CAI-2018-02

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 21, 2018

SHM52 Highwall Miner
Bundy Auger Mining, Inc.
Rhodell, Raleigh County, West Virginia
ID No. 46-09531

Accident Investigators

Rex A. Hampton
Lead Accident Investigator/Electrical Specialist

Charles E. Justice
Electrical Specialist

Originating Office
Mine Safety and Health Administration
District 12
4499 Appalachian Highway
Pineville, West Virginia 24874
Brian M. Dotson, District Manager

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PHOTO OF ACCIDENT SCENE

OVERVIEW

On Wednesday, February 21, 2018, at approximately 5:15 p.m., James A. Whitlock, a 38-year old Highwall Mining Machine Operator with approximately 21 years of total mining experience, was electrocuted when he came into contact with an energized connection of a 7,200 volt alternating current (VAC) electrical circuit. He was found inside the onboard high voltage transformer compartment that supplies power to the mining machine. He had entered the compartment to troubleshoot and/or perform electrical work on the circuit.

The accident occurred because the operator did not ensure the safe operation, testing, and repair of electrical equipment and circuitry, including use of proper lock out/tag out procedures. Mine management was aware that Whitlock's electrician certification had expired, and therefore, he was precluded from performing electrical work by State and Federal regulations. However, mine management advised, directed, and assisted him in performing electrical work at the mine.

GENERAL INFORMATION

SHM52 Highwall Miner is operated by Bundy Auger Mining, Inc. At the time of the accident, the highwall mining machine was operating at the Pocahontas Highwall Mine property (MSHA ID 4609096) in the Pocahontas No. 5 coal seam, located near Rhodell, Raleigh County, West Virginia. The mining machine operated during two twelve hour shifts,

five days per week. Maintenance was performed as needed during each shift. The mined coal is transported by truck to the preparation plant.

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

David D. Bundy	Owner/Operator
William D. Taylor	Superintendent of Operations
Kevin S. Owens	Superintendent/Electrician
Jeffrey R. Hartley	Day Shift Foreman
Paula Shuman	Safety Representative

A regular (E01) safety and health inspection was completed on September 19, 2017. The non-fatal days lost (NFDL) rate for this mine in 2017 was 0 as compared to a national NFDL rate of 0.77 for mines of this type.

DESCRIPTION OF THE ACCIDENT

On February 21, 2018, Whitlock arrived at the mine at approximately 6:00 a.m. He met Day Shift Foreman and Fork Loader Operator, Jeffrey R. Hartley; Front End Loader Operator Larry Cassell; and Pad Man, Jeffrey A. Harvey, at the mining machine to begin the shift. The miners on the previous shift had completed mining in one pit and had started moving the mining machine to the next pit but were impeded by excessive mud and debris. To continue the moving operation, Cassell began removing mud and debris from the pit, while Hartley, Harvey, and Whitlock performed routine maintenance on the mining machine. Superintendent/Electrician Kevin S. Owens arrived at approximately 8:00 a.m. and performed mechanical and electrical maintenance on the machine.

The miners continued maintenance and pit preparation throughout the shift. Sometime between 2:30 and 3:00 p.m., K. Owens left the mine to obtain supplies in Beckley, WV. K. Owens informed investigators that he received a text message on his personal cell phone from the company's cell phone. The text message informed K. Owens that electrical power had been lost. K. Owens then began sending texts to Whitlock's personal cell phone regarding electrical work.

Hartley informed MSHA investigators that Whitlock instructed him to drive to the substation, approximately 8,000 feet from the mining machine, to lock out the power source. Hartley stated he locked out the power and verified the load break switch was open by using a flashlight to look through the sight glass. Hartley informed Whitlock by text message that the power was locked out and waited for Whitlock's instructions. Whitlock's cell phone records indicate at 4:51 p.m. a text message was received from Hartley stating "It is locked out."

Harvey stated he and Cassell assisted Whitlock in making the mining machine trailing cable repair on the ground near the mining machine. Whitlock then returned to the mining machine as Harvey and Cassell began fueling the welder, air compressor, and pump.

Whitlock's cell phone records indicate K. Owens sent a text message to Whitlock at 5:04 p.m. describing a loose ground lug (which can cause electrical power to be lost) he had previously encountered. This ground lug was inside the high voltage transformer compartment.

At 5:04 p.m., Whitlock instructed Hartley, who had remained at the substation, to re-energize the electrical power. Hartley re-energized the electrical power and asked Whitlock what to do next. Whitlock said he could sit there or go home since it was close to the end of the shift. Hartley remained at the substation in his vehicle. Whitlock's cell phone records indicate at 5:05 p.m., a message from Hartley stated "Turning on light switch" and at 5:10 p.m., stating "Sit here a min?."

K. Owens sent another text message at 5:10 p.m. stating "If you don't see anything pretty obvious let's set it back up and try to have nightshift running bud."

At 5:13 p.m., Whitlock responded to Hartley stating "Yeah, just chill a few more mins then go home."

After fueling the equipment, Harvey and Cassell walked toward the mining machine and heard Whitlock yell. Cassell went to the Electronic Control Module (ECM) room and Harvey went to the transformer compartment where he found Whitlock laying inside.

Harvey and Cassell pulled Whitlock out of the transformer compartment and checked his vital signs. Cassell and Harvey stated they could not find a pulse and began cardiopulmonary resuscitation (CPR).

Cassell tried to call K. Owens and Hartley with his cell phone to inform them of the accident, however, K. Owens and Hartley did not answer their phones. Cassell informed investigators that he sent text messages to K. Owens and Hartley at approximately 5:20 p.m. Cassell's text to K. Owens stated "Call me now." The text sent to Hartley stated "Do not set power up and come to miner." Cassell stated his phone history indicated K. Owens called him back at 5:21 p.m. At this time, Cassell informed K. Owens of the accident. K. Owens informed Cassell he would call Hartley.

Whitlock's personal cell phone shows he received a text message at 5:44 p.m. from Hartley stating, "Headed back." Investigators believe Hartley sent this message several minutes before 5:44 p.m., but it was not received by Whitlock's cell phone when it was sent because of the loss of cell phone coverage.

Terry L. Bird, Night Shift Foreman and Fork Loader Operator, stated he arrived at the mine and met Hartley at the substation. Hartley was sitting in his truck and said the mining machine had lost power and he had lost cell phone service. Bird allowed Hartley to use his cell phone booster. When Hartley connected his phone to the booster he received a call from K. Owens informing him of the accident and instructing him to go to the mining machine.

Hartley locked the power out at the substation and followed Bird to the mining machine. Upon arrival, Hartley helped Cassell and Harvey with CPR. The 911 telephone recordings indicate receiving a call at 5:40 p.m. from an unidentified individual and at 5:46 p.m. from Hartley, reporting the accident. Bird stated he spoke with K. Owens on the telephone, gave him the ambulance telephone number, and went to the entrance of the mine to escort the ambulance to the mining machine.

The Jan-Care Ambulance Service reports indicate that two ambulances arrived on mine property at 7:00 p.m. Emergency medical technicians found the victim to be non-responsive. Due to the extended time of CPR treatment (1 ½ to 2 hours) and the lack of response, CPR was discontinued per orders of Dr. Michael S. Johnson of Regional Command at Raleigh General Hospital. The time of death was recorded as 7:04 p.m.

INVESTIGATION OF THE ACCIDENT

On February 21, 2018, at 9:23 p.m., Bruce Vance, Superintendent of Pocahontas Coal Company's Pocahontas Highwall Mine notified Jeff Branham and Aaron Cline, MSHA Coal Mine Inspectors, of the accident. The mine operator did not notify the Department of Labor (DOL) National Contact Center to report the accident immediately, at once, without delay, and within 15 minutes once an injury occurred to an individual at the mine which caused death. As a result, MSHA issued a noncontributory citation for a violation of 30 CFR § 50.10(a). Although Hartley stated he called Federal officials when the accident occurred at 5:15 p.m.; he did not produce records of these calls and MSHA has no record of any calls being made before 9:23 p.m.

At 9:33 p.m., Cline notified Nicholas Christian, MSHA Pineville Field Office Supervisor, of the accident. Christian notified Larry E. Bailey, Assistant District Manager (Technical); Clark Blackburn, Assistant District Manager (Enforcement); and Rex A. Hampton, Electrical Specialist. Bailey notified Brian Dotson, District Manager.

At midnight, Cline, Hampton, Christian, and Bailey arrived at the mine site and issued a 103(k) order to William D. Taylor, Superintendent of Operations. This 103(k) order was issued to preserve the accident scene and to prevent the destruction of any evidence that would assist in determining the cause or causes of the accident. Cline and Hampton conducted informal interviews with miners and obtained their written statements. MSHA investigators reviewed examination and training records before traveling to the accident scene with Taylor and investigators from the West Virginia Office of Miners Health Safety and Training (WVOMHST). The accident scene was secured, examined, and photographed.

On February 22, 2018, at 9:00 a.m., Hampton, along with Charles E. Justice, Electrical Specialist; Jason Hess, Roof Control Supervisor; Brian Dotson, District Manager; and Tracy Calloway, Staff Assistant, arrived at the mine and met with WVOMHST investigators and company officials to continue investigating the accident. A non-contributory citation was issued for damaged areas on the mining machine trailing cable, which needed to be repaired before electrical testing could be conducted.

On February 23, 2018, Hampton, Justice, and Hess conducted tests of the mining machine and substation. Testing of the substation included resistance measurements of the ground fields, as well as ground fault simulations to test the relay. Additionally, the mining machine transformer compartment back-up ground fault and the emergency stop switches were tested. All components were found to be in proper operating condition and no hazards or violations were observed that would have contributed to the accident.

On February 26, 2018, MSHA and WVOMHST jointly conducted formal interviews at the National Mine Health and Safety Academy in Beaver, WV. The persons who participated in the investigation and who were interviewed are listed in Appendix A.

On February 28, 2018, Bobbie Pauley, Educational Field and Small Mine Services (EFSMS), reviewed the mine operator's training records.

DISCUSSION

Accident Scene

The accident occurred in the transformer compartment located on the rear of the mining machine. The victim was found lying on the floor of the compartment with the upper portion of his body positioned behind three high voltage transformers. An access panel adjacent to the transformer bank had been removed to gain entry into the compartment. This provided a 12 inch wide opening between the transformer bank and the incoming 7,200 VAC cable connections/load break switch (see Appendix B).

Transformer Compartment

The transformer compartment measures 124 inches long, 53 inches wide, and 72 inches high and contains a three phase high voltage transformer bank, which transforms the incoming 7,200 VAC to 995 VAC and 480 VAC for the motors used to operate the highwall mining machine system. The compartment also contains another 480 VAC transformer, ventilating fans, high voltage lightning arrestors, and ground fault/ground monitor components for the 995 VAC and 480 VAC circuitry, along with a manually operated high voltage load break switch. The load break switch is a gang-operated (one action opens or closes three connections, one for each phase, at the same time) visual disconnect switch; it was found in the open position. When in the open position, the switch provides visual evidence that the circuitry in the transformer compartment is deenergized, except the line side of the switch, which remains energized with 7,200 VAC.

The victim came in contact with one phase of the energized portion of the switch, which caused him to experience 4,160 VAC phase-to-ground. The grounding resistor, at the substation, was 261.3 ohms and the grounding circuit from the transformer compartment to the substation was 1.98 ohms. The maximum possible ground fault current was 15.8 amperes.

Testing and Examination

The mine operator's records indicate that a pre-shift examination and two on-shift

examinations are conducted during each shift. The pre-shift and the on-shift examination records did not show any hazards or violations for the day of the accident.

The last monthly electrical examination of the mining machine, including ground faulting all breakers, was conducted by K. Owens on January 6, 2018. The substation was last examined and tested on January 20, 2018. No hazards or violations were reported in the examination record.

Training and Experience

Whitlock had 21 years of total mining experience, approximately eleven of which were in highwall mining. He began working at the SHM52 Highwall Miner on June 12, 2017, as the forklift loader operator. Additionally, he operated all equipment as needed, including the mining machine.

MSHA's EFSMS determined that Whitlock was up-to-date in his experienced miner training, which he received on June 12, 2017, as well as in his task training for the forklift loader, front-end loader, and the mining machine, which he received on June 13, 2017.

Whitlock also received an electrical certification from the State of West Virginia on June 15, 2007, for a Class 26 low, medium, and high voltage classification, however, his certification expired December 31, 2016. Therefore, Whitlock was not certified by the State of West Virginia as an electrician at the time of the accident. Also, Whitlock was not qualified by MSHA to perform electrical work at the time of the accident because he had not certified to the District Manager that he had completed an electrical retraining program. MSHA Regulations, Title 30 CFR, Part 77.103(g), states:

> An individual qualified in accordance with this section shall, in order to retain qualification, certify annually to the District Manager, that he has satisfactorily completed a coal mine electrical retraining program approved by the Secretary.

Electrical Troubleshooting and Electrical Work

Text messages on Whitlock's personal cell phone indicate K. Owens provided advice on troubleshooting and electrical repair being done approximately 15 minutes before the accident. Cassell and Harvey assisted Whitlock in making a repair to the trailing cable prior to the accident, and Harvey also stated he had observed Whitlock working on electrical control systems on other days.

Hand tools and repair materials (i.e. electrical tape, pliers, screwdrivers, plastic zip ties, and a Fluke® multimeter) were found lying on the floor and on top of the back-up ground fault system access panel inside the onboard transformer compartment (see Appendix B). The meter was turned off but had the test leads deployed. One of the back-up ground fault transformers had a broken mounting bracket and was hanging by the wiring. Investigators could not determine if this condition was present before the accident or was caused by the accident.

Whitlock did not personally lock and tag out the trailing cable at the substation that supplies 7,200 VAC to the mining machine. In response to Whitlock's request, Hartley traveled to the high voltage substation and disconnected the power to the trailing cable to allow Whitlock to perform repairs. Hartley stated that he opened the visual disconnect for the trailing cable and used a flashlight to confirm all three blades of the switch were open. He then sent a text to Whitlock's personal cell phone confirming the power was disconnected. He waited at the substation and, when Whitlock texted him to turn the power back on, he reenergized the trailing cable. Whitlock sent a text message instructing him to remain at the substation.

Title 30 CFR § 77.501 requires that electrical work only be performed by a qualified person or by a person "trained to perform electrical work and to maintain electrical work under the direct supervision of a qualified person." In addition, the regulation provides that disconnecting devices must be locked and tagged, and the only persons who are permitted to do this are those doing the work. Lastly, the lock and tag can only be removed by the person who installed them. If that person is unavailable, the mine operator or his agent can authorize persons to remove them.

K. Owens and Hartley were both aware that the victim was no longer certified to do electrical troubleshooting and/or electrical work, but they directed, discussed, and allowed him to do electrical troubleshooting and electrical work. The victim had been performing electrical troubleshooting and electrical work prior to this accident when he was no longer certified to do so. Bundy and K. Owens told investigators that Whitlock was not certified to do electrical troubleshooting and/or electrical work. Also, Whitlock was not on the mine operator's list of certified and qualified persons required by 30 CFR § 77.106.

In addition, Hartley knew that Whitlock had not personally locked and tagged the 7,200 VAC circuit before the victim performed electrical work on that circuit. Hartley had first-hand knowledge of this because, as indicated by his testimony and text messages, he deenergized the 7,200 VAC electrical circuit for Whitlock. Hartley also knew that Whitlock had not personally removed his lock and tag prior to the 7,200 VAC circuit being reenergized, because Hartley removed the lock and tag and reenergized the circuit for him.

ROOT CAUSE ANALYSIS

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

Listed below is the root cause identified during the investigation and the operator's implemented corrective actions to prevent a reoccurrence of this type of accident.

Root Cause: The mine operator did not perform test and repair work on electrical equipment and circuitry in a safe manner. The mine operator did not use proper lock out/tag out procedures.

Corrective Action: The mine operator developed and implemented an action plan to prevent similar occurrences. This plan includes controls to ensure:

1. Only qualified personnel perform electrical work;
2. Miners receive additional training on electrical testing and repair;
3. The installation of safety features on electrical equipment. The safety features include lid switches wired into the ground monitor circuit, a grounding bar on the load break switch for the three phases of the high voltage transformers, and an additional external visible vacuum disconnect, which will also interrupt the ground monitor circuit causing the substation to remove power on the trailing cable; and
4. Proper lock /tag out procedures.

The mine operator incorporated the provisions of the action plan into the training and ground control plans for this mine. All miners were trained in these new company policies.

CONCLUSION

On Wednesday, February 21, 2018, at approximately 5:15 p.m., James A. Whitlock, a 38-year old Highwall Mining Machine Operator with approximately 21 years of total mining experience, was electrocuted when he came into contact with an energized connection of a 7,200 VAC electrical circuit. He was found inside the onboard high voltage transformer compartment that supplies power to the mining machine. He had entered the compartment to troubleshoot and/or perform electrical work on the circuit.

The accident occurred because the operator did not ensure the safe operation, testing, and repair of electrical equipment and circuitry, including use of proper lock out/tag out procedures. Mine management was aware that Whitlock's electrician certification had expired, and therefore, he was precluded from performing electrical work by State and Federal regulations. However, mine management advised, directed, and assisted him in performing electrical work at the mine.

Approved By:

_____ _____

Brian M. Dotson Date
District Manager

ENFORCEMENT ACTIONS

1. 103(k) Order (9173411) issued February 22, 2018 at 00:01 a.m. to Bundy Auger Mining, Inc.

   An accident occurred at this operation on 02/21/2018 at 17:30. This order is issued under section 103(k) of the Federal Mine Safety and Health Act of 1977, to assure the safety of all persons at this operation and prevent the destruction of any evidence which would assist in the investigation of the cause or causes of the accident. It prohibits all activity in the Highwall Miner Pit including the Highwall Miner, Substation, and the high voltage trailing cable and components until MSHA has determined that it is safe to resume normal mining operations in the area. The operator shall obtain prior approval from an Authorized Representative for all actions to recover and/or restore operations to the affected area.

2. 104(d)(1) Citation (9068282) for violation of 30 CFR § 77.501 was issued to Bundy Auger Mining, Inc.

   An accident occurred at this mine on February 21, 2018, in which a highwall mining machine operator was fatally injured when he contacted an energized component inside the onboard high voltage transformer compartment located on the rear of the SHM52 Highwall Mining Machine. The victim was troubleshooting and/or working on the 7,200 volt alternating current (VAC) system when the accident occurred. It was determined during the investigation the operator did not ensure the 7,200 VAC electrical circuit was being properly locked out and suitably tagged by the person doing the electrical work as required by this standard. Failure to ensure that electrical circuits are locked out and suitably tagged by the person doing the electrical work exposes persons to the hazards associated with electrical shock. Additionally, the circuit was not de-energized as required by 30 CFR § 77.500. The operator engaged in aggravated conduct constituting more than ordinary negligence by allowing someone other than the person conducting the electrical work to lock out and tag out the circuit. This violation is an unwarrantable failure to comply with a mandatory standard.

3. 104(d)(1) Order (9068283) for violation of 30 CFR § 77.103(g) was issued to Bundy Auger Mining, Inc.

   An accident occurred at this mine on February 21, 2018, in which a highwall mining machine operator was fatally injured when he contacted an energized component inside the onboard high voltage transformer compartment located on the rear of the SHM52 Highwall Mining Machine. The victim was troubleshooting and/or working on the 7,200 volt alternating current (VAC) system when the accident occurred. It was determined during the investigation that the operator did not ensure that electrical work was being performed by a qualified person as required by this standard. The operator has engaged in aggravated conduct constituting more than ordinary negligence in that, the operator knew the victim failed to retain his electrical qualification and still permitted him to perform electrical troubleshooting and/or work. This violation is an unwarrantable failure to comply with a mandatory standard.

APPENDIX A
Persons Participating in the Investigation
(Persons interviewed are indicated by a * next to their name)

Bundy Auger Mining, Inc.

*David D. Bundy ..... Owner/Operator
William D. Taylor ..... Superintendent of Operations
*Kevin S. Owens ..... Superintendent/Electrician
*Jeffrey R. Hartley ..... Day Shift Foreman/Fork Loader Operator
*Larry Cassell ..... Front End Loader Operator
*Jeffrey A. Harvey ..... Pad Man
*Terry L. Bird ..... Night Shift Foreman/Fork Loader Operator
*Dustin J. Owens ..... Night Shift Ground Man

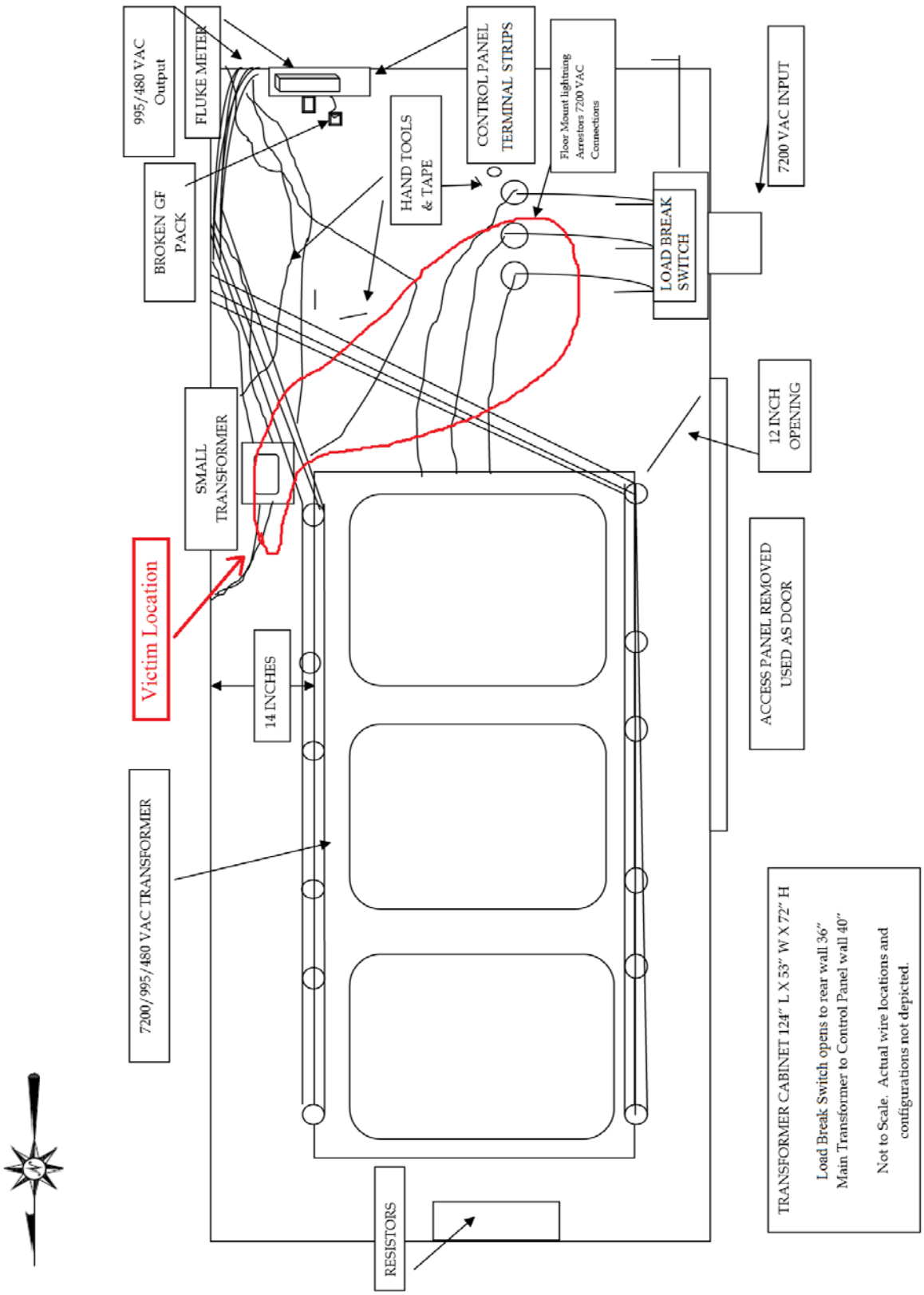
West Virginia Office of Miners Health, Safety and Training

Greg Norman ..... Director
Kendall Smith ..... Mine Safety Specialist/Electrical
Mike Hale ..... Mine Safety Specialist/Electrical
Matthew Mollohan ..... Inspector at Large

Mine Safety and Health Administration

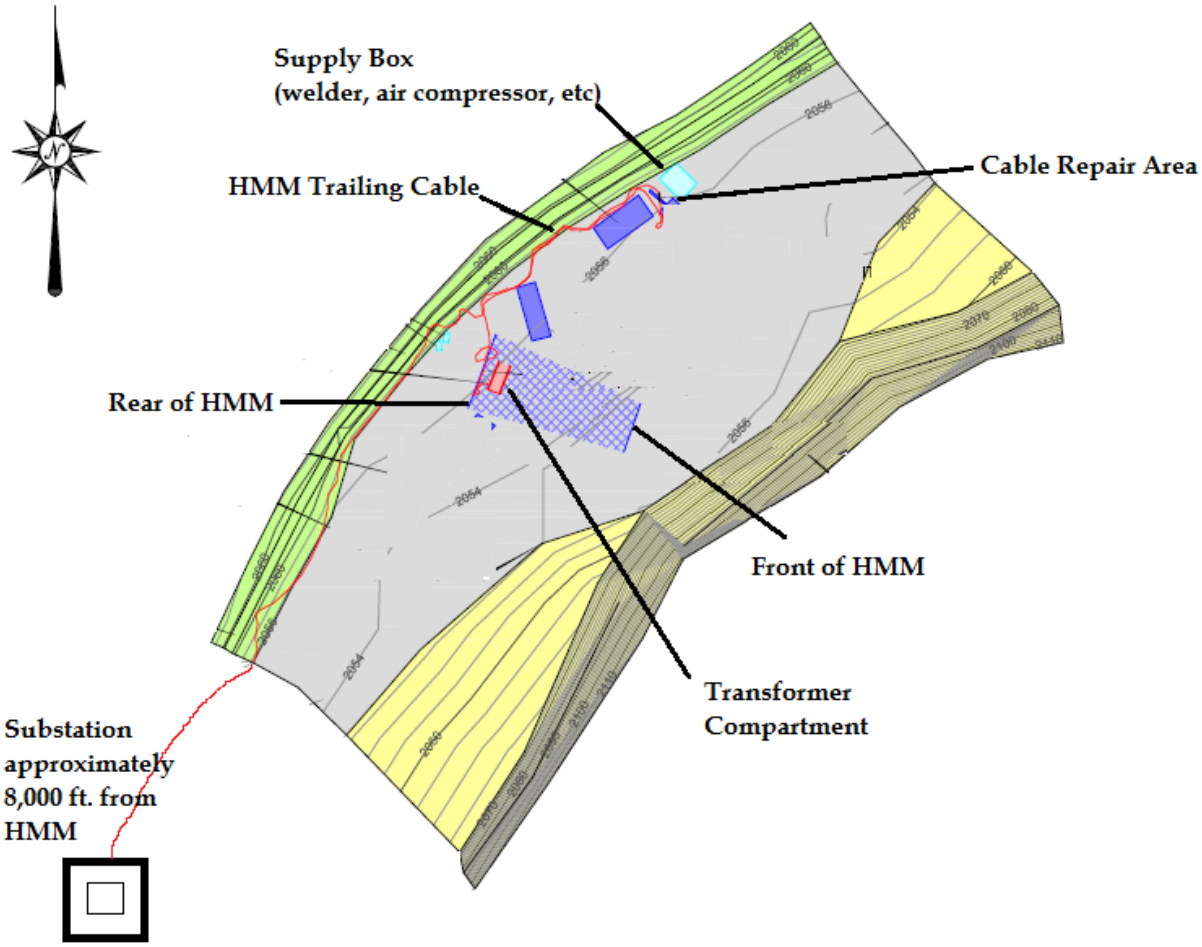
Brian Dotson ..... District Manager
Larry E. Bailey ..... Assistant District Manager, Technical
Jason Hess ..... Roof Control Supervisor
Nicholas Christian ..... Pineville Field Office Supervisor
Rex A. Hampton ..... Lead Accident Investigator/Electrical Specialist
Charles E. Justice ..... Electrical Specialist
Aaron Cline ..... CMS&H Surface Inspector

APPENDIX B
Sketch of Transformer Compartment



APPENDIX C
Sketch of Accident Scene

NOT TO SCALE



APPENDIX D
Victim Information

Victim Information: 1

1. Name of Injured/Ill Employee:	2. Sex:	3. Victim's Age:	4. Degree of Injury:
James A. Whitlock	M	38	01 Fatal

5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:		6. Date and Time Started:	
a. Date: 02/21/2018	b. Time: 19:04	a. Date: 02/21/2018	b.Time: 06:00

7. Regular Job Title:	8. Work Activity when Injured:	9. Was this work activity part of regular job?
170 Highwall miner operator	020 Electrical maintenance/Repair	Yes: No: X

10. Experience:	Years	Weeks	Days	Years	Weeks	Days	Years	Weeks	Days	Years	Weeks	Days
	a. This Work Activity:		b. Regular Job Title:			c. This Mine:			d. Total Mining:			
	5			11	0	0	0	36	3	20+		

11. What Directly Inflicted Injury or Illness?	12. Nature of Injury or Illness:
043 Electric apparatus NEC	210 Electric Shock, Electrocution

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

14. Company of Employment: (If different from production operator)
Operator
Independent Contractor ID: (if applicable)

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

16. Part 50 Document Control Number: (form 7000-1)
17. Union Affiliation of Victim: