

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Fall of Roof Accident
October 6, 2006

at

Mine No. 2
D & R Coal, Incorporated
Barbourville, Knox County, Kentucky
ID No. 15-18261

Accident Investigators

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Coal Mine Safety and Health Inspector

Dennis Cotton
Coal Mine Safety and Health Inspector, Roof Control Specialist

Roy T. Cornelius
Coal Mine Safety and Health Inspector, Ventilation Specialist

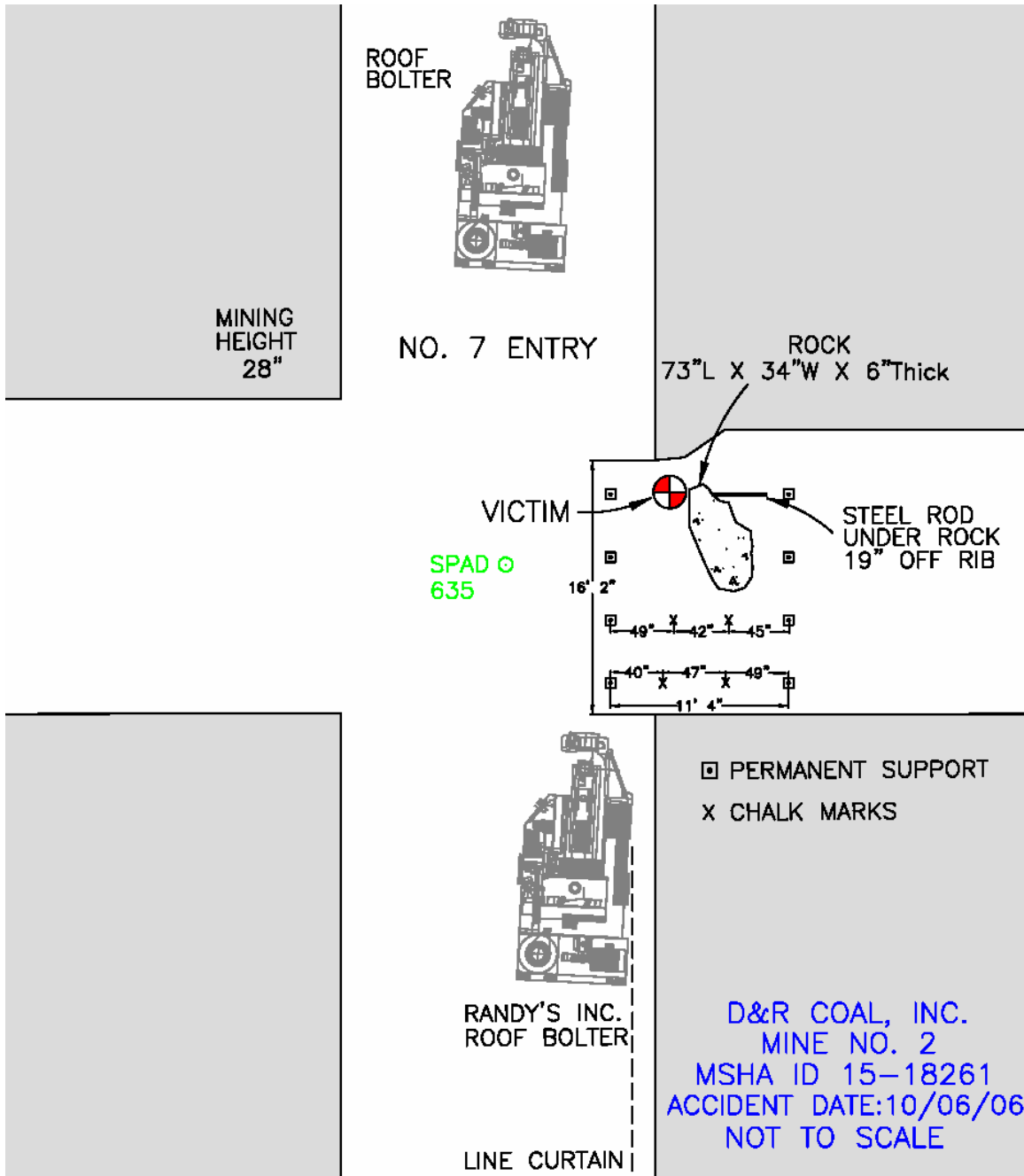
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ACCIDENT SITE



OVERVIEW

On Friday, October 6, 2006, Joseph B. Seay, a 56-year old roof bolter operator with 12 years of experience roof bolting and 27 years of mining experience was fatally injured at D & R Coal, Inc., Mine No. 2. The accident occurred when Seay traveled inby the last row of permanent roof supports while marking the mine roof for locations to install roof bolts in the last open crosscut that connected the No. 7 and No. 8 entries of the working section. A section of roof rock measuring approximately 34-inches wide by 73-inches long by 6 to 8-inches thick fell from the unsupported area, striking Seay, causing fatal crushing injuries. The accident occurred because of mine management's failure to ensure that employees did not work or travel under unsupported roof,

GENERAL INFORMATION

D & R Coal, Inc., Mine No. 2 is located one mile southeast on Goodin Creek off Hwy 11 in Knox County, Kentucky. Mine No. 2 is opened in the Blue Gem coal seam, which averages 24-28 inches in height. The mine has been in active status since July 13, 2000, and employs 12 persons. The mine produces approximately 175 tons of raw coal daily utilizing conventional mining methods. Coal is produced during one 8-hour shift, five days per week.

Coal is mined from the seam using solid blasting techniques. Coal is loaded from the faces with Mescher three wheel battery powered tractors with drag bottom scoop buckets (scoop) and transported to the belt conveyor. The coal is then transported by a series of belt conveyors to the surface.

The mine is ventilated by a split ventilation system with two exhausting fans, installed in the No. 1 drift opening and installed in the No. 5 drift opening. Mining operations are currently conducted in 14 headings on the 001 section. The No. 1 through No. 8 headings are mined from left to right and the No. 9 through No. 14 headings are mined right to left. The mine has no history of methane liberation.

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

Lloyd C. Cole.....President
Larry Hubbard.....Owner

Prior to the accident, the Mine Safety and Health Administration (MSHA) completed the last regular safety and health inspection on September 26, 2006. The Non-Fatal Days Lost (NFDL) injury incidence rate for the mine in 2005 was 0.00 compared to a National NFDL rate of 5.10.

DESCRIPTION OF ACCIDENT

On Friday morning, October 6, 2006, William Henry Harris, the section foreman entered the mine and conducted a preshift examination and called the results to the outside. At approximately 7:00 a.m., the day shift crew entered the mine. The scoops are charged on the surface, and the operators tram their equipment in and out of the mine each shift. Other miners are transported in the buckets of the scoops to their work locations. On this day, Harris was going to operate one of the two roof bolting machines due to James Davis (regular roof bolting machine operator) having sore knees. Davis was reassigned to operate one of the five scoops.

Upon arriving on the section they experienced problems with the mine power at the splice box located outby the section power center. Harris and Seay left the section and went to work on the mine power. Seay was a certified electrician. No coal was produced during this time. While the mine power problem was being worked on, clean-up and rock dusting was being conducted by the other miners. The scoop operators rock dusted the last two open crosscuts from No. 1 through No. 4 entries. Tommy Ayers, shot firer, cleaned his powder magazines and organized his blasting caps and powder. Kenneth Grubb, dump man, cleaned up around the dump. It was approximately 1 ½ hours before the mine power problems were corrected.

Upon restoring mine power, mining operations began on the left side of the section in the No. 1 entry. Larry Hubbard, owner and coal drill operator, stated he traveled underground around 9:00 a.m. and started drilling operations. Individual accounts of the mining activities from this time until lunch are not consistent. The typical mining cycle at the mine includes drilling the area, loading the drill holes with explosives, detonating the explosives, removing the loose coal with drag bottom scoops, installing permanent roof supports, and the final phase is cleaning up with drag bottom scoops. The area is then ready for another mining cycle.

Prior to the lunch break, mining had been completed in the No. 2 through the No. 4 entries. Hubbard completed drilling operations in the No. 4 entry prior to traveling outside for lunch. Harris completed roof bolting in the No. 5 left cross cut and Seay completed the roof bolting in the No. 5 entry. Meanwhile, the coal removal and clean-up crews finished in the No. 6 through the No. 8 entries.

The crew stopped at approximately 11:00 a.m. for a lunch break, with the exception of Ayers, who prepared No. 4 face for blasting. Fred Jones, scoop operator traveled to the roadway outby No. 5 entry and picked up Harris and Seay, where they had parked their roof bolting machines. They traveled to the dump and met with Tommy Lawson and Teddy Wilson, scoop operators, and joined Grubb and Davis for lunch. Vernon Cole, scoop operator, parked his scoop and stayed on the machine until he heard sound or felt movement which signaled the end of lunch.

At approximately 11:20 a.m., Jones transported Harris and Seay back to their roof bolting machines. They emptied their dust collection boxes and loaded the machines with supplies. The scoop operators then began the final clean-up in the No. 5, No. 6, No. 7,

and No. 8 entries. The results of the investigation support a finding that during this time, the final cut in the connecting crosscut between entries No. 7 and No. 8 was loaded out, although details of the time of the cut and its cleanup could not be established. Harris directed the other scoop operators to start loading coal from the No. 14 entry.

Hubbard returned underground at approximately 12:00 noon and traveled to the No. 5 heading to perform coal drilling operations. Meanwhile, Harris trammed his roof bolting machine into the face of No. 6 entry to install permanent roof supports, while Seay trammed his bolting machine up the No. 7 entry to the connecting crosscut between entries No. 7 and No. 8 to install permanent roof supports (see sketch). This was the last contact with Seay before the accident. Harris completed installation of permanent roof supports and trammed his roof bolting machine out of the entry and through the last open crosscut from No. 6 to No. 7 entry. He saw Seay's roof bolting machine sitting on the right side of the No. 7 entry, but did not observe Seay. Concerned about Seay, he trammed his roof bolting machine into the No. 7 heading past Seay's energized machine. At this time, he observed Seay lying next to the inby corner of the No. 7 right crosscut approximately 4 feet inby permanent roof supports in the unsupported cut between No. 7 and No. 8 entries.

At approximately 12:30 p.m., Harris checked Seay for a pulse and shouted for Ayers to help. He directed other miners to call outside and to summon an ambulance. He also directed them to bring a scoop and to get the mine emergency kit (first aid supplies). Marshall Davis, outside man, called 911 at 12:39 p.m. and requested an ambulance. Wilson arrived with his scoop and they put Seay into the bucket. Harris and Ayers traveled in the scoop bucket with Seay to the surface. Cardio-pulmonary-resuscitation (CPR) was conducted on Seay until the ambulance arrived at 12:58 p.m. Seay was pronounced dead at the mine site by the Knox County Deputy Coroner, William M. Johnson.

INVESTIGATION OF THE ACCIDENT

Lloyd Cole, President of D & R Coal, Inc., Mine No. 2, notified MSHA of the accident at 12:45 p.m. on October 6, 2006. A 103(k) order was issued to ensure the safety of any person in the mine and to secure the accident scene while the investigation was conducted. An investigation was conducted in cooperation with the Kentucky Office of Mine Safety and Licensing (OMSL). Investigation team members traveled underground where measurements, photographs, and other information were gathered. A regular inspection was conducted concurrently with the investigation. The training program and records were reviewed. Interviews of nine miners and management officials were conducted at the OMSL office in Barbourville, Kentucky on October 7, 2006, and with two miners on October 11, 2006. A list of those persons who participated in the investigation is shown in Appendix A of this report.

DISCUSSION

Roof Bolting Machine

The permissible roof bolting machine located in the No. 7 entry on the outby approach to the intersection bore an approval plate of a single-head Wilcox, Serial Number 126, Model Number 100SL-AC, with an Approval Number of 2G-4049A-0, rebuilt by Randy's Incorporated. It was equipped with an ATRS. Harris stated this was the machine that Seay had been operating. The ATRS of the roof bolting machine was not set against the mine roof and the machine was energized when he came upon the accident site. The roof bolting machine was examined, and it was determined that it did not contribute to the occurrence of the fatality.

Geologic Conditions

The immediate roof at D & R Coal Inc., Mine No. 2 is comprised of gray shale. The Blue Gem coal seam in Mine No. 2 averages 24 to 28 inches in thickness. Maximum overburden depth over the active section was approximately 200 feet, with overburden at the accident site estimated to be 200 feet. Entries were driven on 50 foot to 60 foot centers and rooms were driven on 40 foot by 40 foot centers in the area of the accident. The location of the accident site was approximately 1700 feet from the surface.

Roof Control

The approved Roof Control plan, dated June 23, 2000, permitted a maximum roof bolt spacing of 48-inches and a minimum 30-inch fully grouted resin roof bolt with 6-inch by 6-inch bearing plates. Roof bolts were required to be installed within 2 feet of all working faces and within 2 feet of the coal rib where crosscuts were to be turned from an entry. The maximum entry width is 20 feet. The plan also requires that "openings that create an intersection will be supported by permanent supports or be supported with two rows of temporary supports on 5-foot centers across the opening before any work or travel in the intersection."

In order to prevent the scoop operator from proceeding inby permanent roof supports while loading cuts, the approved roof control plan contains several stipulations. The maximum depth of cut is limited to 6 feet to be accomplished by limiting the length of the coal auger to 6 feet with a minimum scoop bucket length of 6 ½ feet.

The crosscut between the No. 7 and No. 8 entries measured 16 feet and 2-inches wide at the accident site and measured approximately 19 feet and 6-inches toward the No. 8 entry. Surveyor flagging ribbon is used and attached to the last row of roof bolts to serve as a warning device to alert miners of the location of unsupported roof. These warning devices also increase the likelihood that miners will be made aware of the location of the last row of bolts after an area has been shot. The unsupported crosscut did not have a warning device installed in the No. 7 entry, where the victim was located. During interviews, it was revealed that mine management had not established or assigned

responsibility for installing these warning devices. The safety standard 30 CFR, Part 75.208, states that: "Except during the installation of roof supports, the end of permanent roof support shall be posted with a readily visible warning, or a physical barrier shall be installed to impede travel beyond permanent support."

The accident investigation and concurrent regular inspection resulted in non-contributory unwarrantable actions citing violations of 30 CFR 75.202(b), 75.208, and 75.220(a)(1).

Accident Scene

The accident occurred in the last open crosscut that connected the No. 7 and No. 8 entries, at the inby edge of the crosscut adjacent to the No. 7 entry. This was the last cut taken in this connecting crosscut and had been cleaned up through the crosscut and in the No. 7 entry by the scoops. The exact sequence of loading the cut could not be determined. The unsupported area measured 11 feet and 4-inches from permanently installed roof support in the No. 7 entry to the next permanent roof supports installed in the crosscut. The spacing of permanently installed roof supports in the No. 7 entry where the crosscut was turned measured 34-inches on the outby corner to the rib and 53-inches on the inby corner to the rib. The rock that fell from the unsupported area was approximately 34-inches wide by 73-inches long by 6 to 8-inches thick and was broken 23-inches wide by 24-inches long by 6-inches thick near the victim.

The last contact with Seay was at approximately 11:45 a.m. when Harris talked to Seay after cleaning the dust boxes and loading supplies on the roof bolting machines. Harris then traveled into No. 6 entry to bolt the face, and he stated that Seay was supposed to bolt the crosscut between No. 7 and No. 8 entries.

Seay was found by Harris inby permanent roof support at approximately 12:30 p.m. There were no eyewitnesses to the accident, and the exact time could not be determined. Seay was located 24-inches from the inby rib, and his head was located 47-inches inby the crosscut from the last permanently installed roof bolt. Two leather gloves and a piece of yellow mine marking chalk was found 23-inches from the inby rib underneath the victim. Both gloves had yellow chalk marks on the palm sides. A 3/4 inch by 47-inch long thin metal pipe, used as a marking device, was found 19-inches from the inby rib and was lying under the broken-up roof rock. Black electrical tape was wrapped around the most inby end of the metal pipe. There was no evidence of chalk being under this taped area and the tape was flush with the end of the metal pipe.

There were four yellow chalk marks present on the mine roof in the unsupported crosscut, indicating locations where roof bolts were to be installed (See Sketch).

Unsafe Position

At the time of the roof fall, the victim was positioned in an unsupported area of the crosscut. It was stated in interviews by Harris and a fellow miner that Seay used a marking stick (metal pipe) with chalk taped to the end of it to mark-up his places

(measure the distance from one roof bolt to another) prior to installing permanent roof supports. They claimed that they had never seen Seay go inby permanent roof support. Evidence at the accident scene indicated that chalk marks had been placed in an area of unsupported roof.

Seay approached the unsupported crosscut between No. 7 and No. 8 entries from the No. 7 entry. The scoop operators had loaded coal and cleaned the unsupported crosscut through the crosscut from the No. 8 entry. Observations at the accident scene indicate that while loading coal from the crosscut, scoop operators traveled beyond permanent roof support. Loose coal that was present in the No. 7 entry had been cleaned, which allowed Seay access to the area from the No. 7 entry. While cleaning and loading coal out of the No. 7 entry the scoop operators traveled inby an unsupported opening that created an intersection. The approved roof control plan requires that openings that create an intersection will be permanently or temporarily supported across the opening before any work or travel in the intersection.

Experience and Training

Seay had been employed at this mine since July 13, 2000, as a roof bolter operator. He had 27 years total mining experience, 12 of which was as a roof bolter operator. According to witness testimony and documentation of training received, the victim had been given all the required training, including training in the provisions of the approved roof control plan.

ROOT CAUSE ANALYSIS

An analysis was conducted to identify the most basic causes of the accident that were correctable through reasonable management controls. During the analysis, root causes were identified that, if eliminated, would have either prevented the accident or mitigated its consequences.

Listed below are root causes identified during the analysis and their corresponding corrective actions implemented to prevent a recurrence of the accident:

1. *Root Cause:* The standards, policies, and administrative controls in use at this mine did not ensure that persons would not position themselves or travel inby the last row of permanent roof supports (roof bolts), and would not work or travel in an opening that created an intersection without additional roof support as is required by the approved roof control plan. The victim traveled inby permanent roof support to mark roof bolt locations. In addition, the unsupported crosscut had been cleaned of coal which allowed the roof bolting machine access to the unsupported area from the No. 7 entry. In order to completely clean the coal from the crosscut the scoop operators would have had to travel under unsupported roof. 30 CFR 75.202(b) requires that no person shall work or travel under unsupported roof.

Corrective Action: All employees received 8 hours of Annual Refresher Training conducted by OMSL, which included emphasis on the revised Roof Control Plan.

2. *Root Cause:* The mine foreman routinely operated equipment and failed to exercise the duties and responsibilities which would reasonably be expected to be conducted by a certified mine foreman. Adequate observations of the work habits and mining cycle would have detected the conditions and practices which contributed to the accident.

Corrective Action: Mine management should establish and train certified mine foremen in the responsibilities of the position and their expectations for compliance. The certified mine foremen did attend the training class.

CONCLUSION

The accident occurred because of mine management's failure to ensure that employees did not work or travel under unsupported roof. It was apparent to the Investigation Team, that this operator disregarded safe mining practices as shown by the significant violations of both 75.202(b) and its Roof Control Plan, leading ultimately to the death of Mr. Seay. A section of roof rock measuring approximately 34-inches wide by 73-inches long by 6 to 8-inches thick fell from the unsupported area, striking Seay causing fatal crushing injuries. The accident occurred because of mine management's failure to ensure that employees did not work or travel under unsupported roof.

Approved By:

Norman G. Page
District Manager

Date

ENFORCEMENT ACTIONS

1. A 103(k) Order, Number 6662608 was issued to D & R Coal Incorporated to ensure the safety of all persons until an investigation was completed and the area deemed safe.

2. A 104(d) (1) Order, Number 6662671, was issued to D & R Coal Incorporated for a violation of 30 CFR 75.202(b). An investigation of the fatal fall of roof accident which occurred on October 6, 2006, revealed that the operator failed to ensure that employees would not work or travel under unsupported roof. The victim, Mr. Joseph Seay, was found inby the last row of permanent roof supports, where a roof rock measuring 34-inches wide by 73-inches long by 6 to 8-inches thick fell on him causing fatal crushing head injuries. He was located inby the last row of permanent supports in the crosscut between the No. 7 and No. 8 entries. The unsupported area was 11 feet 4-inches and Seay was located 24-inches from the inby rib and his head was located 47-inches inby the crosscut from the last permanently installed roof bolt. There were four yellow chalk marks present on the mine roof indicating locations where roof bolts were to be installed. These chalk marks were located in the most outby area of the unsupported crosscut. Chalk mark measurements from permanently installed roof bolt in the No. 7 entry on the most outby rib were 40-inches, 47-inches, and 49-inches. Chalk mark measurements from the next inby permanently installed roof bolt were 49-inches, 42-inches, and 45-inches.

Appendix A
Persons Participating in the Investigation

D & R Coal Incorporated Officials

<u>Name</u>	<u>Title</u>
Lloyd D. Cole.....	Owner
Larry Hubbard.....	Owner
William Henry Harris	Section Foreman
Tommy Ayers	Shot Firer
Vernon Cole	Scoop Operator
James Davis	Scoop Operator
Marshall Davis	Outside Man
Kenneth Grubb.....	Dump Man
Fred Jones	Scoop Operator
Tommy Lawson	Scoop Operator
Teddy Wilson.....	Scoop Operator

Kentucky Office of Mine Safety and Licensing

<u>Name</u>	<u>Title</u>
Greg Goins	Chief Accident Investigator
Ron H. Hughes.....	Director of Investigations
Eugene Hollis.....	Roof Control Specialist
Dill Finley	Mine Inspector II
Randy Partin.....	Electrical Inspector
Rick Johnson.....	District Supervisor

Mine Safety and Health Administration

<u>Name</u>	<u>Title</u>
Alice Blanton	CMS&H Inspector/Accident Investigator
Debbie Combs.....	Training Specialist (EFS)
Roy T. Cornelius	CMS&H Inspector/Ventilation Control Specialist
Dennis Cotton	CMS&H Inspector/Roof Specialist
Lester Cox Jr.	CMS&H Inspector/Supervisor
Donna Sonner.....	Attorney, Office of the Solicitor

APPENDIX B

Victim Information

Accident Investigation Data - Victim Information

Event Number: 4 2 4 1 4 3 6

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



Victim Information: 1

1. Name of Injured/III Employee: <i>Joseph B. Seay</i>		2. Sex: <i>M</i>	3. Victim's Age: <i>56</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: 10/06/2006 b. Time: 13:30</i>				7. Date and Time Started: <i>a. Date: 10/06/2006 b. Time: 7:00</i>	
8. Regular Job Title: <i>046 Roof Bolter Single Head</i>			9. Work Activity when Injured: <i>080 Roof Bolter</i>		10. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X <input type="checkbox"/>
11. Experience: a. This Work Activity:	Years <i>12</i>	Weeks <i>0</i>	Days <i>0</i>	b. Regular Job Title: <i>12 0 0</i>	c. This Mine: <i>6 16 0</i>
12. What Directly Inflicted Injury or Illness? <i>124 Underground</i>				13. Nature of Injury or Illness: <i>350 Cerebral Hemorrhage</i>	
14. Training Deficiencies: Hazard: <input type="checkbox"/> New/Newly-Employed Experienced Miner: <input type="checkbox"/> Annual: <input type="checkbox"/> Task: <input type="checkbox"/>					
15. Company of Employment (if different from production operator) <i>Operator</i> Independent Contractor ID: (if applicable)					
16. On-site Emergency Medical Treatment: Not Applicable: <input type="checkbox"/> First-Aid: <input type="checkbox"/> CPR: <input checked="" type="checkbox"/> X <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)			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: a. This Work Activity:	Years <i>12</i>	Weeks <i>0</i>	Days <i>0</i>	b. Regular Job Title: <i>12 0 0</i>	c. This Mine: <i>6 16 0</i>
12. What Directly Inflicted Injury or Illness?				13. Nature of Injury or Illness:	
14. Training Deficiencies: Hazard: <input type="checkbox"/> New/Newly-Employed Experienced Miner: <input type="checkbox"/> Annual: <input type="checkbox"/> Task: <input type="checkbox"/>					
15. Company of Employment (if different from production operator) <i>Operator</i> Independent Contractor ID: (if applicable)					
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)			18. Union Affiliation of Victim:		

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: a. This Work Activity:	Years <i>12</i>	Weeks <i>0</i>	Days <i>0</i>	b. Regular Job Title: <i>12 0 0</i>	c. This Mine: <i>6 16 0</i>
12. What Directly Inflicted Injury or Illness?				13. Nature of Injury or Illness:	
14. Training Deficiencies: Hazard: <input type="checkbox"/> New/Newly-Employed Experienced Miner: <input type="checkbox"/> Annual: <input type="checkbox"/> Task: <input type="checkbox"/>					
15. Company of Employment (if different from production operator) <i>Operator</i> Independent Contractor ID: (if applicable)					
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)			18. Union Affiliation of Victim:		