high pressure hose to prevent damage by moving machine components.

GENERAL INFORMATION

The Century Mine is located near Beallsville, in Belmont County, Ohio. American Energy Corporation operates this underground coal mine. The mine employs 698 persons; 609 are underground employees working 3 production shifts per day, 7 days per week. The mine's production averages 22,000 tons per day. Coal is extracted by four advancing mechanized mining units (MMUs), using continuous mining machines and one retreating longwall unit. On developing sections, the coal is transported from the working faces by shuttle car to belt conveyors for transport to the surface. On retreating sections, the coal is transported from the working face by conveyor chain to belt. Battery-powered, rail-mounted, and rubber-tired vehicles are used to transport supplies and mine personnel.

The mine accesses the Pittsburgh No. 8 coal seam, which averages 72 inches in height, by eight shaft openings and two slopes. The mine liberates 2,066,599 cubic feet of methane every 24 hours and was entered into 103(i) status for hazardous methane spot inspections on October 4, 2004.

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

Robert E. Murray .....President, Murray Energy Corp., American Energy Corporation
Kevin Hughes.....Superintendent, American Energy Corporation, Century Mine
William Mullet .....Safety Director, American Energy Corporation, Century Mine

A regular safety and health inspection (E01) by the Mine Safety and Health Administration (MSHA) was ongoing at the time of the accident. The previous E01 inspection conducted by MSHA was completed on September 30, 2013. The Non Fatal Days Lost (NFDL) incident rate for this mine in 2012 was 4.44, compared to a National NFDL rate of 3.24.

DESCRIPTION OF ACCIDENT

On Saturday, November 23, 2013, the day shift crew for the 2-West Longwall Section entered the mine at 8:00 a.m., under the direction of Daniel Clark, Section Foreman. The crew arrived on the section at approximately 8:50 a.m. After servicing and repairing the cable handler on the shearer, they began extracting coal from the 1,500-foot longwall face.

At approximately 3:30 p.m., Chad Burley and Josh Beckett, Shearer Operators, began a mining pass from the tailgate towards the headgate. Ryan Lashley and Michael Yost, Shieldmen, followed the shearer to initiate the pushing of the panline. Nathan Bondy, Shieldman, also followed the shearer to advance the shields. Levi Wilson, Longwall Foreman and Duane Rush, Laborer, stayed on the tailgate to clean up loose coal and

material after the shearer left the tailgate. Levi Wilson and Vance Phillips, Longwall Foreman (Maintenance), and Jim White, Stageloader Operator, were working near the headgate. At approximately 4:00 p.m., the ladder line at the No. 144 shield ruptured, causing serious injuries to Lashley. Yost noticed that the hose burst, actuated the emergency stop button on the No. 148 shield and shut the panline off. He then notified White by pager phone that a man was down and requested assistance and a backboard. Wilson and Rush left the tailgate to help with the victim. Clark called Richard Bunting, Dispatcher, and told him they need emergency medical technicians (EMTs) on the face. Clark travelled down the face and administered cardiopulmonary resuscitation (CPR) to the victim. At 4:12 p.m., Bunting called "911." Phillips and Bondy carried EMT supplies to the accident site. The crewmembers placed the victim on a backboard and carried him toward the power center at the headgate where they met John Phillips and Anthony Proger, EMTs. The EMTs assessed the victim's condition and determined he was unresponsive and that the automated emergency defibrillator (AED) would not help. Phillips and Proger then transported the victim to the surface where he was transferred to the Beallsville Ohio Rescue Squad. He was pronounced dead at 5:50 p.m. at the mine by Dr. Troy Balgo, Belmont County Coroner.

INVESTIGATION OF THE ACCIDENT

The MSHA Emergency Call Center was notified of the accident on November 23, 2013, at 4:07 p.m., who then notified Richard Show, Field Office Supervisor. Show notified Gregory Fetty, District 3 Staff Assistant, at approximately 4:25 p.m. Fetty issued a 103(j) order by telephone that was later modified to a 103(k) order upon arrival at the mine site by the accident investigation team.

James C. Preece and Andrew Wilt, Coal Mine Safety and Health Inspectors in the St. Clairsville, Ohio field office, initiated an investigation immediately. The investigation was conducted in conjunction with mine management, representatives of the miners, and the Ohio Department of Natural Resources.

Upon arriving at the mine, the investigation team was briefed regarding the circumstances of the accident. The parties agreed to conduct interviews with miners having knowledge of the accident prior to traveling underground. After the interviews were completed, the parties traveled underground to the accident site and began the physical investigation. A preliminary inspection of the accident scene included digital photographs of the accident area. Franklin D. Thomas, Coal Mine Safety and Health Specialist (Electrical), and Fetty travelled to the mine and collected additional information on Sunday, November 24, 2013.

MSHA Technical Support staff assisted with the on-site accident investigation by evaluating the ladder line hydraulic system in use at the Century Mine when the accident occurred. The accident investigation team and Technical Support personnel

visited the Powhatan No. 6 mine on Wednesday, December 11, 2013, to evaluate the use of similar ladder lines and evaluate the hydraulic system. Ladder lines were inspected and longwall pressure pumps were tested to determine outgoing pressures.

DISCUSSION

Accident Scene

The accident occurred on the 2-West Longwall Section (MMU-016), which began production on June 24, 2013. There were 303 longwall roof support shields installed on 1.5 meter spacing along the longwall face. Mining height on the face was 66 inches. The longwall face is 1,500 feet in length. The longwall shearing machine was at the No. 115 shield mining towards the headgate when the accident occurred. The high-pressure hydraulic hose that connected the shield hydraulic circuit to the ring main circuit (ladder line) was in the walkway in front of the shield pontoon. The ladder line extended from a tee connection on the panline structure to the shield valve bank. As the No. 144 shield tailgate pontoon advanced and pressurized against the roof, a portion of the ladder line was caught beneath the pontoon, pinching the hose between the pontoon and mine floor. A section of severed hose 19 inches long extended from beneath the pontoon. The other end of the hose broke off at the fitting of the tee connection mounted on the panline structure. The No. 144 shield was pushed tight against the panline structure.

General Machine Information

The 4,160 volt, 3-phase, 60 hertz longwall mining system involved in the accident was assembled by the American Coal Company. It received MSHA Approval No. 2G-3856A-2 on April 18, 2002. At the time of the accident, the face conveyor advance cycle was in progress.

Longwall Shield Controls and Operation

Each shield had a Marco electronic control panel below the canopy and above the base lift jack. An emergency stop button mounted on all shield control boxes caused hydraulic fluid to dump into the return line when activated. The control program allowed shieldmen to operate each shield separately from an adjacent shield or operate up to ten shields in a batch function.

Use of Ladder Lines

The hydraulic system for the longwall was a closed system consisting of two 2-inch diameter high pressure hoses supplying emulsion fluid to the headgate and three 2-inch

diameter return hoses that routed the emulsion back to the pumps (see Appendix D). The emulsion was fed to the longwall face from the headgate end of the longwall through a 2.5-inch high-pressure hose to the No. 285 shield. Two 2-inch return hoses routed the hydraulic fluid from the No. 288 shield back to the headgate. These hoses were installed in the panline under the cable tray.

The hydraulic circuit was completed through shield-to-shield pressure and return hoses which were connected from the manifolds mounted on the shields. A manifold mounted on each shield distributed pressure to the shield. Normal system pressure was 3,750 pounds per square inch (psi).

The typical hydraulic systems in the District 3 area (those used in face lengths of 1,200 feet or less) use a set of ladder lines near the headgate and another set at the tailgate to more evenly distribute hydraulic pressure. However, larger longwall faces, 1,200 feet or greater, require a larger volume of hydraulic fluid to operate the additional shields. Therefore, Century Mine strategically placed additional ladder lines along the longwall face to maintain consistent operating pressures between the headgate and tailgate. At five locations along the longwall face, 1-inch hoses extended from a tee connection to the shield-to-shield lines (See Appendix D). This was done for both the pressure and the return lines. An examination of the ladder line installations along the longwall face revealed the ladder lines were supported by nylon rope. It appeared the shield pontoons had contacted ladder lines installed in the other locations along the face. This was verified during interviews.

Training and Experience

Lashley was an experienced shieldman. All of his experience was at the Century Mine. He had approximately ten years of experience as a miner, with over six years working on longwalls, including four years and three months as a longwall shieldman. Training records for the victim were reviewed and were found to be current.

ROOT CAUSE ANALYSIS

MSHA conducted an analysis to identify the underlying cause of the accident that was correctable through management controls. During this analysis, a root cause was identified, that if eliminated, would have either prevented the accident or mitigated its consequences.

Listed below is the root cause identified during the analysis and the corresponding corrective action implemented to prevent a recurrence of the accident.

Root Cause:
The mine operator failed to assure ladder lines were installed and maintained in a manner to prevent contact with longwall shields.

Corrective Action:
The mine operator removed the ladder lines along the face which were previously located between the headgate and tailgate. If the operator determines ladder lines are necessary to maintain adequate hydraulic pressure, the company has developed a means to assure the ladder lines will not be struck by the shield pontoons. Ladder lines will be suspended from longwall shields with a wire rope, chain, or other suitable means to prevent contact with shield pontoons.

CONCLUSION

The accident was caused by the failure to assure the ladder line located at No. 144 shield was installed and maintained in a manner to prevent contact by the longwall shield or its components.

Carlos Mosley — 4-7-2014

Carlos T. Mosley
Acting District Manager

Date

ENFORCEMENT ACTIONS

1. A 103(k) Order was issued to ensure the safety of the miners until the investigation could be completed.

2. A citation was issued for a violation of 30 CFR § 75.1725(a). A fatal accident occurred at this mine on November 23, 2013 involving a high pressure hydraulic hose (ladder line). A fatal accident investigation revealed the mine operator failed to maintain the longwall in safe operating condition by installing the ladder line at the No. 144 shield on the 2 West Section, MMU 016-0, in a manner that allowed it to be struck by an advancing shield. The ladder line was pinched between the mine floor and the shield pontoon as the shield advanced due to excessive slack. The continuation of the push sequence of the panline caused the hose to rupture at the tee fitting, allowing high pressure hydraulic fluid (3,750 psi) to strike the victim, resulting in fatal injuries.

APPENDIX A – Persons Participating in the Investigation

Listed below are the persons furnishing information and/or present during the investigation:

MINE SAFETY AND HEALTH ADMINISTRATION

Jim Preece	Coal Mine Safety & Health Inspector
Frank Thomas	Coal Mine Safety & Health Inspector (Electrical)
Andy Wilt	Coal Mine Safety & Health Inspector

OHIO DEPARTMENT OF NATURAL RESOURCES

John Ziants	DMRM Underground Supervisor
Richard Hurley	DMRM Mine Safety Inspector II

MINING COMPANY OFFICIALS

Robert Moore	Executive Vice President, Chief Financial Officer and Member of the Board of Directors
Ryan Murray	Vice President, Operations
Pat Brady	Manager of Regulatory Affairs
Allen McGilton	Assistant Corporate Safety Director
Kevin R. Hughes	General Manager and Superintendent
Ron VanHorne	Manager of Injury - Prevention/Compliance
William Mullett	Safety Director (Century)
Casey Crooks	Assistant Superintendent
Jason Witt	General Council
Mike Ruble	Human Resources Director

APPENDIX B – Persons Interviewed

Vance Phillips	Longwall Foreman (Maintenance)
Levi Wilson	Longwall Foreman (Maintenance)
Daniel Clark	Longwall Foreman
Michael Yost	Longwall Helper (mechanic trainee)
Richard Bunting	Dispatcher
Chad Burley	Tailgate Shearer Operator
Josh Beckett	Headgate Shearer Operator
Derek Brown	Shieldman
Jordan Kinney	Shieldman
Nathan Bondy	Shieldman
John Phillips	Emergency Medical Technician

APPENDIX C – Victim Information

Accident Investigation Data - Victim Information

Event Number: 6 2 6 3 2 3 3

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

Victim Information: 1

1. Name of Injured/Ill Employee:	2. Sex	3. Victim's Age	4. Degree of Injury:
Ryan E. Lashley	*M*	*32*	*01 Fatal*

5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:
a. Date: 11/23/2013 *b.Time: 16:00*

6. Date and Time Started:
a. Date: 11/23/2013 b.Time: 8:01

7. Regular Job Title:
041 Longwall Helper (Shieldman)

8. Work Activity when Injured:
099 Shieldman

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

10. Experience	Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days
a. This Work Activity:	2	42	0	b. Regular Job Title:	2	42	0	c: This Mine:	5	3	0	d. Total Mining:	5	3	0

11. What Directly Inflicted Injury or Illness?
067 Longwall Supports _ Hydraulic Fluid

12. Nature of Injury or Illness:
180 Puncture

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

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: X | EMT: X | Medical Professional: | None:

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

17. Union Affiliation of Victim: *9999* *None (No Union Affiliation)*

APPENDIX D – Ladder Lines Drawing