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

Report of Investigation

Surface Nonmetal Mine
(Limestone)

Fatal Machinery Accident
March 24, 2004

Bellco Materials, Inc.
Bellco #2
Claremore, Rogers County, Oklahoma
Mine ID No. 34-00410

Investigators

Dani D. White
Mine Safety and Health Inspector

Charles M. Morrison
Mine Safety and Health Inspector

Benjamin W. Gandy
Mining Engineer

Originating Office
Mine Safety and Health Administration
South Central District
1100 Commerce Street, Room 462
Dallas, Texas 75242
Edward E. Lopez, District Manager


SHERIFF LINE DO NOT CROSS

OVERVIEW

On March 24, 2004, Rocky D. Wheeler, driller, age 41, was fatally injured when his clothing became entangled in a rotating drill steel.

The accident occurred because the procedure used to add drill steels was inadequate. The victim tried to manually thread the drill steel onto a rotating collar and striker bar with the drill mast in the vertical drill position.

GENERAL INFORMATION

Bellco #2, a crushed limestone operation, owned and operated by Bellco Materials, Inc., was located 7 miles north of Claremore, Rogers County, Oklahoma. The principal operating official was Michael C. Bell, president. The mine normally operated one 10-hour shift a day, five days a week, and one 5-hour shift on Saturday. Total employment was 13 persons.

Limestone was drilled and blasted from a single bench in the quarry. The blasted limestone was loaded into haul trucks with a front-end loader and transported to the crusher. The crushed rock was conveyed to the screening plant where it was processed and stockpiled. Finished products were sold for use in the construction industry.

The last regular inspection of this operation was completed on November 5, 2003.

DESCRIPTION OF ACCIDENT

On the day of the accident, Rocky D. Wheeler (victim) reported for work at 5:45 a.m., his normal starting time. Wheeler met with Lonnie G. French, mine foreman, who instructed him to move the drill off the drill site. French planned to load and shoot the blast holes that were drilled the previous day.

Wheeler moved the drill out of the blast area and met French at the powder magazine, where they loaded the powder truck with explosives. They loaded the blast holes and secured the blast area. French detonated the round at approximately 8:30 a.m.

At approximately 9:30 a.m., Wheeler moved the drill back to the drill site and began drilling holes. About 10:30 a.m., French talked to Wheeler. From the quarry floor, French last observed Wheeler operating the drill about 1:00 p.m.

Sometime after that, Wheeler evidently seized a drill steel in the hole he was drilling. Wheeler then got a new bit, three new 12 feet long steels, and three new collars. He started drilling another hole with a 12 foot starter steel and continued drilling a second 12 foot steel. Apparently, Wheeler attempted to add a third drill steel on the rotating striker bar while the drill mast was in the vertical drilling position. (See Appendix B) The drill steel apparently cross threaded and Wheeler’s clothing became entangled in it.

About 3:30 p.m., French drove to the drill site and noticed the drill rotating without a drill steel. French found Wheeler lying at the base of the drill mast with a 12 foot drill steel lying next to him. He checked Wheeler for a pulse, but found none.

French called Melissa Evans, scale clerk, and told her to call 911. When emergency personnel arrived, they checked the victim, but could not detect any vital signs. The victim was pronounced dead at the scene as a result of asphyxiation.

INVESTIGATION OF ACCIDENT

Larry Kinsey, mine safety and health inspector was notified of the accident at 3:50 p.m. on March 24, 2004, by a telephone call from Michael Shore, safety manager. An investigation was started the same day. An order was issued pursuant to Section 103(k) of the Mine Act to ensure the safety of the miners. MSHA's accident investigation team traveled to the mine, conducted a physical inspection of the accident scene, interviewed employees, and reviewed conditions and work procedures relevant to the accident. The investigation was conducted with the assistance of mine management and the miners.

DISCUSSION

Location of the Accident

The accident occurred on top of the highwall located in the southeast corner of the quarry. Weather conditions were overcast and windy with a light drizzle.

Drill

The track drill, a 1998 Furukawa 636 rock drill, model number HCR12ED was powered by a 167 hp diesel engine. It was equipped with an extended version boom with drifter rotation speed of 0 to 250 revolutions per minute.

Drill & Control Unit Functional Tests

The drill controls were electric over hydraulic. The drill rotation lever was found in the down position, indicating a down hole drilling cycle. The drill unit control indicated it was in the high speed mode. All other controls were in the neutral position.

The variable rotation knob, which acts as a variable speed control, was found stuck. The operating pressure for the variable rotation was 1000 to 1100 pounds per square inch, which was normal.

The rotation, drill feed pressure, and impact controls were all functional. The hood and centralizer controls were functional. The anti-jamming device and speed controls were functional. The anti-seize applicator was found to be operational.

The drill steel changing unit was not functional in the automatic mode. When tested, the drill steels could not be indexed using this control. The operator had to use the manual mode located on the left side of the control unit which was functional.

The drill steel being added to the drill string at the time of the accident did not come from the storage magazine on the drill. Wheeler was physically placing the drill steel on the rotating striker bar while the drill mast was in the vertical drilling position. The correct procedure would have required two workers to place the steel in the magazine with the drill mast in the horizontal position and the machine turned off. (See Appendix B)

Drill Steel

Drill operators used three drill steels to drill one hole: One 14 feet long, 1.75 inch diameter starter steel with 4 inch diameter button bit and two 12 feet long, 1.75 inch diameter drill steels.

At the time of the accident, the hole being drilled contained two 12 feet long drill steels, one with a 4 inch diameter button bit. The third steel, found near the victim, was 12 feet long. The drill steels were straight and smooth.

A new collar was found seized onto the striker bar. The starter thread and second thread on the bottom portion of this collar appeared very shiny and galled, indicating the steel had cross-threaded.

The drill steel found lying next to the victim also had signs of cross-threading on the top portion of the steel.

The investigators found a 14 foot starter drill steel and a 12 foot drill steel with collars in a hole 12 feet west of the last hole Wheeler was drilling. These steels were subsequently recovered after the round was shot.

Drill Holes

Typically, holes were drilled 32 feet deep with a 10 feet by 13 feet drill pattern. The victim had drilled eight holes. The last hole drilled was 22 feet deep. A mechanical angle indicator, located on the drill mast, showed the hole was being drilled at an angle of 97 degrees from horizontal. Drilling time was approximately 10 minutes per hole.

Victim's Clothing
The victim was wearing a t-shirt under a long sleeve shirt and jacket. All three articles of clothing were torn.

Drugs
During the investigation of the accident, chief investigator Larry Elkins of the Rogers County Sheriff's Department found a white powdery substance in a zip lock bag in the victim's wallet. The substance tested positive for methamphetamines.

Training
Wheeler had 22 years mining experience. He had been employed at this mine for six weeks working as a driller. He had received training in accordance with 30CFR, Part 46.

ROOT CAUSE ANALYSIS

A root cause analysis was conducted and the following causal factor was identified:

Causal Factor: A drill operator did not follow the drill manufacturer's procedures for adding drill steels. He attempted to manually thread a drill steel into a rotating collar with the drill mast in the vertical drill position when his clothing became entangled in the drill steel.

Corrective Action: Procedures should be established to ensure that all drill operators understand any potential hazards associated with their work. The procedures should require that drill operators follow the manufacturer's recommendations for adding drill steels.

The procedures should also address the hazards of wearing loose fitting clothing when personnel work around rotating machine parts and equipment. All personnel should be trained to stay clear of rotating drill steel and understand procedures to safely perform tasks. Supervisors should routinely monitor personnel to determine that safe operating procedures are being followed.

CONCLUSION

The accident occurred because the procedure used to add drill steels was inadequate. The victim tried to manually thread the drill steel onto a rotating collar and striker bar with the drill mast in the vertical drill position.

ENFORCEMENT ACTIONS

Order No. 6247905 was issued on March 24, 2004, under the provisions of Section 103(k) of the Mine Act:

A fatal accident occurred at this operation on March 24, 2004, when the driller became entangled in the drill steel. This order is issued to assure the safety of all persons at this operation. It prohibits all activity with the Furukawa Drill, model HCR-12ED, serial number 351009 and the surrounding drill site until MSHA has determined that it is safe to resume normal mining operations in the area. The mine operator shall obtain prior approval from an authorized representative for all actions to recover and/or restore operations to the affected area.

The order was terminated on March 27, 2004. The conditions that contributed to the accident have been corrected and normal mining operations can resume.

Citation No. 6247928 was issued on June 10, 2004, under the provisions of Section 104a of the Mine Act in violation of 56.7005:

A fatal accident occurred at this operation on March 24, 2004, when the drill operator’s clothing contacted the rotating drill steel. He was attempting to thread the drill steel on the rotating collar with the drill mast in the vertical drilling position and did not stay clear of the drill steel in motion.

The citation was terminated on June 10, 2004, when the company provided additional training to the drill operators and drill maintenance personnel on safe operating procedures including the hazards of working around rotating equipment and loose clothing. The training also addressed the safety features of the drill and following the manufacturer's recommendations for safe drill operation including adding drill steels.

Approve by: _____ Date: _____

Edward E. Lopez
District Manager

APPENDICES

A. Persons Participating in the Investigation
B. Drill Picture – Illustration of the Terminology

Appendix A

Persons Participating in the Investigation

Bellco Materials, Inc.

Michael L. Shore	safety manager
Michael R. Sellers	mine superintendent
Lonnie G. French	mine foreman

Jackson & Kelly

Karen L. Johnston	attorney

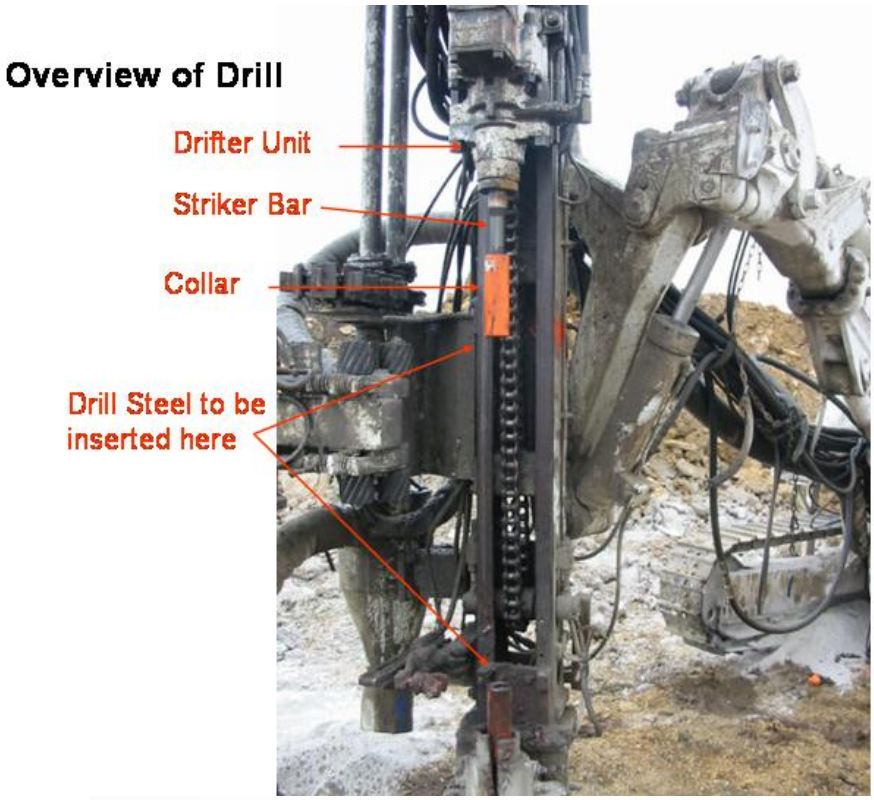
Rogers County Sheriff's Department

Larry Elkins	chief investigator

Mine Safety and Health Administration

Dani D. White	mine safety and health inspector
Charles M. Morrison	mine safety and health inspector
Benjamin W. Gandy	mining engineer

APPENDIX B



Drill mast in lowered horizontal position for manually placing steels in the magazine.