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GENERAL INFORMATION

Coal Mine Fatal Accident 2003-11



Operator:	Freeman United Coal Mining Co.
Mine:	Crown III Mine
Accident Date:	April 15, 2003
Classification:	Machinery
Location:	District 8, Vincennes, Indiana
Mine Type:	Underground
Employment:	243
Production	8,500 tons/day

OVERVIEW

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- On April 15, 2003, at approximately 12:30 a.m., a continuous mining machine operator, was fatally injured when he was pinned by a continuous mining machine against the coal rib.
- There were no eyewitnesses to the accident.
- Evidence indicated that the continuous mining machine operator was backing the continuous mining machine out of the face area and repositioning it to clean up the left side of the cut when he was pinned between frame of the continuous mining machine and the left rib.
- The cause of the accident was the failure to ensure that all workers followed the safety precautions in regard to not standing or walking between the continuous mining machine and the coal rib while the continuous mining machine is in motion.

ACCIDENT DETAILS

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- At approximately 4:00 p.m., the 10th East Unit crew traveled underground and began normal mining operations.
- At approximately 12:00 a.m., the continuous mining machine operator, began cutting coal from the face of the No. 2 entry.
- At approximately 12:25 a.m., he completed the cut to a depth of approximately 15 feet and started backing the continuous mining machine to reposition it on the left side of the entry to clean up loose coal.
- He was standing behind the blowing line curtain while backing up the continuous mining machine.
- He became pinched between the continuous mining machine main frame and the left coal rib.
- A ram car operator was positioned behind the continuous mining machine and responded to the victim yelling for help.
- The victim was pinched tightly by the continuous mining machine for the ram car operator to free him. The ram car operator used his radio to call for help.

ACCIDENT DETAILS

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- Efforts were made to extricate the victim by cutting the straps on the remote control box and his coveralls, but he could not be freed.
- The remote control box battery and cord was replaced with that from another remote control box on the section and was used to move the continuous mining machine away from the rib.
- The victim was placed on a backboard and checked for a pulse, none was found and CPR was started immediately. He was transported to the surface.
- He was transported by ambulance and life flight helicopter to the hospital where he was pronounced dead.

PHYSICAL FACTORS

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- There were no eyewitnesses to the accident.
- The mine floor was dry, smooth, with no uneven areas.
- The mining height in the immediate area was 7½ feet.
- The continuous mining machine was being operated by remote control at the time of the accident.
- After the accident, the continuous mining machine was energized, the headlights were on, the area lights were turned off, and the pump motor was not running.
- A line curtain was between the victim and the continuous mining machine.
- It could not be determined why the victim was positioned behind the line curtain.
- Had the area lights been turned on the victim would have been able to see the lights through the translucent curtain.

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- An examination of the continuous mining machine and remote control box revealed no visual or operational defects.
- The following components of the remote control system and related components were removed from the continuous mining machine for further testing:
 - Limited Remote Control Demultiplexer,
 - Limited Permissible Radio Transmitter, Model TX3,
 - Limited Receiver, Type RX1, and
 - Magenetek Firing Package.
- Tests revealed no operational or physical defects in these components that could have contributed to the accident.

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- A second TX3 remote control unit was being used to control the continuous mining machine on the left side of the fishtail unit at the time of the accident.
- Tests were conducted and no cross activation was indicated during any of the tests.
- Motorola HT1000 radios being used on the working section for communication were tested and transmitting frequencies of these radios had no effect on the remote control components that could have caused the accident.



Continuous Mining Machine

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- The continuous mining machine and remote control unit had been moved from their original positions to free the victim.
- Switch position on the remote unit at the time of the accident could not be determined since all switches return to the neutral position when released.
- Mine personnel, who first arrived at the accident scene, stated that the pump motor was off, and the machine headlights were ON.
- This indicates that the remote control Shutdown Bar, CB Trip, or Pump Start/Off switch had been activated.
- The continuous mining machine was configured for the following tram speeds:
 - 15 ft/min - "SLOW"
 - 30 ft/min - "FAST"
 - 85 ft/min - "HIGH/TURBO"

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- Tests were performed to determine the machine's slew rate, the time for the left rear corner of the machine to contact the rib, for various tramming conditions with 26 inches separating the machine and the rib. These results are tabulated below:

Tram Condition	Time (seconds)
Split cat condition (left forward, right reverse) in fast speed	3.1
Split cat condition (left forward, right reverse) in slow speed	6.3
Right tram reversed in fast speed	9.8
Left tram forward in fast speed	10.0
Right tram reversed in slow speed	13.0
Left tram forward in slow speed	15.5

Human Factors

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- A review of the victim's training records indicated that these records were complete and up to date.
- There were 5 safety meetings held in the past 9 months dealing with hazards identified in the moving of mining equipment including "Do not position yourself along side the continuous miner during tramming."
- The annual refresher training packet contained a sheet on safety precautions for remote control operation of continuous mining machines and a fatalgram where a miner was crushed between a continuous mining machine and the coal rib while backing the continuous mining machine.

ROOT CAUSE ANALYSIS

- **Causal Factor:** The continuous mining machine operator's vision was blocked because he was standing behind a line curtain while he was tramming the continuous mining machine by remote control.
- **Corrective Actions:** Management shall ensure that all continuous mining machine operators follow established procedures for remote control operation including having visual contact with the continuous mining machine.
- **Causal Factor:** The continuous mining machine lighting system was not being used at the time of the accident.
- **Corrective Actions:** Management shall ensure that all machine mounted lighting fixtures are illuminated when self-propelled mining equipment is operated in working places.

ROOT CAUSE ANALYSIS

- **Causal Factor**: The mine operator's established procedures, for tramming a remote control continuous mining machine from a safe location, were not being followed.
- **Corrective Action**: Management shall ensure that all workers understand and follow their safety precautions for operation of remote control continuous mining machines.

CONCLUSION

- The cause of the accident was the failure to ensure that all workers followed the safety precautions in regard to not standing or walking between the continuous mining machine and the coal rib while the continuous mining machine is in motion.
- Contributing factors were that the victim's vision of the continuous mining machine was blocked by a line curtain and that the lighting fixtures installed on the continuous mining machine were not illuminated. Test and evaluation of the continuous mining machine and the results of the additional testing of the components removed from the continuous mining machine after the accident did not reveal any deficiencies that could be attributed to causing the accident.

ENFORCEMENT ACTION

104(a) Citation

Violation of 30 CFR 75.1719-1(e)(1)

The area lights on the No. 22 continuous mining machine being operated in the No. 2 Entry of the 10th East unit (MMU 001) were not being used

BEST PRACTICES

- Avoid pinch points between the rib and machinery during tramming operations.
- Ensure everyone is in a safe location when starting and moving the equipment.
- Avoid positioning yourself behind the line curtain while tramming machinery.
- Ensure that persons are beyond the machines turning radius during remote control tramming.