

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Machinery Accident
August 4, 2007

No. 8
Rockhouse Creek Development, LLC
Hampden, Mingo County, West Virginia
I.D. No. 46-09018

Accident Investigators

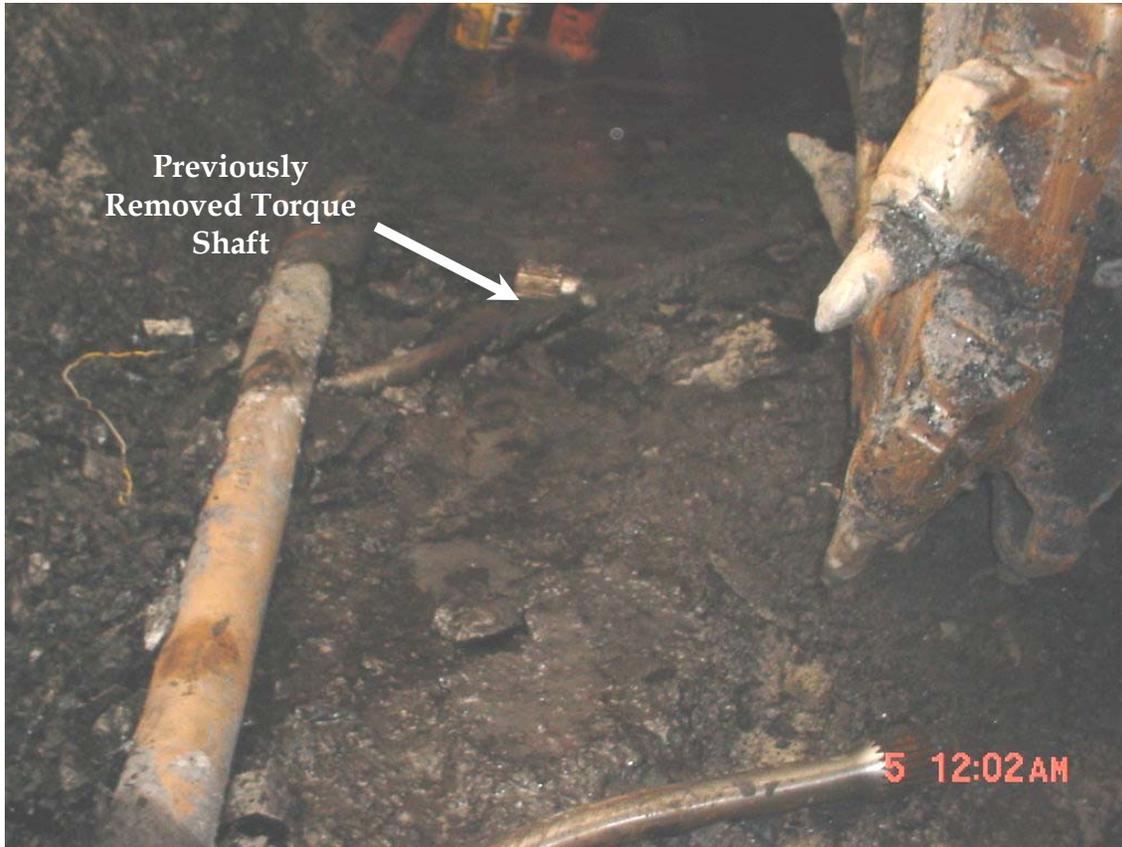
Dennis J. Holbrook
Accident Investigator/Coal Mine Safety and Health Inspector

James D. Honaker
Coal Mine Safety and Health Inspector (Electrical)

Originating Office
Mine Safety and Health Administration
District 4
100 Bluestone Road
Mt. Hope, West Virginia 25880
Robert G. Hardman, District Manager

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OVERVIEW

At 6:15 p.m. on Saturday, August 4, 2007, Stevie J. Browning, a 25-year old foreman was fatally injured while assisting a mechanic in the replacement of a cutter motor torque shaft on a continuous mining machine. During the installation of the new torque shaft, the shaft became stuck in the operator's side of the cutting head motor. In an attempt to remove the shaft, as the motor was turning after being shut off, the shaft contacted the turning motor and rotated, striking the victim in the head and face.

The accident occurred because proper work procedures were not being followed. The repair was performed while the continuous mining machine remained energized with a person exposed to an unguarded, rotating, machine part.

GENERAL INFORMATION

The No. 8 mine is an underground coal mine located near Hampden, Mingo County, West Virginia. The mine operates in the #2 Gas seam. Seam height is approximately 36 inches and the mining height is maintained at approximately 45 inches. The mine operates two 8-hour production shifts per day and one 8-hour maintenance shift per day, 6-days per week. The mine employs 132

persons and operates three active mining sections. Each mining section utilizes two continuous mining units.

The mine produces approximately 3,000 tons per day. Coal is transported on the working sections by shuttle car haulage. Belt conveyors are installed throughout the mine which transports the coal to the surface. At the surface, an overland conveyor belt transports the coal to the Mingo No 1 preparation plant, operated by Hampden Coal Company LLC.

The principal officers for Rockhouse Creek Development, LLC are:

Raymond McKinneyPresident
Scott MillsManager of Underground Mines
Timothy JusticeSafety Coordinator

The last regular MSHA inspection of the No. 8 mine was completed on May 11, 2007. A spot inspection was conducted from July 17 to July 30, 2007. The mine's Non Fatal Days Lost (NFDL) incidence rate in 2006 was 0.00, compared to the national average of 4.92 for mines of the same type.

DESCRIPTION OF THE ACCIDENT

On August 4, 2007 at 2:30 p.m. the second shift crew, assigned to the Mains section, entered the mine by way of rubber-tired, battery-powered mantrips. The crew arrived at the Mains section at approximately 3:30 p.m.

The right side continuous mining machine began mining in the face of the No. 5 entry. Mining concluded in the cut without incident and the continuous mining machine was moved to face of the No. 8 entry where mining continued. One shuttle car was loaded when the continuous mining machine's cutter head stopped. Johnathon Kennedy, continuous mining machine operator, informed Wendell Adkins, shuttle car operator, that both of the cutter motor torque shafts were broken. Adkins left the area to go to the section power center, located outby, to inform the maintenance foreman of the mechanical breakdown.

Kennedy backed the continuous mining machine away from the coal face, positioning it to allow access to both cutter motors for repair. Chad Daniels, Maintenance Foreman, arrived at the miner and instructed Kennedy to deactivate the machine mounted electrical breaker located on the side of the machine. Kennedy deactivated the electrical power at this location.

Daniels removed a broken shaft from the operator's side (right side looking towards face) cutter motor. He then attempted to install a new torque shaft, but the last 1 ½ inches of the new shaft would not go completely into the socket. He struck the shaft several times with a hammer, but it would not fully engage and the gears would not mesh. He then attempted to remove the shaft with pliers

and discovered that it was stuck. Daniels then proceeded to the offside of the continuous mining machine (left side looking towards face) and successfully changed the torque shaft with no problems.

At approximately 5:30 p.m., Stevie Browning, section foreman, arrived at the No. 8 face. Browning and Daniels met at the operator's side of the continuous mining machine. Browning attempted to use pliers to pull the stuck shaft from the operator's side cutter motor, without success. Browning requested a puller tool for use to remove the torque shaft. Daniels used a fully threaded rod, ½ inch by 7 inches in size, outfitted with multiple washers and nuts, as a puller in an attempt to pry the stuck shaft from the motor. Although a slate bar was used for leverage, the stuck shaft could not be freed.

Kennedy told Browning and Daniels that he had heard operating the continuous mining machine cutter motors momentarily (bumping) would free a stuck torque shaft. Kennedy had not previously observed or tried this procedure. The group discussed the procedure for several minutes.

Browning and Daniels went to the front of the machine, while Kennedy, located at the outby portion of the machine, reenergized the machine mounted breaker supplying electrical power to the machine. Adkins was located near the end of the continuous mining machine discharge boom. Kennedy started the cutter motors momentarily and then hit the panic bar to stop the machine. The torque shaft was sticking out of the machine approximately 4 inches, and was rotating. Browning began removing the rotating shaft, by contacting it with a hammer in a raking motion. As the shaft began to exit the motor, it engaged the rotating cutter motor, and began to rotate in a wide arcing motion. The rotating shaft struck Browning several times before the motor and shaft stopped turning.

Daniels immediately rushed to aid Browning. The torque shaft was removed to assist in the movement of the victim and first aid was immediately administered. Browning was transported to the surface of the mine where the Stafford Emergency Ambulance Service rendered additional aid. The victim was then transported to a local football field where he was flown via helicopter to St. Mary's Medical Center located in Huntington, West Virginia. The victim expired on August 6, 2007.

INVESTIGATION OF THE ACCIDENT

The Mine Safety and Health Administration was notified of the accident at 6:30 p.m. on August 4, 2007. An MSHA inspector from the Madison Field Office arrived at the scene and issued a 103(k) order. The 103(k) order was issued to insure the safety of all persons during the investigation. A list of the persons who participated in the investigation is contained in Appendix A.

DISCUSSION

Continuous Mining Machine

The continuous mining machine involved in the accident was a 14CM15 manufactured by Joy Mining Machinery, Serial Number JM 5948, MSHA Approval Number 2G-4159A-00. The machine was purchased new and placed in service in February, 2007. The machine has two 1800 RPM cutter motors, manufactured by Reliance Electric, which operate on 995 volts (AC), generating 235 HP.

Immediately after the accident the pump motor of the miner would not operate. Maintenance personnel at the mine could not identify the problem and a service representative from the manufacturer assisted diagnosing the repair. The start up control circuit was repaired. The sensor on the conveyor motor current transformer had failed and was replaced. All functions of the continuous mining machine and remote control were checked and no further problems were found.

The cutter motors were started and immediately shut down using the panic switch located on the remote control. The right side motor started and continued to turn (free-wheel) for one minute and thirty-seven seconds after the power had been removed from the motor.

Torque Shaft Replacement Procedure

Interviews with equipment operators and electricians revealed that it was a common practice at the mine to replace torque shafts by deactivating the machine mounted breaker to deenergize the electrical power. This practice allowed 995 volts (AC) to remain on the trailing cable and in the main control panel of the machine. Electrical power to the trailing cable was not disconnected from the power center while the torque shafts were being replaced.

The manufacturer's Technical Manual 06-TMCM0569, Page 11, step 1 beneath the subheading Replacement, states, "Confirm that electrical power to the machine is disconnected." The technical manual further states on page 11, step 3, "Pack the splines of the torque shaft with grease. This will lubricate mating parts when replaced." The new torque shaft being installed did not have any grease on any portion of the shaft.

Additionally, the manufacturer's Technical Manual Page 11, steps 6 through 9 beneath the subheading Replacement, detail the procedures for replacing the torque shaft cap, snap ring, O-ring, clutch cover access cap, and the cutter motor/clutch access door or cover prior to the restoration of electrical power to the machine. Adherence to this procedure would prevent a miner from being contacted by a rotating torque shaft. Immediately prior to the accident, when the continuous mining machine cutter motors were momentarily operated, the victim was exposed to an unguarded and unsecured rotating machine part.

The torque shaft replacement procedures used prior to the accident did not conform to the recommended procedures from the machine manufacturer.

Torque Shaft

The torque shaft involved in the accident was manufactured by RI-JA Machining Company in Oak Hill West Virginia. Markings present on the end of the shaft indicated the numbers, 1069528-2193, and the letters RI JA. The torque shaft is constructed of rolled steel and is 43 inches long with machined splines on both ends. The inside or gear case end spline is 2 inches in diameter. The outside or clutch cover end spline is 2 ¼ inches in diameter. The shaft diameter between the splines is 1 ¾ inches in diameter.

The torque shaft was examined and the inside gear case end spline diameter was found to be in excess of the maximum allowable size. The measured diameter of the pilot area was 0.005 inches larger than the diameter specified by the continuous mining machine manufacturer (manufacturer's tolerance is 0.002 inches). The excessive diameter of the shaft could have contributed to the difficulty experienced when trying to seat the shaft properly in the cutter motor but would not have prevented the shaft from seating. The face of the clutch cover end of the shaft had numerous marks where it appears it was contacted during the attempted installation. The gear case end spline pilot area had some surface damage, which also likely occurred during the attempted installation.

ROOT CAUSE ANALYSIS

An analysis was conducted to identify the most basic causes of the accident that were correctable through reasonable management controls. Listed below are root causes identified during the analysis, and their corresponding corrective actions which were implemented to prevent a recurrence of the accident.

Root Cause: Improper procedures and unsafe work practices were used. The manufacturer's recommended procedure was not followed for the replacement of the continuous mining machine torque shafts. Electrical power was not disconnected, the torque shafts were not greased, and the torque shaft cap, snap ring, O-ring, clutch cover cap, and the cutter motor/clutch access door or cover were not replaced prior to the restoration of electrical power to the machine.

Corrective Action: Maintenance personnel were retrained in the proper procedures for replacing a cutter motor torque shaft. In addition, the mine operator established a policy where repairs or maintenance cannot be performed until all persons are in a safe location, and machine power is disconnected.

Root Cause: A miner was in close proximity to an unguarded, unsecured, rotating machine part while the continuous mining machine was energized.

Corrective Action: The mine operator established a policy where repairs or maintenance cannot be performed until all persons are in a safe location, and machine power is disconnected. All miners were trained in the new policy.

CONCLUSION

Stevie Browning, section foreman, was fatally injured while assisting a mechanic in the replacement of a cutter motor torque shaft on a continuous mining machine. The accident occurred because proper work procedures were not being followed. The repair was performed while the continuous mining machine remained energized with a person exposed to an unguarded, rotating, machine part.

Approved By:

ORIGINAL SIGNED BY
Robert G. Hardman
District Manager

NOVEMBER 26, 2007
Date

ENFORCEMENT ACTIONS

1. A 103(k) Order was issued to Rockhouse Creek Development, LCC to ensure the safety of persons at the mine until an investigation of the accident could be completed.

2. A 104(d)(1) Citation No. 7266739 was issued to Rockhouse Creek Development, LCC for violation of 30 CFR Part 75.1725(c) stating in part, A repair was attempted on the Joy 14CM15 continuous mining machine, serial number JM 5948, while the machine power was on and the machine was in motion. The section foreman attempted to remove a stuck torque shaft from the right side of the continuous mining machine while the cutter motor was rotating.

During the repair, the rotating torque shaft contacted the foreman resulting in fatal injuries.

Although electrical power was interrupted from the cutter motor moments prior to the accident, electrical power remained on the machine, and the cutter motor continued to rotate. The cutter motor was not blocked against motion and machinery motion was not necessary to complete the repair.

APPENDIX A
Persons Participating in the Investigation

Rockhouse Creek Development, LCC

Scott Mills Manager Underground Mines
John B. Earls Human Resources Manager
Timothy Justice..... Safety Coordinator
Carol Ann Marunich.....Attorney
Charles C. Justice..... Consultant
Chad Daniels..... Maintenance Foreman
Dallas Mounts..... Maintenance Foreman
Wendell Adkins..... Shuttle Car Operator
Johnathan Kennedy Continuous Miner Operator
Jerry Walker Continuous Miner Operator
Randall Lester Mine Foreman
Kenny Mills..... Superintendent
Steve Meade Mine Foreman
Oley Bishop.....Shift Foreman

West Virginia Office of Miners' Health, Safety and Training

Ron Wooten Director
Eugene White..... Inspector at Large
Terry Farley..... Accident Investigator
Dennie Ballard Assistant Inspector at Large
James Dingess Electrical Inspector
Michal R. Pauley Inspector

Mine Safety and Health Administration

Robert G. Hardman District Manager
Dennis J. Holbrook..... Accident Investigator
Jim Honaker Coal Mine Inspector (Electrical)
Paul Fought..... Inspector in Training

Appendix B - Victim Information

Accident Investigation Data - Victim Information

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



Event Number: 4 1 1 4 2 9 2

Victim Information: 1

1. Name of Injured/III Employee: <i>Stevie J. Browning</i>		2. Sex: <i>M</i>		3. Victim's Age: <i>25</i>		4. Last Four Digits of SSN:		5. Degree of Injury: <i>01 Fatal</i>											
6. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 08/06/2007 b. Time: 10:42</i>					7. Date and Time Started: <i>a. Date: 08/04/2007 b. Time: 16:00</i>														
8. Regular Job Title: <i>049 Section Foreman</i>				9. Work Activity when Injured: <i>039 Maintenance Repair</i>				10. Was this work activity part of regular job? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>											
11. Experience		Years	Weeks	Days	b. Regular		Years	Weeks	Days	c. This		Years	Weeks	Days	d. Total		Years	Weeks	Days
a. This					Job Title:					Mine:					Mining:				
12. What Directly Inflicted Injury or Illness? <i>077 Continuous Mining Machine</i>										13. Nature of Injury or Illness: <i>140 Head Injury</i>									
14. Training Deficiencies: Hazard: <i>New/Newly-Employed Experienced Miner</i>										Annual:		Task:							
15. Company of Employment (If different from production operator) <i>Operator</i>										18. Union Affiliation of Victim: <i>9999 None (No Union Affiliation)</i>									

Victim Information:

1. Name of Injured/III Employee:		2. Sex:		3. Victim's Age:		4. Last Four Digits of SSN:		5. Degree of Injury:											
6. Date(MM/DD/YY) and Time(24 Hr.) Of Death:					7. Date and Time Started:														
8. Regular Job Title:				9. Work Activity when Injured:				10. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input type="checkbox"/>											
11. Experience:		Years	Weeks	Days	b. Regular		Years	Weeks	Days	c. This		Years	Weeks	Days	d. Total		Years	Weeks	Days
a. This					Job Title:					Mine:					Mining:				
12. What Directly Inflicted Injury or Illness?										13. Nature of Injury or Illness:									
14. Training Deficiencies: Hazard: <i>New/Newly-Employed Experienced Miner</i>										Annual:		Task:							
15. Company of Employment (If different from production operator)										18. Union Affiliation of Victim:									
16. On-site Emergency Medical Treatment: Not Applicable: <input type="checkbox"/> First-Aid: <input type="checkbox"/> CPR: <input type="checkbox"/> EMT: <input checked="" type="checkbox"/> Medical Professional: <input checked="" type="checkbox"/> None: <input type="checkbox"/>										17. Part 50 Document Control Number: (form 7000-1)									

Victim Information:

1. Name of Injured/III Employee:		2. Sex:		3. Victim's Age:		4. Last Four Digits of SSN:		5. Degree of Injury:											
6. Date(MM/DD/YY) and Time(24 Hr.) Of Death:					7. Date and Time Started:														
8. Regular Job Title:				9. Work Activity when Injured:				10. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input type="checkbox"/>											
11. Experience:		Years	Weeks	Days	b. Regular		Years	Weeks	Days	c. This		Years	Weeks	Days	d. Total		Years	Weeks	Days
a. This					Job Title:					Mine:					Mining:				
12. What Directly Inflicted Injury or Illness?										13. Nature of Injury or Illness:									
14. Training Deficiencies: Hazard: <i>New/Newly-Employed Experienced Miner</i>										Annual:		Task:							
15. Company of Employment (If different from production operator)										18. Union Affiliation of Victim:									
16. On-site Emergency Medical Treatment: Not Applicable: <input type="checkbox"/> First-Aid: <input type="checkbox"/> CPR: <input type="checkbox"/> EMT: <input type="checkbox"/> Medical Professional: <input type="checkbox"/> None: <input type="checkbox"/>										17. Part 50 Document Control Number: (form 7000-1)									