UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

REPORT OF INVESTIGATION

Underground Mine
(Coal)

Fatal Powered Haulage Accident
October 13, 2020

Cardinal Mine
Warrior Coal, LLC
Madisonville, Hopkins County, Kentucky
ID No. 15-17216

Accident Investigators

Matthew Stone
Roof Control Specialist

John Benson
Electrical Specialist

Originating Office
Mine Safety and Health Administration
Central Region
Madisonville District
100 YMCA Drive
Madisonville, KY 42431
Robert A. Simms, District Manager

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OVERVIEW

On Tuesday, October 13, 2020, at 8:45 p.m., Phillip T. Ramsey, a 58-year-old Shuttle Car Operator with thirty years of mining experience, was fatally injured when he was struck by a battery-powered scoop. Ramsey had parked his shuttle car in an intersection behind an opaque ventilation curtain and was exiting the cab of the shuttle car when a battery-powered scoop trammed through the ventilation curtain and struck him.

The accident occurred because the mine operator did not: (1) prevent scoops from being trammed through ventilation curtains that restrict visibility, (2) prevent section equipment from being parked in intersections behind ventilation curtains, (3) ensure effective communication between mobile equipment operators, and (4) ensure that effective audible warnings are used prior to equipment being trammed through ventilation curtains.

GENERAL INFORMATION

The Cardinal Mine has been operating since 1993 and is currently mining in the Kentucky No. 9 seam. It employs 436 underground miners and 18 surface miners. The mine operates 10 mechanized mining units (MMU) and produces approximately 24,500 tons of coal daily.

At the time of the accident, the Mine Safety and Health Administration (MSHA) was in the process of completing a regular E01 safety and health inspection of the mine. MSHA completed the previous regular E01 safety and health inspection of the mine on September 26, 2020. The 2019 non-fatal days lost (NFDL) incident rate for Cardinal Mine was 2.48, compared to the national average of 3.10 for mines of this type.

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

Bill Adelman	General Manager
Joel Bradley	Assistant General Manager
Bruce Morris	Director of Safety and Training

DESCRIPTION OF THE ACCIDENT

On Tuesday, October 13, 2020, Phillip T. Ramsey, Shuttle Car Operator, began his shift at 3:00 p.m. Ramsey traveled to the No. 5 Unit and operated a shuttle car as normal mining operations progressed.

At approximately 8:40 p.m., Ramsey received a partial load of coal in his shuttle car as the continuous mining machine (CMM) finished mining a crosscut to the left of the No. 6 entry. Kevin Blythe, Scoop Operator, contacted William Burns, Shuttle Car Operator, via two-way radio to ask if he had received his last full load of coal from the crosscut. Burns replied that he had and trammed his shuttle car to the dumping point at the feeder in the No. 5 entry. After dumping the load of coal, Burns trammed his shuttle car into the No. 6 entry and parked just inby the intersection as seen in Appendix A.

Blythe also attempted to contact Ramsey by radio about his plans to follow him out. Ramsey never confirmed that he received the message. Blythe announced on the radio he was going to tram the scoop from the No. 5 entry to the No. 9 entry. Blythe told investigators he planned to follow Ramsey's partially loaded shuttle car as it traveled its normal route to the dumping point through the last open crosscut.

Blythe stopped the scoop in the last open crosscut to unload roof bolting supplies, approximately 42 inches behind a ventilation curtain that was hanging in the No. 6 entry. When Blythe was finished unloading supplies, he entered the scoop to wait for Ramsey's shuttle car to pass. He turned off the lights on the scoop.

Burns exited his shuttle car and began adjusting the ventilation curtain in the area of the last open crosscut. At 8:45 p.m., Ramsey trammed the shuttle car outby in the No. 6 entry, stopped in the last open crosscut, and turned off the lights on his shuttle car. Ramsey began to exit his shuttle car to assist Burns with adjusting the ventilation curtain. At that moment, Blythe trammed the scoop through the ventilation curtain because when Blythe didn't see Ramsey's lights, he thought Ramsey had turned his shuttle car into the last open crosscut and was traveling his normal route to the feeder. The scoop crushed Ramsey between the scoop's batteries and the shuttle car (see Appendix A).

Nick Hardrick, Section Foreman, and Davory Walker, Shuttle Car Operator, also emergency medical technicians, heard about the accident on the radio and rendered first aid at the scene. Miners transported Ramsey to the surface in a diesel personnel carrier where first responders from the Hopkins County Ambulance Service transported him to Baptist Health Hospital. Ramsey was pronounced dead at 9:34 p.m. by Andrea R. Williams, Doctor of Osteopathic Medicine.

INVESTIGATION OF THE ACCIDENT

On October 13, 2020, at 9:03 p.m., Morris contacted the Department of Labor National Contact Center (DOLNCC) to report that a worker had sustained a head injury. The DOLNCC contacted Randy Boyd, Conference Litigation Representative Supervisor, who contacted Robert A. Simms, District Manager. Simms contacted William Barnwell, Assistant District Manager. Barnwell called Morris to obtain more details about the reported accident, and learned the accident involved an equipment collision between a scoop and a shuttle car.

Barnwell contacted Matthew Stone, Roof Control Specialist, and assigned him to be the lead accident investigator. Barnwell also contacted Louis Adams, Electrical Supervisor, and John Benson, Electrical Specialist, to assist in the accident investigation. MSHA's investigation team traveled to the mine,

interviewed witnesses, conducted a physical examination of the accident, and reviewed conditions and work procedures relevant to the accident. MSHA jointly investigated the accident with Kentucky Department of Mine Safety. See Appendix B for a list of persons who participated in the investigation.

DISCUSSION

Accident Scene

The accident occurred in the intersection of the No. 6 entry at the 17+75 crosscut. The mining height in this area was 67 inches and the entry was 18.5 feet wide. The CMM was moving from the No. 6 left crosscut at 18+45 to set up and cut the No. 6 face.

Ramsey trammed shuttle car No. 2087 from the CMM located in No. 6 left crosscut at 18+45 to the intersection of the No. 6 entry at 17+75 stopping parallel to the ventilation curtain. Burns trammed shuttle car No. 2086 from the dumping point in the No. 5 entry at crosscut 15+65 and stopped between crosscuts 17+05 and 17+75 in the No. 6 entry (see Appendix C). Miners ventilated the No. 6 left crosscut with opaque white curtain, which was installed from the CMM location and extended outby across the intersection at the 17+75 crosscut, and a clear curtain installed at an angle across the No. 6 entry. The opaque white curtain prevented Blythe from seeing the shuttle car parked on the other side with its lights turned off.

Radio Communications

Shuttle car operators, scoop operators, and other production miners on the unit are equipped with portable radios, which are used for general communication in the work area. Blythe told investigators he announced his intention to travel across the face area to get to the No. 9 entry. Witnesses verified this. Ramsey did not respond to the radio communication verifying that he had heard Blythe. During MSHA's investigation of the accident, investigators tested the portable radios in the areas where Ramsey, Blythe and Burns were located and found they functioned properly.

Effective Warning Device

Investigators sounded the audible warning device on the battery scoop and determined it could be heard at Burns' location. The scoop operator told investigators he sounded the audible device prior to moving his scoop through the curtain. Burns could not corroborate this.

Previous Accident

This is the second fatal injury to occur at the Cardinal Mine involving battery-powered scoops traveling through ventilation curtains in intersections on active working sections, striking miners. The previous fatal injury occurred on September 5, 2019. At that time, the mine operator voluntarily agreed to install and test a proximity detection system (PDS) on the scoop involved in the accident because a PDS is designed to automatically stop mobile equipment if it gets too close to a miner. The PDS installed on the scoop was the IntelliZone, manufactured by Matrix Design Group, which is owned by Alliance Resource Partners, the parent company of Warrior Coal, LLC. At the time of the investigation, the scoop involved in the September 5, 2019, fatality was located on an idle section.

As a result of the September 2019 fatal accident, the mine operator also agreed to install the PDS on all battery powered scoops as they were rebuilt. At the time of the investigation, the mine operator had not installed PDS on any other scoops because no scoops had been rebuilt since the fatality in September 2019. During this period, Alliance Resource Partners had no need to rebuild any equipment.

Equipment
Ramsey was operating an Auxier Welding Inc. shuttle car, model CT27-B-4-64, and Blythe was operating a DBT battery powered scoop, model 488. Investigators did not find any defects or issues with the equipment involved in this accident.

Training and Experience
Ramsey had 30 years of underground mining experience with 1 year and 8 months experience as a shuttle car operator. Ramsey was employed at the Cardinal Mine for 1 year and 9 months. He received task training for the mid-drive shuttle car on January 3, 2019. Blythe's received task training as a scoop operator on August 19, 2019. All employees were trained on the safeguard issued in February 2020 as a result of the fatality that occurred in September 2019.

ROOT CAUSE ANALYSIS

MSHA conducted an analysis to identify the fundamental causes of the accident that were correctable through reasonable management controls. Investigators identified root causes that, if eliminated, would have either prevented the accident or mitigated the consequences.

Listed below are the root causes identified during the analysis and the corresponding corrective actions implemented to prevent a recurrence.

1. Root Cause: The scoop involved in the accident was not equipped with a PDS.

   Corrective Action: The mine operator recently installed a redesigned PDS on a scoop with newly developed zone configurations that are expected to be less susceptible to nuisance slowdown and shutdown events. In addition, enhanced audible and visible warnings were integrated with the PDS and machine control system.

   Once the evaluation is complete and the PDS is acceptable for use in the mine environment, the mine operator plans to install PDS on all battery scoops used on working sections in the mine. Contingent upon obtaining all requisite approvals from MSHA and not encountering any technical setbacks, the mine operator intends to install the newly developed PDS system on all scoops at the Cardinal Mine by December 31, 2021.

2. Root Cause: The mine operator's policies, procedures, and programs did not address the installation of opaque line ventilation curtain in an intersection. The non-transparent line ventilation curtain prevented the scoop operator from seeing the shuttle car parked on the other side.

   Corrective Actions: The mine operator developed and implemented the following written policy regarding line ventilation curtains and provided training for miners: all line face ventilation curtains extending into the last open crosscut will be transparent curtain, scoops will not travel through line brattice face ventilation curtains on active working sections except when performing cleaning and rock dusting activities, and shuttle cars will not travel through line face ventilation curtains in intersections on active working sections.

3. Root Cause: The mine operator did not have a policy or procedure to prevent miners from parking shuttle cars in intersections behind ventilation curtains.

Corrective Action: The mine operator developed and implemented the following written policy and provided training for miners: all rubber tired mobile equipment operators are to position their equipment to prevent the deck from being struck by other equipment if they have to stop or park in an intersection beside or behind ventilation curtains.

4. Root Cause: The mine operator had no policy or procedure that required scoop operators to receive acknowledgement of their radio transmissions of their intended routes of travel, from all shuttle car operators, prior to proceeding.

   Corrective Action: The mine operator developed and implemented the following written policy and provided training for miners: radio communication concerning intent of scoop travel will be verified by all affected shuttle car operators prior to scoops intersecting shuttle car haulage routes.

5. Root Cause: The mine operator had no policy or procedure related to the sounding of an audible warning device by scoop operators to provide an alert prior to scoops being trammed through ventilation curtains.

   Corrective Actions: The mine operator developed and implemented the following written policy and provided training for miners: an effective audible warning device shall be installed on scoops, maintained in functional condition, and checked during a pre-operational examination each shift. The warning device shall be one that miners can hear above the surrounding noise.

   A record of any deficiencies found during the pre-operational examinations of the audible warning device will be recorded as part of the on-shift examination for that section. An effective audible alarm or audible warning is defined as three consecutive signals.

CONCLUSION

On Tuesday, October 13, 2020, at 8:45 p.m., Phillip T. Ramsey, a 58-year-old Shuttle Car Operator with thirty years of mining experience, was fatally injured when he was struck by a battery-powered scoop. Ramsey had parked his shuttle car in an intersection behind an opaque ventilation curtain and was exiting the cab of the shuttle car when a battery-powered scoop trammed through the ventilation curtain and struck him.

The accident occurred because the mine operator did not: (1) prevent scoops from being trammed through ventilation curtains that restrict visibility, (2) prevent section equipment from being parked in intersections behind ventilation curtains, (3) ensure effective communication between mobile equipment operators, and (4) ensure that effective audible warnings are used prior to equipment being trammed through ventilation curtains.

Approved By:

_____ _____

Robert A. Simms Date
District Manager

ENFORCEMENT ACTIONS

1. A 103(k) Order, No.9148189, was issued to protect the miners and preserve the accident scene. The order prohibits all activities inby the tailpiece on the No. 5 unit (MMU 009-0/010-0), 6th North, until MSHA determines the area is safe to resume normal operations.

2. A 314(b) Safeguard was issued to Warrior Coal, LLC in accordance with 30 CFR 75.1403-10(f).

   The operator of a battery-powered scoop trammed the scoop through a white ventilation curtain while on the No. 5 unit (MMU 009-0/010-0). A miner died after the scoop struck him while exiting a shuttle car located on the opposite side of the ventilation curtain. This is a notice to provide safeguard that when scoops are operating on an active working section the following safety precautions will apply:

   A. Scoops will be equipped with a properly maintained and functioning proximity detection system by December 31, 2021.

   B. Scoops will not travel through line brattice face ventilation curtains on active working sections except when performing cleaning and rock dusting activities. An effective audible warning device will be sounded before traveling through curtains.

   C. Shuttle cars will not travel through line brattice face ventilation curtains in intersections on active working sections.

   D. All line brattice face ventilation curtains extending into the last open crosscut will be transparent curtain.

   E. An audible warning device shall be maintained in functional condition and checked during a pre-operational examination each shift. Scoops shall not be operated without a functioning audible warning device that can be heard above any surrounding noise.

   F. A record of any deficiencies found during the pre-operational examination of the audible warning device will be recorded as part of the on-shift examination for that section.

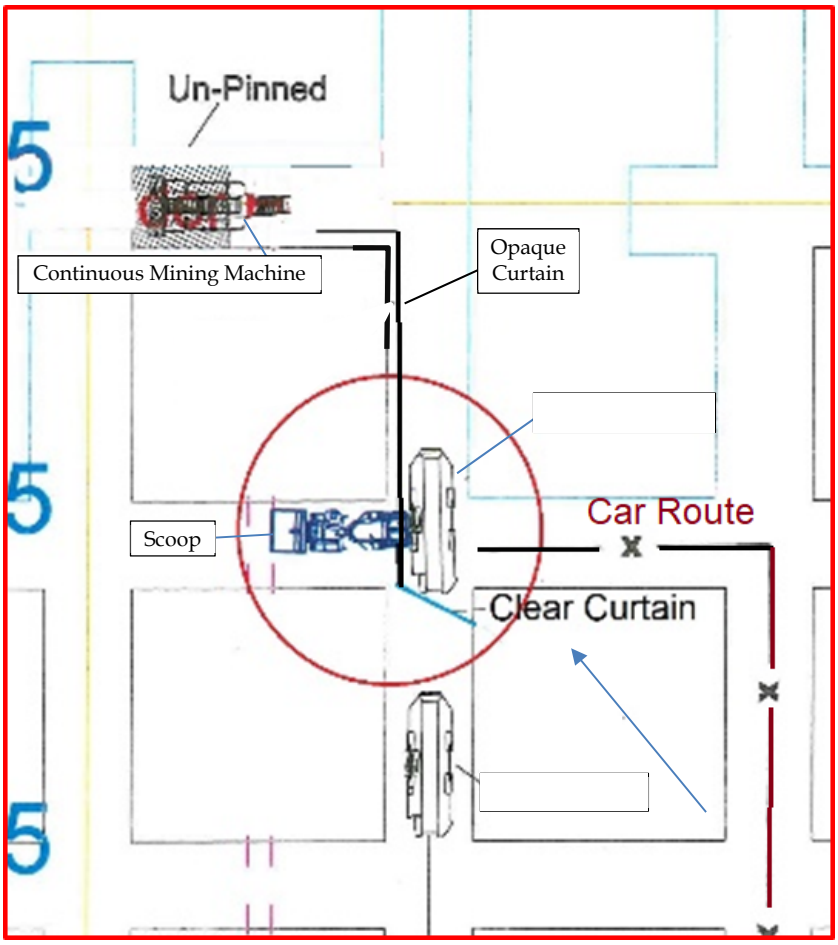
   G. An audible alarm or audible warning is defined as three (3) consecutive audible signals.

   H. Radio communication concerning intent of scoop travel will be verified by all affected shuttle car operators prior to scoops intersecting shuttle car haulage routes.

   I. All rubber tired mobile equipment operators are to position their equipment so as to prevent the deck from being struck by other equipment if they have to stop or park in an intersection beside or behind line curtains.

APPENDIX A
Accident Scene

Ramsey (victim) operated shuttle car #2087,
Burns operated shuttle car # 2086, and
Blythe operated the scoop



APPENDIX B
Persons Participating in the Investigation

Warrior Coal, LLC

Bill Adelman	General Manager
Joel Bradley	Assistant General Manager
Kenny Murray	Corporate Safety
Dustin Blanchard	Safety and Training
Bruce Morris	Director of Safety and Training
Kevin Blythe	Scoop Operator
William Burns	Shuttle Car Operator
Paul Hansen	Continuous Mining Machine Operator
Jacob Jones	Continuous Mining Machine Operator
Trent Peak	Shuttle Car Operator
Darrell Jones	Scoop Operator
Bruce Gibson	Outby General Labor
Mitchell McElroy	Continuous Mining Machine Helper
John Short	Mine Foreman
James Crowell	Unit Mechanic
Davory Walker	Shuttle Car Operator & Emergency Medical Technician
Nick Hardrick	Section Foreman & Emergency Medical Technician

Kentucky Division of Mine Safety

Kenny Mitchell	District Manager
Mark Turner	Mine Safety Specialist
Eric Nichols	Mine Safety Specialist
Bill Millay	Mine Safety Specialist
Rodney James	Mine Safety Specialist

Mine Safety and Health Administration

William Barnwell	Assistant District Manager
Louis Adams	Electrical Supervisor
Matthew Stone	Roof Control Specialist
John Benson	Electrical Specialist
Joe Fritz	Educational Field and Small Mine Services

APPENDIX C
Shuttle Car Travel Routes

Ramsey (victim) operated shuttle car #2087,
Burns operated shuttle car # 2086, and
Blythe operated the scoop