

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

REPORT OF INVESTIGATION

**Underground Metal Mine
(Lead-Zinc Ore)**

**Fatal Powered Haulage Accident
June 11, 2009**

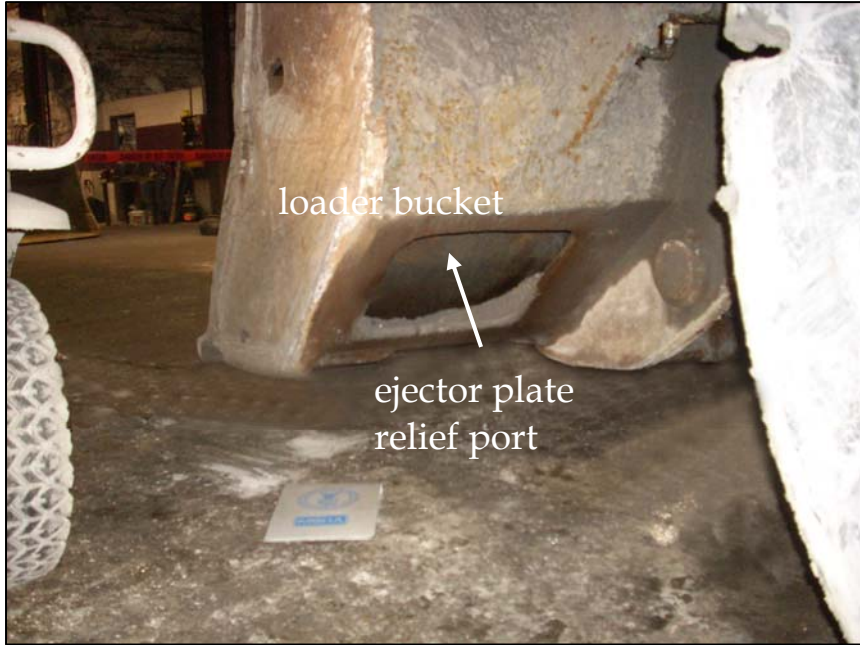
**Doe Run Company
Viburnum #29 Mine
Viburnum, Washington County, Missouri
Mine ID No. 23-00495**

Investigators

**Frederick B. Moore
Supervisory Mine Safety and Health Inspector**

**Denzil L. Hughes
Mine Safety and Health Inspector**

**Originating Office
Mine Safety and Health Administration
South Central District
1100 Commerce Street, Room 462
Dallas, TX 75242-0499
Edward E. Lopez, District Manager**



loader bucket

ejector plate
relief port

Overview

On June 11, 2009, Joseph I. Roy, Mechanic, age 57, was fatally injured when he was struck by the ejector plate of a loader bucket. He looked in the left ejector plate relief port of the bucket while testing for a hydraulic leak inside the bucket.

The accident occurred because the procedure used to perform maintenance on the loader's hydraulic system did not effectively protect persons from the hazardous motion of the ejector plate.

GENERAL INFORMATION

Viburnum #29 Mine, an underground lead-zinc mine, owned and operated by Doe Run Company (Doe Run), was located at Viburnum, Washington County, Missouri. The principal operating official was Robert W. Roscoe, General Manager. The mine operated one 10-hour shift per day, 4 days per week. Total employment was 19 persons.

Lead-zinc ore was mined underground and hoisted to the surface. The ore was crushed and transported by truck to other Doe Run mines where it was milled to form a concentrate. The finished product was shipped to a smelter where it was refined for a variety of industrial uses.

The last regular inspection at this operation was completed on February 23, 2009.

DESCRIPTION OF ACCIDENT

On the day of the accident, Joseph I. Roy (victim) reported for work at 6:30 a.m., his normal starting time. Roy entered the mine and spoke briefly with two mechanics in the lunchroom on his way to the shop.

About 8:30 a.m., Matthew Thompson, Mine Support, brought a loader to the shop because there appeared to be a hydraulic leak inside the bucket. Thompson asked John Bell, Mechanic, to check his loader. Bell was working on other equipment and told Thompson to ask Roy to check the loader.

Thompson met Roy in the warehouse. They returned to the shop where Roy looked at the loader bucket. He told Thompson to start the loader and raise the bucket about 18-24 inches off the shop floor.

After Thompson raised the loader bucket, Roy looked into the left ejector plate relief port. Roy then stepped back from between the front left tire of the loader and the loader bucket so Thompson could see him. The shop was too noisy to verbally communicate. Roy used his hand to signal Thompson to retract the ejector plate. Roy then stepped out of Thompson's sight and looked into the left ejector plate relief port.

About 9:05 a.m., the ejector plate struck Roy on the left side of his head. When Thompson did not see Roy, he exited the loader and discovered Roy lying on the shop floor near the loader bucket. Thompson called for help and Bell, Mike Lewis, Driller, and David Sundhausen, Mechanic, responded.

Thompson and Sundhausen checked for vital signs while Lewis ran to the underground office to get a first aid kit. Lewis told Allen Mercer, General Mine Supervisor, to call for Emergency Medical Services (EMS).

Mercer called Dixie Bess, Maintenance Clerk, at the nearby Doe Run Casteel Mine and asked her to call EMS. He called Bess a few minutes later to ask that she call for a helicopter. Roy was transported to a local hospital where he was pronounced dead at 10:41 a.m. by the attending physician. Death was attributed to head injuries.

INVESTIGATION OF THE ACCIDENT

On the day of the accident, the Mine Safety and Health Administration (MSHA) was notified at 9:46 a.m. by a telephone call from Shawn Pratt, Safety Specialist, to MSHA's emergency hotline. A citation was issued for untimely reporting. Elwood Burriss, Staff Assistant, was notified and an investigation was started the same day. An order was issued pursuant to section 103(k) of the Mine Act to ensure the safety of miners.

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 and employees.

DISCUSSION

Location of the Accident

The accident occurred at the rear area of the main bay in the underground shop. The shop floor was level and dry.

Loader

The loader involved in the accident was an ST8B Wagner Scooptram load-haul-dump unit manufactured in 1989. It had a diesel engine, hydraulic controls, and an 8.5-yard ejector bucket. The rubber-tired loader weighed about 41 tons and was equipped with 4-wheel drive and a 4-speed transmission that operated in forward or reverse.

The loader consisted of two major sections with a pivot joint between them. The front section included the bucket, boom, hydraulic cylinders, and front axle. The rear section included the engine, torque converter, transmission, rear drive axle, and operator's compartment.

The operating controls for the loader consisted of several levers in the operator's compartment. One of those levers controlled all functions of the boom and bucket. Moving the lever forward or backward tilted the bucket forward or backward. Moving the lever to the right or left raised or lowered the boom. The lever was spring-loaded and would return to center when released by the loader operator.

An ejector plate in the bucket was activated by pressing a button on the end of the boom/bucket lever. Moving the lever forward or backward, while depressing the button, moved the ejector plate forward or backward.

One 20-inch by 20-inch ejector plate relief port was located on each side of the back of the loader bucket. These ports allowed loose material that accumulated behind the ejector plate to be pushed out of the bucket as the ejector plate retracted.

The hydraulic jacks and associated hoses for the ejector plate were located almost entirely inside the bucket. They were located behind the ejector plate between the two relief ports. To observe the hydraulic hoses through a relief port, mechanics would have to place their head partially into the port and look toward the mid-point of the bucket.

Several small holes were cut in each end of the loader bucket. Typically, mechanics would check for hydraulic leaks in the bucket by looking directly into one of these holes.

Training and Experience

Joseph Roy had 31 years of mining experience, including 2 years and 36 weeks at this operation. He had received training in accordance with 30 CFR Part 48.

Matthew Thompson had 11 years and 4 weeks of mining experience, including 5 years at this operation. He had received training in accordance with 30 CFR Part 48.

ROOT CAUSE ANALYSIS

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

Root Cause: The manufacturer of the loader did not provide any procedures in the service manual to protect persons performing maintenance and testing on the vehicle. Management did not have safe work procedures established for persons performing maintenance and testing on the loader hydraulic system. The procedure used to test the loader hydraulic system did not effectively protect persons from hazardous motion of the ejector plate.

Corrective Action: Management retrained all persons regarding safe work procedures for performing maintenance and testing for hydraulic leaks on mobile equipment.

CONCLUSION

The accident occurred because the procedure used to perform maintenance on the loader's hydraulic system did not effectively protect persons from the hazardous motion of the ejector plate.

ENFORCEMENT ACTIONS

Order No. 6463990 was issued on June 11, 2009, under the provisions of Section 103(k) of the Mine Act:

A fatal accident occurred at this operation on June 11, 2009, when a mechanic was attempting to check for a hydraulic leak on a Wagner ST8B loader located in the main underground shop. This order is issued to assure the safety of all persons at this operation. It prohibits all activity at the east end of the PM bay until MSHA has determined that it is safe to resume all mining activities in this 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 June 12, 2009, after the condition and practices that contributed to the accident has been corrected.

Citation No. 6240148 was issued on June 30, 2009, under the provisions of Section 104(a) of the Mine Act for a violation of 30 CFR 57.14105:

A fatal accident occurred at this operation on June 11, 2009, when a miner was crushed by the ejector plate in a loader bucket while testing the loader for a hydraulic leak. The miner was not effectively protected from hazardous motion.

This citation was terminated on July 1, 2009, after additional training had been given to all underground employees regarding safe work procedures while performing maintenance and testing on mobile equipment.

Approved: _____

Edward E. Lopez
District Manager

Date: _____

APPENDIX A

PERSONS PARTICIPATING IN THE INVESTIGATION

The Doe Run Company

William J. Courtney.....General Maintenance Supervisor
Allen L. Mercer.....General Mine Supervisor
Denis N. Murphy.....Safety Director
David R. Tucker.....Safety Specialist

Mine Safety and Health Administration

Frederick B. Moore.....Supervisory Mine Safety and Health Inspector
Denzil L. Hughes..... Mine Safety and Health Inspector

APPENDIX B

Accident Investigation Data - Victim Information										U.S. Department of Labor																	
Event Number:										Mine Safety and Health Administration																	
Victim Information: 1																											
1. Name of Injured/Ill Employee: <i>Joseph I. Roy</i>			2. Sex <i>M</i>	3. Victim's Age <i>57</i>		4. Degree of Injury: <i>01 Fatal</i>																					
5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:										6. Date and Time Started:																	
a. Date: <i>06/11/2009</i>					b. Time: <i>10:41</i>					a. Date: <i>06/11/2009</i>		b. Time: <i>6:30</i>															
7. Regular Job Title: <i>004 Mine Equipment Mechanic</i>				8. Work Activity when Injured: <i>039 Checking for hydraulic leak</i>				9. Was this work activity part of regular job?																			
								Yes		<input checked="" type="checkbox"/>		No															
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>2</i>		<i>35</i>		<i>6</i>		Job Title:	<i>2</i>		<i>35</i>		<i>6</i>		Mine:	<i>2</i>		<i>35</i>		<i>6</i>		Mining:	<i>31</i>		<i>1</i>		<i>5</i>	
11. What Directly Inflicted Injury or Illness? <i>068 Hydraulic ejector plate</i>										12. Nature of Injury or Illness: <i>170 Caught between ejector plate & bucket</i>																	
13. Training Deficiencies:																											
Hazard:	<i>New/Newly-Employed Experienced Miner:</i>										Annual:		Task:		<input checked="" 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:		First-Aid:	<input checked="" type="checkbox"/>	CPR:	<input checked="" type="checkbox"/>	EMT:	<input checked="" type="checkbox"/>	Medical Professional:		None:																	
16. Part 50 Document Control Number: (form 7000-1)										17. Union Affiliation of Victim: <i>9999</i>						<i>None (No Union Affiliation)</i>											