MAI-2009-16

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

REPORT OF INVESTIGATION

Surface Metal Mine
(Copper)

Fatal Powered Haulage Accident
September 27, 2009

Ray
Asarco LLC
Ray, Gila County, Arizona
Mine I.D. 02-00150

Investigators

Steven H. Thoring
Mine Safety and Health Inspector

F. Terry Marshall
Mechanical Engineer

Originating Office
Mine Safety and Health Administration
Rocky Mountain District
P.O. Box 25367, DFC
Denver, CO 80225-0367
Richard Laufenberg, District Manager

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OVERVIEW

Robert C. Stewart, truck driver, age 28, was fatally injured on September 27, 2009, when a loaded haul truck he was operating left a haul road and drove onto a berm, causing it to overturn. The victim, who was not wearing a seat belt, fell approximately 20 feet from the truck cab to the ground.

The accident occurred because the truck driver did not maintain control of the haul truck he was operating. The failure of the driver to wear the provided seat belt contributed to the severity of his injuries.

GENERAL INFORMATION

Ray, an open pit copper mine, owned and operated by Asarco LLC, was located in Ray, Gila County, Arizona. The principal operating official was Steve Holmes, general manager. The mine operated multiple shifts, 24 hours a day, seven days per week. Total employment was 700 persons.

Copper ore was drilled and blasted in the open pit and transported by haul truck to the primary crusher. Crushed ore was transported to the mill by belt conveyor. The ore was then milled, concentrated, and smelted into copper plates. The last regular inspection of this operation was completed on September 17, 2009.

DESCRIPTION OF ACCIDENT

On September 27, 2009, Robert C. Stewart (victim) started work at 12:00 a.m., his normal starting time. He was assigned to drive a haul truck and haul ore from the pit to a dump.

At approximately 1:30 a.m., Stewart reported a problem on his truck, parked it, and was assigned another truck to operate. He continued his regular haulage activities throughout the shift until the accident occurred.

About 6:15 a.m., Stewart was driving his loaded haul truck to the No. 4 dump. Dennis Jones, supervisor, was driving a service truck following the haul truck. Stewart turned left at a haul road intersection and Jones turned right. Jones heard the engine of Stewart's truck accelerate and saw the haul truck drive up onto the left berm of the haul road and overturn.

Jones radioed for emergency medical assistance. He found Stewart on the ground where he had fallen from the truck's cab. First responders arrived and administered cardiopulmonary resuscitation (CPR). Stewart was transported to a local hospital where he was pronounced dead by the attending physician. The cause of death was blunt force trauma.

INVESTIGATION OF THE ACCIDENT

On the day of the accident, the Mine Safety and Health Administration (MSHA) was notified at 6:53 a.m., by a telephone call from James Krueger, supervisor, to MSHA's emergency hotline. Dustan Crelly, supervisory mine safety and health inspector, was notified and an investigation was started the same day. An order was issued pursuant to Section 103(j) of the Mine Act to ensure the safety of the miners.

MSHA's investigation team traveled to the mine, conducted a physical inspection of the accident site, interviewed employees, and reviewed conditions and work procedures relevant to the accident. MSHA conducted the investigation with the assistance of mine management, employees, miners' representatives, and the State of Arizona Mine Inspector's Office.

DISCUSSION

Location of the Accident

The accident occurred on the haul road that approached the No. 4 dump. The haul road was 132 feet wide and oriented east to west with a 1.8% grade. The left berm was 10 feet high and was constructed of earthen material. A left-hand traffic pattern was used on this haul road.

Haul Truck

The truck involved in the accident was a 1997 Komatsu 830E rigid frame rear dump truck with a direct current electric-drive system. The truck was equipped with a Detroit Diesel 16v 4000 series diesel engine rated at 2,500 base horse power at 1,910 revolutions per minute and a General Electric Statex III electric drive system. The engine could not be operated due to damage caused by the accident.

A tag on the frame of the truck indicated that the maximum gross vehicle weight was 830,000 pounds (415 tons) with an original equipment manufacturer (OEM) payload of 240 tons. The truck had an aftermarket bed installed with a maximum payload of approximately 260 tons. The truck's load of material was collected and weighed approximately 261 tons.

The truck had two principal hydraulic systems; the hoist system and the brake/steering system. The diesel engine supplied the mechanical power to operate these systems.

Each system had a separate pump but shared a common hydraulic fluid tank. Two separate tests were conducted on the brake and steering systems. The brake/steering hydraulic pump was removed from the truck and bench tested. No defects were identified during the bench test. The hydraulic brake and steering systems were then tested using hydraulic power from the bench tested pump. To perform this test, the pump was installed onto another haul truck of the same make and model. Specialized hydraulic lines and fittings were used to connect the hydraulic systems from the damaged truck to the hydraulic pump installed on the other truck. No defects were identified in the braking or steering systems that would have affected the operation of the haul truck on the day of the accident.

The diesel engine had a DDEC IV type electronic control module which stored historical engine operating data. The electronic information was reviewed for information pertinent to the accident. No active engine faults existed at the time of

the accident. The electric drive system's electronic control module information was also reviewed. No drive system faults existed at the time of the accident.

The operator restraint system in the truck was a type 1 seat belt assembly, which provided pelvic and upper torso restraint. It conformed to the safety specifications of Society of Automotive Engineers J386. The restraint system was inspected, tested, and functioned properly. No defects were found with the operator restraint system.

Weather Conditions

The weather at the time of the accident was clear with a temperature of 80 degrees Fahrenheit and calm winds. Weather was not considered to be a factor in the accident.

Training and Experience

Robert C. Stewart, victim, had two years and 32 weeks of mining experience that included two years and eight weeks operating a haul truck. He had received training in accordance with 30 CFR Part 48.

ROOT CAUSE ANALYSIS

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

Root Cause: The truck driver did not maintain control of the haul truck he was operating.

Corrective Action: All truck drivers received additional training regarding the safe operation and control of a haul truck.

Root Cause: Management policies, procedures, and controls did not ensure the truck driver wore his seat belt when operating the haul truck.

Corrective Action: All truck drivers received additional training regarding the required use of seat belts when operating a haul truck. Management will monitor truck drivers to ensure seat belts are worn.

CONCLUSION

The accident occurred because the truck driver did not maintain control of the haul truck he was operating. The failure of the driver to wear the provided seat belt contributed to the severity of his injuries.

ENFORCEMENT ACTIONS

Order No. 6453931 was issued on September 27, 2009, under provisions of Section 103(j) of the Mine Act:

An accident occurred at this operation on September 27, 2009, at 6:15 a.m. As rescue and recovery work is necessary, this order is being issued, under Section 103(j) of the Federal Mine Safety and Health Act of 1977 to ensure the safety of all persons at this operation. This order is also being issued to prevent the destruction of evidence which would assist in investigating the cause or causes of the accident. It prohibits all activity at the North end (west side) of the North dike tie down area (a.k.a. Hercules area) until MSHA has determined that it is safe to resume normal mining operations in this area. The order applies to all persons engaged in the rescue and recovery operation and any other persons onsite. This order was initially issued orally to the mine operator at 8:15 a.m., and has now been reduced to writing.

The order was subsequently modified to a Section 103(k) order and was terminated on November 6, 2009. Conditions that contributed to the accident no longer exist.

Citation No. 6445788 was issued on November 12, 2009, under provisions of Section 104(a) of the Mine Act for violation of 30 CFR 56.14131(a):

A fatal accident occurred at this operation on September 27, 2009, when a haul truck left the haul road it was traveling on and climbed a berm, causing it to overturn and land on the haul road. The driver was not wearing a seat belt provided in the truck. He fell from the cab of the truck and received fatal injuries.

The citation was terminated on December 21, 2009. All truck drivers have received additional training regarding the required use of seat belts.

Citation No. 6445789 was issued on November 12, 2009, under provisions of Section 104(a) of the Mine Act for violation of 30 CFR 56.9101:

A fatal accident occurred at this operation on September 27, 2009, when a haul truck left the haul road it was traveling on and climbed a berm, causing it to overturn and land on the haul road. The driver of the haul truck did not maintain control of the truck while it was in motion. The driver fell from the cab of the truck and received fatal injuries.

The citation was terminated on December 21, 2009. All truck drivers have received additional training regarding the safe operation and control of mobile equipment.

Approved by, Date: January 19, 2010

Richard Laufenberg
District Manager

LIST OF APPENDICES

APPENDIX A

Persons Participating in the Investigation

Asarco LLC

Kim Bradshaw	Corporate Safety Director
James Brown	Safety Engineer
James Coward, Jr.	Attorney
Wes Cruea	Senior Safety Engineer

Patton Boggs LLP

Mark Savit	Attorney

United Steel Workers

Robert Manriquez	President
Greg Zaragoza	Safety Representative

State of Arizona Mine Inspector's Office

Jack Speer	Deputy Mine Inspector

Mine Safety and Health Administration

Steven H. Thoring	Mine Safety and Health Inspector
F. Terry Marshall	Mechanical Engineer

APPENDIX B

Accident Investigation Data - Victim Information

Event Number: 1 1 0 8 5 0 4

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:
Robert C. Stewart	*M*	*28*	*01 Fatal*

5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:	6. Date and Time Started:
a. Date: 09/27/2009 b.Time: 6:15	*a. Date: 09/27/2009 b.Time: 0:00*

7. Regular Job Title:	8. Work Activity when Injured:	9. Was this work activity part of regular job?
176 Truck Driver	*005 Operate Haulage Truck*	Yes X No

10. Experience	Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days
a. This Work Activity:	*2*	*8*	*0*	b. Regular Job Title:	*2*	*8*	*0*	c: This Mine:	*2*	*32*	*0*	d. Total Mining:	*2*	*32*	*0*

11. What Directly Inflicted Injury or Illness?	12. Nature of Injury or Illness:
110 Vehicles, NEC	*140 Concussion -- brain, cerebral*

13. Training Deficiencies:
Hazard: | New/Newly-Employed Experienced Miner: | Annual: | Task:

14. Company of Employment: (If different from production operator)
Operator
Independent Contractor ID: (if applicable)

15. On-site Emergency Medical Treatment:
Not Applicable: | First-Aid: | CPR: | EMT: X | Medical Professional: | None:

16. Part 50 Document Control Number: (form 7000-1)

17. Union Affiliation of Victim: *2605* *United Steel Workers of America*