CAI-2010-41

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
July 9, 2010

Willow Lake Portal
Big Ridge Inc
Equality, Saline County, Illinois
I.D. No. 11-03054

Accident Investigators

James B. Coomes, Jr.
Coal Mine Safety and Health Inspector

Ron Medina
Mechanical Engineer
Mechanical Safety Division
MSHA Approval and Certification Center

Originating Office
Mine Safety and Health Administration
District 8
2300 Willow Street
Vincennes, Indiana
Hubert Payne, District Manager

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OVERVIEW

At approximately 12:35 p.m., on Friday, July 9, 2010, a 61-year old Production Supervisor was killed in a powered haulage accident. Thomas N. Brown (victim) was located at or near a run-through check curtain hung in the travel-way, used to gain access to the ratio feeder on the No. 4 Section. While hauling coal from the continuous miner to the ratio feeder, a battery-powered coal hauler (ram car) traveled trailer first, through a check curtain, striking the victim and running over him. The section scoop operator discovered the victim lying to the immediate right of the intersection, about 42 feet from the check curtain, which was located between the No. 6 and No. 7 Entries at Crosscut No. 107.

GENERAL INFORMATION

The Willow Lake Portal, I.D. No. 11-03054, is located near Equality in Saline County, Illinois. The mine operator is Big Ridge Inc., a subsidiary of Peabody Midwest Operations, LLC. The International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers and Helpers Union represent the miners at the Willow Lake Portal mine.

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

Mark Cavinder	Operations Manager
Rickie Phillips	Underground Mine Superintendent
Terry Ward	Ventilation Mine Manager
Charles Stephenson	Maintenance Manager
Todd Grounds	Compliance Manager
Mike Biaze	Safety Director

Willow Lake Portal mine has five active working sections. The working sections are accessed by a slope, which is developed into the Illinois No. 5 coal seam. Four of the working sections use a dual split of air (split-air unit) for ventilation; each with two mechanized mining units (MMUs) and a 5th MMU is ventilated by one split of air. The mine produces coal, seven days a week. All working sections are advance mining utilizing the room and pillar method of mining. A system of conveyor belts transport coal from the working sections to the preparation plant on the surface.

In the 1st East Panel off 1st North Submain area, the No. 3 and No. 4 Entries supply intake air to the No. 4 Section. The belt conveyor is located in No. 5 Entry, with the travel way in No. 6 Entry. The right side return air courses are located in No. 1 and No. 2 Entries and the No. 7 and No. 8 Entries are designated left side return air courses for the section. The section mines three development rooms on each side of the section. MMU 004-0 is located on the right side of the section and MMU 014-0 is located on the left side of the section. Section entries and rooms are numbered from right to left (See Appendix C).

MSHA started a regular safety and health inspection (E01) on July 6, 2010, which was ongoing at the time of the accident. The previous regular safety and health inspection was completed on June 28, 2010. The Non Fatal Days Lost (NFDL) incidence rate for this mine in 2009 was 8.55, compared to the National NFDL rate of 4.04 in 2009.

DESCRIPTION OF THE ACCIDENT

On the morning of July 9, 2010, Brown reported to work at the Willow Lake Portal, dressed for work, and then counter-signed the pre-shift inspection report for the No. 4 Section. The crew entered the mine at approximately 6:30 a.m., arriving on the No. 4 Section at approximately 6:55 a.m. The crew started producing coal at approximately 7:15 a.m. Coal production progressed normally until approximately 11:00 a.m., when No. 885 battery-powered coal hauler (ram car) broke down on the left-side dump of the ratio feeder. The ratio feeder was in the intersection of the No. 5 Entry at Crosscut No. 107. Tom McDermott repaired the ram car at the ratio feeder.

The section equipment operators substituted for each other, allowing each to eat lunch. Jamison Cummins, Scoop Operator, substituted for the continuous mining machine operators during lunch. Randy Stevens, Continuous Mining Machine Operator, spoke with Brown at the dinner hole at approximately 12:10 p.m. At 12:20 p.m., Stevens went back to the continuous mining machine in the No. 3 Room on the section's left side.

The No. 880 ram car, used to spread rock dust, broke down while McDermott was repairing the No. 885 ram car at the ratio feeder. McDermott then repaired the No. 880 ram car and noticed that the No. 885 ram car was still located at the ratio feeder. As McDermott passed the dinner hole, he told Brown that No. 885 ram car was repaired and ready to go.

Kevin Collins, Ram Car Operator, talked to Brown approximately three minutes before the accident. Collins was on his way to the dinner hole. Brown was standing on the right side of the No. 6 Entry, outby the intersection at Crosscut No. 107, and adjacent to the ratio feeder.

For their lunch break, Ed Pogue, Ram Car Operator, replaced David Teegarden, on the No. 859 ram car. Pogue loaded the ram car at the continuous mining machine. He pulled the ram car into Crosscut No. 106, with the batteries facing the forward direction of travel. Teegarden replaced Pogue on No. 859 ram car. Teegarden trammed the ram car to Crosscut No. 107, between No. 7 and No. 8 Entries, with the trailer end toward the ratio feeder. Teegarden waited in the No. 7 Entry for Pogue to clear the intersection with his ram car.

Pogue got on the No. 885 ram car, which was still located at the ratio feeder. As he was leaving the ratio feeder, he talked to Brown. Brown was standing on the left side, outby Crosscut No.107, in the No. 6 Entry. This was Brown's last known location prior to accident. Pogue trammed his ram car through the check curtain in Crosscut No. 107 and turned outby.

As Pogue cleared the intersection and left the area, Teegarden started toward the ratio feeder. He proceeded through Crosscut No.107, with his ram car trailer

pointing forward, striking Brown. The ram car operator's deck had not cleared the check curtain when the car struck Brown. Teegarden did not see Brown through the check curtain on the feeder side of the entry. Brown was apparently dragged under the No. 859 ram car, across the intersection. At that point, Brown was located approximately three feet behind the end of the ram car, while the car transferred the coal into the ratio feeder. The ram car ran over Brown a second time as it left the feeder and returned to the continuous mining machine.

Cummins left the continuous mining machine when Stevens returned from lunch. Cummins walked to the scoop, parked inby Crosscut No. 108 in the No. 7 Entry, to retrieve his dinner bucket. While walking to the dinner hole, he discovered Brown in the intersection, at approximately 12:35 p.m. Cummins immediately summoned help. McDermott, an EMT, responded to assist and realized that Brown's injuries were fatal. Mike Gibbons, Mechanic, notified the responsible person on the surface of the accident.

INVESTIGATION OF THE ACCIDENT

At approximately 12:40 p.m. July 9, 2010, Larry D. Morris, Mine Safety and Health Administration (MSHA) Coal Mine Inspector, was notified of a fatality at the mine. At 12:42 p.m. CDT, the MSHA Call Center was notified of a death at the mine, by Todd Grounds, Compliance Officer. Larry Morris and the Call Center notified the Vincennes District 8 Office. Larry Morris issued a 103(j) Order verbally, by phone, to Todd Grounds. Bobby Jones, MSHA Inspector from the Benton, Illinois Field Office, James B. Coomes, Jr., Accident Investigator, District 8 Office, and Wilbur Deuel, District 8 Accident Coordinator, were immediately dispatched to the mine. At the mine site, the 103(j) Order was modified to a 103(k) Order, to insure the safety of persons at the mine and preserve the evidence at accident scene.

The accident investigation was conducted in cooperation with the Illinois Department of Natural Resources, Office of Mine and Minerals. A physical examination of the accident scene was conducted the evening of the accident and on Saturday, July 10, 2010. On Tuesday, July 13, 2010, an accident reenactment was conducted at the accident scene. On July 15, 2010, the investigation team conducted interviews with five persons. Additional interviews were conducted on July 20 and July 23, 2010. Seven persons were interviewed during the investigation. A list of persons who participated in the investigation is shown in Appendix A of this report.

DISCUSSION

Physical Factors

The accident occurred at Crosscut No. 107 in the intersection of the No. 6 Entry. A run-through check curtain was installed, midway between coal pillars, in Crosscut No. 107, between the No. 6 and No. 7 Entries. Check curtains were used as ventilation controls to maintain the desired amount of ventilating air at the working faces. The check curtain was a heavyweight, translucent plastic curtain, with the top 18 inches made of white plastic. A supplemental curtain was installed in between the translucent curtains. The supplemental curtain was heavyweight white plastic, hanging three quarters of the way from the roof, toward the floor. A wooden board was roof bolted to the roof to hang check curtains. The curtains were nailed to the board with spads (survey markers). . The check curtains attached at the top only, to allow equipment pass through, without pulling the curtain down. At the accident site, a piece of the curtain was pulled away from the top, causing a hole in the right side, middle portion of the check curtain.

The mine floor was dry.

BH10H STAMLER BATTERY COAL HAULER DESIGN: The Stamler BH10H Coal Hauler (ram car) is an articulated machine. It is loaded by a continuous mining machine and the coal is discharged with an ejector blade into a feeder. The service manual refers to the battery end as the front of the machine and the load-carrying end as the rear. The operator's compartment was provided with a seat that was perpendicular to the direction of travel. With respect to an operator sitting in the compartment and turning his head to face the front (battery) end of the machine, the operator's compartment was on the left side of the machine. The unit was provided with an accelerator foot pedal and service brake foot pedal, with the accelerator pedal located to the right of the brake pedal in the standard automotive orientation. A joystick control on the left side of the compartment controlled numerous functions. Steering capability was provided by pushing the joystick forward or rearward. Push buttons on the steering joystick controlled the pump motor, travel direction, lights, and emergency parking brake.

MACHINE DIMENSIONS: The coal hauler (No. 859 ram car) was 38 feet – 1 inch long. The battery end was 10 feet - 8 inches wide and the haulage end was 12 feet - 6 inches wide. The distance from the center articulation joint to the battery end of the machine was 15 feet – 9 inches, while the distance from the articulation joint to the end of the haulage portion was 22 feet – 4 inches. The canopy height was 48.75 inches. The top of the battery compartment was 43 inches high and the top of the sideboards was 47 inches high.

VISIBILITY: The Stamler Coal Hauler is typically loaded with a heaped load of coal, to within a foot of the mine roof. The mining height at the Willow Lake Mine is approximately 5 feet – 6 inches. The heaped coal blocks the operator's view when tramming with the load end in the leading direction. Testing showed that a person standing in front of the coal hauler, where the victim was struck, was not visible to the coal hauler operator. When traveling with the battery end in the leading direction, objects less than approximately 3 feet from the ground are not visible to the operator.

The following conditions created visual obstructions for the ram car operators:
1. Check curtains were installed in the haulage travelways.
2. The ram car trailer was loaded with a full load of coal.

LIGHTS: The illumination system on the coal hauler had an MSHA Statement of Test and Evaluation (STE) Number of 5005142. A copy of the MSHA STE letter was obtained from the manufacturer, but there was not an STE plate on the machine. The lighting system was designed with two HE50 Ocenco Headlamps (X/P Number 3221-0, or 2) on the front of the machine and two on the rear.

The coal hauler, as found after the accident, was correctly equipped with four Ocenco X/P 3221-0 headlights. The front headlights were installed at the forward edge of the machine, 32 inches above the ground. The rear headlights (the direction of travel at the time of the accident) were attached to the machine, 86 inches back from the leading edge of the haulage end of the machine. These lights were located on the bottom side of structural gussets attached to the side of the haulage body. The headlight on the operator side of the machine was 24 inches above the ground and the headlight on the off-driver side of the machine was 21 inches above the ground. The locations of the lights conformed to the drawings for the illumination system documented in MSHA STE No. 5005142 issued for this machine.

TRAMMING SYSTEM: The coal hauler was provided with an accelerator pedal that provided variable speed control from zero, to 5 mph. The front axle was mechanically powered, full time, and the rear axle was powered by two hydraulic motors when needed. In poor traction conditions, the operator can engage the rear wheel assist feature. No tramming system defects were found.

BRAKING SYSTEM: Operations of the service brake system, the emergency-parking brake system, and the panic bar were tested. The brake gauges were defective. Dynamic service brake and emergency-parking brake tests were conducted with the coal hauler fully loaded, as conditions existed when the accident occurred. The emergency-parking brake stopped and held the coal hauler when the panic bar was actuated. The service brake could also quickly stop and hold the coal hauler. No brake stopping performance defects were found at this time.

PANIC BAR: The coal hauler was equipped with a strip-switch type panic bar on the left side of the operator's compartment. There was not a panic bar on the right side of the operator's compartment. When actuated, the panic bar de-energized the tram motors and applied the emergency-parking brake.

AUDIBLE WARNING: The ambient noise level at the accident scene was likely to have diminished the ability of the victim to hear the ram car's audible alarm as it was tramming toward the check curtain. The ambient noise was caused by the conveyor chain, a roof bolt on the pick breaker in the ratio feeder, the conveyor belt, and the ram car.

Training and Experience

Thomas N. Brown had a total of 33 years underground mining experience, of which 2 years and 40 weeks were at the Willow Lake Portal mine, including 1 year and 45 weeks as a Foreman. Brown had 18 years prior experience as a Foreman before coming to this mine. Brown received the State of Illinois Certificate of Competency to discharge the duties of Mine Manager on April 7, 2008. Brown received Newly Employed Experienced Miner Training on October 1, 2007 and received Annual Retraining on March 10, 2010. No deficiencies were identified with Brown's training records.

Brown also worked at Pyro Mining from October 1977 to March 2003 as an Equipment Operator, Section Foreman, 2nd Shift Mine Foreman and 1st Shift Mine Foreman. Brown worked from September 2004 to September 2007 as a Foreman at Pleasant View Mining.

Communication and Safe Task Coordination

The ram car operators were unaware that Brown would be in the roadway, on the other side of the check curtain, as they hauled coal to the ratio feeder.

The operator did not have written prescribed procedures or policies in place to ensure direct communication is made between members of the section crew or other personnel when a miner is located in a hazardous position. Such procedures would be necessary to provide information about work activities of each miner, or others present on the section, and allow for coordination of work activities to ensure the safety of the crew or other persons.

ROOT CAUSE ANALYSIS

An analysis was conducted to identify the underlying cause or causes of the accident that were correctable through reasonable management controls. Listed

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

Root Cause: The mine operator failed to establish a policy that ensured establishment of a direct line of communication, which shared details of the section crew's activity and the projected or ongoing mining activities within the working section. This would ensure that activities could be coordinated in such a manner as to provide safety to all employees.

Corrective Action***:*** The mine operator has developed written policy and procedures addressing communication on the working section, including training of the miners. Such training includes hazards associated with haulage travel ways, safe positioning for those present on the section during equipment operation, audible warning alarms, designed to be above the ambient noise levels on the section, and clear communication with other miners or personnel to assure their locations are known to equipment operators.

Root Cause: The mine operator failed to establish a policy that ensures the equipment operators' visibility at check curtains, through which the equipment has to pass.

Corrective Action: The mine operator has developed policy and procedures addressing the use of clear, check/run-through curtains and has trained the miners accordingly. Such training includes the use and proper installation of the transparent curtains on the working sections.

CONCLUSION

The victim was struck and run over by a ram car when the car traveled through a check curtain as it approached the ratio feeder. The accident occurred because the mine operator's policies and procedures were inadequate and failed to ensure that direct communications were established and maintained between section workers. In addition, no policies or procedures existed to assure that miners were familiar with safe positioning locations while equipment was operating on the section. In addition, the ambient noise levels near the check/run-through curtains prevented other miners from hearing the ram cars approaching the check curtains. Finally, failure of the operator to use fully transparent check curtains in areas where equipment traveled through the curtains obstructed the ram car operator's vision.

Approved By:

Hubert Payne
District Manager

Date October 12, 2010

ENFORCEMENT ACTIONS

1. A Section 103(j) Order, No. 8418737, was issued to ensure the safety of all persons in the mine and to prevent the destruction of any evidence, which would assist in investigating the cause of the accident. The Section 103(j) Order was modified to a Section 103(k) Order to insure the safety of miners until the investigation could be completed.

2. A 314(b) Notice to Provide Safeguards, No. 8425063, for 30 C.F.R. § 75.1403, was issued to Big Ridge Inc., Willow Lake Portal. This safeguard requires an audible warning shall be given by the operator of all self-propelled equipment where persons may be endangered by the movement of the equipment. This audible warning shall be above the surrounding noise levels.

3. A 314(b) Notice to Provide Safeguards, No. 8425064, for 30 C.F.R. § 75.1403, was issued to Big Ridge Inc., Willow Lake Portal. This safeguard requires the mine operator to use only approved, clear check curtains as run-through curtains.

4. A 314(b) Notice to Provide Safeguards, No. 8425062, for 30 C.F.R. § 75.1403, was issued to Big Ridge Inc., Willow Lake Portal. This safeguard requires all battery powered coal haulers at this mine to have their load trimmed not to obstruct the operator's view behind the trailer when tramming with the trailer end in the leading direction. Alternatively, to be provided with equivalent means of visibility or awareness for the operator behind the trailer when tramming with the trailer end in the leading direction.

APPENDIX A

Persons Participating in the Investigation

Mine Safety and Health Administration

Hubert L. Payne	District Manager, District 8
James B. Coomes	Coal Mine Safety and Health Inspector, Accident Investigator
Mike Rennie	Coal Mine Safety and Health Supervisor
Bobby Jones	Coal Mine Safety and Health Inspector
Ronald Medina	Mechanical Engineer – Technical Support
Wilbur Deuel	Staff Assistant

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

Joe Angleton	Director, Office of Mines and Minerals
Don McBride	Inspector at Large
John Gabby	Inspector
Mike Simpson	Inspector
Art Rice	Administrative Assistant

Peabody Midwest Operations, LLC

Charles A. Burggraf	Executive Midwest Operations
Thomas Benner	Director of Underground Mines – Midwest
Dave Beerbower	Vice President Safety
Chad Barras	Midwest Safety Director
Jim Hurtte	Assistant Midwest Safety Manager
Chris Van Arsdale	Manager of Continuous Improvement

Big Ridge Inc

Mark Cavinder	Operations Manager
Rickie Phillips	Underground Mine Superintendent
Terry Ward	Ventilation Mine Manager
Charles Stephenson	Maintenance Manager
Lester Thompson	Maintenance Foreman – C Crew
Todd Grounds	Compliance Manager
Mike Biaze	Safety Director

International Brotherhood of Boilermakers

Greg Forte	Local S8 President
Rodney Shires	Local S8 Vice President
Don Bradley	Local S8 Recording Secretary
Bill Shover	Union Representative
Calvin Melvin	Mechanic
Keith Schutt	Mechanic
Tom McDerrnett	Mechanic
Randy Stevens	Continuous Miner Operator
David Teegarden	Ram Car Operator
Jameson Cummins	Scoop Operator
Ronal Wood	Ram Car Operator
Kevin Collins	Ram Car Operator
Ed Pogue	Ram Car Operator
Richard Price	Continuous Miner Operator
Jeremy Fletcher	Shift Leader – Right Side
Mike Gibbons	Mechanic
Uriah Easley	Examiner
Tim Darnell	Rock Duster

Saline County Coroners Office

Randy Reed	Coroner
Tracey Felty	Deputy Coroner

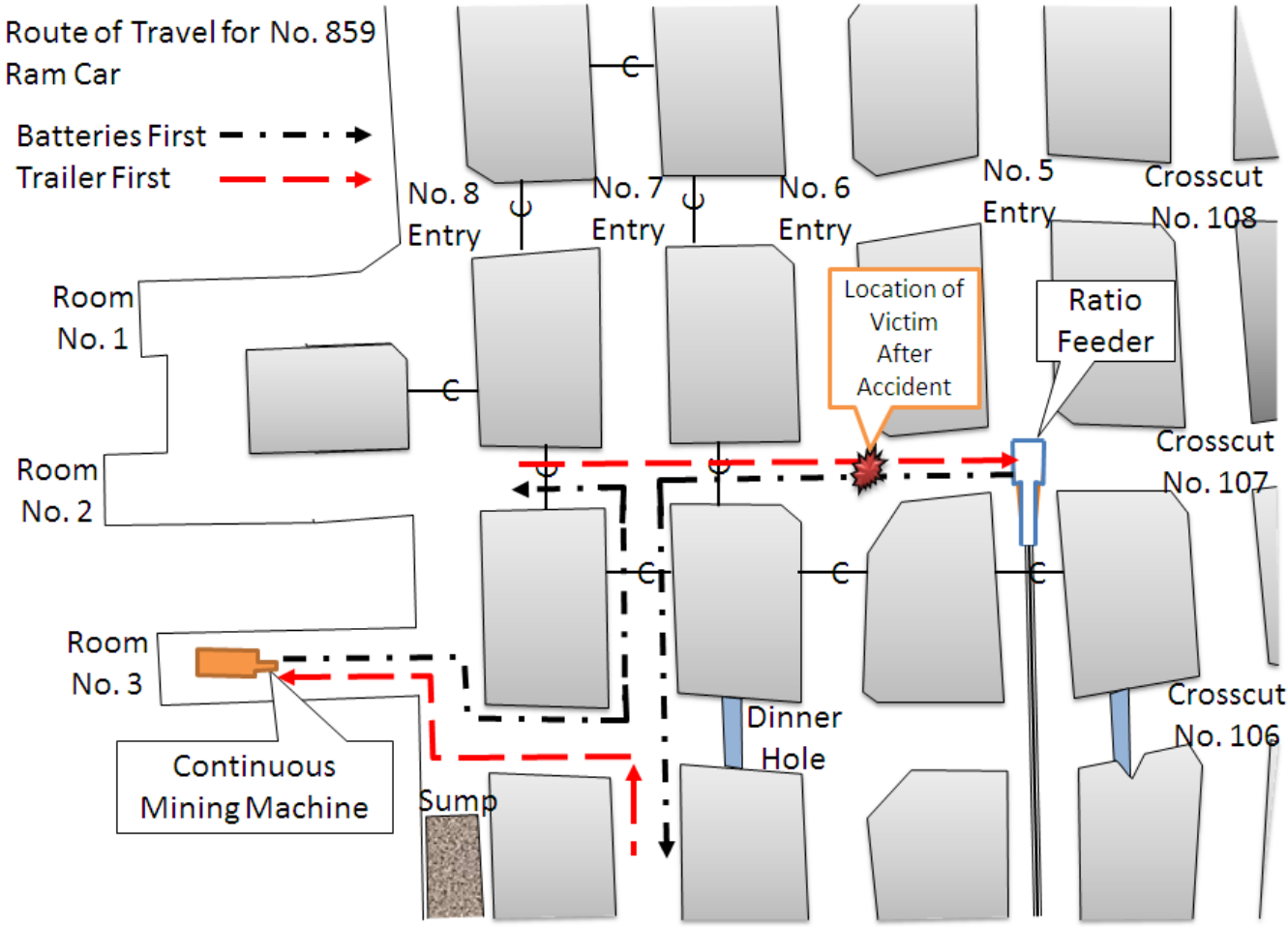
APPENDIX B

Persons Interviewed

Jamison Cummins	Scoop Operator
Ed Pogue	Coal Hauler Operator
Kevin Collins	Coal Hauler Operator
Randy Stevens	Continuous Mining Machine Operator
Tom McDermott	Repair Person
David Teegarden	Coal Hauler Operator
Chris Van Arsdale	Time Study - Peabody

APPENDIX C

Area of Accident



APPENDIX D

Victim Information

Accident Investigation Data - Victim Information

Event Number: 4 2 5 1 8 2 4

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. Last Four Digits of SSN:	5. Degree of Injury:
Thomas N. Brown	*M*	*61*		*01 Fatal*

6. Date(MM/DD/YY) and Time(24 Hr.) Of Death:	7. Date and Time Started:
a. Date: 07/09/2010 b.Time: 12:35	*a. Date: 07/09/2010 b.Time: 6:00*

8. Regular Job Title:	9. Work Activity when Injured:	10. Was this work activity part of regular job?
049 Foreman	*092 Walking*	Yes X No

11. Experience	Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days
a. This Work Activity:	*19*	*45*	*0*	b. Regular Job Title:	*1*	*45*	*0*	c: This Mine:	*2*	*40*	*0*	d. Total Mining:	*33*	*0*	*0*

12. What Directly Inflicted Injury or Illness?	13. Nature of Injury or Illness:
077 Battery powered coal hauler	*170 Compound fracture of skull*

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

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

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

17. Part 50 Document Control Number: (form 7000-1)
18. Union Affiliation of Victim: *9999 None (No Union Affiliation)*