MAI-2010-24

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

REPORT OF INVESTIGATION

Surface Nonmetal Mine
(Dimension Sandstone)

Fatal Falling Material Accident
December 29, 2010

Martinez Stone
Martinez Stone
San Saba, San Saba County, Texas
Mine ID No. 41-04848

Investigators

Ralph Rodriguez
Supervisory Mine Safety and Health Specialist

Lance Miller
Mine Safety and Health Inspector

F. Terry Marshall
Mechanical Engineer

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

hydraulic lift arm cylinder

clevis

lift arm

rod eye

OVERVIEW

On December 29, 2010, Jesus M. Martinez, laborer, age 41, died while performing maintenance on a skid-steer loader. Martinez was attempting to replace a hydraulic lift arm cylinder on the loader when the lift arms accidentally lowered and pinned him against the frame of the loader.

The accident occurred because management failed to ensure safe work procedures were followed while maintenance was being performed on the skid-steer loader. The lift arms were not secured to prevent them from accidentally lowering. Martinez had not received new task training for operating or maintaining a skid-steer loader.

GENERAL INFORMATION

Martinez Stone, a surface dimension sandstone operation, owned and operated by Martinez Stone, is located near San Saba, San Saba County, Texas. The principal operating official is Juan Martinez, owner. The mine operates one 9-hour shift per day, five days per week. Total employment is 6 persons.

Sandstone is removed with a front-end loader after stripping 3 to 4 feet of overburden. Slabs of sandstone are moved with skid-steer loaders to a rock cutting machine where the stones are sized for sale. Final products are sold for residential construction purposes.

This operation had not been inspected prior to the accident because the mine operator did not provide a legal identity report to the Mine Safety and Health Administration (MSHA).

DESCRIPTION OF THE ACCIDENT

On the day of the accident, Jesus Martinez (victim) arrived at the mine at 7:00 a.m., his usual starting time. He worked at the rock cutting table during the morning and took a lunch break from noon to 1:00 p.m. After lunch, Juan Martinez, owner and the victim's nephew, instructed Jesus Martinez to replace the right hydraulic lift arm cylinder on a skid-steer loader because it was leaking hydraulic oil.

Jesus Martinez elevated the lift arms of the loader. Juan Martinez activated the lift arm support device by pulling the pin that secured it in a stowed position near the left hydraulic lift arm cylinder. Juan Martinez then left the area to operate a front-end loader.

Jesus Martinez removed the defective hydraulic lift arm cylinder and began installing a new hydraulic cylinder. He installed a pin in the eye at the base of the cylinder and attempted to line up the eye at the rod end of the cylinder with the clevis located about mid-length on the right lift arm of the loader.

Investigators concluded that Jesus Martinez encountered difficulty aligning the eye at the end of the rod with the clevis. Apparently, he attached the hydraulic hoses leading to the right hydraulic lift arm cylinder to move the rod. However, he did not sufficiently tighten the hose connections.

Jesus Martinez extended the right hydraulic lift arm cylinder rod and placed a 5/8-inch diameter by 21-inch long steel bar through the rod eye and clevis. He then stowed the lift arm support device and shut off the loader using the key switch.

At 2:00 p.m., Jesus Martinez told Juan Martinez the new hydraulic cylinder on the skid-steer loader was leaking oil. The rod end of the new cylinder was still unpinned with the 5/8-inch diameter bar in it.

Juan Martinez told Jesus Martinez to fix the hydraulic leak then watched as he walked to the skid-steer loader and attempted to enter the operator's compartment. Before he could enter the operator's compartment of the skid-steer loader, the hose connections for the right hydraulic lift arm cylinder failed, the hydraulic system lost pressure, and the lift arms lowered. The right lift arm of the loader pinned Jesus Martinez against the skid-steer loader frame.

Juan Martinez and other miners attempted unsuccessfully to manually raise the lift arms of the skid-steer loader to free Jesus Martinez. Another skid-steer loader was then used to raise the lift arms and the victim was moved to a safe position.

Juan Martinez called for emergency medical services (EMS). He then drove the victim toward a local hospital in a pickup truck. They met EMS after leaving the mine and EMS transferred the victim to the ambulance. Jesus Martinez was pronounced dead at 4:34 p.m. at the local hospital. The cause of death was listed as blunt force trauma.

INVESTIGATION OF THE ACCIDENT

On the day of the accident, MSHA was notified at 7:58 p.m. by an anonymous telephone call to the emergency call center alleging that a fatal accident had occurred at a mining operation near San Saba, Texas. Elwood Burris, staff assistant, was notified and inquiries were made the same day to determine the location of the mine.

The mine was located on December 30, 2010, but the mine operator and employees were not present when investigators arrived. The mine operator was located on January 3, 2011, with the assistance of the San Saba County Sheriff's Office. A legal identity report was completed and an order was issued under section 103(k) of the Mine Act to ensure the safety of all persons at the mine. Non-contributory citations were issued for failing to report the legal identity of the mine and failing to report the accident.

MSHA's investigators 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 and the San Saba County Sheriff's Office.

DISCUSSION

Location of the Accident

The accident occurred outdoors near a tool shed in the main rock cutting area of the mine. Weather conditions were clear skies with a temperature of 60 degrees Fahrenheit. The weather was not considered to be a contributing factor to the accident.

Skid-Steer Loader

The skid-steer loader involved in the accident was a 2007 Gehl model 6640E. It had a Deutz 3.1-liter diesel engine rated at 82 Hp at 2500 rpm and an operating weight of about

7,800 pounds. The skid-steer loader was equipped with a quick-attach hitch and fork attachment on the front of the loader.

The skid-steer loader had two double-acting hydraulic cylinders to raise the lift arms and two similar cylinders to tilt the front attachments. The four hydraulic cylinders were controlled by a T-bar control located in the right side of the operator's compartment of the loader.

The hydraulic circuits for both the lift and tilt functions of the loader were equipped with an interlock valve to prevent backflow of hydraulic oil from the cylinders to the hydraulic reservoir under specified conditions. These interlock valves were designed to close and prevent movement of the skid-steer loader components when the loader operator was absent from the seat, when the operator restraint bar was raised, or when the ignition key was in the OFF position.

Investigators found that two flexible hydraulic hoses had separated from where they connected to two rigid hydraulic lines attached to the right lift arm cylinder. The ends of the threads on both male portions of the connections were damaged, indicating that these connections had not been tightened adequately and then failed under pressure. One of the failed hose connections was located between the interlock valve for the lift arm circuit and the right lift arm cylinder.

The engine of the skid-steer loader was not running when the accident occurred and the ignition key was in the OFF position. However, the interlock valve for the lift arm hydraulic circuit was ineffective since lift pressure had been lost between the valve and the right lift arm. With no pressure to the lift arms and the lift arm support device stowed, the lift arms lowered accidentally.

The interlock valve functions for the lift arm and tilt hydraulic circuits of the skid-steer loader were tested with the hydraulic system intact and found to operate properly.

Training and Experience

Jesus M. Martinez (victim) had 4 years of mining experience including 5 weeks experience at this operation. He had received training in accordance with 30 CFR Part 46 at another mining operation but had not received any training at this operation.

Juan P. Martinez had 12 years of mining experience including 1 year, 6 months experience at this operation. He had not received training in accordance with 30 CFR Part 46 at this operation.

ROOT CAUSE ANALYSIS

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

Root Cause: Management had not established safe work procedures for persons to perform maintenance on a skid-steer loader.

Corrective Action: Management trained all persons regarding safe work procedures when performing maintenance, including proper blocking of equipment components to prevent them from accidentally lowering.

Root Cause: Management had not provided new task training for operating or maintaining a skid-steer loader to the victim.

Corrective Action: Management provided new task training to all persons regarding their respective work assignments.

CONCLUSION

The accident occurred because management failed to ensure safe work procedures were followed while maintenance was being performed on the skid-steer loader. The lift arms were not secured to prevent them from accidentally lowering. Martinez had not received new task training for operating or maintaining a skid-steer loader.

ENFORCEMENT ACTIONS

Order No. 8614431 was issued on January 3, 2011, under the provisions of Section 103(k) of the Mine Act:

A fatal accident occurred at this operation on December 29, 2010. This order is issued to assure the safety of all persons at this operation and prohibits operation of the Gehl skid-steer loader. 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 January 24, 2011, after conditions that contributed to the accident no longer existed.

Citation No. 6201573 was issued on January 21, 2011, under the provisions of Section 104(a) of the Mine Act for a violation of 30 CFR 56.14211(c):

A fatal accident occurred at this operation on December 29, 2010, when a miner was struck by the boom of a skid steer loader. The miner was replacing one of the boom lift cylinders when the boom accidentally lowered. The boom (raised component) was not blocked or mechanically secured to prevent accidental lowering.

This citation was terminated on January 24, 2011, after all persons were trained regarding blocking of equipment and equipment components.

Citation No. 6201574 was issued on January 21, 2011, under the provisions of Section 104(a) of the Mine Act for a violation of 30 CFR 46.7(a):

A fatal accident occurred at this operation on December 29, 2010, when a miner was struck by the boom of a skid steer loader. The miner was replacing one of the boom lift cylinders when the boom accidentally lowered. The mine operator had not provided new task training to the miner for operating or maintaining a skid-steer loader.

This citation was terminated on January 24, 2011, after all persons were provided new task training for their respective work assignments.

Approved:_____ Date:_____

Edward E. Lopez
District Manager

Appendix A

Persons Participating in the Investigation

Martinez Stone

Juan P. Martinez	Owner

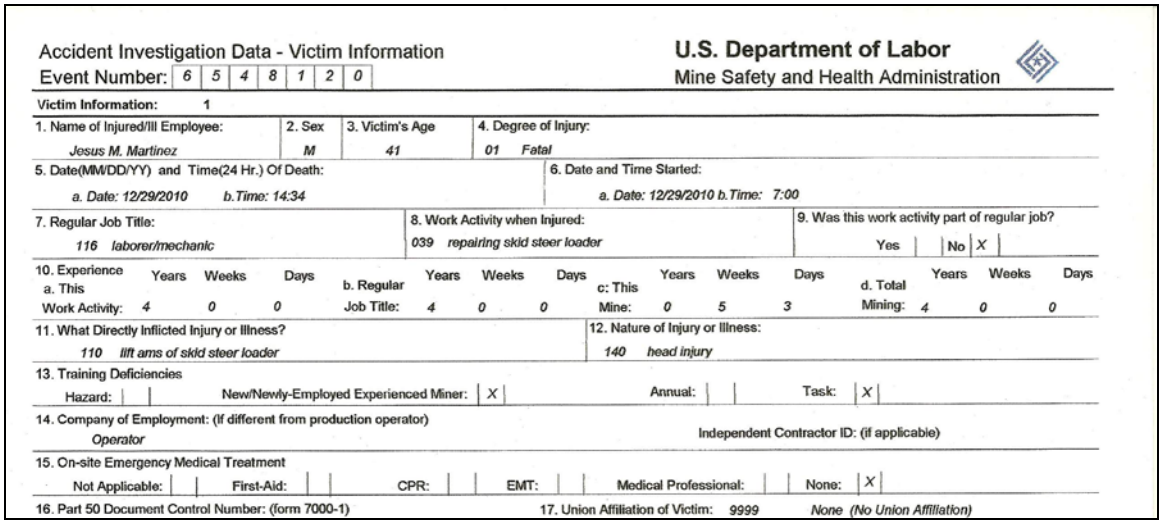
San Saba County Sheriff's Office

L. A. Brown	Sheriff
William Price	Chief Deputy

Mine Safety and Health Administration

Ralph Rodriguez	Supervisory Mine Safety and Health Inspector
Lance Miller	Mine Safety and Health Inspector
F. Terry Marshall	Mechanical Engineer

Appendix B



Accident Investigation Data - Victim Information

Event Number: 6 5 4 8 1 2 0

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:
Jesus M. Martinez	*M*	*41*	*01 Fatal*

5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:	6. Date and Time Started:
a. Date: 12/29/2010 b.Time: 14:34	*a. Date: 12/29/2010 b.Time: 7:00*

7. Regular Job Title:	8. Work Activity when Injured:	9. Was this work activity part of regular job?
116 laborer/mechanic	*039 repairing skid steer loader*	Yes | No X

10. Experience	Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days
a. This Work Activity:	*4*	*0*	*0*	b. Regular Job Title:	*4*	*0*	*0*	c: This Mine:	*0*	*5*	*3*	d. Total Mining:	*4*	*0*	*0*

11. What Directly Inflicted Injury or Illness?	12. Nature of Injury or Illness:
110 lift arms of skid steer loader	*140 head injury*

13. Training Deficiencies

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

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: | | Medical Professional: | | None: | X |

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

17. Union Affiliation of Victim: *9999* *None (No Union Affiliation)*