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UNITED STATES DEPARTMENT OF LABOR MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Roof Fall Accident March 13, 2013

Newtown Energy, Inc. Peerless Rachel Mine Comfort, Boone County, WV I.D. Number 46-09258

Accident Investigators

Daris L. Barker, Jr. Mining Engineer/Accident Investigator

James Jackson Coal Mine Safety and Health Inspector

Timmy Crawford Coal Mine Safety and Health Inspector

Originating Office Mine Safety and Health Administration District 4 100 Bluestone Road Mount Hope, West Virginia, 25880 David S. Mandeville, District Manager

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Photo of the accident scene reenactment

OVERVIEW

On Wednesday, March 13, 2013, Asa Fitzpatrick (victim), a 63-year-old Roof Bolting Machine Operator with 24 years of total mining experience, was killed when he was struck by a large section of roof rock. Fitzpatrick was at the last row of installed roof bolts, installing a rib bolt in the 8 right crosscut on the Number 1 Section. The large roof rock fell and tipped toward the roof bolting machine, pinning the victim between the drill head and the rock and caused crushing type injuries. Fitzpatrick had just installed the glue resin and the rib bolt in the hole that he had completed when he was struck by the rock.

GENERAL INFORMATION

The Peerless Rachel Mine is an underground coal mine operating in the Peerless coal seam, located near Comfort, in Boone County, West Virginia. The mine is operated by Newtown Energy, Inc., a subsidiary of Patriot Coal Corporation.

Bituminous coal is mined at this operation with the room and pillar method of mining, utilizing two sections. The mine operates two nine-hour production shifts and one maintenance shift, five to six days a week. The mine employs 120 people with 115 of these working underground and 5 on the surface. The employees at this operation are not represented by a labor organization. The mine produces on average 2,972 tons of clean coal a day.

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

Gerald R. Swanson	General Manager / President
E. Kent Hartsog	Vice President
Brandon Bowling	Superintendent
John Hensley	Mine Manager
Christopher Cox	Manager of Safety

Prior to the accident, the Mine Safety and Health Administration (MSHA) completed the last regular safety and health inspection (E01) on December 20, 2012. The Non-Fatal Days Lost (NFDL) injury incidence rate for this mine during the period of January through December 2011 was 2.69, compared to a national rate of 3.52 for this type of mine.

DESCRIPTION OF ACCIDENT

On Wednesday March 13, 2013, the evening shift crew for the Number 1 Section (MMU numbers 001-0 and 004-0) started underground at 3:06 p.m. The entire crew traveled underground in the normal manner on a diesel powered mantrip to the section. The section crew arrived on the Number 1 Section at 3:29 p.m. After arrival on the section, William Smith, Section Foreman, conducted an on shift examination of the faces and the rest of the crew conducted pre-operational checks on the mining equipment assigned to them. Asa Fitzpatrick and Brian Allport were the normal operators for the right side roof bolting machine on the Number 1 Section, MMU number 001-0.

The right side roof bolting machine was located in the face area of the number 6 entry, which was fully bolted when they arrived on the section. Fitzpatrick and Allport performed pre-operational checks on the roof bolting machine in the

number 6 entry while waiting on the right side continuous mining machine. The right side continuous mining machine operator, Robert DeBoard, was completing a scrap cut in the 8 right crosscut, connecting it to the number 9 entry. After the continuous mining machine finished the scrap cut, Fitzpatrick and Allport trammed the roof bolting machine into the 8 right crosscut from the number 6 entry. Fitzpatrick and Allport began installing roof bolts and rib bolts in the 8 right crosscut. Rib bolts were not required in this area, but were being installed on 8 foot centers for precautionary measures.

Prior to the accident, the last full row of roof bolts installed in the 8 right crosscut were 10 feet 7 inches from the roof bolts in the number 9 entry. Fitzpatrick then drilled a hole in the right rib for the installation of a rib bolt. After drilling the 4-foot deep hole, Fitzpatrick walked out in front of the roof bolting machine drill mast to insert the resin glue and the 4-foot long steel bolt into the drill hole.

While Fitzpatrick was at the inby end of the roof bolting machine drill mast, a large piece of roof rock (approximately 6 feet long x 5.5 feet wide x 0 to 9 inches in thickness) fell from the roof. The rock fell in such a manner that the Automatic Temporary Roof Support (ATRS) could not prevent it from hitting Fitzpatrick. The edge of the rock closest to Fitzpatrick struck and pinned him in a semi-upright position against the roof bolting machine drill mast.

At approximately 5:00 p.m., Allport was operating the left side of the roof bolting machine, when he heard the rock fall and turned around to find Fitzpatrick pinned by a rock up against the drill mast. Allport rushed over and attempted to push the rock off of Fitzpatrick. Allport was unable to move the rock due to its weight. Allport then attempted to move the roof bolting machine. He lowered the ATRS, causing it to lose contact with the mine roof. At that point, Allport decided that moving the roof bolting machine may cause more harm to Fitzpatrick, so he stopped and ran, shouting for help.

Robert DeBoard, the Right Side Continuous Mining Machine Operator, was in the face area of the number 7 entry when he heard Allport yelling for help. Deboard rushed to the scene of the accident and found Fitzpatrick lying on the mine floor on his left side, with the rock over him. The right side roof bolting machine drill mast was over Fitzpatrick, but not touching him.

Allport and DeBoard tried to lift the rock off of Fitzpatrick, but were not able to do so. At this time Fitzpatrick was losing consciousness, and was unable to respond verbally. DeBoard used a long slate bar to lift the rock off of Fitzpatrick. As the rock was lifted, Deboard realized Fitzpatrick was not trapped by the rock, but was only under it partially.

James Raines, Right Side Shuttle Car Operator, arrived and helped DeBoard pull Fitzpatrick out from beneath the rock. Fitzpatrick was given first aid treatment. William Smith, Section Foreman, traveled across the section yelling for help and then called outside to notify the dispatcher of the accident. After the call outside was made he returned to the scene of the accident. The Dispatcher, Jimmy Higginbotham, received Smith's call at approximately 5:05 p.m., and he immediately called for an ambulance.

By this time, other miners had arrived on the accident scene to render assistance: Robert Vance and Roy Wheeler, Left Side Roof Bolting Machine Operators; Steve Block, Left Side Continuous Mining Machine Operator; David Davis, Section Electrician; and Harold Barker, Shuttle Car Operator.

Davis directed Wheeler to swing the right side roof bolting machine's drill boom toward the inside of the machine to make room for first aid supplies and a back board. Vance noticed that the roof bolting machine ATRS was not in contact with the mine roof, so he reset the ATRS to protect the miners providing first aid to Fitzpatrick. Barker had also arrived with additional first aid supply boxes.

Once the hazard of the fallen rock was controlled coworkers were able to access the site and administer first aid to Fitzpatrick. Fitzpatrick's breathing was shallow at the time and he was placed on a backboard for transport to the emergency ride.

Fitzpatrick was carried outby the accident scene one break, into the number 7 entry. Block noticed that Fitzpatrick was not breathing, so they stopped and immediately provided CPR and attempted resuscitation. While William Smith and Allport performed CPR, Block went to call outside for the automated external defibrillator (AED).

Shortly before 5:30 p.m., Randell Alderman, Compliance Foreman and EMT, arrived on the Number 1 section. Alderman directed that Fitzpatrick be placed onto the emergency ride. William Smith and Allport continued to perform CPR, while Ralph Smith, Shuttle Car Operator, stabilized Fitzpatrick's head. Block then drove the emergency ride, leaving the section and heading outside.

Jeff Carney, Evening Shift Outby Electrician, administered emergency care to Fitzpatrick and met the emergency ride. The emergency ride arrived on the surface and Fitzpatrick was transferred to the Boone County Ambulance Authority paramedics at approximately 6:05 p.m. Fitzpatrick was transported to the CAMC General Hospital, where he was pronounced dead by the emergency room physician at 7:04 p.m.

INVESTIGATION OF ACCIDENT

This MSHA investigation was conducted in cooperation with the West Virginia Office of Miner's Health, Safety and Training (WVOMHS&T), the mine operator, and employees at the mine.

At approximately 5:24 p.m. on March 13, 2013, Christopher Cox, Manager of Safety for the Peerless Rachel Mine, notified the MSHA emergency call center of the accident. The MSHA call center notified Marty Carver, Mount Carbon Field Office Supervisor, of the accident at 5:48 p.m. A verbal 103(j) order was issued to the mine operator at 6:10 p.m. The order affected the entire mine.

Timothy Crawford and James Jackson, MSHA Coal Mine Inspectors, along with Daris Barker, District 4 Roof Control Specialist and Accident Investigator, were notified and dispatched to the mine to conduct the accident investigation.

Crawford arrived at the mine and preliminary written statements were obtained from persons having knowledge of the facts and circumstances concerning the accident. Jackson and Barker arrived and started conducting the physical portion of the accident investigation. Mine tracking and training records information was requested and obtained from the mine operator. Crawford reduced the verbal 103(j) order to writing and then modified the action to a 103(k) order to ensure the safety of all persons during the accident investigation and to preserve all evidence at the accident scene.

Barker and Jackson traveled underground along with state mine inspectors from the WVOMHS&T and mine officials. The scene of the accident was photographed and measurements were taken. The mine operator was allowed to survey the scene of the accident the next day and a drawing of the accident scene was provided to MSHA.

Due to the movement of the roof bolting machine while providing first aid to the victim, the investigation team conducted an accident reenactment on March 15, 2013. Photographs and measurements were taken of the accident enactment.

Witness interviews were conducted on March 19, 2013 at the MSHA Madison Field Office with persons considered to have knowledge of the facts and circumstances concerning the accident. Additional interviews were conducted at the same location on March 20, 2013, with all roof bolting machine operators for the mine. A second interview was also conducted with Section Forman, William Smith, on March 22, 2013.

After the interviews on March 20, 2013, Barker traveled back to the accident scene and took additional photographs and measurements of the accident scene to clarify additional information learned during the interviews.

A list of the persons who participated in the investigation is contained in the Appendix A.

DISCUSSION

Time of the Accident

Fitzpatrick was operating the right side drill station for the right side roof bolting machine (S/N 2011144) on the Number 1 Section of the Mine at the time of the accident. Brian Allport was operating the left side drill station. Allport and Fitzpatrick were installing roof and rib bolts in the number 8 right crosscut and were nearing completion of the unbolted area. The 8 right crosscut was connected to the Number 9 Entry and only approximately 10 feet 7 inches remained to be bolted. Fitzpatrick was installing a rib bolt into the right side rib after completing the row of roof bolts. Allport was preparing to install a rib bolt on the left side. There was no direct eyewitness of the accident; however Allport turned around and observed Fitzpatrick pinned by the fallen roof rock after he heard a noise. Based on interviews and information from the mine tracking system, the time of the accident was 5:00 p.m.

Accident Scene

The mining height at the accident scene averaged 7 feet and 7 inches and the width of the 8 Right crosscut was 19 feet. The top rock mined above the coal seam was less than 12 inches in the area of the accident. The mine ribs were in good condition, showing no signs of sloughage and consisted of coal with shale partings throughout the mining height.

The rock that struck Fitzpatrick was found on the mine floor with the leading edge approximately 5 inches outby the front edge of the ATRS. The rock measured 6 feet by 5.5 feet and averaged 5 inches in thickness. The rock weighed approximately 2,200 pounds. The rock shape was semi-elliptical in profile and had a shallow dome shape, which ranged in thickness from 0 to 9 inches, (5-inch average thickness). The rock had measurements of 100 inches and 80 inches, measured diagonally. There was approximately 12 inches of clearance under the rock after it came to rest on the mine floor.

The roof bolting machine had not been moved, however the right side drill mast of the machine had been moved from its original position to allow first aid to be performed on the victim. The rib bolt drill hole was present in the right rib with four feet of resin glue still in the hole. When the drill mast was realigned with the rib bolt drill hole, and with the 4-foot section of drill steel, there was only 12 inches of clearance from the inby edge of the drill mast to the inby edge of the ATRS. At this location, it would not be possible to install the bolt resin glue from the opposite side of the drill mast without the use of a glue insertion device. The roof rock that struck Fitzpatrick fell in such a manner that the portion of rock closest to Fitzpatrick pinned and crushed him in a semi-upright position against the inby edge of the drill mast. This placed Fitzpatrick at the inby edge of the drill mast with only 12 inches of clearance to the front of the ATRS. At least a portion of his body was under unsupported roof when the rock fell. Based on the evidence at the accident scene, Fitzpatrick apparently positioned himself in this manner in order to insert the resin glue and the rib bolt into the hole.

Geological Conditions on the Number 1 Section

The immediate roof rock consisted of gray shale, which contains numerous slickenside formations in the rock strata. Based on core drill hole information supplied by the mine operator, the immediate roof rock was approximately 6.67 feet thick. These slickenside formations were circular or oblong in nature, and very shallow, with middle thicknesses of less than 2 feet. The diameters of these slickenside formations ranged from 1 to 20 feet in diameter and were prevalent across the entire Number 1 Section. Based on witness testimony, the slickenside formations usually fall out shortly after mining, but before roof bolting operations begin.

The main mine roof consisted of sandy shale that was approximately 7 feet in thickness with a laminated coal parting.

Existing Roof Control Plan at Time of Accident

Rib bolting is required by the roof control plan in certain areas of the mine. The areas that require rib bolting are defined by two different zones; yellow and red. The yellow zone is defined as areas with overburden and multiple seam mining where the in situ (situated naturally) stresses exceed 950 pounds per square inch (psi), but less than 1150 psi. Within the yellow zone, the ribs are required to be bolted if the mining height is over 7 feet. The red zone is defined as areas with overburden and multiple seam mining, with in situ stresses greater than 1150 psi. In the red zone areas, the ribs have to be bolted, regardless of the mining height.

The Number 1 Section was not under either of the full yellow or red zone parameters therefore, rib bolting was not a requirement. However, the mine was bolting the ribs on the Number 1 Section on 8-foot centers, as an additional safety precaution for the area being developed, and the mining height was greater than 7 feet.

Roof and Rib Bolting Practices at this Mine

The primary roof bolting pattern on this section consisted of 4-foot long, fully grouted resin bolts, ³/₄ inches in diameter with a steel grade of "60." The primary

roof supports were on a bolt pattern, having a maximum of 5-foot between bolts, with a minimum of 4 bolts per row, and a maximum of 4 feet between rows.

The rib bolts being installed were also 4-foot long, fully grouted resin bolts, #6 bar, ³/₄ inches in diameter with a steel grade of "60." The rib bolt pattern was one rib bolt for every 8 foot of rib length, or one rib bolt installed for every other row of roof bolts.

During the accident investigation interview process, it was discovered that rib bolting was not being conducted in a safe manner by all roof bolting machine operators. Four of the seven roof bolting machine operators stated that they walked in front of the roof bolting machine drill mast in order to reach the rib bolt drill holes and insert the glue resin and the rib bolts. The roof bolting machine operators admitted to this practice and felt that it was acceptable, since they said they were under the ATRS at all times. But during reenactment of the accident, it was determined that when using a 4-foot drill steel with the drill mast rotated to the rib, that the distance from the inby edge of the ATRS and the drill mast ranged from 6 to 16 ½ inches. The distance depends on the length of drill steel used and distance that the drill mast is moved in or out from the roof bolting machine frame. This practice can place roof bolting machine operators in a dangerous position by exposing them to unsupported roof hazards. As a result of the investigation, the mine's roof control plan was revised to address and prevent this unsafe practice.

The unsafe practice did not follow all installation requirements contained within the equipment manufacturer's operator's manual. Fletcher Mining Equipment issued an operator's manual with the purchase of two C-DDR-13-A roof drills, serial numbers 2011144 and 2011145, on June 2012, which states on page 41, "Bolters used for angle or rib bolting must be equipped with hydraulic drill guides and have a resin inserter as required." The hydraulic drill guides had been removed from both the roof bolting machines in use on the Number 1 Section. Additionally, a resin insertion device was not found on either roof bolting machine, or on the Number 1 Section, or in the mine. The absence of hydraulic drill guides and specifically the resin inserters made insertion of the resin glue difficult for the roof bolting machine operators.

Experience and Training

Fitzpatrick received his West Virginia Underground Experienced Miner Certification on September 30, 1982. Based on records obtained from Newtown Energy, Inc., Fitzpatrick had 24 years, 45 weeks, and 6 days of mining experience. He began working at the Peerless Rachel Mine 38 weeks and 1 day prior to the accident. Fitzpatrick had approximately 24 ¹/₂ years of experience as a roof bolting machine operator.

On May 30, 2012, Fitzpatrick received Experienced Miner Training at the Peerless Rachel Mine from Andrew Ramey. Fitzpatrick received New Task Training for both roof bolting machines, which were located on the Number 1 Section, on November 12, 2012, from William Smith, Section Foreman. On February 9, 2013 Fitzpatrick received Annual Refresher Training, which was provided by Camron R. Stover.

The accident investigation team determined that the roof bolting machine operators did not receive specific training on the use of hydraulic drill guides or training on use of the resin insertion tools as part of their task training for the operation of the roof bolting machines and resin installation.

ROOT CAUSE ANALYSIS

A root cause analysis was conducted to identify the causes of the accident that were correctable through reasonable management controls. Listed below are root causes identified during the analysis and the corresponding corrective actions implemented to prevent a reoccurrence of the accident.

Root Cause: The mine operator failed to prevent miners from being exposed to unsupported roof. The roof bolting machine operators were allowed to position themselves in front of the machine's drill mast at the ATRS, while installing resin glue and steel bolts into the rib. This practice exposed the miners to unsupported roof during the installation of rib bolts. The mine operator had removed the hydraulic drill guides provided by the roof bolting machine manufacturer and did not provide the recommended resin insertion tools to assist miners in angle or rib bolting. The roof bolting machine operators had not been trained in the use of the resin insertion devices, as required by the manufacturer.

Corrective Actions: The mine operator was required to revise the roof control plan, requiring that the following safety precautions be taken during rib bolting operations that are conducted as part of the roof bolting cycle, with the installation of primary support where there are areas with unsupported roof located inby:

• At least two full rows of primary support shall be installed inby the proposed location of a rib bolt before any work is performed to install rib support. At least two rows of primary support are required for additional support inby the rib bolting location.

• Fletcher Resin Inserters will be maintained on all roof bolt machines at this mine that will aid in the insertion of a resin cartridge during rib bolting operations. There will be a resin inserter available to roof bolting machine operators at any time a machine is in operation.

• Prior to operating a roof bolting machine at this mine, training was conducted under these safety precautions and documented on an MSHA 5000-23 Form and maintained at the mine for review.

The mine operator was required by MSHA to reinstall the hydraulic drill guides and make resin insertion tools available on each roof bolting machine. Finally, the mine operator was required to provide additional task training to the affected roof bolting machine operators, which included specific training on the use of hydraulic drill guides and the resin insertion tools.

CONCLUSION

Roof bolting machine operators were allowed to position themselves in front of the roof bolting machine drill mast at the automated temporary roof support during rib bolting operations. This practice exposed roof bolting machine operators to unsupported roof hazards while rib bolting. In addition, the mine operator failed to maintain the roof bolting machines with hydraulic drill guides and resin inserters, as required by the equipment manufacturer, which caused the roof bolting machine operators to position themselves in front of the roof bolting machine.

Approved By:

level

David S. Mandeville District Manager Coal Mine Safety and Health, District 4

Date

ENFORCEMENT ACTIONS

1. <u>Order Number 7165647</u>, was issued verbally by telephone at approximately 6:10 p.m. on March 13, 2013, under the provisions of section 103(j) of the Mine Act:

A fatal accident occurred at this operation on March 13, 2012, when a roof bolting machine operator was crushed by a roof fall while operating the right side of roof bolting machine. This order was issued to prevent the destruction of any evidence which would assist in the investigation of the cause or causes of the accident. The 103(j) Order, Number 7165647, was modified on March 13, 2013 to a 103(k) order and was reduced to writing at 7:15 p.m.

2. <u>Citation Number 7215071</u>, was issued under the provisions of Section 104(a) of the Mine Act, for a violation of 30 CFR, § 75.202(b):

On March 3, 2013, a roof bolting machine operator received fatal crushing injuries after being struck by a rock. The roof bolting machine being used to rib bolt, as well as the other roof bolting machines in use at this mine, were not equipped with hydraulic drill guides, nor were provided with resin inserters as required. This caused the roof bolting machine operator to walk around the front of the drill mast, placing a portion of his body beyond the protection of the ATRS, to manually place the resin cartridge and bolt in the drill hole located in the rib. During the interviews conducted for the accident investigation, it became known that this was a common practice at this mine.

A resin inserter device and proper training in its use, would have provided the victim to means to install rib bolts while remaining at the drill station, beneath a canopy, and behind the protection of the ATRS. Mine management was aware that roof bolting machines were not adequately equipped and that proper training to safely install rib bolts had not been provided.

3. <u>Citation Number 7219324</u>, was issued under the provisions of Section 104(d) of the Mine Act, for a violation of 30 CFR, § 48.7(a)(1):

Roof control machine operators did not receive adequate task training to safely install rib bolts. On page 41, the operator's manual for the DDR – Dual Head, Mast Feed Roof Drill, states that rib bolting is "more difficult

to master" than roof bolting, and advises that bolters should not attempt to install rib bolts without adequate task training and previous experience roof bolting. A few lines below these warnings the manual explicitly states, "Bolters used for angle or rib bolting must be equipped with hydraulic drill guides and have a resin inserter as required." The steps for "Installing a Resin Rib Bolt," on page 46 of the operators manual, call for the use of a resin insertion device and drill guide when installing a rib bolt. Lastly, page 57 of the manual, which contains the directions for operating an Automated Temporary Roof Support (ATRS), states that the operators must position themselves behind the ATRS Beam at all times. At the time of the fatal accident none of the DDR roof bolting machines at the mine were equipped with a hydraulic drill guide, nor provided with resin cartridge insertion devices. The absence of these safety devices prevented the operator from conducting adequate task training for the roof bolting machine operators at this mine. This violation is an unwarrantable failure to comply with a mandatory standard.

APPENDIX A Persons participating in the accident investigation

Gerald Swanson Jr.President / General Manager Jamie Wiant Corporate Operations Specialist Jason AcordOperations Manager John Hensley Mine Manager Ben McFarlandAttorney with Jackson & Kelly David Davis Section Electrician Robert DeBoard Right Side Continuous Miner Operator William Smith Section Foreman Robert Vance Left Side Roof Bolting Machine Operator Roy Wheeler Left Side Roof Bolting Machine Operator James Rains Shuttle Car Operator Steve Block Left Side Continuous Miner Operator Brian Allport Right Side Roof Bolting Machine Operator Jimmy Higginbotham Dispatcher Dale Elswick Section Electrician Darren Smith Left Side Roof Bolting Machine Operator Joseph Laws Right Side Roof Bolting Machine Operator Karl D. Viars Left Side Roof Bolting Machine Operator Robert Wright Maintenance Supervisor

Newtown Energy Inc.

Family Representative

Ryan Stewart	 Attorney with BB&J
Mark Barney	 Attorney with BB&J

APPENDIX A (continued) Persons participating in the accident investigation

West Virginia Office of Miner's Health, Safety and Training

Eugene White	Deputy Director
John Kinder	Inspector at Large
Danny Jarrell	Assistant Inspector at Large
Wayne A. Pauley	Underground Mine Inspector
Fred Newsome	Roof Control Specialist
Barry Koerber	Attorney with WVOMHS&T
Randy Murphy	Underground Mine Inspector

Mine Safety and Health Administration

Daris Lee Barker, Jr, PE	Mining Engineer/Accident Investigator
Timothy H. Crawford	Coal Mine Inspector
James Jackson	Coal Mine Inspector
Frank Hartenstein, Jr	District 4 Roof Control Specialist

APPENDIX B Victim Information

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Victim Information: 1	0.0	O Mathemate	A ==	14 Deeree	of Inlune								
. Name of Injured/III Employee:	2. Sex	3. VICIIM'S	Age	4. Degree C	Ji injury.								
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5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:				6. Dat	e and Tim	e Started:						
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Nork Activity: 11. What Directly Inflicted Injury or Illin	ess?	Job Title:	r	WEEKS	Days	c: This Mine: 12. Natur	e of Injury o	weeks or illness:		d. Total Mining:		**6663	
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APPENDIX C Sketch of the Accident



(Drawing shown is not to scale)



Photo of Resin Insertion Device