

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

REPORT OF INVESTIGATION

**Underground Metal Mine
(Molybdenum)**

**Fatal Powered Haulage Accident
May 17, 2013**

**Chevron Mining Inc.
Questa Mine & Mill
Questa, Taos County, New Mexico
Mine ID No. 29-01267**

Investigators

**William D. O'Dell
Mine Safety and Health Specialist**

**Lloyd B. Ferran
Mine Safety and Health Inspector**

**Steve M. Powroznik
Supervisory Mine Safety and Health Specialist**

**Originating Office
Mine Safety and Health Administration
South Central District
1100 Commerce Street, Room 462
Dallas, TX 75242-0499
Joseph O. Steichen, Acting District Manager**



OVERVIEW

On May 17, 2013, Isaac A. Garcia, Mucker, age 22, was killed when he was pinned between two loaded ore cars. An electric locomotive was pulling a train of 13 cars loaded with ore up a slight grade when the eleventh car derailed and uncoupled from the tenth car. Garcia was attempting to unhook the safety chain between the two ore cars.

The accident occurred due to management's failure to ensure that established safe procedures were followed while Garcia worked between ore cars. The victim did not notify the locomotive operator that he would be positioned between the two ore cars and he did not block the ore cars against hazardous motion. Additionally, the braking systems on the locomotive were not maintained in functional condition.

GENERAL INFORMATION

Questa Mine & Mill, an underground molybdenum mine, owned and operated by Chevron Mining Inc., is located near Questa, Taos County, New Mexico. The principal operating official is Phillip A. Howard, General Manager. The mine typically operates two 8-hour shifts per day, five days per week. Total employment is 168 persons.

Molybdenum ore is recovered using a block caving mining method. Broken ore is transported in rail ore cars underground then transported up a decline to the surface by belt conveyor. On the surface, the broken ore is crushed, ground and processed to yield molybdenum sulfide. Finished materials are placed into 4,000-pound bags and transported to customers by truck. Molybdenum is primarily used to make stainless and alloy steel.

The Mine Safety and Health Administration (MSHA) completed the last regular inspection at this operation on March 27, 2013.

DESCRIPTION OF THE ACCIDENT

On May 16, 2013, Isaac Garcia (victim) reported for work at 10:00 p.m., his usual starting time. Garcia was part of a 4-man crew but one of the crew members was absent that shift. Virgil Martinez, Locomotive Operator, and Kenneth Taylor, Mucker, started their shift at 8:00 p.m. because they needed to leave the mine early that shift.

Garcia went underground and met Taylor who was operating a battery locomotive. Virgil Martinez was operating an electric locomotive, pulling empty ore cars to the loading chutes and then pulling loaded ore cars to the loading pocket. Garcia and Taylor rode on the battery locomotive, offering assistance for Virgil Martinez such as opening air doors and providing additional locomotive power when needed to move the ore cars.

On May 17, 2013, about 1:00 a.m., Virgil Martinez, operating the electric locomotive, pulled 13 loaded ore cars into an area known as the D-Ore South Ladder. The battery locomotive followed close behind but was not connected to the train even though the cars were being pulled up a slight grade.

About 1:15 a.m., Virgil Martinez radioed Garcia and Taylor to tell them that one of the loaded ore cars had derailed. Garcia responded that he would check it out. He exited the battery locomotive and started walking upgrade toward the front of the train. Garcia soon discovered that the eleventh car, from the front of the train, had derailed and was disconnected from the tenth car but the safety chain between the two cars was still hooked. He radioed Virgil Martinez and told him briefly what he saw.

Garcia removed the safety chain between the two ore cars. At that time, the tenth ore car moved a few inches downgrade. Garcia had not notified Virgil Martinez that he was going between the two ore cars and the ore cars had not been blocked against hazardous motion. Blocking was usually accomplished by placing a chain behind the wheels of the ore cars.

After parking the battery locomotive, Taylor started walking and was only moments behind Garcia. By the time Taylor reached the derailment, Garcia was pinned between the tenth and eleventh ore cars. Virgil Martinez radioed Garcia and Taylor several times without a response then radioed Anton Leon, Step-up Supervisor, for assistance. Leon, who had been monitoring the radio traffic, walked to the derailment and found Garcia pinned between the two ore cars.

Leon radioed Virgil Martinez and told him to move the ore cars forward. When they moved, Leon freed Garcia from the two ore cars, directed Taylor and Virgil Martinez to assist, and radioed for additional help from other miners in the area.

Garcia was stabilized and placed on a back board then transported to the shaft and hoisted to the surface. During this time, Leon and Veto Vialpando, Jr., Shift Safety Specialist, administered first aid and began cardiopulmonary resuscitation (CPR.)

At 2:04 a.m., Emergency medical services (EMS) arrived and relieved Leon and Vialpando. When EMS could not revive Garcia, they called The New Mexico Medical Investigator's Office and Garcia was pronounced dead (by telephone) at 3:40 a.m. The cause of death was attributed to blunt force injuries.

INVESTIGATION OF THE ACCIDENT

MSHA was notified of the accident at 1:41 a.m. by a telephone call from James Martinez, Hoist Operator, to the National Call Center. The National Call Center notified Elwood Burriss, Staff Assistant, and an investigation was started the same day. An order was issued under provisions of Section 103(j) of the Mine Act. This order was later modified

to Section 103(k) of the Mine Act after the arrival of an Authorized Representative at the mine site.

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, employees, and the miners' representative.

DISCUSSION

Location of the Accident

The accident occurred in the D-Ore South Ladder area of the underground mine. This area was on the rail haulage level of the mine where broken ore was loaded, hauled and dumped. The immediate area of the accident was a 12-foot by 12-foot drift that had a steel track with wooden cross ties ballasted with crushed rock. The drift was slightly upgrade from the entrance going into the area. The track had a 42-inch gauge with 90-pound rails.

Electric Locomotive

The locomotive involved in the accident was a 28-ton electric (trolley) model with two drive motors. It was 6.2 feet high, 6.6 feet wide, and 19.4 feet long. The locomotive was equipped with a dynamic braking system and friction brakes. It also had an on-board air compressor to provide air pressure to release the spring actuated friction brakes.

The dynamic braking system was used to slow the locomotive by creating resistance within the drive motors and was the primary braking system for the locomotive. When inspected, investigators found the dynamic braking system was not functional. Without a functional dynamic braking system, the locomotive operator would have relied on the friction brakes, resulting in premature wear of the friction brake components.

The friction brakes on the locomotive were engaged when the locomotive was parked and turned off. However, when the locomotive was energized and air pressure was available, the locomotive operator could depress a "dead-man" pedal to release the friction brakes. The locomotive operator could then gradually apply the friction brakes with a hand lever or fully engage the friction brakes by releasing the "dead-man" pedal.

Upon inspection of the friction brakes, investigators found that they had not been maintained in functional condition. The brake pads on the right side of the locomotive did not contact the wheels and the brake pads on the left side of the locomotive were severely worn. When tested the day after the accident, the friction brakes would not hold the locomotive on the grade where the accident occurred.

Ore Cars

The ore cars involved in the accident were 10-ton cars that were 6.0 feet high, 6.4 feet wide, and 13.3 feet long. The ore cars were not equipped with brakes but depended upon

the braking power of the locomotive(s) moving them to stop. Each ore car was equipped with a coupling on either end for connecting it to either another ore car or to a locomotive. Each car was also equipped with a safety chain on one end and a means of attaching a safety chain on the opposite end of the car.

TRAINING AND EXPERIENCE

Isaac A. Garcia (victim) had 31 weeks of mining experience, all at this mine. A representative of MSHA's Educational Field Services reviewed the training records for Garcia and found he had received all required training, including task training and annual refresher training. Garcia's training was found to be in compliance with MSHA requirements.

ROOT CAUSE ANALYSIS

The investigators conducted a root cause analysis and the following root causes were identified:

Root Cause: Management did not ensure established safe work procedures were being followed while Garcia attempted to unhook the safety chain between two ore cars. The locomotive operator was not notified before Garcia went between two ore cars.

Corrective Action: Although they had been trained, management retrained all miners regarding established procedures to be followed when rail cars derail on the track. Miners will not be positioned between rail cars until they notify the locomotive operator of their intentions and he acknowledges their presence.

Root Cause: Management did not ensure established safe work procedures were followed while Garcia attempted to unhook the safety chain between two ore cars. The ore cars were not blocked against hazardous motion before the victim went between them.

Corrective Action: Although they had been trained, management retrained all miners regarding established procedures to be followed when rail cars derail on the track. Management instructed miners to block rail haulage equipment against hazardous motion before working on derailed ore cars.

Root Cause: Management did not ensure the braking systems on the locomotive were maintained in functional condition.

Corrective Action: The locomotive was removed from service.

CONCLUSION

The accident occurred due to management's failure to ensure that established safe procedures were followed while Garcia worked between ore cars. The victim did not notify the locomotive operator that he would be positioned between the two ore cars and he did not block the ore cars against hazardous motion. Additionally, the braking systems on the locomotive were not maintained in functional condition.

ENFORCEMENT ACTIONS

Issued to Chevron Mining Inc.

Order No. 8687862 – Issued on May 17, 2013, under the provisions of Section 103(j) of the Mine Act. An Authorized Representative modified this order to Section 103(k) of the Mine Act upon arrival at the mine site:

On May 17, 2013, a fatal accident occurred at the underground haulage level at the south D-ore body entrance area. A verbal 104(j) order was issued and was modified to a 104(k) order upon arrival to the mine. This Order is being issued to assure the safety of all persons at this level until MSHA has determined that it is safe to resume normal mining operations in this area. The mine operator shall obtain prior approval from the authorized representative for all actions to recover and /or restore operations to the affected area.

This order was terminated on May 21, 2013, when conditions that contributed to the accident no longer existed.

Citation No. 6244612 – Issued under provisions of Section 104(a) of the Mine Act for a violation of 30 CFR 57.9319(b):

A fatal accident occurred at this underground operation on May 17, 2013, when a miner was pinned between two loaded ore cars. The eleventh car of a train of 13 ore cars derailed and uncoupled from the tenth car while being pulled up a grade by an electric locomotive. The victim did not notify the train operator that he was going between the two ore cars.

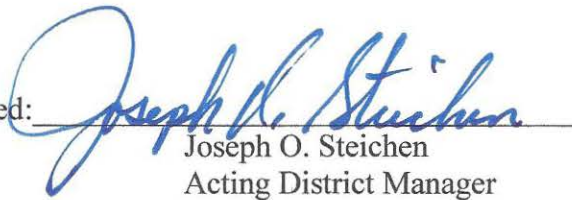
Citation No. 8767397 – Issued under provisions of Section 104(a) of the Mine Act for a violation of 30 CFR 57.14102:

A fatal accident occurred at this underground operation on May 17, 2013, when a miner was pinned between two loaded ore cars. The eleventh car of a train of 13 ore cars derailed and uncoupled from the tenth car while being pulled up a grade by an electric locomotive. The braking systems on the locomotive were not maintained in functional condition.


Citation No. 8767398 – Issued under provisions of Section 104(a) of the Mine Act for a violation of 30 CFR 57.14105:

A fatal accident occurred at this underground operation on May 17, 2013, when a miner was pinned between two loaded ore cars. The eleventh car of a train of 13 ore cars derailed and uncoupled from the tenth car while being pulled up a grade by an electric locomotive. The ore cars were not blocked against hazardous motion before the victim attempted to disconnect the safety chain between the two cars.

Approved: _____


Joseph O. Steichen
Acting District Manager

Date: _____



APPENDIX A

PERSONS PARTICIPATING IN THE INVESTIGATION

Chevron Mining Inc.

Joel Giarrizzo	Senior Safety Specialist
David Hamm	Training Specialist
Phillip Howard	General Manager
John Martinez	Shift Safety Specialist
Daniel McClain	Health and Safety Manager
James Trujillo	Shift Safety Specialist

Unite Steel Workers of America

Joel Flory	Miners' Representative
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Mine Safety and Health Administration

William D. O'Dell	Mine Safety and Health Specialist
Lloyd B. Ferran	Mine Safety and Health Inspector
Steve M. Powroznik	Supervisory Mine Safety and Health Specialist

APPENDIX B

Accident Investigation Data - Victim Information										U.S. Department of Labor																	
Event Number: 6 6 0 9 6 2 2										Mine Safety and Health Administration																	
Victim Information: 1																											
1. Name of Injured/Ill Employee: <i>Isaac A. Garcia</i>			2. Sex <i>M</i>	3. Victim's Age <i>22</i>		4. Degree of Injury: <i>01 Fatal</i>																					
5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 05/17/2013 b. Time: 3:40</i>						6. Date and Time Started: <i>a. Date: 05/16/2013 b. Time: 22:00</i>																					
7. Regular Job Title: <i>029 mucker</i>				8. Work Activity when Injured: <i>015 unhooking safety chains</i>				9. Was this work activity part of regular job? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																			
10. Experience																											
a. This	Years		Weeks		Days		b. Regular	Years		Weeks		Days		c. This	Years		Weeks		Days		d. Total	Years		Weeks		Days	
Work Activity:	<i>0</i>		<i>31</i>		<i>4</i>		Job Title:	<i>0</i>		<i>31</i>		<i>4</i>		Mine:	<i>0</i>		<i>31</i>		<i>4</i>		Mining:	<i>0</i>		<i>31</i>		<i>4</i>	
11. What Directly Inflicted Injury or Illness? <i>127 Movement of Ore cars</i>										12. Nature of Injury or Illness: <i>170 Blunt force trauma</i>																	
13. Training Deficiencies: Hazard: <input type="checkbox"/> New/										Newly-Employed		Experienced Miner:		Annual: <input type="checkbox"/>		Task: <input type="checkbox"/>											
14. Company of Employment: (if different from production operator) <i>Operator</i>										Independent Contractor ID: (if applicable)																	
15. On-site Emergency Medical Treatment: Not Applicable: <input type="checkbox"/> First-Aid: <input checked="" type="checkbox"/>										CPR: <input checked="" type="checkbox"/>		EMT: <input checked="" type="checkbox"/>		Medical Professional: <input type="checkbox"/>		None: <input type="checkbox"/>											
16. Part 50 Document Control Number: (form 7000-1)										17. Union Affiliation of Victim: <i>2605 United Steel Workers of America</i>																	