

MNM Fatal 2013-16/17

- Explosives
- November 17, 2013 (Colorado)
- Underground Silver Mine
- Nipper
 - 33 years old
 - 4 weeks of experience
- Shift Boss
 - 59 years old
 - 36 years of experience

Overview

On November 17, 2013, two miners died as a result of carbon monoxide poisoning in the unventilated Monogahela drift.

The accident occurred due to management's failure to dispose of deteriorated explosives in a safe manner. Management did not follow the guidance of the explosives manufacturer concerning the proper disposal of the deteriorated explosives. The explosives were detonated in an area of the mine that was not ventilated.

No post-blast examinations were conducted. Three miners went into the unventilated area and two of them reported feeling ill, however, management failed to take any action. Management also failed to withdraw persons as a result of the imminent danger created by detonating the deteriorated explosives in an unventilated area of the mine. Management failed to establish an accurate and effective ventilation plan for the Monogahela drift and failed to barricade or seal unventilated areas. Additionally, management failed to indoctrinate new employees in safe work procedures and properly train miners.

Further, management failed to notify the Mine Safety and Health Administration (MSHA) of an immediately reportable accident - an inundation of carbon monoxide gas, which occurred after the blast was detonated in the Monogahela drift on November 16, 2013.



Root Causes

- **Root Cause:** Management failed to establish safe blasting procedures. Specifically, management failed to establish procedures to ensure that damaged and deteriorated explosives were disposed of in a safe manner in accordance with the instructions of the manufacturer. Management failed to ensure that miners did not engage in blasting operations without direction and immediate supervision until the miners demonstrated safe blasting procedures. In addition, management failed to establish procedures to ensure that a person, with the ability and experience to perform an examination, conducted a post-blast examination to address potential blast-related hazards before work resumed in the blast area.
- **Corrective Action:** After the accident, about 400 pounds of damaged and deteriorated explosives were removed from the mine and safely detonated by the ATF and Grand Junction Bomb Squad. The remaining explosives were removed from the underground storage facilities, inventoried, separated by product type and date code, and stored in surface magazines. Management established and trained all miners in safe blasting procedures. In the future, inexperienced miners will be supervised and directed until management determines the miners are fully trained and knowledgeable in safe blasting procedures. Management established procedures and trained all miners in the identification and proper disposal of deteriorated or damaged explosives. In addition, management developed written standard operating procedures (SOP's) regarding proper post-blast examinations and trained all miners in these SOP's.

Root Causes

- **Root Cause**: Management failed to ensure that the Monogahela drift was ventilated or sealed or barricaded and posted against entry. Ventilation was not provided as stated in the submitted mine ventilation plan. The lack of ventilation in the Monogahela drift allowed carbon-monoxide gas to accumulate after the blast.
- **Corrective Action**: Management developed a mine ventilation plan to ventilate the Monogahela drift. All other unventilated areas of the mine were ventilated, sealed, or barricaded and posted against entry.
- **Root Cause**: Management failed to establish procedures to ensure miners did not enter areas where an imminent danger could be present. The shift bosses were not trained in addressing potential hazards which could cause immediate harm to the miners in the affected area.
- **Corrective Action**: Management implemented procedures to train persons to recognize conditions that create an imminent danger. When an imminent danger is found, the condition will be immediately corrected or miners withdrawn from the area and the area barricaded and posted against entry.

Root Causes

- **Root Cause**: Management failed to ensure MSHA was immediately contacted at once without delay within 15-minutes once the mine operator knew an accident (inundation of carbon monoxide) had occurred on November 16, 2013.
- **Corrective Action**: Management implemented a notification tree to ensure MSHA is immediately contacted after an immediately reportable accident occurs.

Best Practices

- Conduct effective workplace examinations. Identify all hazards and take action to correct them.
- Ensure all active working areas are ventilated prior to allowing miners to work in those areas.
- Monitor gasses as frequently as necessary to determine the adequacy of control measures.
- Use properly maintained and calibrated gas detection instruments with alarms for concentrations outside of safe limits that are audible and visual.
- Ensure all miners are trained to recognize all potential hazards and emergency procedures, including evacuation procedures.
- Dispose of damaged or deteriorated explosive material in a safe manner in accordance with the instructions of the manufacturer.