

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Surface Coal Mine
Fatal Electrical Accident
February 18, 2008

A-FN Machine Technology, Inc. (Contractor ID R317)
New Kensington, Pennsylvania

Consolidation Coal Company 14-North Impoundment
Consolidation Coal Company
Harmarville, Allegheny County, Pennsylvania
MSHA ID 36-08094

Accident Investigators
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ACCIDENT SITE



OVERVIEW

At approximately 12:35 p.m. on Monday, February 18, 2008, a 51-year old Mechanical Pump Technician with less than one year of mining experience was fatally injured at Consolidation Coal Company's Consolidation Coal Company 14-North Impoundment (14-North). The accident occurred when a truck-mounted crane became energized by a 25,000 high voltage power line while the victim was performing crane-rigging duties on the haul road.

GENERAL INFORMATION

14-North is a non producing coal mine located in Harmarville, Allegheny County, Pennsylvania. This mine acts as a water treatment facility and maintains the water elevation in the nearby abandoned mines and treats effluent that is discharged into the state waterways. Consolidation Coal Company (Consol) contracted A-FN Machine Technology Inc., Incorporated (A-FN) to perform daily operations since May 22, 2007. A-FN is located in New Kensington, Westmoreland County, Pennsylvania.

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

J.B. Harvey	President
P.B. Lilly	Vice President
Peter Luttrell.....	Senior Project Engineer
Richard Lunn.....	Environmental Engineer

The principal officer for the contractor at the mine at the time of the accident was:

Thomas Fenn.....	Owner
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Prior to the accident, the Mine Safety and Health Administration (MSHA) completed the last regular safety and health inspection on September 24, 2007. The Non-Fatal Days Lost (NFDL) injury incidence rate for the mine in 2007 was 0.00 compared to a National NFDL rate of 1.79.

Description of Accident

Angelo Petricca (victim), Thomas Fenn (owner, A-FN), and Larry J. Stoops (equipment operator/technician) reported to A-FN headquarters at approximately 6:00 a.m. on Friday, February 15, 2008 prior to traveling to the 14-North mine site. Richard Lunn (Consol, Environmental Engineer) arrived on site shortly afterward. While on site, Lunn discussed the placement of concrete barriers in relation to the overhead power

lines with the A-FN employees. Prior to Friday, Petricca painted areas on the ground where the barriers were to be placed. On Friday, Petricca and Stoops placed 15 concrete barriers on the lower portion of the haul road.

On Monday, February 18, 2008, Petricca, Fenn, and Stoops reported to A-FN headquarters at approximately 6:00 a.m. While at A-FN headquarters, the above referenced personnel discussed delivery truck access in addition to barrier placement and boom truck setup. The men then traveled to the 14-North mine site in separate vehicles. Petricca and Stoops arrived at approximately 7:30 a.m. Shortly thereafter, David Twidwell (A-FN Technician) and Lunn arrived on site. Petricca and Stoops discussed the power line hazards. Twidwell also mentioned the power line hazards to Petricca and Stoops. Petricca and Stoops began spreading non-skid material on the haul road. While Petricca and Stoops were spreading the material, Fenn also arrived onsite.

When the concrete barriers were delivered to the site, Petricca, and Stoops unloaded the barriers from the truck near the treatment plant. Stoops operated the boom truck while Petricca was performing crane rigging duties. After the barriers were unloaded from the delivery truck, Petricca and Stoops proceeded with the barrier placement. Petricca and Stoops placed approximately 11 barriers before stopping for lunch between 11:30 a.m. and 12:00 p.m. Technical Electrical Services' electrical contractors, Mike Huston and John Rudzinski, arrived at this time.

Petricca and Stoops resumed barrier placement by loading barriers onto the boom truck. The men found a spot where they believed two barriers could be placed along the haul road without exposing themselves to the hazards of the high-voltage lines. Stoops backed the boom truck into position following Petricca's directions. Stoops exited the cab and operated the crane from the driver's side. Petricca connected the hoist to a barrier located on the bed of the boom truck and walked to the painted placement area. Petricca hand motioned to Stoops to extend the barrier out further.

At approximately 12:35 p.m., the boom was energized by the overhead 25,000 high-voltage power line. Stoops observed a flash from the outriggers. While walking up the haul road to the impoundment, Rudzinski, Huston, and Lunn also heard a noise and observed a flash. Lunn called 911 while Rudzinski called Allegheny Power Company. Upon arrival at the mine site, the Allegheny County Coroner pronounced the victim dead due to electrocution.

INVESTIGATION OF THE ACCIDENT

MSHA was notified of the accident by the national call center. Lunn reported the accident at 1:06 p.m. MSHA personnel were immediately dispatched to the facility. A 103(k) order was issued to insure the safety of all persons during the recovery of the

victim and accident investigation. The investigation was conducted in conjunction with the Pennsylvania Department of Environmental Protection Agency.

The accident scene was documented with photographs, sketches and measurements. Interviews were conducted of 7 persons. Other documents and evidence were collected from A-FN, Tri-State Safety Training, Allegheny Power, and Consol. The on-site portion of the investigation was completed on March 4, 2008.

DISCUSSION

Safety Talks

On Friday, February, 15, 2008, Lunn conducted a safety talk with Petricca and Stoops. The safety talk included the hazards of energized high voltage power lines. All personnel involved in the safety talk were instructed that the crane was to be lower than the communication lines when working near the power lines. The communication lines were approximately 11-feet below the energized high voltage lines. On Friday, February, 15, 2008, and on Monday, February, 18, 2008, Fenn conducted a safety talk with Petricca and Stoops. The safety talk included the hazards of energized high voltage power lines. Both men were instructed that the crane was to be lower than the communication lines when working near the power lines. This involved a horizontal boom-stick orientation during barrier placement under the wires.

Barrier Placement

Concrete barriers were being placed along the roadway to function as berms and prevent vehicle over-travel. On Friday, February 15, 2008, Petricca and Stoops placed a truck load of barriers (15 barriers) at the lower end of the haul road. On the day of the accident after the concrete barrier truck was unloaded; the procedure involved Petricca hooking the barriers to the crane and then unhooking them once they were loaded onto the boom truck. Petricca and Stoops discussed placement of each barrier and the boom truck set-up position. Once the two men agreed on a set-up position, Stoops drove the boom truck to the set-up area and Petricca guided/directed Stoops into position. Stoops was to access the crane controls on the side of the truck that gave him the best view of the work to be performed. Petricca would then climb onto the flat bed of the boom truck and place the hook on the barrier. Petricca would dismount the truck and go to the area that he marked with paint for barrier placement. Once in this position, Stoops hoisted the block towards Petricca while observing his hand signals for final placement.

Stoops was supposed to perform crane operations for the concrete barrier placement. Stoops was instructed by Fenn, when working near the high voltage lines, to work with a horizontal boom. However, to accomplish this task, the boom had to be raised above horizontal to remove the barrier from the bed of the boom truck. This involved raising

the lift to clear the boom rest, swinging the boom to the barrier placement side, booming down to horizontal, and then horizontally booming the barrier to the painted area.

When the accident occurred, the boom was raised above the boom rest at the rear of the bed. The boom was not in a horizontal position and it was not beneath the communication lines. The crane operator had to monitor the victim's hand signals, the load (concrete barrier), and the electrical lines. Also, additional obstacles were encountered during the last set-up position. The additional obstacles encountered included the tree-line on the driver's side and high voltage lines located in front, behind, and on the passenger side of the boom truck. This set-up position added additional monitoring to the task. Broken tree branches and damaged saplings from crane operations were observed during the investigation.

Electrical

Electrical power was delivered to the work site via overhead power lines. The phase to phase voltage of these lines was 25,000 volts. The phase to ground voltage was 14,400 volts. The victim was exposed to the phase to ground voltage. The circuit protective devices employed by Allegheny Power were not intended to provide personnel protection. However, all circuit protective devices functioned appropriately.

Orientation of the electrical lines

Appendix B illustrates the orientation of the electrical lines. Figure 1 shows a top view of the power lines in reference to the haul road. Figure 2 shows a side view of the communication and power lines and was the typical view for the barrier placement along the haul road except during the accident. The A-phase power line was 35.5 ft. from ground level, when measured, at the point where it was contacted by the boom. Two communication lines were located beneath the power lines in the vicinity of the accident. One communication line was 21.9 ft. from ground level and 13.6 ft. beneath the A-phase power line. The second communication line was 19.3 ft. from ground level and 16.2 ft. beneath the A-phase power line. Figure 3 shows a top view of the communication and power lines when the accident occurred. This was the first time barrier placement was attempted at this position. The lower communication lines are oriented beneath the center (B-phase) 14,400 volt to ground power line. The A-phase 14,400 volt to ground power line energized the crane. The communication lines are not as obvious to see when comparing the accident location (Figure 3 & page ii) versus the prior placement location along the haul road (Figure 2). Therefore, viewing the communication lines from a different position complicated the process. The complexity of using the communication lines as a safe reference point varied based on the location of the crane set-up.

Crane Information

The National Crane, Model No. 556B, manufactured in 1990, was a truck-mounted crane which attached to the frame of a truck carrier. This type of crane was designed to universally fit a variety of trucks from several manufacturers. The main crane structure consisted of a stationary vertical crane frame with A-frame outriggers. A rotating turntable with lifting hoist was mounted to a slew bearing attached to the top of the crane frame. A three section, 56-foot long telescoping boom was mounted to the turntable. The crane was originally equipped with a 35-foot jib mounted to the side of the main boom which had been removed by the crane owner. The single sheave hook-block was configured with 2-part lines with the wire rope anchored at the boom nose tip.

A total of four outriggers (crane stabilizers) were located on each of the far front and rear corners of the truck carrier flatbed. Two of the outriggers were attached to the crane assembly previously mentioned and two of the A-frame outriggers were attached to the truck carrier frame. These A-frame outriggers were used to provide a stable and level platform for proper crane operation. The crane had manual control valves for machine operation with an automatic anti-two block shutdown device.

Operator's Station

The operator's stations, on either side of the truck, were located near the flatbed deck of the truck carrier, between the flatbed and drivers compartment. A series of levers housed in a metal box structure were used to control the operation of the crane functions. The crane operator stands on a small platform to operate the controls of the crane.

Machine Operation

The machine was operated through all functions and no malfunctions were identified.

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 this type of accident:

1. *Root Cause:* The practice of using the lower communication power lines as a visual aid to provide clearance from the higher power lines gave a false sense of security when the boom truck crane was re-positioned to install the last two concrete barriers. This procedure contributed to the crane operating within ten feet of the energized overhead power line.

Corrective Action: When using visual aids, procedures such as viewing from all directions may necessitate high visibility markers along with a spotter with direct communications with the crane operator.

2. *Root Cause:* The procedure used in selecting set-up location did not include full consideration of the obstacles and hazards. The crane set-up location for placing the last two concrete barriers required the operator to view the barrier placement over the bed of the truck. The operator had to simultaneously monitor victim's hand signals, the load (concrete barrier), and the lines with the boom raised at approximately a 30 degree angle. Broken tree branches and damaged saplings from crane operations were located between the boom rest and edge of the haul road. The location of the crane made the task difficult to perform beneath the energized high voltage wires.

Corrective Action: An assessment of each crane set-up position and orientation should be conducted and include consideration of the associated hazards and obstacles. Written procedures should be formulated to include de-energizing power lines when necessary or providing a means to ensure equipment or personnel are not located within ten feet of the energized overhead power conductors.

CONCLUSION

The accident occurred because the truck-mounted crane contacted the energized 25,000 high-voltage power line. The victim was fatally electrocuted when the crane became energized while the victim was performing crane-rigging duties.

Approved By:

William Parson

District Manager

1-16-09
Date

ENFORCEMENT ACTIONS

1. A 103(k) Order No. 7020179 was issued to Consolidation Coal Company to ensure the safety of the miners until the investigation could be completed.
2. A 104(a) Citation No. 7020193 was issued to A-FN Machine Technology, Inc., Incorporated, citing 30 CFR, Section 77.807-2.

Condition or Practice: The boom truck (National / Series 500 Crane, mounted on a Ford 800 Flat Bed Truck), was operated within ten feet of the energized 14,400 Volt to ground overhead power lines while placing concrete barriers. The boom truck, located on the main haul road of the 14 North Impoundment mine site, became energized. The miner performing rigging-duties for the crane activities was fatally injured.

Appendix A - Persons Participating in the Investigation

Consolidation Coal Company

<u>Name</u>	<u>Title</u>
John A. Owsiany	Director, Compliance & Water Resources
Peter Lutrell.....	Manager, Conservation Group
Dennis Hellgren.....	Manager, Safety
Richard Lunn.....	Environmental Engineer

A-FN Machine Technology, Inc.

<u>Name</u>	<u>Title</u>
Thomas Fenn.....	Owner
Larry Stoops.....	Technician/Machine Operator
David Twidwell.....	Technician/Machine Operator

Technical Electrical Services

<u>Name</u>	<u>Title</u>
John Rudzinski.....	Owner
Michael Huston.....	Electrician

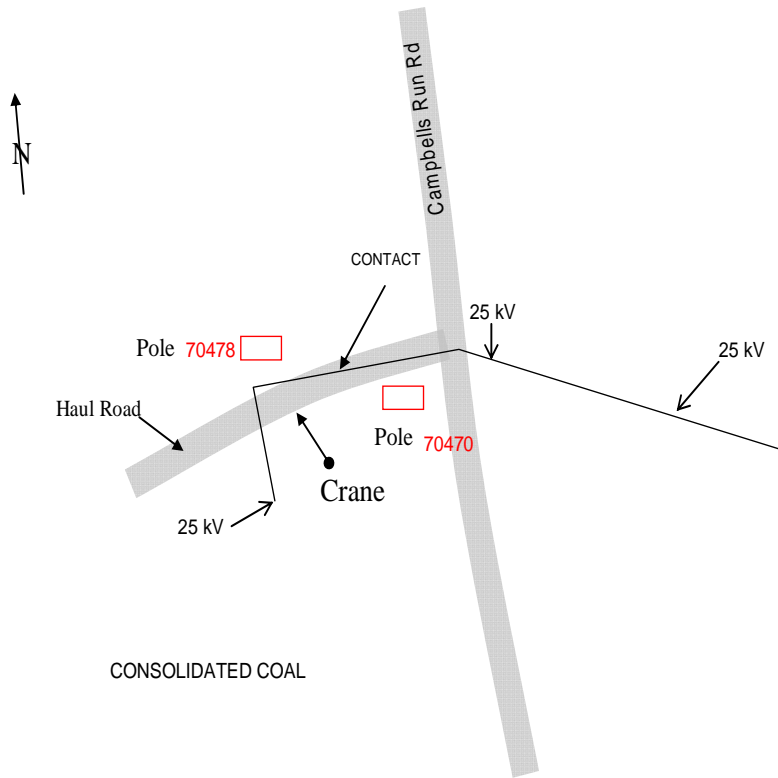
Tri-State Safety, Incorporated

<u>Name</u>	<u>Title</u>
John Peton.....	Owner

Mine Safety and Health Administration

<u>Name</u>	<u>Title</u>
Craig A. Mikulsky.....	Civil Engineer
Kevin Deel.....	Coal Mine Safety and Health Inspector
Richard Swartz.....	Education and Field Services Specialist
Phillip McCabe.....	Mechanical Engineer, Technical Support
Dean Skorski.....	Supervisory Electrical Engineer, Technical Support

Appendix B



NOT TO SCALE

Figure 1

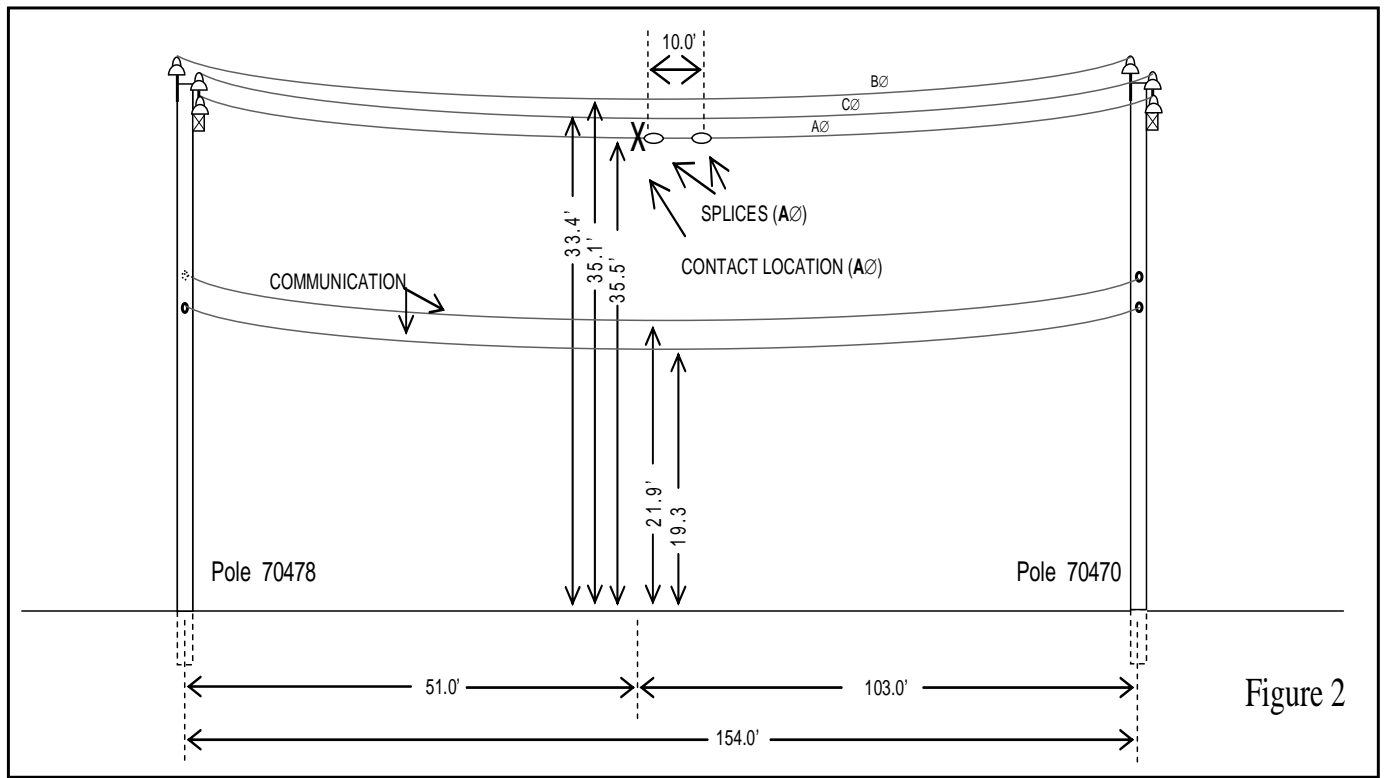


Figure 2

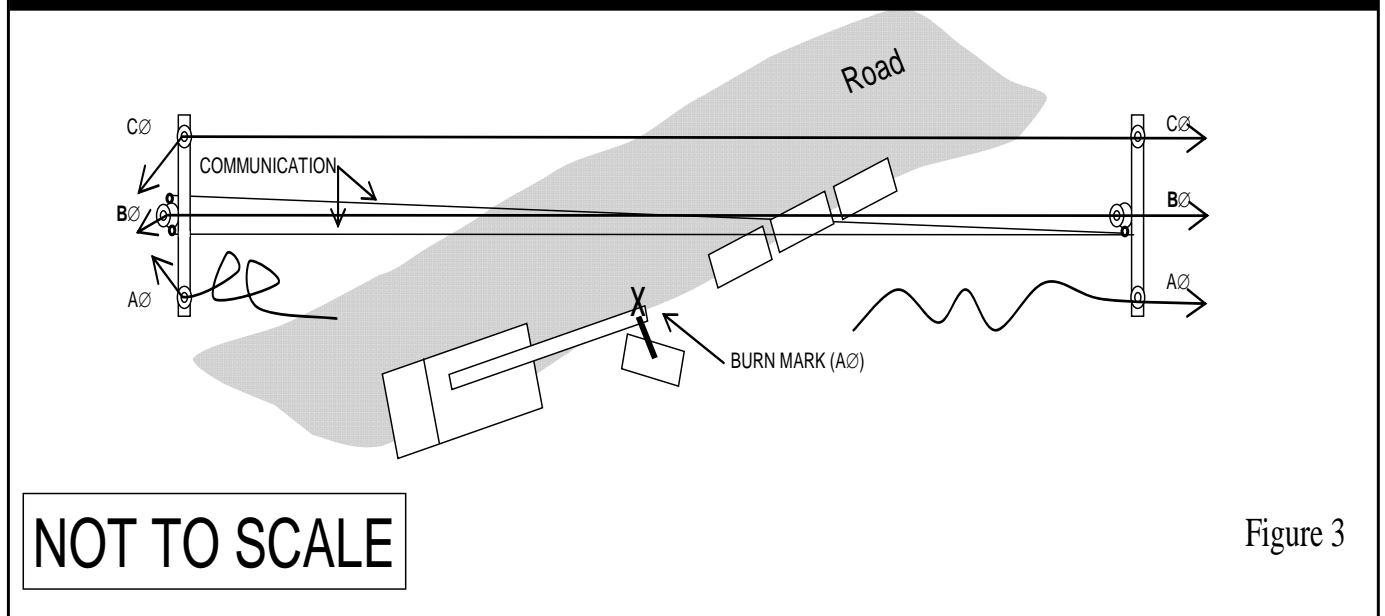


Figure 3

Appendix C Photographs





Appendix D

Accident Investigation Data - Victim Information

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



Event Number: 4 0 1 3 5 4 8

Victim Information: 1

1. Name of Injured/Ill Employee: <i>Angelo Petricca</i>		2. Sex: <i>M</i>	3. Victim's Age: <i>51</i>	4. Degree of Injury: <i>01 Fatal</i>	
5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 02/18/2008 b. Time: 12:35</i>			6. Date and Time Started: <i>a. Date: 02/18/2008 b. Time: 6:00</i>		
7. Regular Job Title: <i>116 Laborer</i>		8. Work Activity when Injured: <i>028 Unloading concrete barriers with crane</i>		9. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
10. Experience: a. This Years Weeks Days Work Activity: <i>0 0 2</i>		b. Regular Years Weeks Days Job Title: <i>0 36 0</i>		c. This Years Weeks Days Mining: <i>0 36 0</i>	
11. What Directly Inflicted Injury or Illness? <i>042 Contact energized wires</i>			12. Nature of Injury or Illness: <i>210 Electrocution</i>		
13. Training Deficiencies: Hazard: <input type="checkbox"/> New/Newly-Employed Experienced Miner: <input type="checkbox"/> Annual: <input type="checkbox"/> Task: <input type="checkbox"/>					
14. Company of Employment: (If different from production operator) <i>A-FN Machine Technology, Inc.</i> Independent Contractor ID: (if applicable) <i>R317</i>					
15. On-site Emergency Medical Treatment: Not Applicable: <input type="checkbox"/> First-Aid: <input type="checkbox"/> CPR: <input checked="" type="checkbox"/> EMT: <input type="checkbox"/> Medical Professional: <input type="checkbox"/> None: <input type="checkbox"/>					
16. Part 50 Document Control Number: (form 7000-1)			17. Union Affiliation of Victim: <i>9999 None (No Union Affiliation)</i>		

Victim Information: 2

1. Name of Injured/Ill Employee: <i>Larry J. Stoop</i>		2. Sex: <i>M</i>	3. Victim's Age: <i>56</i>	4. Degree of Injury: <i>03 Days away from work only</i>	
5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:			6. Date and Time Started: <i>a. Date: 02/18/2008 b. Time: 6:00</i>		
7. Regular Job Title: <i>116 Laborer</i>		8. Work Activity when Injured: <i>028 Crane Operator</i>		9. Was this work activity part of regular job? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
10. Experience: a. This Years Weeks Days Work Activity: <i>30 0 0</i>		b. Regular Years Weeks Days Job Title: <i>2 0 0</i>		c. This Years Week Days Mining: <i>0 2 1</i>	
11. What Directly Inflicted Injury or Illness? <i>042 Electric wire</i>			12. Nature of Injury or Illness: <i>390 Other</i>		
13. Training Deficiencies: Hazard: <input type="checkbox"/> New/Newly-Employed Experienced Miner: <input type="checkbox"/> Annual: <input type="checkbox"/> Task: <input type="checkbox"/>					
14. Company of Employment: (If different from production operator) <i>A-FN Machine Technology, Inc.</i> Independent Contractor ID: (if applicable) <i>R317</i>					
15. 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 checked="" type="checkbox"/>					
16. Part 50 Document Control Number: (form 7000-1)			17. Union Affiliation of Victim: <i>9999 None (No Union Affiliation)</i>		

Victim Information:

1. Name of Injured/Ill Employee:		2. Sex:	3. Victim's Age:	4. Degree of Injury:	
5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:			6. Date and Time Started:		
7. Regular Job Title:		8. Work Activity when Injured:		9. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input type="checkbox"/>	
10. Experience: a. This Years Weeks Days Work Activity:		b. Regular Years Weeks Days Job Title:		c. This Years Week Days Mining:	
11. What Directly Inflicted Injury or Illness?			12. Nature of Injury or Illness:		
13. Training Deficiencies: Hazard: <input type="checkbox"/> New/Newly-Employed Experienced Miner: <input type="checkbox"/> Annual: <input type="checkbox"/> Task: <input type="checkbox"/>					
14. Company of Employment: (If different from production operator) Independent Contractor ID: (if applicable)					
15. 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"/>					
16. Part 50 Document Control Number: (form 7000-1)			17. Union Affiliation of Victim:		