

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Powered Haulage Accident
October 5, 2013

Pattiki Mine
White County Coal LLC
Carmi, White County, Illinois
ID No. 11-03058

Accident Investigators

Larry D. Morris
Coal Mine Inspector/Accident Investigator

Michael D. Rennie
Supervisory Safety and Health Inspector

Terry Hudson
Electrical Inspector

Originating Office
Mine Safety and Health Administration
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Overtuned Battery-Powered Personnel Carrier

OVERVIEW

At approximately 1:07 p.m. on October 5, 2013, Robert E. Smith, a 47-year-old general laborer, was fatally injured at the White County Coal LLC, Pattiki Mine. The victim was traveling out of the mine at the end of his shift. The victim was driving a battery-powered, two-man personnel carrier. Evidence indicates that a diesel-powered vehicle began to push the victim's personnel carrier, which caused the personnel carrier to overturn on top of Smith. The accident occurred because mine management did not have adequate programs, policies, and procedures in place to ensure safe travel of self-propelled vehicles on outby travelways of the mine.

GENERAL INFORMATION

The Pattiki Mine, I.D. No. 11-03058, is operated by White County Coal, LLC and is located in White County near Carmi, Illinois. The mine began production in the Herrin No. 6 coal seam in March of 2002. The mine has 312 employees, with 275 underground workers.

Coal is produced on two shifts daily, five days a week, with an average daily production of 10,703 tons. The mine has eight mechanized mining units (MMUs), which utilize shuttle cars to transport coal from the working face to the belt tail. Conveyor belts transport the coal from the working section to the surface.

The last regular safety and health inspection (E01) of the mine was completed by MSHA on September 26, 2013. A regular safety and health inspection was not in progress at the time of the accident. The Non-Fatal Days Lost (NFDL) injury incidence rate for the mine operator in 2012 was 3.82, compared to a National NFDL rate of 3.24.

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

Johnny Garrett	General Manager
Joshua Bell	Safety Director
Randy Taylor	Superintendent

DESCRIPTION OF ACCIDENT

On Saturday, October 5, 2013, at approximately 1:07 p.m., Smith, (victim) was driving the No. 7 personnel carrier out of the mine at the end of his shift. His shift started at 3:00 a.m. He had been to the No. 2 unit to assist on a power move and to build brattices (stoppings). Smith and Steven Brown, Roof Bolter, left the section at approximately 12:37 p.m. after finishing their work for the day. While traveling out of the mine on the No. 7 battery-powered personnel carrier, they were asked by Chris Buchanan, Mine Manager, to take the Company No. 7359 "Blue Jake" diesel-powered personnel carrier out of the mine. Brown exited the No. 7 personnel carrier at crosscut #23 on the 4th 48 travelway. Smith proceeded in front, driving the battery-powered carrier, and Brown followed him driving the diesel-powered carrier. While traveling out of the mine, at approximately crosscut No. 6 on the 2nd 48 travelway, Brown noticed Smith's vehicle swerve, hit the left side rib, and then overturn. Smith was trapped under the No. 7 personnel carrier. Brown tried to move the No. 7 carrier to free Smith from under the vehicle. Brown was unable to move the vehicle and radioed for help.

Josh Knight, Mine Examiner, heard the call for help and traveled from the mechanic's shack to the scene of the accident, a distance of approximately 1,500 feet. Knight and Brown tried to lift the overturned personnel carrier to free Smith,

but they were unable to move it. They located a timber and used it to pry the personnel carrier upward to free Smith. After Smith was removed from under the personnel carrier, Knight evaluated Smith and did not detect any vital signs. Knight began to perform cardio pulmonary resuscitation (CPR) on Smith. Knight continued CPR until the arrival of Biff Mosby, Mechanic. Smith was transported out of the mine by Knight, while Mosby continued CPR until arrival on the surface.

The White County Ambulance Service arrived at 1:38 p.m. Upon arrival on the surface, emergency medical service personnel from the ambulance service relieved Mosby. The White County Coroner arrived a short time later. Smith was pronounced dead at 1:59 p.m.

INVESTIGATION OF THE ACCIDENT

The MSHA call center was notified of the accident at 1:50 p.m. on October 5, 2013, by Joshua Bell, Safety Director. 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. The call center notified Mary Jo Bishop, Assistant District Manager/Enforcement, at the District 8 Office in Vincennes, Indiana. MSHA personnel were immediately dispatched to the mine. A section 103(j) order was issued to ensure the safety of persons at the mine until an investigation could be conducted.

The accident investigation was conducted in cooperation with the Illinois Department of Natural Resources, Office of Mines and Minerals. Photographs and measurements of the accident scene were taken and interviews with four miners and management officials were conducted by the investigation team on the day of the accident. Operational checks of the equipment were performed and additional photographs were taken at the accident site on October 7, 2013. An additional interview was conducted with a miner on October 15, 2013, at the Pattiki Mine office. The on-site portion of the investigation was completed on October 21, 2013. A list of those persons who participated in the investigation is shown in Appendix A of this report.

DISCUSSION

Accident Scene

The accident occurred on the 2nd 48 travelway, which is the secondary escapeway and a main haulage road for the mine. The specific location of the accident was between crosscuts No. 5 and No. 6 of the travelway. The 2nd 48 travelway at the accident scene was in good condition, with a four-foot elevation difference between crosscut No. 12 and crosscut No. 5. The victim was traveling outby and uphill at the time of the accident. No mine-bottom irregularities were observed in the area. The entry was 21-feet wide, with windrows of coal and

rock on each side of the travel way. Loose material from rib sloughage was present in the area where the accident occurred.

During interviews, Brown stated that he saw the No. 7 personnel carrier swerve, hit the left rib (facing outby), and overturn. Brown stated that the left side of the carrier rose and caused the carrier to overturn in a clockwise direction from his position.

Evidence at the scene of the accident, however, does not support Brown's account of the carrier swerving and hitting the rib. There were no visible tire marks or disruption of the soft wind row of raw coal and rock along the left rib to indicate that the carrier hit or ran up on the rib (Appendix B).

Additionally, there was a fresh skid mark approximately 14.5 feet in length, that indicated that one tire of the No. 7 personnel carrier skidded in a straight line, with respect to the entry, while the wheels were turned to the left (Appendix B). The tires on this personnel carrier have a unique and pronounced alternating tread. A tire will not leave this type of pattern, unless it was skidding.

Anonymous Complaint

On the day after the fatal accident involving Smith, an anonymous hazardous condition complaint was filed with MSHA, alleging that golf carts (battery-powered personnel carriers) were being pushed by diesel-powered carriers. During the formal interviews conducted during the accident investigation, three of the four miners interviewed stated that they have seen golf carts pushed at this mine only to get them out of the way and not for long distances, but they did not believe it was a practice at the mine.

As a result of the hazardous condition complaint, an investigation of the complaint was performed by MSHA. The complaint investigator interviewed four individuals who were not interviewed during the fatal accident investigation. The complaint investigator interviewed one miner who was currently employed at the mine, and three individuals who were former employees at the mine. Two of the former mine employees are currently MSHA inspectors. These four individuals stated that they had witnessed battery-powered personnel carriers being pushed by diesel-powered carriers in the mine. Two of the individuals stated that pushing was normally done to move battery-powered carriers to a power center for charging purposes, or out of the travelway.

As a result of the complaint investigation, Safeguard No. 8439341 was issued to the mine operator. This safeguard requires battery-powered, self-propelled personnel carriers or mantrips to operate independently and not be pushed by any other self-propelled personnel carriers or mantrips, except in certain limited conditions. The safeguard allows disabled personnel carriers or mantrips to only be pushed at minimal speeds and only the distance necessary to move the

disabled carrier or mantrip to the side of the roadway in the immediate area. All subsequent movement must be done by towing.

MSHA accident investigators found fresh scrape marks on the rear bumper of the No. 7 battery-powered personnel carrier, which indicated that this carrier had recently been pushed (Appendix B). Yellow paint markings on the front bumper of the company No. 7359 diesel-powered carrier indicate that it had recently pushed something with similar paint as the paint on the No. 7 personnel carrier (Appendix B). The bumper of the diesel-powered carrier matches some of the fresh scrape markings on the rear bumper of the No. 7 personnel carrier.

Brown, who was driving the diesel-powered carrier behind the victim, stated that he was not pushing the battery-powered carrier that Smith was driving. There were no other miners who witnessed this accident. The physical evidence, however, does not support Brown's statement. Rather, the evidence indicates that the diesel-powered carrier was used to push the victim's personnel carrier and caused it to overturn.

Company No. 7 Battery-Powered Personnel Carrier

The battery-powered personnel carrier being used at the time of the accident was manufactured by the mine operator. This battery-powered personnel carrier is referred to as a golf cart by personnel at the Pattiki mine, but it does not resemble a golf cart. It was a two-seat personnel carrier identified as Model No. GC15. This carrier measures 4 feet in width and 12 feet in length. It is powered by ten, 6-volt batteries for a total of 60 volts direct current (VDC). The battery was operative when checked during the accident investigation. The maximum voltage rating for the motor is 48 VDC. A citation that did not contribute to the accident was issued for a violation of 30 CFR § 75.512, because the voltage was too high for the No. 7 personnel carrier electric motor. The carrier is equipped with 22-inch tires and the bottom of the vehicle is 12 inches above the ground.

A mechanical inspection of the No. 7 battery-powered personnel carrier was performed by the investigation team and no mechanical problems were found with the vehicle that would have contributed to the accident. A post-accident speed test was performed on the surface with the assistance of the White County Sheriff. The radar gun measured the top speed of the vehicle to be 15 miles per hour (mph).

The mine operator is being required to reduce the speed of all of the battery-powered personnel carriers, by removing two of the 6-volt batteries, making them 48 VDC personnel carriers.

During the fatal accident investigation, the mine operator admitted that battery-powered personnel carriers frequently have issues with not having enough

battery power to travel throughout the mine, because of the long travel distances in the mine.

To solve the problem of not having enough battery power, the mine operator is purchasing “quick chargers” to allow for a dead set of batteries to be charged in one hour, instead of the normal 6-hour charging time with the existing chargers.

In addition to reducing the speed of the personnel carriers, the mine operator is in the process of re-manufacturing the front end of the carriers with a bumper extension that will prevent the carrier from getting close to the rib sloughage/piles of material left behind from grading the roads (Appendix B).

Company No. 7359 diesel-powered personnel carrier

Brown was driving a light duty diesel-powered personnel carrier manufactured by Alpha Services. The model number is S4S-DT-VSCA. The serial number is 168014 and the MSHA diesel approval is O7-ENAO50001. This vehicle was examined and driven after the accident. This vehicle, with a top speed of 21 mph, was faster than the battery-powered carrier. No violations were observed.

Previous Accident

An accident, at this mine, on April 20, 2009, involved a battery-powered personnel carrier losing control, traveling upon the sloughage and graded material along the rib, and overturning, injuring three miners.

Alteration of the accident scene

Having directed the battery-powered personnel carrier to be moved to enable the inby vehicles to advance to the cage, the mine operator allowed the scene of the accident to be altered. The No. 7 personnel carrier was dragged approximately 200 feet outby the accident location in the same entry. There was no emergency situation that warranted the movement of the battery-powered personnel carrier. Also, other vehicles and miners outby the accident site were available to travel inby to the accident site, and transport all miners inby the accident scene out of the mine. A citation that did not contribute to the accident for 30 CFR § 50.12 was issued as a result of the mine operator not preserving the evidence at the scene of an accident.

Experience and Training

Smith had 15 years and 6 weeks of underground mining experience. Smith had worked at the Pattiki Mine for 11 years and 6 months.

Training records indicated that Smith had not received task training, as required by 30 CFR § 48.7(a)(3), on the operation of the company manufactured, No. 7 battery-powered personnel carrier. Smith had received training identified as “driver,” but the MSHA 5000-23 training form did not specify what he was trained to drive. There are different types of personnel vehicles at this mine. Task training is required for operation all types of personnel vehicles, since they

operate differently. The accident was not caused by Smith's lack of knowledge of the operating controls for the No. 7 personnel carrier. The No. 7 personnel carrier was assigned to Smith and he drove this vehicle daily. A citation was issued for failure to conduct task training on operation of the No.7 personnel carrier, but was issued as a non-contributory violation.

Toxicology

A toxicology test of the victim's blood was conducted post-mortem. The results of the toxicology indicated that the victim was positive for Butalbital, at 1.2 ugm/ml. Butalbital is a barbiturate with an intermediate duration of action.

ROOT CAUSE ANALYSIS

An analysis was conducted to identify the underlying cause of the accident that was correctable through reasonable management controls. 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: Mine management did not have adequate programs, policies, and procedures in place to ensure safe travel of self-propelled vehicles on outby travelways of the mine. Miners were not appropriately trained on the policies and procedures.

Corrective Action: Safeguard 8439341, issued as a result of the investigation of the anonymous complaint, requires battery-powered self-propelled personnel carriers or mantrips to operate independently and not be pushed by any other self-propelled personnel carriers or mantrips. The safeguard allows disabled vehicles to be slowly pushed to the side of the roadway in the immediate area. Afterwards, all subsequent movement of disabled carriers or mantrips must be done by towing.

Additionally, mine management has established the following written policies, procedures, and programs to ensure that self-propelled vehicles are operated safely:

Mine management will provide tow bars on all diesel powered foremen's vehicles and diesel maintenance mantrips. Personnel needing assistance to tow a disabled vehicle will be able to communicate such needs via text page, leaky feeder, or mine phones.

Mine management will convert all non-permissible battery-powered personnel carriers from 60 VDC to 48 VDC batteries. To ensure consistency between the charging units and the battery-powered carrier voltages, compatible charging units will be installed by the mine operator on all of the charging units necessary to accommodate the modified 48 VDC non-permissible carriers. These modifications are designed to reduce the speed of the battery-powered personnel carriers.

The mine operator has begun the process of cleaning sloughage and wind rows along coal ribs along the travelways to prevent accumulations that create a potential hazard to rubber-tired haulage equipment or personnel carriers being operated along the secondary escapeway (travelway).

The mine operator has begun the process of installing bumper extensions on the non-permissible battery-powered carriers to aid in preventing them from potentially traveling up rib sloughage and wind rows of material left over from grading in the secondary escapeway (travelway). The mine will also continue to

install and maintain a bumper extension on selected non-permissible battery carriers.

The mine operator has revised the Mantrip Safety Section of the Pattiki Mine's Safety Standards Handbook to include a limitation on the traveling distance between personnel carriers, as follows: *"Self-propelled personnel carriers or mantrips operating on mine travelways shall not follow within two (2) crosscuts of any other self-propelled personnel carrier or mantrips, except at air lock doors and in parking such self-propelled carriers or mantrips at work locations and charging stations."*

Training will be conducted for the revised programs, policies, and procedures, with initial training to be given to all miners. In addition, training covering the revised programs, policies, and procedures will be covered during annual refresher sessions.


CONCLUSION

The accident occurred because mine management did not have effective policies, programs, and procedures for safe travel of self-propelled personnel carriers on outby travelways of the mine. Evidence indicates that a diesel-powered vehicle pushed the personnel carrier being operated by the victim, which caused the personnel carrier to overturn on top of the victim.

Approved By:



Robert A. Simms
District Manager



Date

ENFORCEMENT ACTIONS

1. A 103(J) Order, No. 8439338, was issued to ensure the safety of the miners until the investigation could be completed. The order was modified to a 103(k) action upon MSHA's arrival at the mine.
2. As a result of the anonymous hazardous condition complaint filed with MSHA the day after the fatal accident, MSHA investigated the complaint and issued Safeguard No. 8439341 to the mine operator. The complaint alleged that golf carts (battery-powered personnel carriers) were being pushed by diesel-powered carriers. The safeguard required that battery-powered, self-propelled personnel carriers or mantrips be operated independently and not be pushed by any other self-propelled personnel carriers or mantrips, except in certain limited conditions.

Appendix A
Persons Participating in the Investigation

Mine Safety and Health Administration

Larry D. Morris	CMS&H Inspector, Accident Investigator
Terry Hudson	CMH&S Inspector, Electrical
Mike Rennie	Supervisory CMS&H
Bob Bretzman	CMS&H Inspector, Special Investigator

State of Illinois Department of Natural Resources, Office of Mines and Minerals

Tony Mayville	Mine Safety & Enforcement Supervisor
Bill Patterson	Inspector at Large
Gary Roberts	Inspector
Kevin Dixon	Inspector

White County Coal, LLC

Ken Murray	Corporate Safety, Alliance Coal
John Garrett	General Manager
Joshua Bell	Safety Director
Jay Kittinger	Asst. Safety Director
Steven Brown	Roof Bolter
Josh Knight	Mine Examiner
Biff Mosby	Mechanic
Chris Buchanan	Mine Manager
David Baker	Maintenance Foreman

White County Sheriff's Office

Doug Maier	White County Sheriff
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Persons Interviewed During the Investigation

Steven Brown	Roof Bolter
Josh Knight	Mine Examiner
Biff Mosby	Mechanic
Chris Buchanan	Mine Manager
David Baker	Maintenance Foreman

Appendix B

Photographs



Left rib at accident site, undisturbed by personnel carrier tracks.



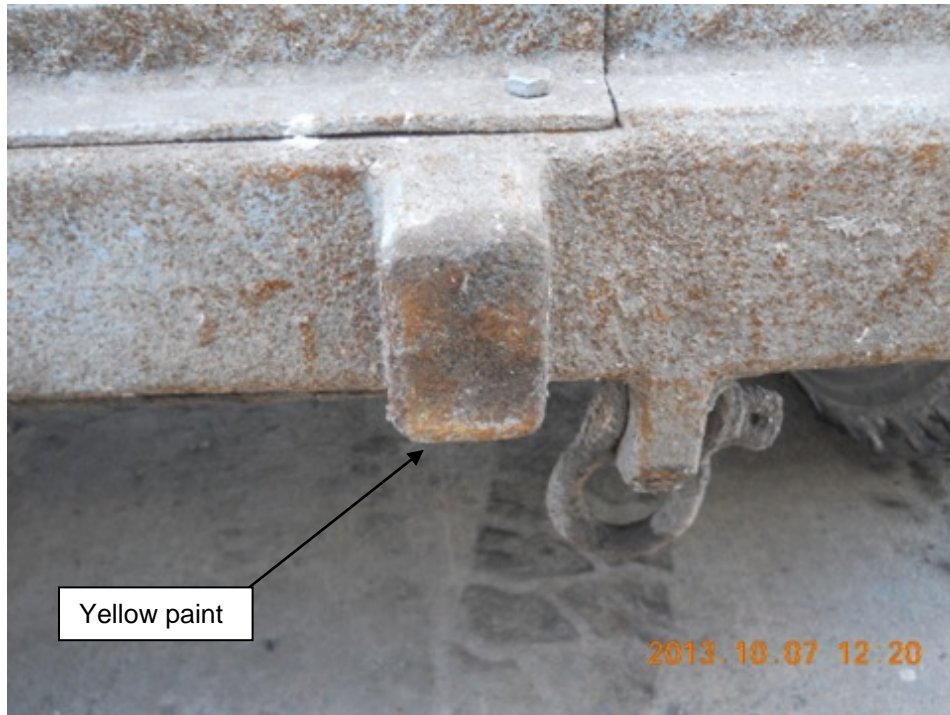
Skid mark – close up



Skid mark – wide angle photo



Rear bumper of company No. 7 battery-powered personnel carrier



Front bumper of company No. 7359 diesel-powered carrier



Modifications made by mine operator to battery-powered carrier

Appendix C Victim Information

Accident Investigation Data - Victim Information

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



Event Number:

4	2	5	4	6	2	3
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Victim Information: 1

1. Name of Injured/Ill Employee: <i>Robert E. Smith</i>		2. Sex <i>M</i>	3. Victim's Age <i>47</i>	4. Degree of Injury: <i>01 Fatal</i>												
5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 10/05/2013 b. Time: 13:59</i>				6. Date and Time Started: <i>a. Date: 10/05/2013 b. Time: 3:00</i>												
7. Regular Job Title: <i>016 General Laborer</i>		8. Work Activity when Injured: <i>062 Driving battery transport vehicle</i>			9. Was this work activity part of regular job? <table style="margin-left: auto; margin-right: 0;"><tr><td>Yes</td><td><input checked="" type="checkbox"/></td><td>No</td><td><input type="checkbox"/></td></tr></table>	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>							
Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>													
10. Experience a. This		Years	Weeks	Days	b. Regular	Years	Weeks	Days	c. This	Years	Weeks	Days	d. Total	Years	Weeks	Days
Work Activity:		<i>15</i>	<i>6</i>	<i>0</i>	Job Title:	<i>15</i>	<i>6</i>	<i>0</i>	Mine:	<i>15</i>	<i>6</i>	<i>0</i>	Mining:	<i>15</i>	<i>6</i>	<i>0</i>
11. What Directly Inflicted Injury or Illness? <i>108 battery powered transport vehicle</i>				12. Nature of Injury or Illness: <i>170 Crushing</i>												
13. Training Deficiencies: Hazard: <input type="checkbox"/> New/Newly-Employed Experienced Miner: <input type="checkbox"/> Annual: <input type="checkbox"/> Task: <input checked="" type="checkbox"/>																
14. Company of Employment: (If different from production operator) <i>Operator</i> Independent Contractor ID: (if applicable)																
15. On-site Emergency Medical Treatment: Not Applicable: <input type="checkbox"/> First-Aid: <input type="checkbox"/> CPR: <input checked="" type="checkbox"/> EMT: <input type="checkbox"/> Medical Professional: <input type="checkbox"/> None: <input type="checkbox"/>																
16. Part 50 Document Control Number: (form 7000-1)			17. Union Affiliation of Victim: <i>9999 None (No Union Affiliation)</i>													

Victim Information: