

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Surface Coal Mine
Fatal Machinery Accident
July 31, 2013

Amerikohl Strips
Oneida Operation Pit 114
Amerikohl Mining Incorporated
Dubois, Jefferson County, Pennsylvania
MSHA ID 36-09654

Accident Investigators
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Civil Engineer

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Mine Safety & Health Surface Specialist

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Thomas Light, District Manager

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OVERVIEW

On Wednesday, July 31, 2013, Steelyn Gary Kanouff (Victim), a 28-year old Mechanic, sustained fatal injuries while trouble shooting the right front suspension cylinder on the CAT 773E off-highway truck. The accident occurred after Kanouff had loosened three bolts on the pressurized suspension cylinder cover assembly and the right front suspension cylinder suddenly collapsed while the victim was working between the top of the truck's right front tire and the bottom of the right front fender.

GENERAL INFORMATION

The Amerikohl Mining Pit 114 is a producing surface coal mine located in Dilltown, Indiana County, Pennsylvania. The mine uses open pit type mining and employed 8 people at the time of the accident. The mine is divided by a township road. The mine operates one shift per day, five days a week. The coal seams being mined are the Upper Freeport, Lower Freeport, and the Upper Kittanning. The daily average production rate is approximately 450 tons.

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

John M. StillelyPresident
John Saugrich..... V.P. of Operations
William K. McLaySuperintendent

Prior to the accident, the Mine Safety and Health Administration (MSHA) completed the last regular safety and health inspection on May 16, 2013. The Non-Fatal Days Lost (NFDL) injury incidence rate for the mine in 2013 was 0.00, compared to a National NFDL rate of 0.75.

DESCRIPTION of the ACCIDENT

On Tuesday, July 30, 2013, Kanouff was informed by Thomas L. Rosencrance, Equipment Operator, of a problem with the suspension on the CAT 773E truck. Rosencrance parked the CAT truck. Kanouff started troubleshooting the suspension. Kanouff determined that the right front suspension cylinder was low in nitrogen and needed adjusted. Kanouff adjusted both the right front and left front suspension cylinders. Kanouff finished the adjustment around noon and instructed Rosencrance to "go-ahead and try it out." Rosencrance operated the truck without any problems for the remainder of the shift.

The next day, on Wednesday, July 31, the mining crew reported to the mine prior to 6:00 a.m. The miners discussed their duties, performed their preoperational equipment checks, and went to their respective work areas. No problems were found during the preoperational check on the CAT 773E truck. Rosencrance went to the active pit area. Kanouff and Gerald Gomola, Foreman/Equipment Operator, discussed the water pump in the Pit. Kanouff and Gomola started removing the pump and hoses.

At approximately 6:15 a.m., Rosencrance notified Gomola by radio that the CAT 773E truck was "listing to the right." Kanouff replied that he would be over to "check it out." At approximately 6:21 a.m., Kanouff left a voicemail message with William Cochenour, Maintenance Manager, to order a new right-front strut for the truck. Kanouff then traveled to the dump area.

Kanouff removed a nitrogen cylinder from the service truck and placed it against the bumper. As Rosencrance was driving from the pit to the dump area, Kanouff evaluated the CAT truck suspension for anything unusual. After Rosencrance dumped the load, Kanouff instructed Rosencrance to leave the CAT truck bed in the raised position. Kanouff started troubleshooting the CAT truck's right front strut from the ground. Kanouff was using a spray bottle filled with soap and water to look for nitrogen leakage. Kanouff showed Rosencrance a cracked weld when it was sprayed with soap and water. They determined this was not the cause of the nitrogen leak. Rosencrance walked over to Gomola's personal truck that was parked in front of the left side of the CAT truck.

At about 7:00 a.m., Rosencrance and Gomola were discussing mine operations when they heard a "whooshing" noise and observed a cloud of dust surrounding the right front tire of the truck where Kanouff was working. Rosencrance saw that Kanouff was trapped between the top of the truck's right front tire and the bottom of the right front fender. The victim had been working between the top of the right front tire and the bottom of the right front fender without blocking the frame of the truck.

Gomola called 911 for emergency assistance. Rescue efforts were started immediately by mine personnel to raise and block the truck's frame until the victim was removed. Kanouff was evaluated by the rescue personnel, but was found to be unresponsive. Upon arrival at the mine site, the Indiana County Coroner pronounced the victim dead.

The Coroner's Office reported the cause of death as "Crushing trauma to the head and chest."

INVESTIGATION of the ACCIDENT

On the morning of July 31, 2013, Ronald Hixson, MSHA Assistant District Manager, was notified of the accident by the National Call Center at approximately 7:18 a.m. A 103(j) Order was issued to ensure the safety of all persons during the recovery operation. The order was modified to a 103(k) action upon MSHA's arrival at the mine.

The accident investigation was conducted jointly with the Pennsylvania Department of Environmental Protection (PADEP), with the assistance from the miners and the mine operator.

The investigation team documented the accident scene by taking photographs and making measurements. Interviews were conducted with employees and management personnel of Amerikohl Mining Incorporated. Several employees from Cleveland Brothers Equipment Company were also interviewed because their mechanics assist with equipment maintenance at the mine periodically. A list of the persons who participated in the investigation is shown in Appendix A. Other documents and evidence were collected from Cleveland Brothers Equipment Company, Incorporated and Amerikohl Mining Incorporated.

The accident investigation of the site and equipment involved included an evaluation by MSHA's Technical Support Division on August 1, 2013.

The on-site portion of the accident investigation was completed on August 2, 2013.

DISCUSSION

General Machine Information

The truck involved in the accident was a 2003 Caterpillar off-highway truck, model 773E, serial number CBDA00408.

Maintenance of Suspension Cylinders

The CAT truck maintenance records from November 14, 2007 through July 12, 2013 were provided by the mine operator. The records indicate that there were six suspension cylinder replacements within that period. The left front cylinder was replaced once. The remaining replacements were conducted on the rear cylinders. The right front cylinder was considered to be original equipment on the truck.

As previously noted, both the left and right front suspension cylinders were re-pressurized by the victim the day prior to the accident. The victim had the proper CAT nitrogen charging tools for recharging the cylinders on his service truck at the time of the accident.

Suspension Cylinder Inspection

The CAT parts manual was present in the victim's service truck.

The investigation interviews revealed that the victim was initially following the CAT service manual RENR6514-01 procedures. Service manual RENR6514-01 was not located on site. One copy of the service manual was located in another mechanic's truck. The service manual contained instructions for visual inspection of the suspension cylinders.

Suspension System Warnings

The suspension warning labels can be viewed in Appendix B. When viewed after the accident, the warnings on the truck's right side cylinder (accident cylinder) were covered with dirt and black oil. In addition, the warning directly below the cover assembly was scratched. The warning labels should have been readily visible.

The warnings on the left side cylinder were covered with some dirt, but the warning labels should have been visible.

Evaluation of the Warnings and the Cover Assembly

The warnings and cover assembly can be viewed in Appendix B. The warnings in the manual and on the cylinder are specific to the hazard of the machine falling if pressure is released from the cylinder. The warning immediately below the cover assembly provides pictorials of the cover assembly, securing bolts, and a "no tool" sign. It also describes the hazard of a person being trapped between the tire and fender if the truck does fall, as occurred in this accident. The investigation revealed that two of the three bolts of the cover assembly were unthreaded and the last bolt was loosened.

The cover assembly has limited structural rigidity. The outer portion of the cover assembly consists of thin steel that can be manually deflected. It is also open at the outside edge above the bolts securing the cylinder head. The bolts can be seen and the cover assembly appears to be open above the cylinder to the center of the cover. The lack of structural rigidity and the open design of the cover could give the impression that it is a common guard (dust cover) over the cylinder.

CAT's Specifications Systems Operation Testing and Adjusting manual, RENR6514-01, October 2003, addresses the purpose of the cover assembly: "These protective plates cover some of the head bolts in order to prevent removal of the head while there is pressure in the suspension cylinder." Therefore, the cover assembly is an engineering control (safety device). While the cover assembly provides an engineering control to address a hazard to shop mechanics if they fail to follow proper procedure and relieve cylinder pressure before disassembly, no equally effective means is provided to prevent injury to field mechanics if they fail to follow proper maintenance procedures. While the cover assembly provides a safety feature to protect shop mechanics, it creates a hazard for field mechanics. The design of the cover assembly is intuitively counter to the message presented by the warning labels. This possible confusion, along with the different training and experience of field mechanics versus shop mechanics, greatly reduces the effectiveness of the warning labels in addressing the risk.

TRAINING and EXPERIENCE

Kanouff graduated from the Pennsylvania College of Technology on December 22, 2007 with an Associate of Applied Science. His degree was Heavy Construction Equipment Technology; Technician Emphasis.

Kanouff had over seven years of mining experience as a mechanic. He began work for Amerikohl Mining in 2006 on a part time basis. Kanouff started full time with Amerikohl Mining on January 1, 2008. Kanouff completed a mechanic apprenticeship program with Amerikohl Mining that lasted over one year. After the apprenticeship program was complete, Kanouff became a full time mechanic. Kanouff was required to assist the professional mechanics employed by Cleveland Brothers Equipment when they visited the mine.

Kanouff had received annual refresher training. The training records reviewed were found to be current.

No records were found to confirm that Kanouff received adequate task training to recognize the hazards of the cylinder cover assembly.

TOXICOLOGY

Toxicology of the victim's blood was conducted post-mortem. The results of the toxicology stated that the victim was "positive" for Cannabinoids. Cannabinoids are a class of diverse chemical compounds that activate cannabinoid receptors on cells that repress neurotransmitter release in the brain. Marijuana is generally known by the botanical name Cannabis Sativa.

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 frame was not blocked or secured against motion prior to the three cylinder cover assembly bolts being loosened.

Corrective Action: Management has developed and implemented a written field risk analysis and procedures for blocking. All mechanics have received training for proper blocking methods.

2. *Root Cause:* The victim did not receive task training with regard to the hazards associated with the cylinder cover assembly. The cover assembly can be mistaken as a guard on the cylinder head. The lack of structural rigidity and the open design of the cover could give the impression that the cover assembly was a guard for the bolts securing the cylinder head. In addition, the following procedure from the service manual could have been misunderstood or caused confusion: "Check for leakage at the O-rings that are located under the protective plates that are on the head. These protective plates cover some of the head bolts in order to prevent removal of the head while there is pressure in the suspension cylinder."

Corrective Action: All mechanics received task training on the hazards of the cover assembly.

CONCLUSION

The accident occurred when the third and final bolt on the cylinder cover assembly was loosened on the truck's pressurized suspension cylinder cover assembly releasing the cylinder pressure. The right front suspension cylinder suddenly collapsed while the victim was working between the top of the right front tire and the bottom of the right front fender. In addition, the Cat truck frame was not blocked or secured against motion prior to the three cylinder cover assembly bolts being loosened. The victim was not trained adequately with regard to the hazards associated with the cylinder cover assembly.

Approved By:

Thomas E Light

Thomas Light
District Manager

January 14, 2014
Date

ENFORCEMENT ACTIONS

1. A 103(k) Order, No. 7020179, was issued to Amerikohl Mining, Incorporated, to ensure the safety of the miners until the investigation could be completed.
2. A 104(a) Citation was issued to Amerikohl Mining, Incorporated, citing 30 CFR, § 77.404(c).

Condition or Practice: On July 31, 2013, the CAT 773E Off-Highway Truck (CO #358) was not securely blocked in position at Pit 114. A mechanic sustained fatal injuries when the suspension cylinder suddenly collapsed. The victim was working between the top of the right front tire and the bottom of the right front fender without blocking the truck frame.

3. A 104(a) Citation was issued to Amerikohl Mining, Incorporated, citing 30 CFR, § 48.27

Condition or Practice: On July 31, 2013, while loosening the bolts on the pressurized cylinder cover assembly, a mechanic sustained fatal injuries at Pit 114. The cover assembly is located on the top of a CAT 773E (CO #358) Off-Highway Truck's right front suspension cylinder. The victim was not task trained adequately to recognize the hazards of the cover assembly.

Appendix A - Persons Participating in the Investigation

Amerikohl Mining Incorporated

| <u>Name</u> | <u>Title</u> |
|-------------------------|----------------------------|
| John Stilley..... | President |
| Ken McLay..... | Superintendent |
| Gerald Gomola..... | Foreman/Equipment Operator |
| William Conehour..... | Maintenance Manager |
| Thomas Rosencrance..... | Equipment Operator |
| David Colson..... | Equipment Operator |
| Thomas E. Reitz | Equipment Operator |
| Ryan Crissan..... | Equipment Operator |
| Lucus W. Krouse..... | Equipment Operator |
| William Wright..... | Mechanic |
| Arthur Vogel..... | Mechanic |
| Jeff Barger..... | Mechanic |
| John Bortz..... | Superintendent |

Cleveland Brothers Equipment Company, Incorporated

| <u>Name</u> | <u>Title</u> |
|-------------------|--|
| Randy Thomas..... | Corporate Manager Safety & Owner Environment |
| Duane Urias..... | Technical Communicator |
| Joe Weaver..... | Journey Mechanic |
| Adam Beck..... | Mechanic |

Diversified Mining Services, Incorporated

| <u>Name</u> | <u>Title</u> |
|--------------------|-------------------|
| Brian Barrett..... | Safety Consultant |
| Dan Johnston..... | Safety Consultant |

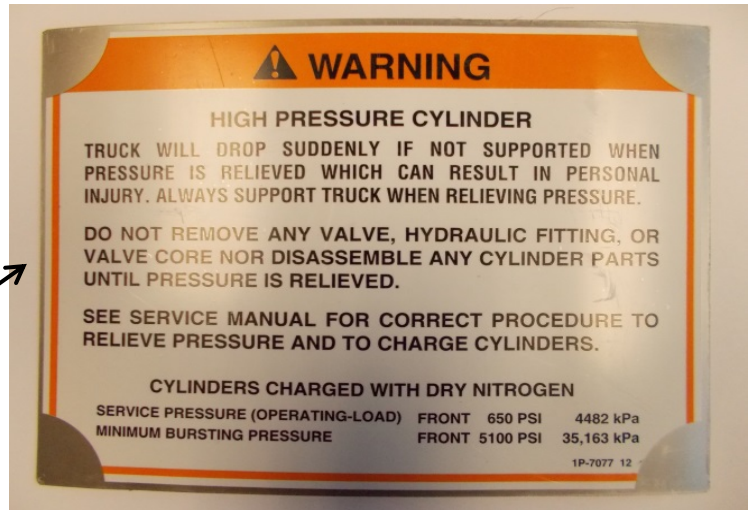
Mine Safety and Health Administration

| <u>Name</u> | <u>Title</u> |
|------------------------|---|
| Craig A. Mikulsky..... | Civil Engineer |
| Albert Serafin..... | Coal Mine Safety and Health Inspector |
| Richard Swartz..... | Education and Field Services Specialist |
| James Angel..... | Mechanical Engineer, Technical Support |

Appendix B - Accident Site



Appendix C - Photographs of Warning Label and Suspension Cylinder Cover Assembly



O-Ring Surrounding Pressure Port

Cover Assembly



Appendix D - Victim Information

Accident Investigation Data - Victim Information

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



Event Number: 4 0 1 1 2 6 4

Victim Information: 1

| | | | | | | | | | | | | | | | | | | | |
|--|--|----------|----------|---|------------|---|----------|---|----------|--|--|----------|-----------|----------|----------|--|----------|----------|------|
| 1. Name of Injured/III Employee: <i>Steelyn G. Kanouff</i> | | | | 2. Sex: <i>M</i> | | 3. Victim's Age: <i>28</i> | | 4. Degree of Injury: <i>01 Fatal</i> | | | | | | | | | | | |
| 5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 07/31/2013 b. Time: 7:18</i> | | | | | | 6. Date and Time Started: <i>a. Date: 07/31/2013 b. Time: 6:00</i> | | | | | | | | | | | | | |
| 7. Regular Job Title: <i>104 Mechanic</i> | | | | 8. Work Activity when Injured: <i>039 Removing cover assembly on strut</i> | | | | 9. Was this work activity part of regular job? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | | | | | | | | | | | |
| 10. Experience | | Years | Weeks | Days | b. Regular | | Years | Weeks | Days | c. This | | Years | Weeks | Days | d. Total | | Years | Weeks | Days |
| a. This | | | | | Job Title: | | | | | Mine: | | | | | Mining: | | | | |
| Work Activity: | | <i>7</i> | <i>6</i> | <i>3</i> | | | <i>7</i> | <i>6</i> | <i>3</i> | | | <i>6</i> | <i>32</i> | <i>6</i> | <i>7</i> | | <i>6</i> | <i>3</i> | |
| 11. What Directly Inflicted Injury or Illness? <i>076 Crushed between fender and wheel</i> | | | | | | 12. Nature of Injury or Illness: <i>170 Crushed</i> | | | | | | | | | | | | | |
| 13. Training Deficiencies: Hazard: <i>New/Newly-Employed Experienced Miner:</i> Annual: Task: <input checked="" type="checkbox"/> X | | | | | | | | | | | | | | | | | | | |
| 14. Company of Employment: (If different from production operator) <i>Operator</i> | | | | | | | | | | Independent Contractor ID: (if applicable) | | | | | | | | | |
| 15. On-site Emergency Medical Treatment: Not Applicable: First-Aid: CPR: EMT: Medical Professional: None: <input checked="" type="checkbox"/> X | | | | | | | | | | | | | | | | | | | |
| 16. Part 50 Document Control Number: (form 7000-1) | | | | | | | | | | 17. Union Affiliation of Victim: <i>9999 None (No Union Affiliation)</i> | | | | | | | | | |

Victim Information:

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|--|--|-------|-------|--------------------------------|------------|----------------------------------|-------|--|------|--|--|-------|------|------|----------|--|-------|-------|------|
| 1. Name of Injured/III 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? <input type="checkbox"/> Yes <input type="checkbox"/> No | | | | | | | | | | | |
| 10. Experience | | Years | Weeks | Days | b. Regular | | Years | Weeks | Days | c. This | | Years | Week | Days | d. Total | | Years | Weeks | Days |
| a. This | | | | | Job Title: | | | | | Mine: | | | | | Mining: | | | | |
| Work Activity: | | | | | | | | | | | | | | | | | | | |
| 11. What Directly Inflicted Injury or Illness? | | | | | | 12. Nature of Injury or Illness: | | | | | | | | | | | | | |
| 13. Training Deficiencies: Hazard: <i>New/Newly-Employed Experienced Miner:</i> Annual: Task: | | | | | | | | | | | | | | | | | | | |
| 14. Company of Employment: (If different from production operator) | | | | | | | | | | Independent Contractor ID: (if applicable) | | | | | | | | | |
| 15. On-site Emergency Medical Treatment: Not Applicable: First-Aid: CPR: EMT: Medical Professional: None: | | | | | | | | | | | | | | | | | | | |
| 16. Part 50 Document Control Number: (form 7000-1) | | | | | | | | | | 17. Union Affiliation of Victim: | | | | | | | | | |

Victim Information:

| | | | | | | | | | | | | | | | | | | | |
|--|--|-------|-------|--------------------------------|------------|----------------------------------|-------|--|------|--|--|-------|------|------|----------|--|-------|-------|------|
| 1. Name of Injured/III 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? <input type="checkbox"/> Yes <input type="checkbox"/> No | | | | | | | | | | | |
| 10. Experience | | Years | Weeks | Days | b. Regular | | Years | Weeks | Days | c. This | | Years | Week | Days | d. Total | | Years | Weeks | Days |
| a. This | | | | | Job Title: | | | | | Mine: | | | | | Mining: | | | | |
| Work Activity: | | | | | | | | | | | | | | | | | | | |
| 11. What Directly Inflicted Injury or Illness? | | | | | | 12. Nature of Injury or Illness: | | | | | | | | | | | | | |
| 13. Training Deficiencies: Hazard: <i>New/Newly-Employed Experienced Miner:</i> Annual: Task: | | | | | | | | | | | | | | | | | | | |
| 14. Company of Employment: (If different from production operator) | | | | | | | | | | Independent Contractor ID: (if applicable) | | | | | | | | | |
| 15. On-site Emergency Medical Treatment: Not Applicable: First-Aid: CPR: EMT: Medical Professional: None: | | | | | | | | | | | | | | | | | | | |
| 16. Part 50 Document Control Number: (form 7000-1) | | | | | | | | | | 17. Union Affiliation of Victim: | | | | | | | | | |