

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

REPORT OF INVESTIGATION

**Underground Nonmetal Mine
(Potash)**

**Fatal Powered Haulage Accident
October 18, 2005**

**Intrepid Potash NM, LLC
Intrepid Potash East
Carlsbad, Lea County, New Mexico
Mine ID No. 29-00170**

Investigators

**Frederick B. Moore
Supervisory Mine Safety and Health Inspector**

**Ronnie V. Crockett
Mine Safety and Health Inspector**

**Ronald Medina
Mechanical Engineer**

**Originating Office
Mine Safety and Health Administration
South Central District
1100 Commerce Street, Room 462
Dallas, Texas 75242-0499
Edward E. Lopez, District Manager**



OVERVIEW

On October 18, 2005, Brian P. Marrs, utility worker, age 36, was fatally injured when a utility water truck rolled onto him. Marrs parked the truck on a grade and went to connect a pump cable. Apparently the truck began to drift and Marrs attempted to stop it but was pinned beneath one of the wheels.

The accident occurred because safe operating procedures were not followed. The utility water truck was left unattended on a grade. The parking brake was not set and the wheels were not chocked or turned into the rib.

GENERAL INFORMATION

Intrepid Potash East, an underground potash mine and surface processing plant, owned by Intrepid Potash NM LLC, was located about 26 miles east of Carlsbad, New Mexico. The principal operating official was Dick Heinen, manager of mines. The mine operated two 12-hour shifts per day, seven days per week. Total employment was 210 persons.

Potash was mined from underground bedded deposits using continuous miners. Mined material was conveyed to a shaft where it was skip-hoisted to the surface. On the surface, the ore was crushed, ground, and screened and impurities were removed. Finished products were shipped to customers by railcar or truck.

The last regular inspection at this operation was completed on September 29, 2005.

DESCRIPTION OF THE ACCIDENT

On the day of the accident, Brian P. Marrs (victim) reported for work at 6:20 a.m., his normal starting time. His regular duties included starting the water pump at the shaft, operating a dozer to muck along the conveyor belt, and pumping water from the sumps located adjacent to the 1st 280 roadway. Marrs typically pumped mine water from small sumps into the tank on a utility water truck. The water was discharged to a larger sump located closer to the shaft.

At the beginning of the shift, Leroy Ross, belt supervisor, told Marrs to pump water the entire shift in the 1st 280 section. Marrs took a utility water truck to the 280 section of the mine and began pumping water.

About 12:45 p.m., James Hicks, electrical supervisor, saw Marrs' utility water truck parked at the intersection of BT-121 and RM-48. He saw Marrs standing at the electrical transformer station located in BT-121.

About 1:00 p.m., Steve Thatcher, scoop operator, was driving a scoop toward the 1st 280 conveyor head roller and 202 conveyor tail pulley. While passing BT-121, Thatcher saw

Marrs' utility water truck but did not see Marrs. The utility water truck was positioned about 25 feet northeast of its last observed location.

Thatcher stopped and walked around the utility water truck looking for Marrs. He called out to Marrs but got no response. Thatcher then walked around the utility water truck and saw Marrs on the ground beneath the right front tire. Thatcher checked Marrs but he was unresponsive. Thatcher went to the 280 mine office to call for help.

Meanwhile, Ross was traveling west in west 280 roadway when he saw the utility water truck parked. Ross began looking for Marrs and found him on the ground beneath the right front tire of the utility water truck. Ross was unable to detect vital signs, traveled to the 280 mine office, and met Thatcher who was already calling for emergency medical assistance.

Marrs was pronounced dead at the scene by Rick Wiedenmann, Office of Medical Investigation. Death was attributed to traumatic asphyxia.

INVESTIGATION OF THE ACCIDENT

MSHA was notified of the accident at 1:30 p.m., March 18, 2005, by a telephone call from Dale Janway, manager of safety, to Larry Parks, supervisory mine safety and health inspector. An investigation was started that 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, 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.

DISCUSSION

Location of the Accident

The accident occurred in the 1st 280 roadway about 25 feet northeast of the BT 121 and RM-48 intersection in the underground portion of the mine. The roadway in this area was straight although it was wet and muddy with a few ruts. It was about 23 feet wide, 6 feet high, and had a 6-7 percent grade.

Utility Water Truck

The utility water truck involved in the accident was a 1981 Elmac with an articulated frame. It was powered by a Deutz, Model F36L-912W, engine and consisted of a water tank unit and an engine unit. The water tank unit was 14 feet long and 8 feet wide and was connected, at the articulation joint, to the engine unit, which was 13 feet long and 8 feet, 9 inches wide. The truck was considered to be moving forward when the engine unit was leading.

The operator's compartment was located on the right side of the truck on the engine unit near the articulation joint area. The operator's seat was perpendicular to the direction of travel. The hydraulic steering cylinders were controlled by a lever in the operator's compartment. The transmission had three forward and three reverse speeds. The two wheels on the engine unit received power from the engine through the transmission and torque converter. The two wheels on the water tank were not powered.

The engine stop control was found pulled outward 5 ¼ inches which was the engine stopped position. The transmission gear shift control was found in third gear, reverse. The accelerator pedal was found in the low idle position.

The engine started and ran smoothly and would stop when the engine shut-down knob was pulled outward 4 ½ inches or more. The knob stayed in position after being pulled.

The axle of the engine unit was equipped with service and parking brakes but the axle of the water tank unit was not equipped with either. Neither the service brakes nor the parking brakes had any defects that would have contributed to the accident.

Service Brakes

The service brake system consisted of an air-operated, two-shoe, internal-expanding drum type arrangement at each of the two wheels on the engine unit. The axle on the engine unit was equipped with type 30-30 brake chambers and manually-adjusted slack adjusters. Each brake chamber was comprised of two separate chambers coupled together into one unit to serve two separate functions. The forward chamber provided service braking capability and the rear chamber provided parking brake capability. When compressed air entered the service brake chambers, the pushrods extended from the chambers and applied the service brake.

Parking Brakes

The rear portion of each brake chamber on the engine unit provided parking brake capability. Without compressed air in the parking brake portion, a self-contained spring expanded, extending the pushrod and applying the parking brake automatically. The parking brake could be applied manually with the push-pull parking brake valve in the operator's cab. Pushing the parking brake control down set the brake and pulling the control up released the brake. The parking brake control was found in the released position.

Brake and Steering System Testing

A series of performance tests were conducted where the utility water truck was found after the accident. To duplicate the conditions at the time of the accident, the engine was shut down, the park brake control knob was placed in the released position, the transmission was placed in reverse third gear and the empty water tank unit was positioned downgrade relative to the engine unit. Tests were repeated at the same location but with the engine running.

The truck was then moved 25 feet up-grade, where witnesses reported seeing it prior to the accident. Tests were again conducted, with and without the engine running.

The results of all the tests showed that when neither the service brake nor the parking brake was applied, the vehicle would usually coast downgrade. Application of only the service brake would stop and hold the vehicle in all cases. Application of only the parking brake would stop and hold the vehicle in all cases.

The elapsed time from activation of the parking brake control knob to application of the brake linings against the drum was approximately two seconds whether the engine was running or not. Once the brake linings made contact with the drum, the truck stopped almost immediately.

The steering was tested while the utility water truck was moving and no defects were found. The accelerator pedal was tested and would not spring return, upon release, to the low idle position whether the engine was running or stopped. However, this defect did not contribute to the accident.

Training and Experience

Brian P. Marrs had worked at this mine for 2 years and 48 weeks. He had received all training in accordance with 30 CFR, Part 48.

ROOT CAUSE ANALYSIS

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

Causal Factor: Administrative controls needed improvement. The victim left the water truck unattended and failed to set the parking brake. The truck was parked on a grade and the wheels were not chocked or turned into the rib.

Corrective Action: Procedures should be implemented to monitor mobile equipment parking procedures. The procedures should ensure that mobile equipment operators set the parking brake of unattended mobile equipment and, if parked on a grade, chock the wheels or turn them into the rib.

CONCLUSION

The accident occurred because safe operating procedures were not followed. The utility water truck was left unattended on a grade. The parking brake was not set and the wheels were not chocked or turned into the rib.

ENFORCEMENT ACTIONS

Order No. 6256164 was issued on October 18, 2005, under the provisions of Section 103(k) of the Mine Act:

A fatal accident occurred at this operation on October 18, 2005, when one miner was run over by the ELMAC #8201 water wagon. This order is issued to ensure the safety of all persons at this operation. It prohibits all activity at the number 280 travel area where the water wagon is located 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 modified October 19, 2005 to release the affected mine area to be recovered and mining operations to continue.

This order was terminated October 21, 2005. Conditions that contributed to the accident no longer existed and operations could resume.

Citation No. 6230395 was issued November 8, 2005, under the provisions of Section 104(a) of the Mine Act for a violation of 30 CFR 57.14207.

A fatal accident occurred at this operation on October 18, 2005, when a piece of unattended mobile equipment, an articulated haulage unit, rolled onto the operator. The parking brake had not been set and the unit had been parked on a grade with the wheels not chocked or turned into the rib.

The citation was terminated on November 8, 2005, after the mine operator retrained all mobile equipment operators on regulatory and company parking requirements when leaving mobile equipment unattended.

Approved: _____

Edward E. Lopez
District Manager

Date: _____

APPENDIX A

PERSONS PARTICIPATING IN THE INVESTIGATION

Intrepid Potash NM, LLC

Richard Heinen	manager of mines
Dale Janway	manager of safety
Curtis Davidson	safety director

Mine Safety and Health Administration

Ronnie V. Crockett	mine safety and health inspector
Stephen R. Kirk	mine safety and health inspector
Ronald Medina	mechanical engineer
Frederick B. Moore	supervisory mine safety and health inspector
Larry D. Parks	supervisory mine safety and health inspector