MAI-2011-09

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

# REPORT OF INVESTIGATION

Surface Nonmetal Mine
(Sand and Gravel)

Fatal Electrical Accident
September 13, 2011

Plant #1
DeAtley Crushing Co.
Oakesdale, Whitman County, Washington
Mine ID No. 10-01658


Investigators

Gary W. Hebel
Supervisory Mine Safety and Health Inspector

Merlin J. McMullen
Mine Safety and Health Inspector

Maxwell A. Clark
Electrical Engineer

Originating Office
Mine Safety and Health Administration
Western District
991 Nut Tree Road, Second Floor
Vacaville, California 95687
Wyatt S. Andrews, District Manager

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## OVERVIEW

James Hussey, quality control person, age 38, was killed on September 13, 2011, while working on an energized electrical circuit. Hussey was attempting to reverse the polarity on an energized power cable at a control trailer when he received a fatal electrical shock.

The accident occurred because management procedures failed to ensure that persons de-energize an electrical circuit prior to performing work on it. The system was not locked out, tagged out, or tested to verify it was de-energized.

## GENERAL INFORMATION

Plant #1, owned and operated by DeAtley Crushing Co., is a portable operation producing construction sand and gravel. The principal operating official is Brien DeAtley, President. At the time of the accident, Plant #1 was located approximately 5 miles east of Oakesdale, Washington on State Route 27. The mine operates one shift per day, five days a week. Total employment is 10 persons.

The last regular inspection at this operation was completed on August 21, 2011.

## DESCRIPTION OF THE ACCIDENT

On the day of the accident, September 13, 2011, James Hussey (victim) reported for work at 6:00 a.m. Hussey, Andy Heitzman, Superintendent, and Brian Goedhart, Nicholas Kress, Jeff Graybill, and Jason Bentley, crew members, replaced two Caterpillar SR4B generators with two new generators of the same type and size for the portable crushing plant.

At approximately 9:20 a.m. the newly installed generators were started for rotation testing of the motors. While testing, they found the motor rotation from one generator was reversed, requiring two phase conductors to be swapped. Hussey hand signaled to Bentley to turn off the generator and then began working on the cable connections located on the opposite side of the MCC trailer. He placed a metal wrench onto the exposed connections and was electrocuted when he contacted an energized conductor. Heitzman called for Emergency Medical Services. (EMS). Cardiopulmonary Resuscitation (CPR) was performed until local paramedics arrived on scene.

## INVESTIGATION OF THE ACCIDENT

The Mine Safety and Health Administration (MSHA) was notified at 10:30 a.m. PST, by a telephone call from Michael Osburn, estimator/safety manager, to MSHA's emergency call center. Kevin G. Hirsch, Assistant District Manager, 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 miners.

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.

## DISCUSSION

### Location of the Accident

The accident occurred at the MCC trailer, which was located at ground level about 30 feet from the primary plant and 50 feet from the generators. The MCC trailer was a metal trailer with a wooden floor. The electrical feeder box was located outside the trailer on the side opposite the generators.

### Electrical Equipment

#### *Generators*

Two generators of the same type were involved in the accident, gen 1 and gen 2. They were three phase wye configured Caterpillar SR4B generators with 480 volt line to line rating at 60 Hertz with a supply capacity of 1091 amps. Gen 1 and gen 2 were located on top of a single generator trailer. Each generator had one 1200 amp breaker.


Trailer mounted Generator

### Physical Layout and Events that Led to the Accident

The generators, gen 1 and gen 2 ran independently. Gen 1 and gen 2 exclusively fed a separate main fused switch at the MCC, main switch 1 and main switch 2 respectively.

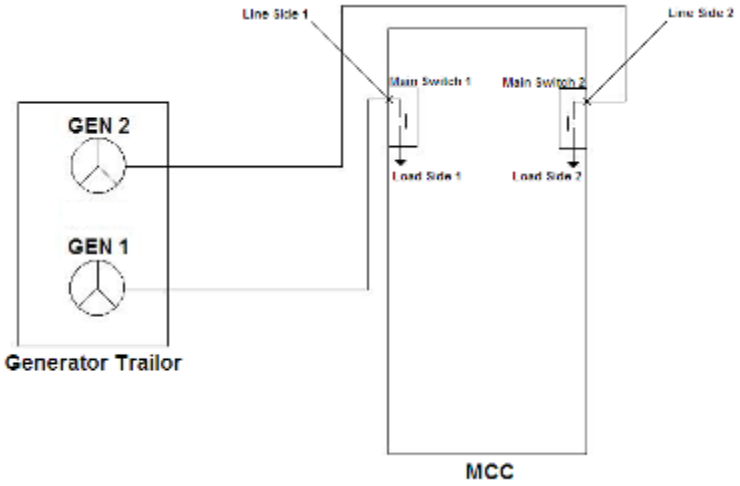
Main Switches Located Inside MCC

The terminations which fed the line side of the two main switches, line side 1 and line side 2, were located at opposite sides of the MCC.

Power Entrance Line Side 1


Power Entrance Line Side 2

Referring to the Physical Layout figure below, line side 1 was facing the generator trailer with the generator trailer in view. Line side 2 was on the opposite side; therefore, the MCC was blocking the view of the generator trailer.




Physical Layout

At the time of the accident, James Hussey was wiring the two Caterpillar SR4B generators, gen 1 and gen 2, to the two independent main switches, main switch 1 and main switch 2, at the MCC power entrance line side 1 and line side 2. During motor rotation testing, it was discovered that two of the phases were reversed on load side 2. One of the generators was de-energized, gen 1. Gen 2 was not de-energized. Hussey started to swap phase conductors fed from gen 2 at the power entrance line side 2 to the MCC. Unaware, Hussey started working on the energized line, line side 2, and received a fatal electrical shock.

## Training and Experience

James Hussey had 3 years, 22 weeks and 6 days of experience all working for this mine operator. Investigators reviewed the training records for the victim and found the task training and annual refresher training records to be up-to-date. However, the investigators found that the training provided did not specifically address the hazards resulting in the accident. After the accident, management established policies and procedures to ensure that persons safely perform work on electrical circuits. All persons were trained regarding these new policies and procedures.

## ROOT CAUSE ANALYSIS

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

*Root Cause*: Management policies and procedures failed to ensure that persons were specifically trained to verify that electrical circuits were de-energized and locked out prior to performing work on them.

*Corrective Action*: Mine management implemented a Standard Operating Program including a new lock out, tag out, and verification system for all of their portable operations. All persons have been trained regarding the new policies and procedures. A company electrician will be at the site any time a plant is set-up, taken down, or when electrical work is performed to ensure that all safety procedures are followed.

## CONCLUSION

The accident occurred because management procedures failed to ensure that persons de-energize an electrical circuit prior to performing work on it. The system was not locked out, tagged out, or tested to verify it was de-energized.

## ENFORCEMENT ACTIONS

### Issued to DeAtley Crushing Co.

**ORDER No. 8605548** was issued September 13, 2011; it is under the provisions of Section 103(j) of the Mine Act:

> An accident occurred at this location on September 13, 2011, at 9:30 a.m. This order is being issued to prevent the destruction of any evidence which would assist in the investigation of the cause or causes of the accident. It prohibits all activity at the Mine Switch Van, Quality Control Van, Generator Trailer and the Diesel Storage tank area, except to the extent necessary to prevent or eliminate an imminent danger, until MSHA has determined that it is safe to resume normal mining operations in this area. This order was issued verbally to the mine operator at 11:05 a.m. on September 13, 2011, and is now been reduced to writing.

This order was modified to a 103(k) order when investigators arrived at the mine. It was terminated on September 20, 2011, after conditions that contributed to the accident no longer existed.

**CITATION No. 8608406** was issued September 18, 2011, under the provisions of Section 104(a) of the Mine Act for a violation of 30 CFR 56.12017:

> A fatal accident occurred at this operation on September 13, 2011, when a miner contacted an energized electrical conductor while attempting to reverse polarity on an energized power cable at the control trailer. The power circuits were not de-energized and locked out before work to change the polarity began. Suitable warning signs were not posted and suitable hot line tools were not being used.

This citation is a "Rules to Live By" priority standard and was terminated on September 18, 2011, after all persons at this mine were retrained to lock-out, tag-out, and test electrical circuits prior to performing work on them.

Approved By:

Wyatt S. Andrews
District Manager

2/9/2012
Date

## APPENDIX A

**Persons Participating in the Investigation**

**DeAtley Crushing Co.**

Michael Osburn…… Estimator / Safety Manager

Andrew Heitzman…… Plant 1 Superintendent

**Mine Safety and Health Administration**

Gary W. Hebel…… Supervisory Mine Safety and Health Inspector

Merlin J. McMullen ……....Mine Safety and Health Inspector

Maxwell A. Clark ..... Electrical Engineer

## APPENDIX B

## Victim Data Sheet

Accident Investigation Data - Victim Information
Event Number: 1 1 5 9 4 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: |
|---|---|---|---|
| *James C. Hussey* | *M* | *38* | *01 Fatal* |

| 5. Date(MM/DD/YY) and Time(24 Hr.) Of Death: | 6. Date and Time Started: |
|---|---|
| *a. Date: 09/13/2011 b.Time: 9:30* | *a. Date: 09/13/2011 b.Time: 9:30* |

| 7. Regular Job Title: | 8. Work Activity when Injured: | 9. Was this work activity part of regular job? |
|---|---|---|
| *199 Quality Control Worker* | *020 Electrical Work* | Yes X No |

| 10. Experience | Years | Weeks | Days | | Years | Weeks | Days | | Years | Weeks | Days | | Years | Weeks | Days |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a. This Work Activity: | *3* | *22* | *6* | b. Regular Job Title: | *3* | *22* | *6* | c: This Mine: | *3* | *22* | *6* | d. Total Mining: | *3* | *22* | *6* |

| 11. What Directly Inflicted Injury or Illness? | 12. Nature of Injury or Illness: |
|---|---|
| *042 Energized Conductors* | *210 Electrocution* |

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: X | CPR: | EMT: X | Medical Professional: | None:

16. Part 50 Document Control Number: (form 7000-1) *220112720021* 17. Union Affiliation of Victim: *9999* *None (No Union Affiliation)*