CAI-2012-06

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Electrocution Accident
March 23, 2012

Shoal Creek Mine
Drummond Company, Inc.
Walker County, Alabama
I.D. No. 01-02901

Accident Investigators

Joseph P. Turner
Coal Mine Safety and Health Inspector

Randall Dickerson
Electrical Specialist

James Conaway
Electrical Specialist

Originating Office
Mine Safety and Health Administration
District 11
135 Gemini Circle, Suite 213, Birmingham, Alabama 35209
Richard A. Gates, District Manager

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OVERVIEW

At approximately 9:30 p.m. on Friday, March 23, 2012, a 37-year old male electrician (victim) was electrocuted after receiving electric shock from an energized 950-volt shuttle car inner machine cable. The victim was positioned inside the cable reel compartment (see photo No. 1), removing insulation from a temporary inner machine cable connection when the accident occurred. The victim had 1 year, 8 months experience as an electrician. The accident occurred because the shuttle car trailing cable was not de-energized, locked, and tagged out at the power source, while the electrical work was being performed.

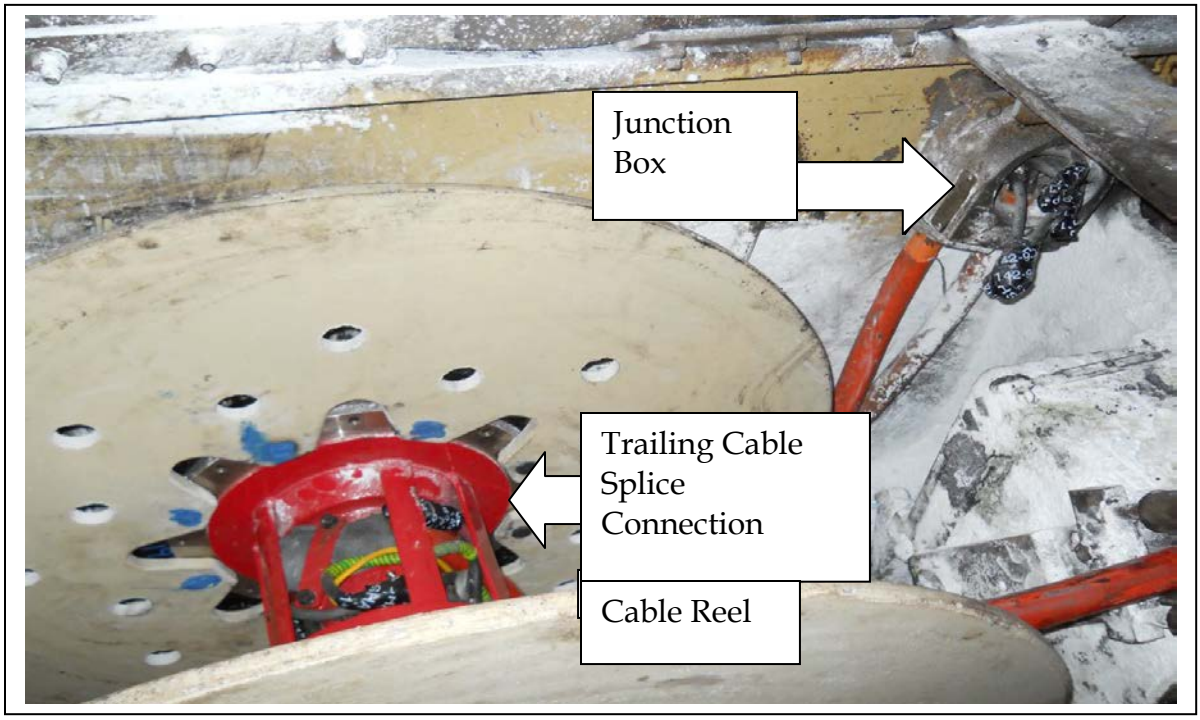
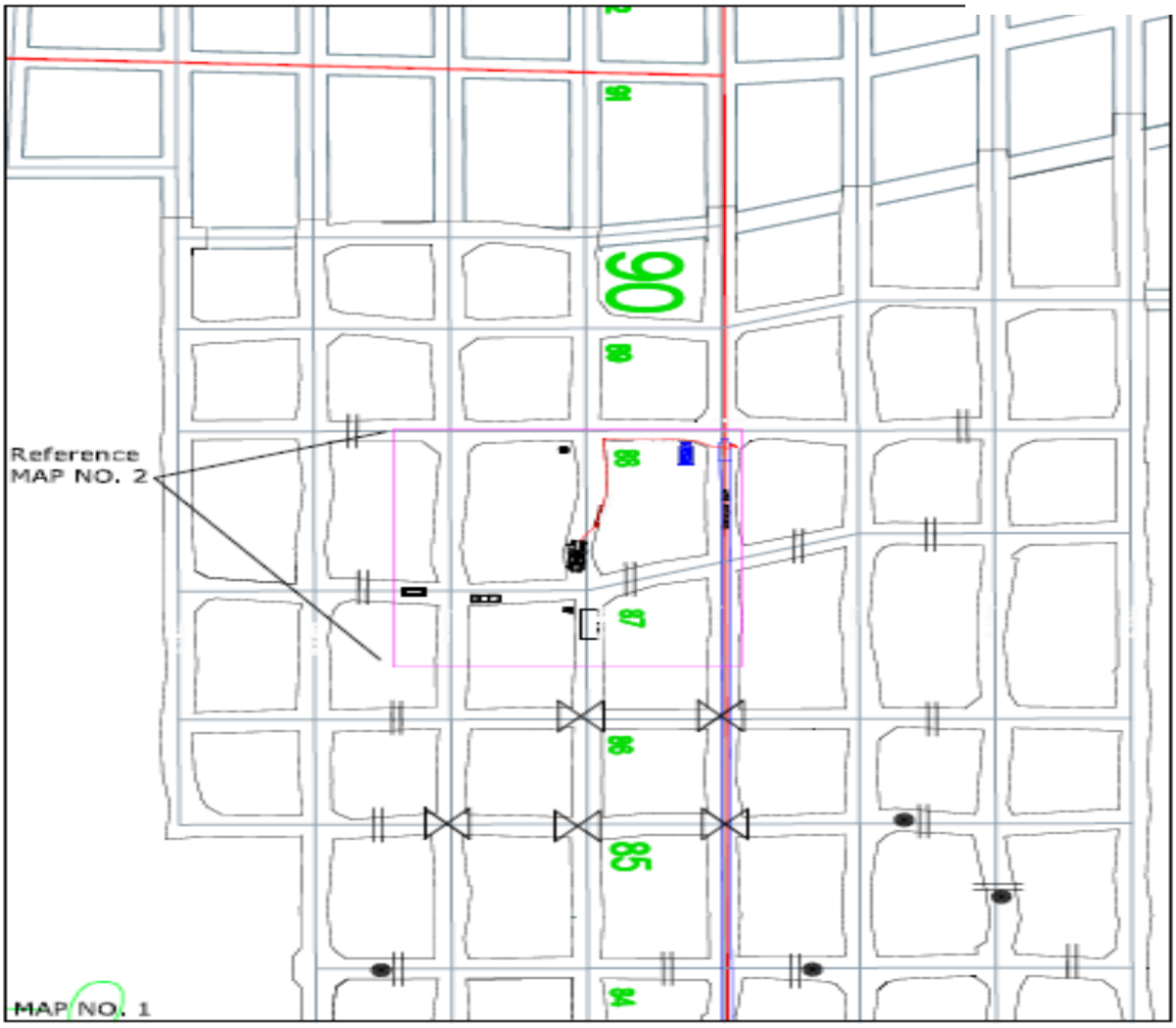
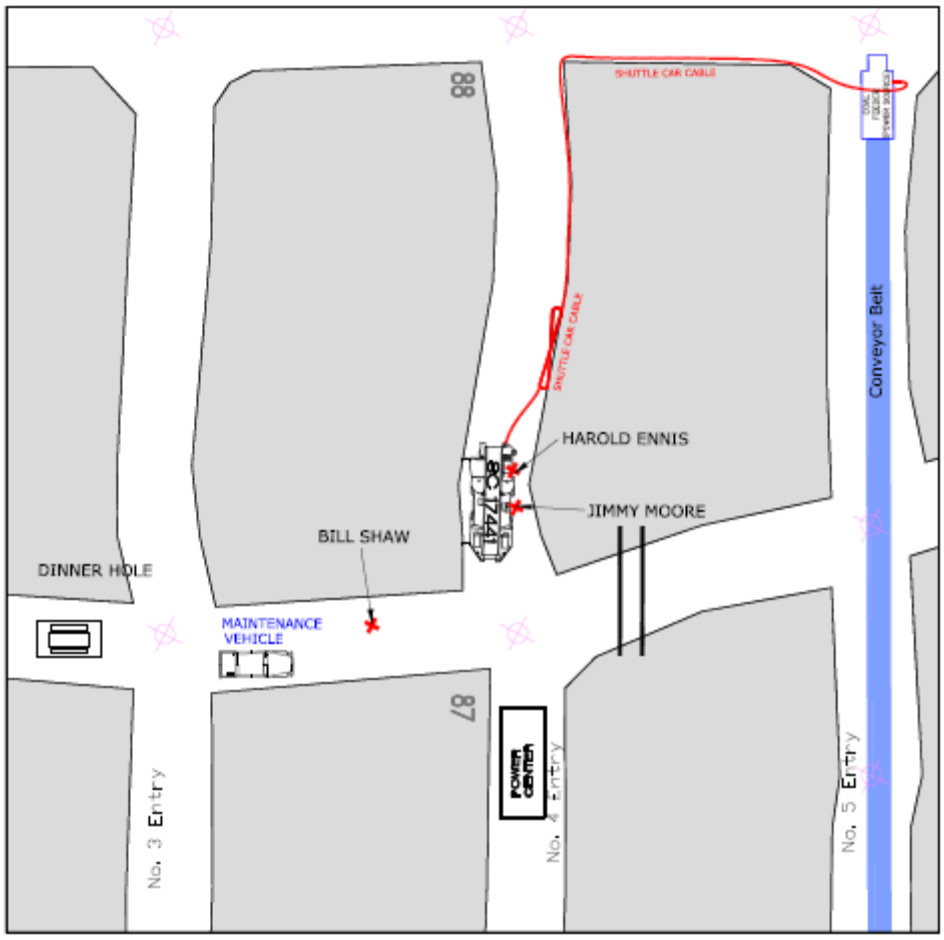


Photo No. 1

WEST MAINS LEFT AND RIGHT




88
SHUTTLE CAR CABLE
SHUTTLE CAR CABLE
Conveyor Belt
HAROLD ENNIS
JIMMY MOORE
BILL SHAW
DINNER HOLE
MAINTENANCE VEHICLE
87
No. 3 Entry
No. 4 Entry
No. 5 Entry

MAP NO. 2

GENERAL INFORMATION

The Shoal Creek Mine, is owned and operated by Drummond Company, Inc. The mine is located in Walker County, Alabama, near the community of Oakman.

The mine provides employment for 689 persons and operates 7 days per week, 3 shifts per day, with production on all shifts. The mine produces an average of 3,410 clean tons of coal per day. The miners are represented by the United Mine Workers of America (UMWA).

The mine operates in the Blue Creek coal seam, with a mining height that ranges from seven to twelve feet. When the electrocution accident occurred, the mine was operating five mechanized mining units (MMU), consisting of four continuous mining machine units and one longwall unit.

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

Don Hendrickson ..... General Manager
Randy Clements ..... Safety Superintendent

A Regular Safety and Health Inspection (E01) had been completed on December 31, 2011, and an E01 inspection was ongoing at the time of the accident. The Non-Fatal Days Lost (NFDL) injury incidence rate for the mine for the calendar year 2011 was 6.00, compared to the national NFDL rate of 3.36.

DESCRIPTION OF THE ACCIDENT

On March 23, 2012, the evening shift for the mine began at 3:00 p.m. Harold Ennis (victim) and the production crew entered the mine and traveled to the West Main Left section to begin mining activities. The West Main Left section is a continuous mining machine unit that was developing four of eight entries in the West Mains of the mine (see map No. 2). After doing other work, Ennis, Jimmy Moore, Jr., Electrician Trainee, and Orbie Burleson, Day Shift Outby Electrician, started the process of removing and installing a new cable reel (see photo No. 1) on Joy Shuttle Car No. 17441. The old cable reel was removed during the day shift by electricians Mike Green, Travis Guthrie, and Orbie Burleson. The shuttle car, No. 17441, remained without power, locked and tagged out by Green. The shuttle car was located in the No. 4 entry between crosscut 87 and crosscut 88.

Mining operations proceeded normally. After the new cable reel was brought to West Main Left section, Ennis, Moore, and Burleson (under supervision of Maintenance Foreman, Bill Shaw) began prep work for installation of the new cable reel. Burleson,

who had worked over into the evening shift, helped prepare the shuttle car inner machine cable for entrance into the junction box. Shaw then transported Burleson to the personnel elevator to exit the mine, at approximately 7:00 p.m. While Shaw was away, Moore and Ennis entered the inner machine cable into the junction box, and Moore then spliced the trailing cable to the cable reel. After returning to the West Main Left section, Shaw installed the cable reel drive chain, while Moore and Ennis were on their lunch break. Moore wired the cable reel after lunch, with Ennis observing. At this time, the leads in the junction box were spliced temporarily. The shuttle car cable reel was now ready to be tested for correct electrical rotation.

Ennis walked to the section coal feeder, the power source for the shuttle car, removed the lock and tag left in place by the day shift electrician, and energized shuttle car No. 17441. Shaw got into the shuttle car operator's compartment, turned the pump motor on, and raised the conveyor boom to check electrical rotation of the shuttle car's pump motor. The electrical rotation was determined to be correct and the cable reel was determined to be spinning in the correct direction. At this time, Moore was standing next to the cable reel compartment, and Ennis was walking toward the shuttle car, approximately 50 feet away. Shaw exited the shuttle car operator's compartment and asked Ennis what tools he would need to complete the job. Ennis responded and then asked Shaw to "knock" (de-energize) the on-board breakers on the shuttle car. Shaw de-energized the on-board circuit breakers on the shuttle car, informed Ennis that he had done so, and went to his maintenance vehicle to get the tools. Ennis then climbed into the shuttle car's cable reel compartment and began cutting electrical tape off of one of the energized 950 volt cable leads. Ennis did not de-energize the shuttle car's power at the section feeder and did not install his lock and tag to assure power was locked out.

Moore, who was standing next to the shuttle car, spoke to Ennis and noticed Ennis was non-responsive. Moore looked inside the cable reel compartment and saw Ennis' knife in contact with the cable lead. At this time, approximately 9:30 p.m., Moore ran to the section feeder and de-energized all shuttle car circuit breakers. Meanwhile, Shaw had returned to the shuttle car and found Ennis unresponsive. Shaw checked Ennis for a pulse and found none. Moore returned, passed the shuttle car in the direction of the section dinner hole, and yelled for help. Dave Bailey, Maintenance Foreman, and John Bevins, Section Foreman, went to the shuttle car to give assistance. Bevins went back to the section dinner hole and called Paul Moore, Control Operator, informing him of the accident, and also told him to call for a life saver helicopter.

Shaw and Bailey removed Ennis from the cable reel compartment and started Cardiopulmonary Resuscitation (CPR). Lee Dodd, Shuttle Car Operator and licensed EMT, arrived and requested an Automated External Defibrillator (AED). Dodd continued CPR and used the AED, once it was obtained. The victim was loaded onto a backboard, placed in a maintenance vehicle, and transported to the elevator. Resuscitation attempts on Ennis were continued and Dodd used the AED two

additional times while in route to the elevator. Once outside, the victim was transported to the helicopter pad. The helicopter Flight Nurse informed Dodd and Shaw to discontinue CPR. The Walker County Coroner arrived at the mine site and pronounced the victim dead. An ambulance had also arrived at the site and transported the victim for an autopsy, at the coroner's instructions. The autopsy was performed by Alabama Department of Forensic Sciences. The cause of death was determined to be electrocution.

INVESTIGATION OF THE ACCIDENT

MSHA was notified of the accident through the National Call Center Hotline at 10:17 p.m., on March 23, 2012. MSHA accident investigators were dispatched to the mine and arrived at 1:30 a.m., on March 24, 2012. A 103(j) Order was issued to prevent destruction of evidence and to ensure the safety of all persons at the mine. MSHA conducted an investigation with the assistance of a mine inspector/investigator from the Alabama Department of Industrial Relations, mine management, and mine employees. Shuttle Car No. 17441 and all electrical components, including the trailing cable and power source, were examined and tested. Ten persons were interviewed during the investigation.

DISCUSSION

Accident Location

The accident occurred on the West mains Left Section, in the No. 2 Entry. There were no unusual conditions associated with the mining environment at the time of the accident. There were no unusual physical conditions associated with the accident location where the shuttle car repairs were made.

MSHA Electrical Testing and Examinations

MSHA Electrical Specialists conducted examinations on shuttle car No. 17441, the Trailing Cable, and the Power Source (coal feeder).

SHUTTLE CAR No. 17441 – A permissibility inspection was performed on the shuttle car including the trailing cable connections and the cable reel.

TRAILING CABLE – The electrical continuity of the ground wire and the continuity of the ground monitor wire were tested.

POWER SOURCE (coal feeder) – The phase-to-ground voltage was measured and ground fault testing of phases 1, 2, and 3 were conducted, along with an electrical resistance test.

No violations associated with these tests/examinations were observed.

Work History and Training

Harold Ennis had a total of 3 years and 8 months mining experience (all at Shoal Creek Mine). Ennis had 1 year, 8 months experience in his job title (Electrician).

A review of Ennis' training records indicated that he had received all of his required training.

The mine's training plan was reviewed by MSHA Educational Field Services (EFS) for possible deficiencies with regard to lock and tag training for qualified electricians. Additional training was provided to include instructions requiring that personnel performing electrical work will use individual locks and tags on disconnect devices.

ROOT CAUSE ANALYSIS

An analysis was conducted to identify the most basic causes of the accident that were correctable through reasonable management controls. The following root cause was identified:

Root Cause: Mine management did not assure that the qualified person performing electrical work followed prescribed lock and tag procedures. The qualified person did not de-energize the shuttle car, disconnect the plug from the circuit breaker receptacle, and lock out and tag the disconnected plug.

Corrective Action: All mine personnel who perform electrical work were re-trained on the requirements of 30 CFR § 75.511, lock and tag out procedures. A record of the training was made and provided to MSHA.

CONCLUSION

The accident occurred because mine management did not assure that Shuttle Car No. 17441 was de-energized and locked/tagged out before electrical work was performed. The victim received fatal electrocution injuries when he made contact with one phase of the energized 950-volt inner machine cable. A contributing factor was that the victim did not use an individual lock and tag on the power disconnect device.

Signed by: _____ Date: 8/29/12

Richard A. Gates
District Manager

ENFORCEMENT ACTIONS

1. A 103(j) Order, No. 8523901, was issued to Shoal Creek Mine, on March 23, 2012, to prevent the destruction of any evidence that would assist in investigating the cause or causes of the accident and to ensure the safety of all persons until an investigation of the accident could be completed.

2. A 104(a) Citation, No. 8523902, was issued to Shoal Creek Mine for a violation of 30 CFR § 75.511. Disconnecting devices shall be locked out and suitably tagged by the persons who perform such work. The medium voltage (950 nameplate voltage) disconnecting device for the No. 17441 Joy Shuttle Car (located on the West Main Left section (MMU 001), was not locked out and suitably tagged by the person performing electrical work on the No. 17441 shuttle car. The electrician was removing insulation from a temporary splice connection (which was energized) when fatal injuries were received by electrocution.

3. A 104(a) Citation, No. 8523903, was issued to Shoal Creek Mine, for a violation of 30 CFR § 75.509. All power circuits and electric equipment shall be de-energized before work is done on such circuits and equipment. Electrical work was performed on the No. 17441 Joy shuttle car, located on the West Main Left section, without the power circuit being de-energized. This action resulted in a fatal accident.

APPENDIX A

List of persons providing information and/or present during the investigation:

Drummond Company, Inc.

Don Hendrickson .....General Manager

Mark Stanley .....Mine Manager

Scott Meadows .....Operations Superintendent

Randy Clements .....Safety Superintendent

Robert Strange .....Maintenance Manager

Gary Ritchason .....Chief Electrician

Bill Shaw .....Electrical Supervisor

David Bailey .....Electrical Supervisor

Terry Harbison .....Electrical Supervisor

John Bevins .....Section Foreman

Chris Miller .....Supervisor Trainee

Larry Armstrong .....Safety Department

Doug Altizer .....Mine Foreman

Noel Hayhurst .....Engineering

United Mine Workers of America

Jimmy Moore Jr. .....Electrician Trainee

Lee Dodd .....Shuttle Car Operator

Michael Green .....Electrician

Travis Guthrie .....Electrician

Orbie Burleson .....Electrician

Gary Jolly .....UMWA Safety Representative

Fred England .....UMWA Safety Representative

Donny Black .....UMWA Local 1948 President

Joe Weldon .....UMWA Safety Representative

Randy Wideman .....UMWA Safety Representative

Elfago Sheppard .....UMWA Miners' Representative

Thomas Wilson .....International Representative

Alabama Department of Industrial Relations

Robert Cagle .....State Investigator/Inspector

Mine Safety and Health Administration

Joseph Turner .....MSHA Inspector

Randall Dickerson .....Electrical Specialist

James Conaway .....Electrical Specialist

Russel Weekly .....Inspection Supervisor

APPENDIX B

Victim Information

Accident Investigation Data - Victim Information
Event Number: 4 4 9 5 4 4 5

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:
Harold E. Ennis	M	37	7379	01 Fatal

6. Date(MM/DD/YY) and Time(24 Hr.) Of Death: a. Date: 03/23/2012 b.Time: 22:45

7. Date and Time Started: a. Date: 03/23/2012 b.Time: 15:00

8. Regular Job Title: 002 Electrician

9. Work Activity when Injured: 020 Removing insulation from a cable splice

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

11. Experience	Years	Weeks	Days
a. This Work Activity:	1	29	0
b. Regular Job Title:	1	29	0
c: This Mine:	3	28	0
d. Total Mining:	3	28	0

12. What Directly Inflicted Injury or Illness? 042 Energized cable

13. Nature of Injury or Illness: 210 Electrocution

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

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

18. Union Affiliation of Victim: 2555 United Mine Workers of Amer.

Victim Information:

1. Name of Injured/Ill 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 | No

11. Experience:	Years	Weeks	Days
a. This Work Activity:			
b. Regular Job Title:			
c: This Mine:		Week	
d. Total Mining:			

12. What Directly Inflicted Injury or Illness?

13.Nature of Injury or Illness:

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

15. Company of Employment: (If different from production operator)

Independent Contractor ID: (if applicable)

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

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

18. Union Affiliation of Victim:

Victim Information:

1. Name of Injured/Ill 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 | No

11. Experience:	Years	Weeks	Days
a. This Work Activity:			
b. Regular Job Title:			
c: This Mine:		Week	
d. Total Mining:			

12. What Directly Inflicted Injury or Illness?

13. Nature of Injury or Illness:

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

15.Company of Employment:(If different from production operator)

Independent Contractor ID: (if applicable)

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

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

18. Union Affiliation of Victim:

MSHA Form 7000-50b, Dec 1994

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