

MAI-2011-3

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION
Metal and Nonmetal Mine Safety and Health

REPORT OF INVESTIGATION

Surface Nonmetal Mine
(Crushed & Broken Quartzite)

Fatal Powered Haulage Accident
February 24, 2011

Crushing and Sampling Unit
Bolinder Resources LLC
Tooele, Tooele County, Utah
Mine I.D. No. 42-01247

Investigator

David M. Sinquefield
Mine Safety and Health Inspector

Originating Office
Mine Safety and Health Administration
Rocky Mountain District
P.O Box 25367, DFC
Denver, Colorado 80225
Richard Laufenberg, District Manager

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Photograph of Accident Scene



VICTIM
WORKING
HERE

OVERVIEW

On February 24, 2011, Allen K. Sherman, front-end loader operator, age 56, was killed when he became trapped between a moving belt conveyor and the bottom of a tramp metal magnet. Sherman climbed up the structure of the belt conveyor to access and clean tramp metal off the magnet when the belt conveyor was started.

The accident occurred because management failed to ensure that safe work procedures were followed while persons performed work on the belt conveyor to clean the tramp metal magnet. The belt conveyor was not deenergized, locked and tagged out, and blocked against motion prior to persons removing tramp metal from the magnet.

Additionally, the startup procedures for the belt conveyor did not ensure that persons were protected when it was started. The required audible warning device could not be heard above the plant noise.

GENERAL INFORMATION

The Crushing and Sampling Unit, a crushed & broken quartzite operation, owned and operated by Bolinder Resources LLC., is located near Toole, Tooele County, Utah. The principal operating official is Bridger Bolinder, vice-president. The mine operates one 10-hour shift, 4 days a week. Total employment is 8 persons.

Material is drilled and blasted from a single bench. The material is pushed into stockpiles with a dozer. The material is then fed into the plant with a front-end loader where it is crushed and screened. Finished products are sold for copper smelting and construction aggregate.

The last regular inspection at this operation was completed on December 3, 2010.

DESCRIPTION OF THE ACCIDENT

On the day of the accident, Allen K. Sherman (victim) arrived at the mine at 6:30 a.m., his usual arrival time. Sherman began his day by operating a front-end loader.

About 7:30 a.m., William Bolinder, front-end loader operator, saw Sherman park his front-end loader at the rip-rap stock pile and descend the ladder of the loader. About 7:40 a.m., Sherman went to the cone crusher and told Ryan Stevens, laborer, to go to the scale house to weigh two trucks that would be arriving.

At 8:00 a.m., Dallas Burton, foreman/plant operator, was stationed in the plant control booth. He started up the plant by switching the power on the tramp metal magnet, belt conveyor, and the crushing plant.

At 8:10 a.m., William Bolinder saw Sherman lying face down on the belt conveyor that was operating. William Bolinder immediately radioed to Burton to shut down the belt conveyor. Burton called for emergency medical services (EMS).

EMS arrived and the victim was pronounced dead at the scene by a police officer at 8:43 a.m. The cause of death was determined to be blunt force trauma.

INVESTIGATION OF THE ACCIDENT

On February 24, 2011, the Mine Safety and Health Administration (MSHA) was notified of the accident at 9:05 a.m., by a telephone call from Bridger Bolinder, vice-president to David Funkhouser, mine safety and health inspector. An investigation began the same day. An order was issued under the provisions of Section 103(j) of the Mine Act to ensure the safety of the miners. This order was later modified to Section 103(k) of the Mine Act when the first Authorized Representative arrived at the mine. A Part 50 citation was issued for untimely reporting.

MSHA's accident investigator traveled to the mine, made a physical inspection of the accident scene, interviewed employees, and reviewed documents and work procedures relevant to the accident. MSHA conducted the investigation with the assistance of mine management and employees and local law enforcement.

DISCUSSION

Location of the Accident

The accident took place at the tramp steel magnet on a belt conveyor at the jaw crusher unit.

Belt Conveyor and Tramp Metal Magnet

The belt conveyor involved in the accident, manufactured by Kolberg, feeds material to the plant. The 36-inch wide belt conveyor is 100 feet long. The belt conveyor is powered by a 480-volt, 20 horsepower motor that operates at a speed of 300 feet per minute. The belt conveyor is eight feet off the ground at the location of the accident.

The tramp metal magnet involved in the accident is an Eriez Magnetics electromagnet, serial #560. It can be started and operated independently of the belt conveyor. There was 9 inches of clearance between the top of the belt conveyor and the bottom of the tramp steel magnet.

Warning Siren

The warning siren for the belt conveyor was located on the control booth about 230 feet from the location of the accident. The siren is an Edwards 875, N5 warning siren with adjustable volume limits. The operating procedures for starting the belt conveyor involved in the accident require that the siren be used before energizing plant equipment. On the day of the accident, the horn setting was used. However, the horn and siren settings were tested and could not be heard above the plant noise when the belt conveyor was started.

Weather Conditions

The weather conditions on the day of the accident were clear and calm with a temperature of 40 degrees Fahrenheit.

Training and Experience

Allen Sherman (victim) had approximately 10 years of mining experience. He had worked at this mine for 1 year and 10 months and had received all training as required by 30 CFR Part 46.

Dallas Burton had 20 years of mining experience, 2 years and 6 months at this mine. He had received all training as required by 30 CFR Part 46.

ROOT CAUSE ANALYSIS

A root cause analysis was conducted and the following root causes were identified:

Root Cause: Management did not ensure that safe operating procedures were followed while persons removed tramp steel from the magnet located above the belt conveyor. The victim accessed the belt conveyor without ensuring that it had been deenergized, locked and tagged out, and blocked against hazardous motion.

Corrective Action: Management established policies, procedures, and controls to ensure that belt conveyors are deenergized, locked and tagged out, and blocked against hazardous motion before persons work on them. All miners have been trained regarding these new procedures.

Root Cause: Management did not ensure that safe operating procedures were followed prior to starting a belt conveyor. The required audible warning device could not be heard above the plant noise at the location of the accident when the belt conveyor was started.

Corrective Action: Two additional warning horns that are audible above the surrounding noise level were installed at appropriate locations so persons could hear the warnings.

CONCLUSION

The accident occurred because management failed to ensure that safe work procedures were followed while persons performed work on the belt conveyor to clean the tramp metal magnet. The belt conveyor was not deenergized, locked and tagged out, and blocked against motion prior to persons removing tramp metal from the magnet.

Additionally, the startup procedures for the belt conveyor did not ensure that persons were protected when it was started. The required audible warning device could not be heard above the plant noise. After the accident, a substantially built work deck and stairway with handrails were installed near the belt conveyor, permitting persons to clean the tramp metal magnet without contacting the belt conveyor. Two additional warning horns, audible above the surrounding noise level, were also installed so that persons could hear warnings..

ENFORCEMENT ACTIONS

Issued to Bolinder Resources LLC

Order No. 6590855 was issued on February 24, 2011, under the provisions of Section 103(j) of the Mine Act. This order was modified to Section 103(k) of the Mine Act when the first Authorized Representative arrived at the mine.

A fatal accident occurred at this operation on February 24, 2011, when a miner became stuck and wedged between the Kohlberg stacker belt and a metal cleaning magnet. This order is issued to ensure the safety of all persons at this mining operation. It prohibits all activity at this mine site until MSHA has determined that it is safe to resume normal mining activities. The mine operator shall obtain prior approval from an authorized representative for all actions to recover and/or restore operations to the affected area.

This order was terminated on March 10, 2011, after conditions and practices that contributed to the accident no longer existed.

Order No. 6589831 was issued on April 19, 2011, under the provisions of Section 104(d)(1) of the Mine Act for a violation of 30 CFR 56.12016

A fatal accident occurred at this operation on February 24, 2011. A front-end loader operator was cleaning a tramp metal magnet positioned 9 inches above a belt conveyor located approximately 8 feet above the ground. He was positioned on top of the belt conveyor when it was energized, pinning him between the magnet and the belt conveyor. The electrically powered equipment was not deenergized and locked out or other measures taken to prevent the equipment from being energized without the knowledge of the person working on it. The equipment was never blocked against motion. Management engaged in aggravated conduct constituting more than ordinary negligence in that they were aware of this practice by the miners to clean the magnet. This violation is an unwarrantable failure to comply with a mandatory standard. This condition was a violation of 56.12016 or, in the alternative, 56.14105.

This citation was terminated on April 19, 2011. Management established policies, procedures, and controls to ensure that belt conveyors are deenergized, locked and tagged out, and blocked against hazardous motion before persons work on them. All miners were provided locks and were trained regarding these new procedures.

Order No. 6589832 was issued on April 19, 2011, under the provisions of Section 104(d)(1) of the Mine Act for a violation of 30 CFR 56.14201(b):

An effective audible warning was not provided to this area when the belt conveyor started. Management engaged in aggravated conduct constituting more than ordinary negligence in that they failed to provide an adequate conveyor start up warning. This violation is an unwarrantable failure to comply with a mandatory standard.

This citation was terminated on April 19, 2011, after two additional warning horns were installed that were audible above the plant machinery and structure noises throughout the mine site. Management revised the start up procedures to allow more time for persons to react to the warning horns. Management also installed an automated belt start up system.

Approved By:

Richard Laufenberg
District Manager

Date:

LIST OF APPENDICES

Appendix A-Persons Participating in the Investigation

Appendix B-Victim Data Sheet

Appendix A

Persons Participating in the Investigation

Bolinder Resources LLC

Bridger Bolinder.....Vice-President
Gary Bolinder..... Company Consultant

Mine Safety and Health Administration

Michael Okuniewicz.....Mine Safety and Health Supervisory Inspector
Michael Tromble..... Mine Safety and Health Inspector
David M. Sinquefield.....Mine Safety and Health Inspector

Appendix B

Accident Investigation Data - Victim Information

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



Event Number: 6 5 5 6 4 2 0

Victim Information: 1																																	
1. Name of Injured/Ill Employee: <i>Allen K. Sherman</i>				2. Sex: <i>M</i>		3. Victim's Age: <i>56</i>			4. Degree of Injury: <i>01 Fatal</i>																								
5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 02/24/2011 b. Time: 8:15</i>									6. Date and Time Started: <i>a. Date: 02/24/2011 b. Time: 8:15</i>																								
7. Regular Job Title: <i>182 Front-end loader operator</i>						8. Work Activity when Injured: <i>011 Cleaning scrap metal from belt magnet</i>						9. Was this work activity part of regular job?																					
												Yes No <input checked="" type="checkbox"/>																					
10. Experience a. This				Years		Weeks		Days		b. Regular		Years		Weeks		Days		c. This		Years		Weeks		Days		d. Total		Years		Weeks		Days	
Work Activity:				<i>1</i>		<i>10</i>		<i>0</i>		Job Title:		<i>1</i>		<i>10</i>		<i>0</i>		Mine:		<i>1</i>		<i>10</i>		<i>0</i>		Mining:		<i>10</i>		<i>0</i>		<i>0</i>	
11. What Directly Inflicted Injury or Illness? <i>035 Head contact with belt structure</i>										12. Nature of Injury or Illness: <i>140 Blunt force trauma</i>																							
13. Training Deficiencies																																	
Hazard: New/Newly-Employed Experienced Miner: Annual: Task:																																	
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"/>																																	
16. Part 50 Document Control Number: (form 7000-1)										17. Union Affiliation of Victim: <i>9999</i>							<i>None (No Union Affiliation)</i>																