

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

REPORT OF INVESTIGATION

**Underground Metal Mine
(Gold Ore)**

**Fatal Electrical Accident
May 23, 2005**

**Placer Turquoise Ridge, Inc.
Turquoise Ridge Mine
Golconda, Humboldt County, Nevada
Mine ID No. 26-02286**

Investigators

**D. Scott Horn
Supervisory Mine Safety and Health Inspector**

**Kevin G. Hirsch
Mine Safety and Health Inspector**

**Bruce A. Grange
Mine Safety and Health Inspector**

**Arlie B. Massey
Supervisory Electrical Engineer**

**Robert C. Boring
Electrical Engineer**

**Originating Office
Mine Safety and Health Administration
2060 Peabody Road, Suite 610
Vacaville, California 95687
Ronald S. Goldade, Acting District Manager**

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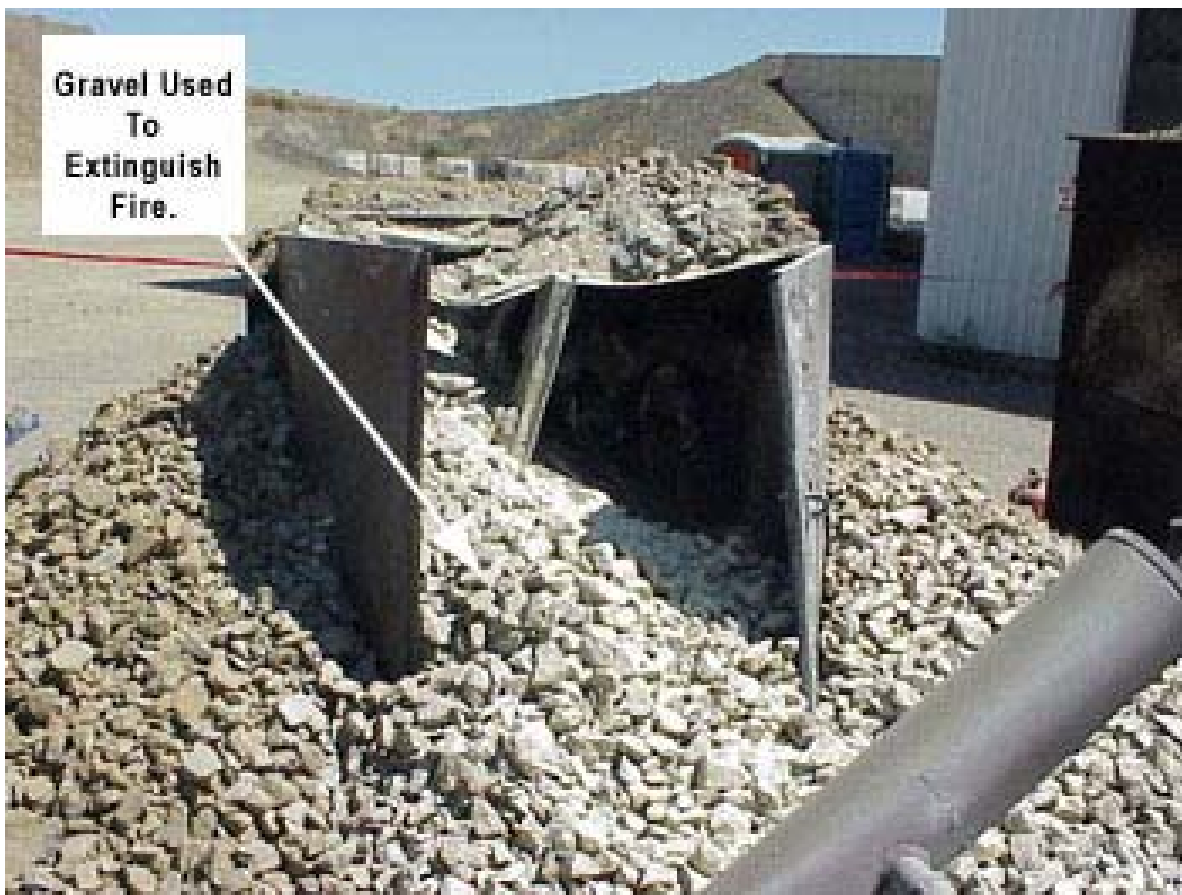
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Gravel Used
To
Extinguish
Fire.



OVERVIEW

Kevin Ball, electrical foreman, age 48, was fatally injured on May 23, 2005, when he contacted an energized component inside a 13800:2400 volt transformer. The victim was checking the stress cones on the primary side of the transformer for excessive dust buildup.

The accident occurred because the operating procedures and controls in place did not ensure that the power circuit was de-energized, locked out, tagged, and tested prior to performing work inside the transformer.

GENERAL INFORMATION

Turquoise Ride Mine, an underground gold mine, owned and operated by Placer Turquoise Ridge, Inc., was located in Golconda, Humboldt County, Nevada. The principal operating official was John Mansanti, general manager. The mine normally operated two 11-hour shifts per day, 7 days a week. Total employment was 312 persons.

Gold ore was drilled, blasted, and transported to the surface via a hoisting system. It was stockpiled, sampled, and hauled off site to a plant for processing.

The last regular inspection at this operation was completed on February 7, 2005.

DESCRIPTION OF ACCIDENT

On the day of the accident, Kevin Ball (victim) began the shift at 7:00 a.m. by conducting the daily safety meeting with the electricians and reviewing various tasks to be performed that day. The meeting concluded about 8:00 a.m.

About 1:00 p.m., Dale Schofield, service maintenance foreman, instructed Page Adkins, electrician, to begin repairing the dewatering well #2 (DW-2) pump so it could be placed back in service. The pump had not been used for approximately five years.

Adkins first went to the #1 outby tapbox to ensure that power was still supplied to the DW-2 transformer and well pump (see Appendix B). While wearing high voltage gloves, he then unlocked the DW-2 transformer and verified that the switch that disconnects power from the secondary side of the transformer was in the open position. Adkins locked the transformer doors and pulled the motor leads at the DW-2 control box.

After pulling the leads, Adkins realized that he brought the wrong megger for measuring the motor. Since Adkins was unable to contact Ball, he traveled to Ball's office. Ball and Adkins went to the electrical shop, picked up the appropriate instrument, and went back to the pump controls to complete the job.

While working on the pump, Adkins commented to Ball that he had seen a lot of dust buildup on the stress cones in the transformer when he had looked inside earlier. At approximately 3:10 p.m., they walked to the DW-2 transformer and unlocked the doors. Although Adkins told Ball the transformer was energized, Ball reached inside the transformer to inspect the material buildup and contacted the energized components.

Emergency medical personnel were called. The victim was pronounced dead at the scene by the Humboldt County coroner. Death was attributed to electrocution.

INVESTIGATION OF ACCIDENT

MSHA was notified of the accident at 3:35 p.m. on May 23, 2005, by a telephone call from Brad Wigglesworth, safety director, to Kevin Hirsch, mine safety and health inspector. An investigation began the same day. An order was issued pursuant to 103(k) of the Mine Act to ensure the safety of the miners. MSHA's accident investigation team traveled to the mine, conducted a physical inspection of the accident scene, interviewed persons, and reviewed conditions and work practices relevant to the accident. MSHA conducted the investigation with the assistance of mine management and employees.

DISCUSSION

Location

The accident occurred on the surface at the DW-2 transformer. The weather was dry and hot with a temperature of approximately 80 degrees Fahrenheit.

Power System

Power to the Turquoise Ridge Substation was supplied by Sierra Pacific Power Company at 120KV. The circuit traveled through a set of disconnects and a circuit switcher into a transformer which stepped the voltage down to 13.8KV. The transformer was connected delta-wye and was solid grounded. The secondary was designed to be resistance grounded through a 320-Ohm neutral grounding resistor, but the investigation showed that the resistor was shorted through a connection made at point SL on the regulators and the station ground field.

The circuit traveled through another set of disconnects, a set of wye-connected voltage regulators, and a substation vacuum circuit breaker (VCB). The circuit traveled through an underground conduit to a 15DV switch-house, containing a main VCB and eight VCBs known as Feeder Breakers Nos. 1-8. Feeder Breaker No. 7 supplied the circuit involved in the accident. Switches were installed across the voltage regulators and the substation VCB for by-pass purposes.

The circuit from Feeder Breaker No. 7 traveled through an underground conduit to the 2nd outby tapbox where it further supplied three branch circuits and the 1st outby tapbox. The 1st outby tap box supplied power to two circuits – the batch plant and the DW- 2 transformer. The victim contacted the center insulator in the input compartment of the DW-2 transformer.

Transformer

The transformer was manufactured by Betz and measured approximately 52 inches on each side. The primary side was 13800 volts and the secondary side was 2400 volts. The 1st outby tapbox was directly upstream and the dewatering pump was located directly downstream. The transformer was located four feet from the well pump controls.

Experience and Training

Kevin Ball had 15 years of mining experience and had received 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: Management policies, standards, and controls were inadequate. The DW-2 transformer circuit was not de-energized, locked out, tagged, and tested prior to performing work inside the transformer enclosure.

Corrective Action: Management should establish procedures to ensure that power circuits are de-energized, locked out, tagged, and the circuit tested prior to performing any electrical work on individual circuits.

CONCLUSION

The accident occurred because the operating procedures and controls in place did not ensure that the DW-2 transformer circuit was de-energized, locked out, tagged, and tested prior to performing work inside the transformer enclosure.

ENFORCEMENT ACTIONS

Order No. 6372195 was issued on May 23, 2005, under the provisions of Section 103(k) of the Mine Act:

The mine experienced a fatal accident on May 23, 2005, at the #2 De-watering well surface transformer. This order is issued to ensure the safety of any person at the mine until an examination or investigation is made to determine that the transformer and the area surrounding the DW#2 transformer as barricaded is safe as determined by an Authorized Representative of the Secretary of Labor. The mine operator shall obtain prior approval from an Authorized Representative for all actions to recover and/or restore operations to the affected area.

The order was terminated on August 18, 2005. The conditions that contributed to this accident no longer existed and normal operations could resume.

Citation No. 6375126 was issued on July 22, 2005, under the provisions of Section 104(d)(1) of the Mine Act for violation of 30 CFR 57.12017:

A fatal accident occurred at this mine on May 23, 2005, when the electrical foreman contacted an energized component while working on the high voltage side of a transformer. The victim opened the access doors and reached inside the transformer enclosure when the accident occurred. Prior to opening the transformer doors, the electrical foreman was informed that the power was not de-energized; nonetheless, he

proceeded with the work. Failure to de-energize and lock out the power circuit prior to working on the transformer constitutes more than ordinary negligence and is an unwarrantable failure to comply with a mandatory standard.

This citation was terminated on July 22, 2005. The mine operator conducted a formal review of the lock-out procedures with all of the miners.

Approved By:

Ronald S. Goldade
Acting District Manager

Date

Appendix
Persons Participating in the Investigation

Placer Turquoise Ridge, Inc.

Brad Wigglesworth	safety director
John G. Mansanti	mine general manager
Stephen B. Jarvis	regional safety coordinator

Turkenburg Power Systems, Inc.

John H. Turkenburg, P. E.	electrical engineer
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Exponent Failure Analysis Associates

Brian F. Gsell, M.Sc.	senior engineer
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Jackson & Kelly

Timothy R. Olson	attorney
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State of Nevada

Brett R. Harris	mine inspector
Edward M. Tomany	chief administrative officer/mine inspector
Cindy L. Hartman	boiler and pressure vessel inspector/mine inspector

Mine Safety and Health Administration

D. Scott Horn	supervisory mine inspector
Kevin G. Hirsch	mine safety and health inspector
Bruce A. Grange	mine safety and health inspector
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