MAI-2012-17

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

REPORT OF INVESTIGATION

Surface Nonmetal Mine
(Common Shale)

Fatal Machinery Accident
November 1, 2012

North American Quarry and Construction Services, LLC
Catskill, Greene County, New York
Contractor I.D. No. 2KX

at

Northeast Solite Corporation
Mt. Marion Pit and Mill
Saugerties, Ulster County, New York
ID No. 30-00287

Investigators

Andrew J. Bower
Mine Safety and Health Inspector

Glenn J. Geosits
Mine Safety and Health Inspector

Dale P. Ingold, P.E.
General Engineer

John P. Homer
General Engineer

Gregory J. Mehalchick, P.E.
Mine Safety and Health Training Specialist

Originating Office
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North East District
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Donald J. Foster, Northeast District Manager

OVERVIEW

Stephen J. Wickham, Contract Driller, age 30, was killed on November 1, 2012. Wickham was attempting to manually load a threaded drill steel into the mast of a crawler drilling machine by engaging it with the rotating drill head when he became entangled in the rotating drill steel.

The accident occurred due to contract management's failure to implement policies and procedures to ensure that drillers stayed clear of a rotating drill steel, specifically while performing drill steel loading operations. Wickham had approximately six months of drilling experience and did not receive effective task training addressing the safe work procedures for loading a drill steel and the potential hazards associated with the task. Additionally, Wickham was assigned to perform work alone where hazardous conditions existed and he could not communicate with others, be heard, or be seen.

GENERAL INFORMATION

Mt. Marion Pit and Mill, a common shale operation owned and operated by Northeast Solite Corporation, was located in Saugerties, Ulster County, New York. The principal operating official was Phil Nesmith, President. The mine normally operated three 8-hour shifts, seven days a week. Total employment was 33 persons.

Common shale was drilled and blasted from a multiple-bench quarry. An excavator loaded haul trucks that transported the material to a processing plant. The material was processed in a rotary kiln and sized to specification. Finished products were sold as construction aggregate and used in the manufacture of lightweight aggregate concrete.

Stephen J. Wickham (victim) was employed by North American Quarry and Construction Services, LLC (NAQCS), a contract rock drilling and blasting company, located in Catskill, Greene County, New York. Pete Leser, President, was the principal operating official. NAQCS, a subsidiary of the Austin Powder Company, was contracted by Northeast Solite Corporation to provide drilling and blasting services. NAQCS typically provided a drill and driller and the blaster who laid out the blast hole pattern and specified the drill hole depth and detonated the explosives. When NAQCS charged the blast holes with explosives, mine employees added the stemming (filled the holes with inert material). Wickham was the only NAQCS employee working at the mine at the time of the accident.

The Mine Safety and Health Administration (MSHA) completed the last regular inspection at this mine on June 6, 2012.

DESCRIPTION OF ACCIDENT

Stephen J. Wickham (victim) did not report to the mine on a regularly scheduled basis. When Wickham arrived at the mine, he would sign the visitor's log in the mine office and travel to his assigned work location. On October 31, 2012, the day before the accident, Wickham signed in and completed drilling 28 blast holes specified for a drill pattern on the Northeast side of the quarry (or East Wall). In preparation for a 43-hole drill pattern to be started on the Southeast side of the quarry, he trammed a drill to a parking area at a "Y" in the road, approximately 1,500 feet from the new drill site (see Appendix C – Figure 1). Wickham secured three sections of drill steel and a starter drill steel to a pickup truck. At 3:15 p.m., he signed out and left the site.

On November 1, 2012, the day of the accident, Wickham returned to the mine and signed the visitor's log at 6:40 a.m. He drove a pickup truck to the drill. He then trammed the drill to the Southeast Side drill site (accident location) located approximately 50 feet above the active pit and approximately 35 feet from the edge of the highwall. Based on the location of the pickup truck, the investigators determined that Wickham walked back to the parking area and then drove the pickup truck to the Southeast Side location (see Appendix C – Figure 2).

Three drill steels were in the drill's six-steel capacity carousel. Based on interviews, the investigators determined that Wickham, as he had been trained, prepared to load an additional drill steel in the drill to reach the approximate 50-foot depth required for each new hole in the pattern. To manually load the drill steel, he positioned the drill's mast at approximately 30 degrees above horizontal (see Appendix C – Figure 3). Wickham retrieved an approximate 13-foot long drill steel that had been secured to the pickup truck and went to add the drill steel to the drill string. He manually picked up and placed the top or male-threaded end of the drill steel in the bottom of the drill guide to load the 4-inch diameter drill steel weighing approximately 150 pounds. Using a 9-foot long ratcheting strap attached to his right wrist,

Wickham lifted up the bottom or female-threaded end of the steel and engaged the top end with the rotating drill head. During this loading process, he became entangled around the rotating drill steel.

About 3:00 p.m., Gregory S. Bull, a maintenance supervisor employed by Northeast Solite Corporation, was repairing a haul truck approximately 310 yards from the drill. Bull was on a 50-foot lower elevation and heard the drill operating but was too far away to observe any problems.

At approximately 6:40 p.m., James Curry, Third Shift Supervisor, received a telephone call from Pete Leser, President of NAQCS, informing him that Wickham had not returned from the mine. Curry and Greg Tangney, Maintenance Worker, drove into to the quarry and arrived at the drill site at about 6:48 p.m., where they found the victim entangled on the drill steel. The drill was not running. Curry called for Emergency Medical Services (EMS). EMS personnel arrived at 6:59 p.m. and the victim was pronounced dead at the scene by the Ulster County Medical Examiner.

INVESTIGATION OF ACCIDENT

MSHA was notified of the accident on November 1, 2012, at 6:57 p.m. by a telephone call to the National Call Center from James Curry, Third Shift Supervisor. The National Call Center notified Dennis Yesko, Assistant District Manager, and an investigation was started the same day. In order to ensure the safety of all persons, MSHA issued an order pursuant to Section 103(j) of the Mine Act. Upon arrival of the first Authorized Representative (AR), MSHA modified the order to section 103(k) of the Mine Act.

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. MSHA conducted the investigation with the assistance of mine and contractor management and employees and local law enforcement and rescue agencies.

DISCUSSION

Location of the Accident

The accident occurred at the 2nd level of the Southeast side of the quarry. The accident location was relatively level and solid.

Weather

On the day of the accident, weather conditions were overcast with an average temperature of 46 degrees Fahrenheit and wind gusts to approximately 16 mph. Sunrise was at 7:29 a.m. The investigators determined that weather conditions and lighting were not contributing factors in the accident.

Physical Factors

The drill involved in the accident was an Atlas Copco/Ingersoll Rand Crawler Drilling Machine Model CM780D.

- Ingersoll Rand Drilling Solutions designed and built the original Crawler Drilling Machine Model CM780D. Atlas Copco acquired Ingersoll Rand Drilling Solutions in 2004. For this report, the drill manufacturer was referred to as Atlas Copco.
- In July 2005, the newly manufactured drill was sold by Atlas Copco to a quarry in Belair, Maryland.

- During interviews, investigators learned NAQCS purchased the drill in "used" condition. At the time of purchase, the operating manual was not supplied with the drill. A manual, examined at NAQCS' office, was for another similar Ingersoll Rand Crawler Drilling Machine (dated 2002). According to Walter S. Pratt and Sons, the company that provided service for this drill, the Ingersoll Rand and the early Atlas Copco manufactured drills were similar as was their respective manuals. A representative of Walter S. Pratt and Sons supplied an electronic copy of the Atlas Copco version, "Operating, Safety, and Maintenance Manual". A comparison of the Ingersoll Rand manual (examined at NAQCS's office) and the Atlas Copco manual (supplied by Walter S. Pratt and Sons) showed both manuals provided safe operating procedures for the user.

- After the accident, the drill was found with three drill steels (locally referred to as pipes) in the storage carousel and a fourth steel coupled to the rotary drill head. The drill guide was rotated at a 30-degree angle down from the horizontal position. The end of the drill steel was approximately 9 feet from the bottom of the drill guide (see Appendix C - Figure 3). The drill steel in the drill guide was rusted and appeared to have been in storage/unused. From interviews, investigators learned the fourth steel was being added to the drill string because the required blast hole depth, up to 57 feet in this new location (Southeast Side), was deeper than the previous drill location (East Wall) where the specified blast hole depth was 47 feet.

After the accident, the controls which affect the operation of the rotary head were found as follows:

- Dust Collector & Rod Changer Selector Switch – Set on Rod Changer (causes rotary head to rotate at a fixed speed – measured in the field at approx. 70 rpm)
- Drill Selection Function Control – Drill Mode
- Drilling Control – Lever in Forward position (Rotary head forward rotation activated)

After the accident, the drill was found with the key in the running position, but had stopped because it was out of fuel. During the investigation, the drill was refueled, equipped with fresh batteries, and started. When the controls were re-positioned as the investigators found them, the drill steel rotated at approximately 72 rpm.

In the Ingersoll Rand Instruction Manual for the Model CM780D drill (the one available to the machine operator) the reader is told "THE DRILL ROTATION LEVER SHOULD NOT BE USED WHILE INSTALLING DRILL STEEL, KEEP CLEAR OF MOVING PARTS."

The emergency shutdown (safety wire – "pull cord") located on the bottom of the drill guide had been removed and the associated electrical component bypassed. Based on the location of the victim at the time of the accident, investigators determined that he could not have accessed the emergency shutdown even if it had been in place and fully functional. A non-contributory 104(d)(1) order was issued for a violation of 30 CFR 56.7002. The emergency stop was reinstalled after the accident (see Appendix C - Figure 4).

SUMMARY:
There were no design, installation, or other physical factors found which caused or contributed to this accident.

Training and Experience

Stephen J. Wickham (victim) had 33 weeks of experience as a driller for NAQCS and 6 years and 28 weeks of total mining experience.

A representative of MSHA's Educational Field Services staff conducted an in-depth review of the contractor's training records. Wickham had not received effective task training. Wickham's initial task training did not include the safe operating procedures related to the assigned task as required. He was not effectively task trained on how to safely load a drill steel prior to being assigned work duties as a driller.

ROOT CAUSE ANALYSIS

The investigators conducted a root cause analysis and identified the following root causes and the corresponding corrective actions implemented to prevent a recurrence:

Root Cause: The victim did not receive effective task training regarding procedures to safely load drill steels. Contract management policies and procedures failed to ensure that drillers stayed clear of a rotating drill steel, specifically while performing drill steel loading operations.

Corrective Action: Contract management established written policies and safe work procedures to ensure that drillers stayed clear of rotating drill steels during drill steel loading operations. These new procedures incorporate the manufacturer's recommendations for loading drill steels and require a minimum of two properly trained persons to perform the task. All persons were provided task training regarding the new policies.

Root Cause: Contract management required drillers to work alone where hazardous conditions existed and they could not communicate with others, could not be heard, or could not be seen while working in the quarry.

Corrective Action: Contract management implemented safe work procedures for loading drill steels which incorporate the manufacturer's recommendations for loading drill steels and require a minimum of two properly trained persons to perform the task. All persons were provided task training regarding the new procedures. In addition, the mine operator has implemented policies and procedures for management personnel to provide increased oversight of contractors working at the site.

CONCLUSION

The accident occurred due to contract management's failure to implement policies and procedures to ensure that drillers stayed clear of a rotating drill steel, specifically while performing drill steel loading operations. Wickham had approximately six months of drilling experience and did not receive effective task training addressing the safe work procedures for loading a drill steel and the potential hazards associated with the task. Additionally, Wickham was assigned to perform work alone where hazardous conditions existed and he could not communicate with others, be heard, or be seen.

ENFORCEMENT ACTIONS

Issued to North American Quarry and Construction Services, LLC

Order No. 8706351 - Issued on November 1, 2012, under the provisions of Section 103(j) of the Mine Act:

An accident occurred at this operation on November 1, 2012, at approximately 8:00-8:30 a.m. This order is being issued, under Section 103(j) of the Federal Mine Safety and Health Act of 1977 to prevent the destruction of any evidence which would assist in investigating the cause of the accident. It prohibits all activity with the Atlas Copco Model CM780D drill (Co. #4) and the surrounding drill area until MSHA has determined that it is safe to resume normal mining operations in this area. The order was initially issued orally to William Sherburne, Location Manager, at 9:31 p.m. on this date and has now been reduced to writing.

The order was subsequently modified to Section 103(k) after an Authorized Representative arrived at the mine. MSHA terminated this order on November 28, 2012, after conditions that contributed to the accident no longer existed.

Citation No. 8712623 – Issued under the provisions of 104(d)(1) of the Mine Act for a violation of 30 CFR 56.7005:

A fatal accident occurred at this operation on November 1, 2012, when a driller (victim) became entangled on the rotating drill steel of an Atlas Copco Model CM780D drill. Management failed to implement policies and procedures to ensure the driller stayed clear of the rotating drill steel.

Management engaged in aggravated conduct constituting more than ordinary negligence by requiring the driller to manually thread a drill steel into the rotating head. This violation is an unwarrantable failure to comply with a mandatory safety standard.

Order No. 8712624 – Issued under the provisions of 104(d)(1) of the Mine Act for a violation of 30 CFR 56.18020:

A fatal accident occurred at this operation on November 1, 2012, when a driller (victim) became entangled on the rotating drill steel of an Atlas Copco Model CM780D drill. The driller was assigned to perform work alone in the quarry where hazardous conditions existed that would endanger his safety. Management's procedure for adding a drill steel exposed the driller to contact with rotating parts. A second person was not present to assist the driller or to intervene in case of an emergency.

Management failed to ensure that the driller could communicate with others, could be heard, or could be seen while working in the quarry. Management engaged in aggravated conduct constituting more than ordinary negligence by requiring the driller to work alone in an area where hazardous conditions existed. This violation is an unwarrantable failure to comply with a mandatory safety standard.

Order No. 8712625 – Issued under the provisions of 104(d)(1) of the Mine Act for a violation of 30 CFR 48.27(a)(1):

A fatal accident occurred at this operation on November 1, 2012, when a driller (victim) became entangled on the rotating drill steel of an Atlas Copco Model CM780D drill. The driller's initial task training did not include the safe operating procedures related to the assigned task as required.

Management engaged in aggravated conduct constituting more than ordinary negligence by not ensuring the driller was properly and effectively task trained on how to safely load a drill steel prior to being assigned work duties as a driller. This violation is an unwarrantable failure to comply with a mandatory standard.

Issued to Northeast Solite Corporation

Citation No. 8712626 – Issued under the provisions of 104(a) of the Mine Act for a violation of 30 CFR 56.18020:

A fatal accident occurred at this operation on November 1, 2012, when a contract driller (victim) became entangled on the rotating steel of an Atlas Copco Model CM780D drill. The mine operator allowed the driller, who was employed by North American Quarry and Construction Services LLC, to perform work alone in the quarry where hazardous conditions existed that would endanger his safety. The contract company's procedure for adding a drill steel exposed the driller to contact with rotating parts. The mine operator failed to ensure that the driller could communicate with others, could be heard, or could be seen while working in the quarry.

Donald Foster

Approved by, Date: 2-14-2013

Donald J. Foster
District Manager

List of Appendices

Appendix A

List of Persons Participating in the Investigation

North American Quarry and Construction Services

Pete Lesser ……. President
Marty Harrington ……... Drill Foreman

Northeast Solite Corporation

Gary Green …… Plant Manager
Michael Weeks …….. Assistant Plant Manager

Austin Powder Northeast LLC

William Beno ……. President

Austin Powder Company

John Brulia …… Director Safety and Compliance

Alpha Engineering Services, Inc.

Gary Hartsog ……. President

Saugerties Police Department

Kenneth Swart, Jr. ……. … Detective Sergeant

Ulster County Health Department

Douglas Heller, M.D. ……. Medical Examiner

Mine Safety and Health Administration

Andrew J. Bower ……Mine Safety and Health Inspector
Glenn J. Geosits ……. Mine Safety and Health Inspector
Gregory J. Mehalchick, P.E. …….. Mine Safety and Health Training Specialist
Dale P. Ingold, P.E. ……General Engineer
John P. Homer ……General Engineer

Appendix B

Victim Information

Accident Investigation Data - Victim Information

Event Number: 6 5 6 9 7 5 3

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

Victim Information: 1

1. Name of Injured/Ill Employee:	2. Sex	3. Victim's Age	4. Degree of Injury:
Stephen J. Wickham	M	30	01 Fatal

5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:	6. Date and Time Started:
a. Date: 11/01/2012 b.Time: 8:00	a. Date: 11/01/2012 b.Time: 6:40

7. Regular Job Title:	8. Work Activity when Injured:	9. Was this work activity part of regular job?
174 Drill Operator	039 Loading drill steel	Yes X No

10. Experience	a. This Work Activity:	b. Regular Job Title:	c: This Mine:	d. Total Mining:
Years	0	0	0	6
Weeks	33	33	33	28
Days	0	0	0	0

11. What Directly Inflicted Injury or Illness?	12. Nature of Injury or Illness:
082 Drill steel	370 Multiple injuries

13. Training Deficiencies:

Hazard:	New/Newly-Employed Experienced Miner:	Annual:	Task: X

14. Company of Employment: (If different from production operator)
North American Quarry and Construction Services
Independent Contractor ID: (if applicable) 2KX

15. On-site Emergency Medical Treatment:

Not Applicable:	First-Aid:	CPR:	EMT:	Medical Professional:	None: X

16. Part 50 Document Control Number: (form 7000-1) 220123210023
17. Union Affiliation of Victim: 9999 None (No Union Affiliation)

Appendix C

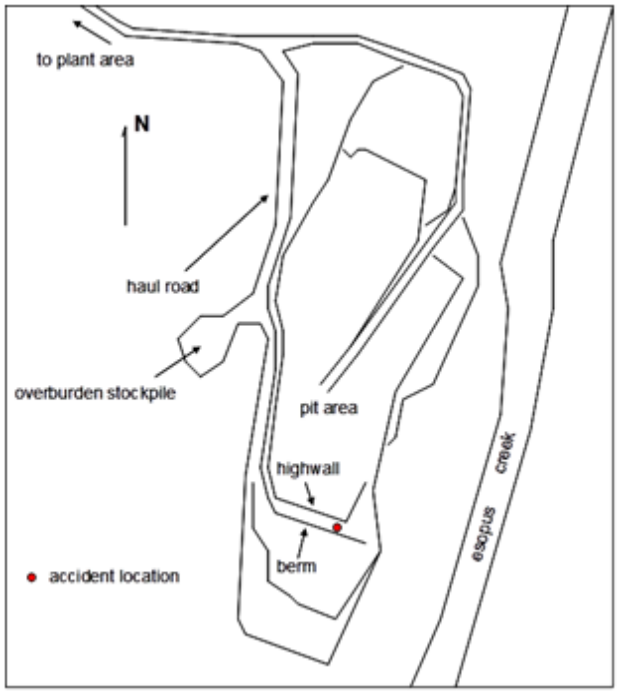

Figure 1 – Schematic of Quarry Showing Location of Accident (not to scale)

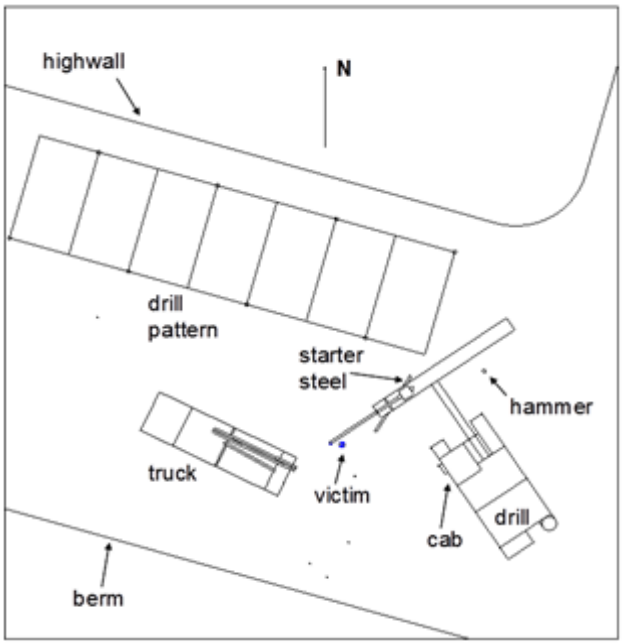

Figure 2 – Schematic of Accident Scene (not to scale)

Appendix C

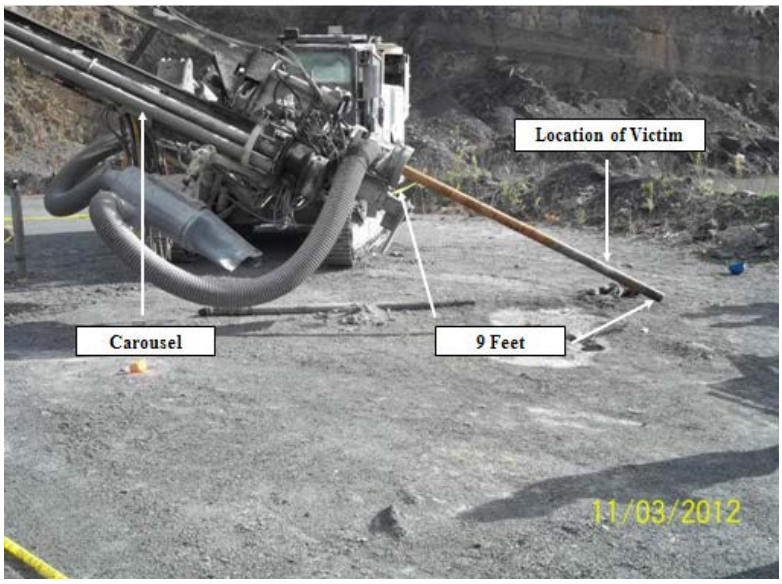

Figure 3 – Photo of Accident Scene

Figure 4 – Photo of Drill (Post-Accident)