

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

REPORT OF INVESTIGATION

Surface Metal Mine
(Gold Ore)

Fatal Falling Material Accident
October 9, 2008

South Area
Newmont USA Limited
Carlin, Eureka County, Nevada
Mine ID No. 26-00500

Investigators

Ronald J. Jacobsen
Supervisory Mine Inspector

Randall S. Adamson
Mine Safety and Health Inspector

James B. Pfeifer
Civil Engineer

Joseph N. Rhoades
Mine Safety and Health Specialist

Originating Office
Mine Safety and Health Administration
Western District
2060 Peabody Road, Suite 610
Vacaville, California 95687
Arthur L. Ellis, District Manager

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Victim was pinned here

OVERVIEW

Ronald W. Keen, welder, age 56, was fatally injured on October 9, 2008. Keen and another miner were disassembling a tool rack in preparation to move it to a new truck shop. Three steel plates had been removed from the front section of the tool rack, placed on the shop floor and leaned against the tool rack. The weight of the detached plates caused the tool rack to rotate, slide, and topple onto the victim and the other miner, who was hospitalized and later released.

The accident occurred because management failed to establish procedures to ensure that persons could safely disassemble the tool rack. A risk assessment to discuss the task with the miners and identify possible hazards was not conducted prior to performing the task. The steel plates were positioned in a manner which created a fall of material hazard.

GENERAL INFORMATION

The South Area mine, a surface gold ore operation, owned and operated by Newmont USA Limited, was located in Carlin, Eureka County, Nevada. The principal operating official was Gary Dowdle, surface mining operations manager. The mine operated two 12-hour shifts per day, seven days per week. Total employment was 1,241 persons.

Gold ore was drilled, blasted, and loaded into haul trucks by electric shovels and front end loaders. The trucks hauled the ore to the milling operation to be processed. The finished products were sold to commercial industries.

The last regular inspection at this operation was completed on August 25, 2008.

DESCRIPTION OF ACCIDENT

On the day of the accident, Ronald W. Keen, reported for work at 6:00 a.m., his normal starting time. Kevin Dowdle, shop foreman, assigned Keen to finish welding on a haul truck and then to disassemble a tool rack in the tool room.

About 11:00 a.m., Keen started disassembling the tool rack. At 1:00 p.m., Ernest Lopez, welder, arrived to help Keen. They worked simultaneously cutting welds off each 4-foot by 8-foot by ¼-inch steel plate with a torch and grinder, leaving only a few spot welds to hold the plates in place. Keen and Lopez worked together to remove the steel plates by using a hand held sledge hammer to hit the last few welds on each plate. Once the plates were removed, the miners set them on the floor and leaned them against the tool rack frame.

A total of five plates needed to be removed. After three plates were removed and leaned against the frame, Lopez began removing the welds off the fourth plate. Keen started removing the welds off the last plate that measured 2 feet by 8 feet by ¼ inch. At 2:35 p.m., the weight of the plates leaning against the frame caused it to rotate 90 degrees and topple onto Lopez and Keen. The rack completely covered Keen and pinned Lopez's legs. Lopez was able to free himself from the rack.

Jason Geesey, laborer, was working in the next room and observed the tool rack falling on Keen and Lopez. He immediately ran to lift the tool rack off Keen but it was too heavy. Geesey shouted for help. Joseph Gretch, tire mechanic, Zachary Frederick, tire technician, and Ed Probst, mechanic, came and lifted the tool rack off Keen. Newmont emergency medical technicians (EMT) responded and began cardiopulmonary resuscitation (CPR). Keen was transported by ambulance to a local hospital where he was pronounced dead. The cause of death was attributed to blunt force trauma.

INVESTIGATION OF THE ACCIDENT

On the day of the accident, the Mine Safety and Health Administration (MSHA) was notified of the accident at 2:50 p.m., by a telephone call from Donald Neff, regional director of safety, to James Fitch, supervisory mine safety and health inspector. 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 investigation team traveled to the mine, made a physical inspection at the accident scene, interviewed employees, and reviewed conditions and work procedures relevant to the accident. MSHA conducted the investigation with the assistance of mine management and employees, and the State of Nevada.

DISCUSSION

Location of the Accident

The accident occurred in a tool room just off the main floor of the truck shop. The truck shop was located across from the company's offices just inside the main gate to the mine. The concrete floor was dry and free of debris.

Description of the Tool Rack

The tool rack involved in the accident was a triangular-shaped A-frame approximately 8 feet high, 18 feet long, and 21 inches wide at the base. Each vertical back leg of the frame (6 legs total) consisted of a 4-inch wide steel channel section. The four angled front legs consisted of 3-inch wide steel channel sections. The top and bottom horizontal rails on the back of the frame were 4-inch wide channels. Individual steel anchor plates measuring $\frac{1}{4}$ -inch thick and 4 inches wide were attached to the base of each front channel leg. The lengths of the anchor plates varied from approximately 4 inches to 8 inches. Some of these plates contained approximately $\frac{3}{4}$ -inch diameter holes for anchorage into the floor; however, the tool rack was not anchored during the dismantling operation.

Steel plates, $\frac{1}{4}$ -inch thick, were used for the construction of two horizontal shelves inside the frame structure. The shelves spanned the entire length of the tool rack and were accessible from the back. The shelves were supported with 2-inch by 2-inch by $\frac{1}{4}$ -inch thick angle sections. The steel plates were fastened along the front sloping face of the tool rack. Dowel rods were installed to hold miscellaneous equipment parts and tools. The steel plates on the front face of the tool rack were 4 feet wide and 8 feet long, except for the plate at the northern end. That plate filled in the remaining gap in the frame and was approximately 2 feet wide and 8 feet long. Dowel rods approximately

½-inch in diameter and 4 to 12 inches long were welded to the steel plates on the front side of the tool rack. The connections on the tool rack were welded.

Stability of the Frame

Investigators determined that the fully assembled tool rack, without the additional weight of any tools or equipment, was relatively stable. An analysis indicated that fully assembled, a lateral force of approximately 450 pounds, acting at a height of 5 feet above the floor, would cause the tool rack to overturn. However, the analyses indicated that the tool rack became less stable, with respect to overturning, as each plate was removed. This was partly caused by the weight of the mounted steel plate that provided resistance to overturning when an external lateral force was applied. With two thirds of the face removed (at failure condition), a lateral force of approximately 250 pounds, acting at a height of 5 feet above the floor, would cause the tool rack to overturn.

The stability of the tool rack, with respect to overturning, was analyzed assuming that the tops of the detached plates were contacting the front face of the tool rack at decreasing heights. This situation represented the failure condition when the tool rack slid away from the detached plates. The analysis indicated that two, 4-foot by 8-foot plates, acting at a height of 6 to 7 feet above the floor, would cause the tool rack to overturn. The analyses also indicated that the tool rack would not have overturned if only one 4-foot by 8-foot plate had slid down the face of the tool rack.

Several factors could have contributed to the rotating and toppling of the tool rack. First, the bottom rail of the tool rack was not level along its entire length. About 6 feet from the northern end, the bottom rail protruded approximately ¼ inch. This low spot may have acted as a fulcrum causing the downward force on the southern end of the tool rack to be reduced. Resistance to sliding (friction) decreased as the normal force (downward force) decreased. Additionally, this low spot on the bottom rail appeared to have been the pivot point around which the tool rack rotated.

Second, the floor slab was cracked and slightly elevated (¼ inch over a distance of less than 3 feet) at the area near the approximate location where the bottom of the tool rack stopped sliding. The slight rise in elevation and the crack in the floor could have caused the tool rack to stop sliding more abruptly than if only frictional forces were acting on it. The abrupt stop in sliding could have initiated the toppling of the tool rack.

Weather Conditions

The weather conditions on the day of the accident were partly cloudy and windy with a temperature of approximately 58 degrees Fahrenheit. The miners were working inside a tool room and weather was not considered to be factor in the accident.

Experience and Training

Ronald Keen, welder, had 21 years and 8 weeks of experience all at this mine. He had received training in accordance with 30 CFR, Part 48.

Ernest Lopez, welder, had 20 years and 19 weeks of experience all at this mine. He had received training in accordance with 30 CFR, Part 48.

ROOT CAUSE ANALYSIS

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

Root Cause: Management failed to establish policies and procedures to ensure that persons could safely disassemble the tool rack. A risk assessment to determine potential hazards and to establish safe work procedures was not conducted prior to performing the task.

Corrective Action: Management should establish policies and procedures to ensure that persons could safely disassemble the tool rack. A risk assessment should be conducted to identify and correct potential hazards associated with the task to be performed. All persons performing the work should be trained regarding the established policies and procedures.

CONCLUSION

The accident occurred because management failed to establish procedures to ensure that persons could safely disassemble the tool rack. A risk assessment to discuss the task with the miners and identify possible hazards was not conducted prior to performing the task. The steel plates were stacked in a manner which created a fall of material hazard.

ENFORCEMENT ACTION

Order No. 6394689 was issued on October 9, 2008, under provisions of Section 103 (k) of the Mine Act:

A fatal accident occurred at this operation on October 9, 2008, when two miners were attempting to dismantle a tool rack inside of the tool room in the #2 truck shop. This order is issued to assure the safety of all persons at this operation. It prohibits all activity at the #2 truck shop tool room until MSHA has determined it 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 October 11, 2008, after conditions that contributed to the accident no longer existed.

Citation No. 6392849 was issued on December 11, 2008, under provisions of Section 104 (a) of the Mine Act for a violation of 30 CFR 56.16001:

A miner was fatally injured on October 9, 2008, while he was in the process of dismantling a tool rack. The tool rack measured 218 inches long by 98 inches tall and was a slanted "A" frame rack that measured approximately 20 inches at the base and 6 inches at the top. The miners had removed three, 4 by 8 feet, ¼ inch thick plates of steel and stacked the plates against the unsecured structure of the A frame. While the miners were removing the last two plates, the weight of the steel plates caused the rack to rotate about 90 degrees and fall over on top of one of them. The plates constituted construction supplies and were stacked in a manner which created a fall of material hazard.

This citation was terminated on December 18, 2008, after the tool rack was placed on blocks on the shop floor to continue the dismantling process. The mine operator established procedures to dismantle other tool racks in the future. All persons were trained regarding the new procedures.

Approved by:

Arthur L Ellis, District Manager

Date:

APPENDICES

- A. Persons Participating in the Investigation
- B. Victim Information Sheet

Appendix A

Persons Participating in the Investigation

Newmont USA Limited

Richard J. Tucker	senior manager of compliance and safety relations
Christopher A. Mabey	regional director of safety
Donald W. Neff	safety specialist

State of Nevada, Mine Safety & Training Section

Michael Anderson	mine inspector
Mike Martindale	mine inspector

Mine Safety and Health Administration

Ronald J. Jacobsen	supervisory mine inspector
Randall S. Adamson	mine safety and health inspector
Joseph N. Rhoades	mine safety and health specialist
James B. Pfeifer	civil engineer

Appendix B

Accident Investigation Data - Victim Information

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



Event Number:

Victim Information: 1

1. Name of Injured/Ill Employee: <i>Ronald W. Keen</i>	2. Sex <i>M</i>	3. Victim's Age <i>56</i>	4. Degree of Injury: <i>01 Fatal</i>
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5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: <i>a. Date: 10/09/2008 b. Time: 15:43</i>	6. Date and Time Started: <i>a. Date: 10/09/2008 b. Time: 6:00</i>
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7. Regular Job Title: <i>121 Welder</i>	8. Work Activity when Injured: <i>093 Dismantling a tool rack</i>	9. Was this work activity part of regular job? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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10. Experience a. This Work Activity: <i>0</i> <i>0</i> <i>2</i>	b. Regular Job Title: <i>18</i> <i>20</i> <i>0</i>	c. This Mine: <i>21</i> <i>8</i> <i>0</i>	d. Total Mining: <i>21</i> <i>8</i> <i>0</i>
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11. What Directly Inflicted Injury or Illness? <i>019 Tool rack fell on top of miner</i>	12. Nature of Injury or Illness: <i>170 Crushing injuries to neck, back and head</i>
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13. Training Deficiencies:			
Hazard: <input type="checkbox"/>	New/Newly-Employed Experienced Miner: <input type="checkbox"/>	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)
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15. On-site Emergency Medical Treatment:			
Not Applicable: <input type="checkbox"/>	First-Aid: <input 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</i>	<i>United Steel Workers of America</i>
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