

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

REPORT OF INVESTIGATION

Surface Nonmetal Mine
(Limestone)

Non-Powered Haulage Accident
February 19, 2007

Martin Marietta Materials Inc.
Bakers Quarry
Monroe, Union, North Carolina
Mine I.D. No. 31-00071

Investigators

Jeffrey L. Phillips
Supervisory Mine Safety and Health Inspector

Joe R. Fritz
Mine Safety and Health Inspector

Eugene D. Hennen
Mechanical Engineer

Ricky Boggs
Mine Safety and Health Specialist

Originating Office
Mine Safety and Health Administration
Southeastern District
135 Gemini Circle, Suite 212 Birmingham, AL 35209
Michael A. Davis, District Manager



OVERVIEW

Billy C. Wallace, truck driver, age 50, was fatally injured on February 19, 2007, when he was crushed between a rail car and a haul truck. The victim was positioned at the brake platform on the leading end of two loaded rail cars that he was dropping on a side track. The rail cars struck the haul truck that was crossing the track.

The accident occurred because policies, standards, and controls were inadequate. The traffic control rules were not followed to ensure that persons could safely move rail cars. The driver of the haul truck failed to yield the right-of-way to rail traffic while crossing the railroad spur.

GENERAL INFORMATION

Bakers Quarry, a crushed limestone operation, owned and operated by Martin Marietta Materials, Inc. was located in Monroe, Union County, North Carolina. The principal operating official was Larry Thomas, plant manager. The mine operated one ten-hour shift per day, five days a week. Total employment was 19 persons.

Limestone was mined from multiple benches. The material was drilled, blasted, and loaded into haul trucks by a front-end loader. The shot rock was crushed, screened, and washed. Finished products were sold for construction aggregate.

The last regular inspection at this operation was completed on November 29, 2006.

DESCRIPTION OF ACCIDENT

On the day of the accident, Billy C. Wallace (victim) reported to work at 7:00 a.m., his normal starting time.

Wallace performed routine duties and attended a safety meeting. About 9:30 a.m., he was assigned to help Benjamin Simpson, utility man, drop loaded rail cars to the northeast end of the company spur for pick up.

David Thomas, loader operator and eye witness, was loading rail cars from a stockpile. Daniel J. Brown, truck driver, was hauling material from the plant to a stockpile on the west side of the company spur and main line tracks.

Simpson dropped the first and third set of rail cars. Wallace dropped the second set and returned. About 11:00 a.m., he was dropping the fourth set while standing on a small platform located by the brake hand wheel on the leading end of the first rail car. Wallace moved the rail cars by releasing a hand brake located on the right front side of the first car, allowing the cars to drift down hill to the pick up location.

As the rail cars were drifting down grade on the spur, they struck a Euclid R-35 haul truck at the intersection of the

rail siding and a haul road. The impact caused the truck to overturn.

Simpson stated that the cars did not appear to be speeding and that Wallace was tied off to the rail car. He noticed that the haul truck was not going to stop at the crossing and saw the rail cars hit the passenger side. Simpson ran to the scene and found the victim alive and pinned between the truck's right front wheel and the front rail car. Simpson then called for emergency medical assistance.

Emergency medical personnel arrived and removed the victim. He died in route to the hospital and was pronounced dead on arrival. Death was attributed to blunt force trauma.

INVESTIGATION OF THE ACCIDENT

MSHA was notified of the accident at 11:08 a.m. on February 19, 2007, by a phone call from Forrest Melton Jr., office manager, to the MSHA call center. Wyatt Andrews, assistant district manager was notified and an investigation was started the same day. An order was issued under the provisions of section 103 (k) of the Mine Act to ensure the safety of the miners.

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

DISCUSSION

Location of Accident

The accident occurred at the intersection of a haul road and rail siding located at the company's rail load out area. The siding was approximately 2,560 feet long and ran parallel to the main line track 23 feet away. The slope on this siding varied from approximately $\frac{1}{2}$ to $1\frac{1}{2}$ percent. The area where the siding was located was used for stockpiling the material to be loaded in the rail cars and was separated from the remainder of the mine by the main line track.

At the time of the accident, the haul truck was empty and traveling down grade. It was returning to the main section of the mine after dumping a load of material in one of the stockpiles. The average gradient of the 50 feet section of road before the track crossing was 6 percent.

Rail Cars

The rail cars involved in the accident were two CSX open hopper, bottom dump type rail cars designed to haul approximately 100 tons. Seventeen rail cars were on the siding at the time of the accident. In addition to the two cars involved in the accident, nine rail cars remained to be loaded. The six rail cars already loaded had been gravity dropped to the location where they were to be picked up by a main line locomotive. Each of the cars had the empty weight of the car along with the maximum allowed cargo weight for that car painted in large numbers on each side of the car. The car that the victim was riding had an empty weight of 63,000 lbs. and a cargo carrying capacity of 200,000 lbs. The second car involved in the accident had an empty weight of 63,100 lbs. and a cargo carrying capacity of 199,900 lbs. Each of the cars had been loaded with approximately 196,000 lbs. of gravel making the total weight of each car with load approximately 259,000 lbs.

The hoppers on each of the cars were approximately $49\frac{1}{2}$ feet long. The distance from the ends of each of the hoppers to the center of the couplers was approximately 2 feet making

the total distance between the center of the couplers on each car approximately 53 ½ feet.

The rail cars had a shoe type brake. When the brake was applied, a single composite lined shoe was pushed against each of the steel wheels. When the cars were connected to the locomotive, an air cylinder activated the brakes. Each car had a single air cylinder located on one end that activated the linkage that engaged the brake on both ends of the car. The brake linkages on each end of the rail cars were connected by a rod that passed through the center of each car. The brake linkage was designed in such a way that no brake force was applied to the wheels until all of the shoes came in contact with the wheels.

When the rail cars were not connected to the locomotive, the brake system on each rail car could be manually applied by using a hand wheel. The wheel was located close to the top of the edge of the rail car on the same end as the air cylinder. When the hand wheel was turned, a chain wrapped around the hand wheel axle. This chain pulled on a rod that was a part of the linkage that activated the same linkage as the air brake cylinder. As the hand wheel rotated, the rail car brakes would be applied.

The investigators determined that the brakes on the rail cars functioned normally.

Haul Truck

The haul truck involved in the accident was a Euclid R35 Off-Road Haul Truck that had an air over hydraulic actuated brake system. It had a wet disc brake at each rear wheel that provided the service braking force for the rear axle. Each of the front wheels had a caliper disc brake to provide the service braking force. The service brake was activated by a foot operated treadle valve. When the operator would push the foot control, the treadle valve would supply air to the air actuated hydraulic master cylinders. The hydraulic master cylinders supplied the hydraulic pressure needed to activate the service brakes. The truck park brake was an air released spring applied drum brake in the driveline of the truck.

The truck was up righted and maintenance repairs were made. The investigators determined that the braking and steering systems functioned normally.

Weather

The weather on the day of the accident was clear and warm, with temperatures ranging from 75 to 80 degrees Fahrenheit. Weather conditions were not a contributing factor.

Training and Experience

Billy C. Wallace had 16 years mining experience and had been employed at this mine for 28 days. He had received training in accordance with 30 CFR, Part 46.

Daniel J. Brown (truck driver) had 11 weeks of experience, all at this mine. He had received training in accordance with 30 CFR, Part 46, but had no previous experience as a truck driver.

ROOT CAUSE ANALYSIS

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

Root Cause: Management policies, procedures, and controls to ensure the safe movement of traffic were not monitored adequately. The truck driver did not stop at the rail spur as required by company policy.

Corrective Action: Management should place more emphasis on monitoring mobile equipment to enforce the traffic control rules they have established.

CONCLUSION

The accident occurred because the traffic controls were not followed. The driver of the haul truck failed to yield the right-of-way as required by company policy.

ENFORCEMENT ACTIONS

Order No. 6130907 was issued on February 19, 2007, under the provisions of section 103(k) of the Mine Act:

A fatal accident occurred at this operation on February 19, 2007, when an R-35 Euclid haul truck and a railcar collided near the rail load out. This order is issued to assure the safety of all persons at this operation. It prohibits all activity at the rail load out until MSHA has determined that it is safe to resume normal 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.

This order was terminated on March 14, 2007, after conditions that contributed to the accident no longer existed.

Citation No. 6091403 was issued on March 21, 2007, under the provisions of section 104(a) of the Mine Act for a violation of 30 CFR 56.9100(a):

A fatal accident occurred at this mine on February 19, 2007, when a haul truck was struck by two loaded railcars while crossing a company maintained railroad track. The victim was positioned on the brake platform on the leading end of the railcars when the two collided. The driver of the haul truck failed to follow the operator's rules governing when to yield the right-of-way to rail traffic while crossing the railroad spur and main line.

This citation was terminated on April 9, 2007. The company has instituted a new policy and trained all employees in the proper procedures for operating mobile equipment around railroad crossings on mine property.

Approved by: _____ Date: _____
Michael A. Davis
District Manager

APPENDICES

- A. Persons participating in the investigation
- B. Victim Data Sheet

APPENDIX A

Persons Participating in the Investigation

Martin Marietta Materials Inc.

Larry Thomas	plant manager
Dexter Tate	production manager
Lloyd Hanson	director, safety & health
Kevin Barnes	human resource/safety manager

Union Emergency Medical Services

Deanna Epps	paramedic
Paul Mullis	paramedic
Krystal T. Gillespie	medical examiner

Mine Safety and Health Administration

Jeffrey L. Phillips	supervisory mine safety and health inspector
Joe R. Fritz	mine safety and health inspector
Eugene D. Hennen	mechanical engineer
Ricky Boggs	mine safety and health specialist

APPENDIX B

Accident Investigation Data - Victim Information

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



Event Number: 0 9 5 2 3 5 6

Victim Information: 1

1. Name of Injured/Ill Employee: <i>Billy C. Wallace</i>		2. Sex: <i>M</i>	3. Victim's Age: <i>50</i>	4. Last Four Digits of SSN:	5. Degree of Injury: <i>01 Fatal</i>
6. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 02/19/2007 b. Time: 11:47</i>				7. Date and Time Started: <i>a. Date: 02/19/2007 b. Time: 7:00</i>	
8. Regular Job Title: <i>176 Truck driver</i>		9. Work Activity when Injured: <i>085 Rail Car Droper</i>			10. Was this work activity part of regular job? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
11. Experience: a. This Years Weeks Days Work Activity: <i>0 2 6</i>		b. Regular Years Weeks Days Job Title: <i>9 21 5</i>		c. This Years Week Days Mine: <i>0 3 6</i>	
12. What Directly Inflicted Injury or Illness? <i>110 crushed between rail car and haul truck</i>		13. Nature of Injury or Illness: <i>170 blunt force trauma to lower abdomen</i>			
14. Training Deficiencies: Hazard: <input type="checkbox"/> New/Newly-Employed Experienced Miner: <input type="checkbox"/> Annual: <input type="checkbox"/> Task: <input type="checkbox"/>					
15. Company of Employment: (If different from production operator) <i>Operator</i>			Independent Contractor ID: (if applicable)		
16. On-site Emergency Medical Treatment: Not Applicable: <input type="checkbox"/> First-Aid: <input type="checkbox"/> CPR: <input checked="" type="checkbox"/> EMT: <input type="checkbox"/> Medical Professional: <input type="checkbox"/> None: <input type="checkbox"/>					
17. Part 50 Document Control Number: (form 7000-1)			18. Union Affiliation of Victim: <i>9999 None (No Union Affiliation)</i>		

Victim Information:

1. Name of Injured/Ill Employee:		2. Sex:	3. Victim's Age:	4. Last Four Digits of SSN:	5. Degree of Injury:
6. Date(MM/DD/YY) and Time(24 Hr.) Of Death:				7. Date and Time Started:	
8. Regular Job Title:		9. Work Activity when Injured:			10. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input type="checkbox"/>
11. Experience: a. This Years Weeks Days Work Activity:		b. Regular Years Weeks Days Job Title:		c. This Years Week Days Mine:	
12. What Directly Inflicted Injury or Illness?		13. Nature of Injury or Illness:			
14. Training Deficiencies: Hazard: <input type="checkbox"/> New/Newly-Employed Experienced Miner: <input type="checkbox"/> Annual: <input type="checkbox"/> Task: <input type="checkbox"/>					
15. Company of Employment: (If different from production operator)			Independent Contractor ID: (if applicable)		
16. On-site Emergency Medical Treatment: Not Applicable: <input type="checkbox"/> First-Aid: <input type="checkbox"/> CPR: <input type="checkbox"/> EMT: <input type="checkbox"/> Medical Professional: <input type="checkbox"/> None: <input type="checkbox"/>					
17. Part 50 Document Control Number: (form 7000-1)			18. Union Affiliation of Victim:		

Victim Information:

1. Name of Injured/Ill Employee:		2. Sex:	3. Victim's Age:	4. Last Four Digits of SSN:	5. Degree of Injury:
6. Date(MM/DD/YY) and Time(24 Hr.) Of Death:				7. Date and Time Started:	
8. Regular Job Title:		9. Work Activity when Injured:			10. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input type="checkbox"/>
11. Experience: a. This Years Weeks Days Work Activity:		b. Regular Years Weeks Days Job Title:		c. This Years Week Days Mine:	
12. What Directly Inflicted Injury or Illness?		13. Nature of Injury or Illness:			
14. Training Deficiencies: Hazard: <input type="checkbox"/> New/Newly-Employed Experienced Miner: <input type="checkbox"/> Annual: <input type="checkbox"/> Task: <input type="checkbox"/>					
15. Company of Employment: (If different from production operator)			Independent Contractor ID: (if applicable)		
16. On-site Emergency Medical Treatment: Not Applicable: <input type="checkbox"/> First-Aid: <input type="checkbox"/> CPR: <input type="checkbox"/> EMT: <input type="checkbox"/> Medical Professional: <input type="checkbox"/> None: <input type="checkbox"/>					
17. Part 50 Document Control Number: (form 7000-1)			18. Union Affiliation of Victim:		