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# GENERAL INFORMATION

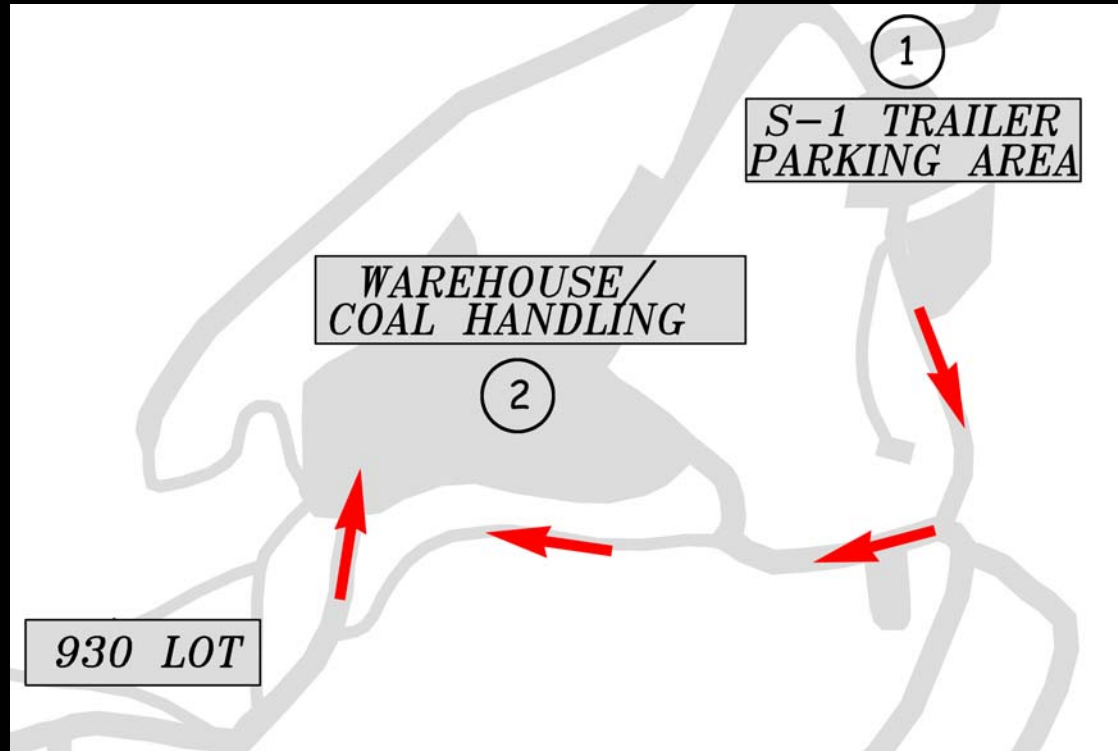
## Coal Mine Fatal Accident 2003-25-26



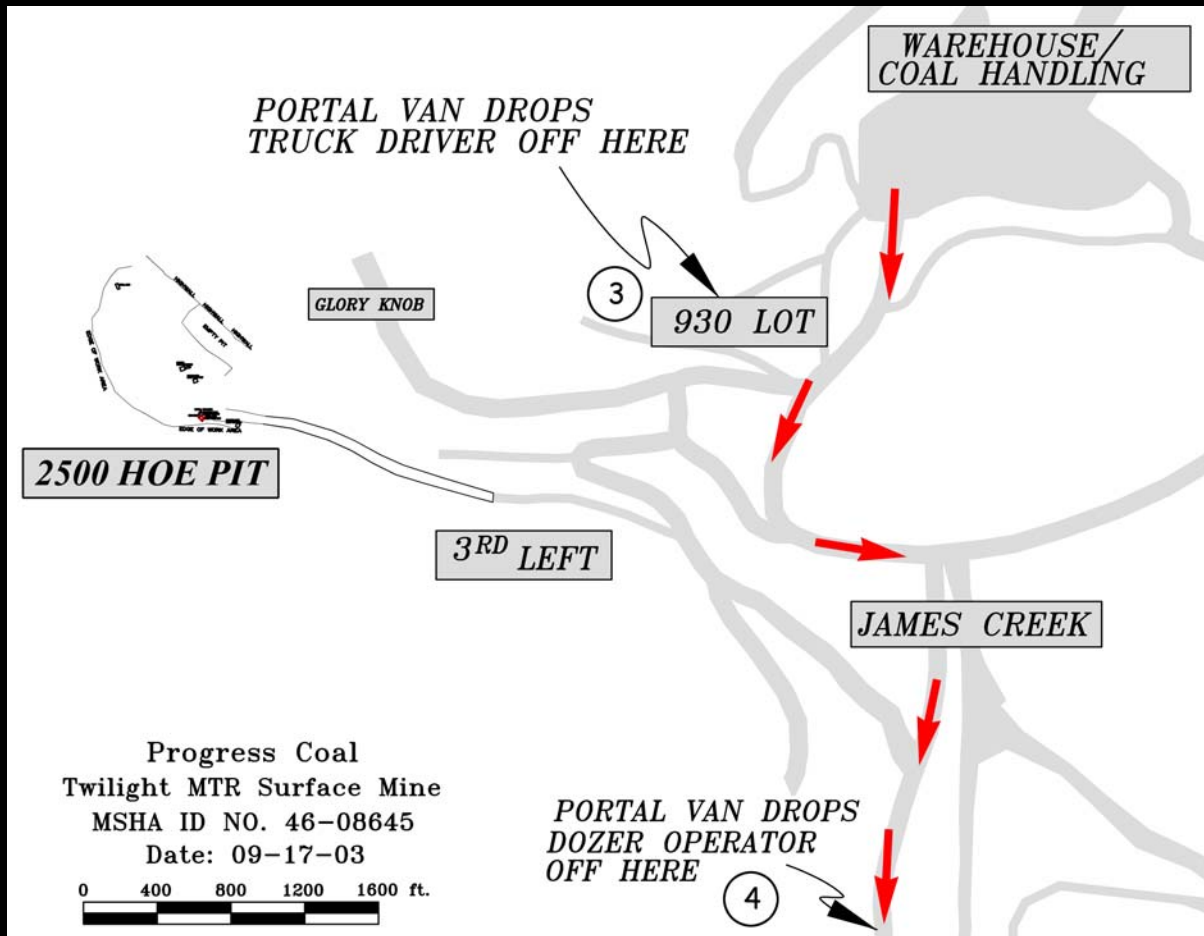
|                 |                                       |
|-----------------|---------------------------------------|
| Operator:       | Progress Coal (Massey Energy Company) |
| Mine:           | Twilight MTR Surface Mine             |
| Accident Date:  | September 17, 2003                    |
| Classification: | Powered Haulage                       |
| Location:       | District 4, Boone County, WV          |
| Mine Type:      | Surface                               |
| Employment:     | 153                                   |
| Production      | 19,000 tons/day                       |

# ACCIDENT DETAILS

1. At ~5:30 a.m., members of the day shift crew arrived in the mine parking lot. Two dozer operators, a highwall drill operator, and a rock truck driver boarded a Ford E-350, Portal Van driven by a track-hoe operator. Prior to leaving the parking lot, a rock truck driver, asked the van driver to obtain toilet paper supplies for him.
2. The portal van traveled approximately one mile to the warehouse to obtain the supplies.

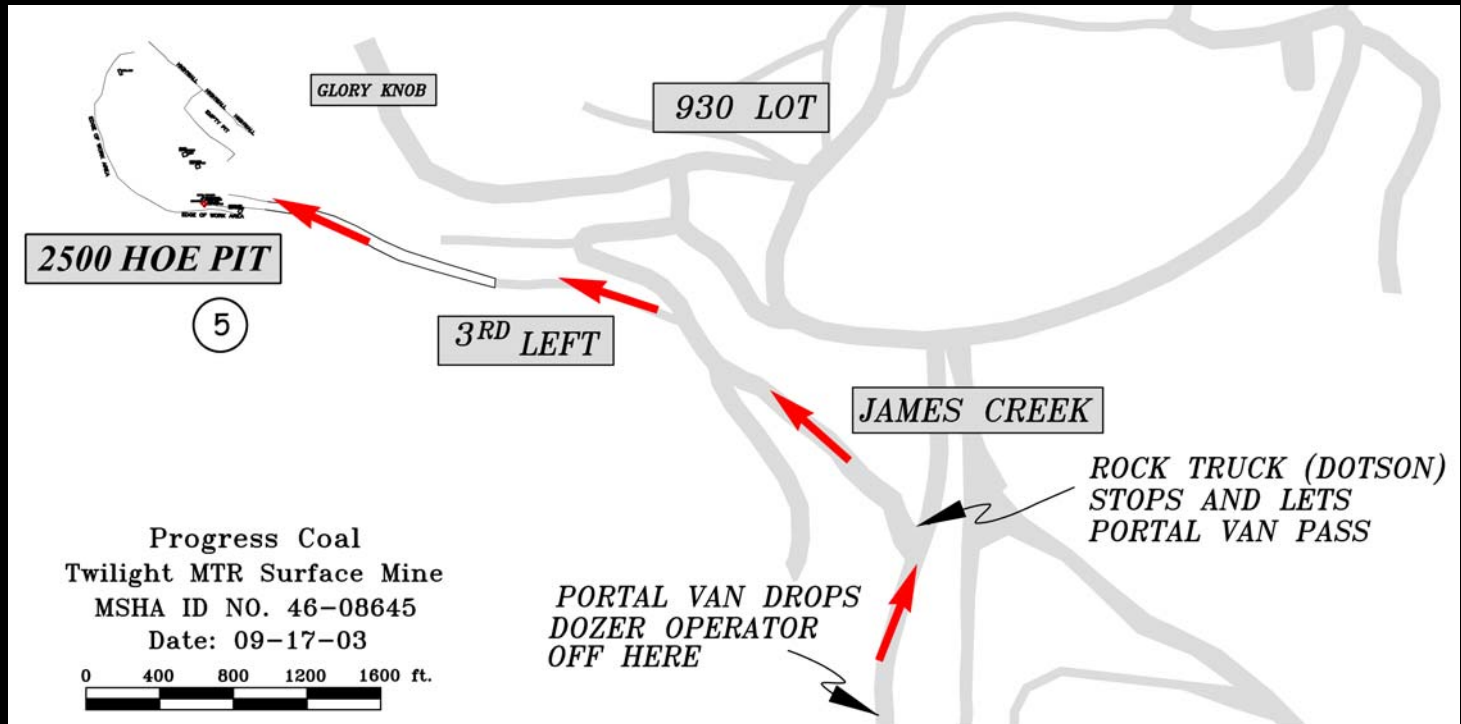


# ACCIDENT DETAILS



3. The back-hoe operator then drove the portal van ~400-500 feet from the warehouse, where he dropped off the rock truck driver at his truck.
4. Next, they dropped off one of the dozer operators on James Creek Road.

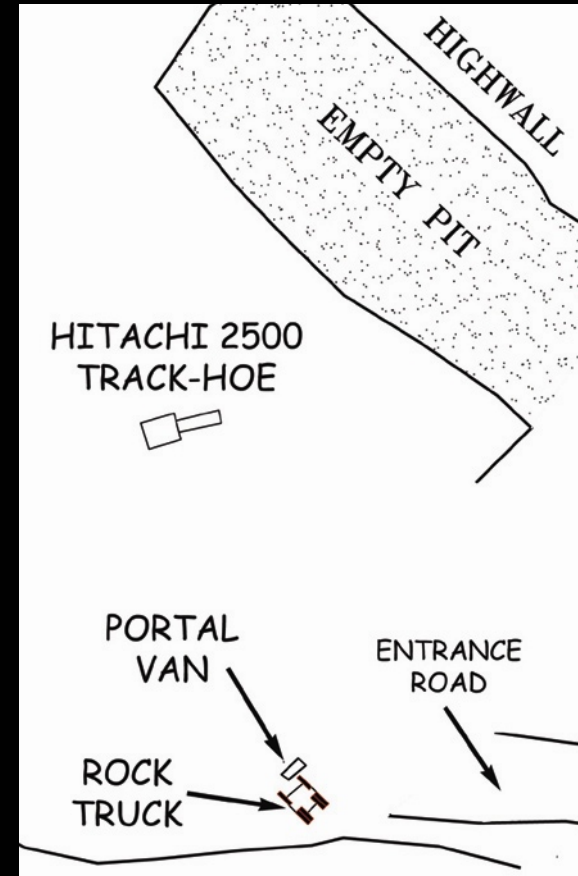
# ACCIDENT DETAILS



5. The 3 remaining miners then traveled to the 2500 Hoe Pit. Another rock truck driver, observed the portal van approaching the intersection of the 2500 Hoe Pit access road. He stopped and allowed the van to cross in front of him. The van then proceeded into the pit ahead of the rock truck.

# ACCIDENT DETAILS

- Meanwhile, the rock truck driver who requested the supplies had left the parking area and traveled to the 2500 Hoe Pit, stopping approximately 270 feet away from the Hitachi Model 2500 Track-hoe.
- Also at this time, a mechanic finished servicing the track-hoe and left its dome lights and small entrance lights illuminated as he left the pit.



- As the portal van approached to within ~50-60 yards of the truck, the van driver radioed a message for the truck driver to get his supplies.



# ACCIDENT DETAILS

- The rock truck driver following the van stopped his rock truck ~300' behind the parked rock truck and he started cleaning the interior of his truck.
- The van driver intended for the rock truck driver to climb down from the cab to meet him. To facilitate transfer of supplies, he parked the van in front of the rock truck bumper, with the driver-side door of the van aligned with the access ladder on the off-side of the truck.
- The rock truck driver was leaning down, getting ear plugs out of his dinner bucket, and did not see the headlights on the approaching portal van when he heard the radio transmission.



# ACCIDENT DETAILS

- The rock truck driver looked toward the track-hoe (which the van driver was scheduled to operate that shift), saw its illuminated dome light, and assumed that he had called from the track-hoe.
- He moved forward with the intent of going to the track-hoe to pick up his supplies, driving his right front bumper and tire into the portal van.
- The driver of the rock truck behind the van heard the radio transmission, looked toward the other truck, saw the van being shoved sideways, and shouted over the radio for the rock truck to stop.
- By the time the truck stopped, the van had rolled over onto its roof and was crushed under the rock truck's bumper/frame and right front tire.



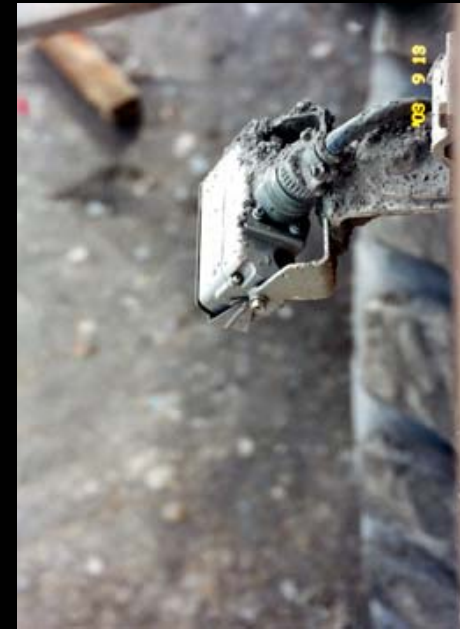


# EUCLID R190 ROCK TRUCK

- A blind spot extended ~60' to the ground on the truck's front, right side.
- Another blind spot extended ~240' directly to the driver's right side.
- A camera system was installed on the truck consisting of 3 cameras and a monitor.
- The cameras provided a view of the blind areas to the front, off-side, and rear.



Off-Side Camera



Front Camera shown overlooking crushed van.

# EUCLID R190 ROCK TRUCK

- The camera vision system was installed to operate in 2 modes:
  - **On Mode** - When the system switch is turned to “On” and a switch is set to view either the front, off-side, or rear camera, the selected view remains on the monitor. When the truck is shifted into reverse, the rear camera view is automatically displayed. The monitor reverts back to the previous view when shifted out of reverse.
  - **Standby Mode** - The monitor remains off in the default “Standby” mode until the truck is shifted into reverse. Then the view from the rear camera is automatically displayed on the monitor. Once the truck is shifted out of reverse, the monitor turns off.
- Since the truck was moving straight forward, the front camera view should have been selected to show the intended direction of travel. However, since the camera system was in standby mode, the monitor remained off as the truck moved forward.



# FORD E-350 PORTAL VAN



- The portal van involved in the accident was a 1999 Ford Model E-350 XL Super Duty, 12-passenger van, licensed for highway use in West Virginia.
- The portal van was white and had a strip of reflective tape on the sides.
- Progress Coal equipped the portal van with a roof-mounted strobe light.
- The strobe light did not have an on/off switch; but received power when the ignition was switched on.
- Two witnesses indicated that the strobe light was not working on the day of the accident.

# ACCIDENT SITE

- The portal van approached the rock truck from the off-side (blind spot area) and stopped in the blind spot immediately in front of the truck, close to the front bumper.
- The front 10 feet of the portal van was in front of the rock truck. This placed the driver's door of the portal van next to the access ladder on the off-side of the rock truck, which would have allowed the transfer of supplies through the van window to the bumper level of the rock truck.
- Tire tracks indicated that the van had backed up approximately 18" before the van was struck by the truck. The van was found in reverse gear.
- A scrape mark on the ground from the portal van front driver-side tire indicated the van was shoved approximately 4-½' before the van's front tire was lifted off the ground.
- As the rock truck continued forward, the van rolled over onto its roof and was crushed under the truck's bumper/frame and the right front tire. Tire tracks indicated the truck moved forward ~32' before stopping (~1 truck tire revolution).

# ACCIDENT RE-CREATION

- A re-creation of the conditions and events leading up to the accident was conducted using the rock truck involved in the accident and an identical van.
- The re-creation was conducted at ~6:00 a.m., at which time outdoor conditions were dark and the weather was clear, similar to the morning of the accident.
- The van approached the parked rock truck from the off-side and stopped in front of the truck, simulating the path of the van involved in the accident.
- The van's headlights were visible from the rock truck driver's seat. When the strobe light was used, flashes on the truck's handrail were also visible from the cab of the rock truck.





# ACCIDENT RE-CREATION

- After portal van stopped, it was clearly visible on the monitor in the front camera view. Use of the strobe light enhanced this view.
- Radio communications between the van and truck functioned properly.
- The dome light of the track-hoe was clearly visible from the truck cab.
- The rock truck horn operated properly.



# COMMUNICATIONS

- The van driver stated that as he approached to within 50-60 yards of the truck, he radioed, "Step down here; I've got your supplies." The rock truck driver stated he heard, "Come and get your [toilet] paper."
- The rock truck driver was not looking out the cab windows and did not see the van's headlights when he received the communication from the van driver.
- The rock truck driver saw the lit track-hoe dome light, concluded that van driver/track-hoe operator radioed him from there, and that he needed to drive over to get his supplies.
- The rock truck operator proceeded to move the truck forward, without first making certain that all persons were clear. He did not sound the horn, utilize the front camera view, confirm his understanding of the van driver's location, or clearly communicate his intent before moving the truck.

# SAFETY PROGRAM

- Progress Coal had a comprehensive safety program (per 30 CFR 77.1708) at MTR Surface Mine.
- Miners interviewed understood the program requirements.
- Flashing lights for vehicles were required by the safety program. However, the strobe light was not operational on the portal van on the morning of the accident.
- Employees indicated that pre-op checks on portal vans were required by the safety program, but were being conducted infrequently and inconsistently.
- The van driver did not conduct a pre-operational check prior to the accident, which should have detected the inoperable strobe light. Although several individuals witnessed the van operating over the previous two shifts, no one reported this condition.
- The rock truck driver stated that he conducted the pre-op check of his rock truck prior to the accident, but he did not record or report several safety defects existing on the truck (none of which contributed to the accident).

# SAFETY PROGRAM

- In 2001, Parking Near Large Mobile Equipment was addressed in the safety program, requiring other drivers to stay the length of a large rock truck away from its sides and front. Drivers were also required to notify the truck operators of their presence and insure that the correct operator was contacted by receiving a response stating his equipment number.
- In September 2002, a mechanic's truck was struck by a rock truck, without injury, after being parked in front of the right front tire of the rock truck. The rock truck operator moved his vehicle without first sounding a warning or performing a visual check.
- In November 2002, a foreman's pickup truck was struck by a rock truck, again without injury, after parking directly in front of the rock truck to deliver cleaning supplies.
- The mine operator determined that their safety guidelines were not being followed and took disciplinary action following both of these accidents.

# SAFETY PROGRAM

- The accident details were reviewed with miners and all employees were trained on these provisions of the following revisions to the safety program:
  - Equipment operators will sound the horn prior to moving.
  - Equipment operators will have cameras turned toward the direction of intended travel and foreman and manager vehicles will use strobe lights in poor visibility, low light levels, and at night.
  - No person will approach or park near a piece of large mobile equipment from the rear, offside, or directly in front with less than 50' of line of sight area, unless positive confirmation has been received from the operator.
- The van driver parked directly in front of the rock truck, where less than 50' of line of sight existed, without first receiving confirmation from the rock truck operator that he was aware of the smaller vehicle's location.
- The rock truck operator did not sound the horn prior to moving the equipment and he did not have the camera turned toward the direction of intended travel.
- Compliance with any one of these requirements would have likely prevented the accident.



# ROOT CAUSE ANALYSIS

*Causal Factor:* Established rules, policies, and procedures for moving large mobile equipment were not followed by the rock truck operator. The rock truck driver did not make certain by signal or other means that all persons were clear before moving the equipment. The rock truck operator did not sound the horn or use the camera monitor prior to moving the parked truck.

*Corrective Actions:* Management should monitor and strictly enforce the established policy regarding the use of standardized signals or other means by equipment operators before starting or moving large equipment. Management, in conjunction with equipment operators and camera manufacturers, should evaluate current camera systems use, installation, employee concerns (glare, monitor placement, etc.), and formulate procedures for the optimum use of cameras with regard to forward and offside views. Following the accident, the operator required front line supervisors, safety department personnel, and other members of management to monitor, on a continuing basis, the policy and practices listed in the safety program for consistency, effectiveness, and accountability.

# ROOT CAUSE ANALYSIS

*Causal Factor:* Established policies and procedures for safely approaching large mobile equipment were not followed by the portal van operator. The portal van was parked directly in front of the rock truck, where less than 50' of line of sight existed, without first receiving confirmation from the rock truck operator that he was aware of the smaller vehicle's location.

*Corrective Actions:* Management should routinely observe work habits, monitor communications, and strictly enforce safety rules to ensure compliance with such procedures. Persons approaching large mobile equipment should clearly identify themselves, their intent, and their location, and receive confirmation of any transmission before nearing such equipment. Following the accident, the operator required front line supervisors, safety department personnel, and other members of management to monitor, on a continuing basis, the policy and practices listed in the safety program for consistency, effectiveness, and accountability.

# ROOT CAUSE ANALYSIS

*Causal Factor:* Procedures were not in place to ensure that pre-operational checks were being performed on mantrips. Employees indicated that pre-operational checks on portal vans were required by the operator's safety program, but were being conducted infrequently and inconsistently. A pre-operational check of the portal van was not conducted on the morning of the accident. A pre-operational check would have identified the inoperable strobe light and prompted corrective measures prior to operating the van in poor visibility conditions.

*Corrective Actions:* Management should evaluate the current pre-operational inspection guidelines and out-of-service criteria. A system of accountability should be implemented to ensure that pre-operational checks are being conducted and company guidelines are being complied with. The guidelines and accountability system should be monitored on a continuing basis utilizing the frontline supervisors, safety department, and other members of management for consistency, effectiveness, and accountability. Strobe lights should be illuminated on vehicles operating on mine property. Management should monitor strobe light use to ensure that such lights are effective for their mine specific applications. Following the accident, the operator required front line supervisors, safety department personnel, and other members of management to monitor, on a continuing basis, the policy and practices listed in the safety program for consistency, effectiveness, and accountability.

# CONCLUSION

The accident occurred because mine management did not adequately and proactively monitor work procedures to ensure that established safety program requirements were being followed and that equipment was in a safe operating condition. The van driver approached the rock truck from the off-side and parked in the truck's front blind spot without effectively communicating his location and intention to the truck driver. The rock truck driver failed to make certain that the area in the front of the truck was clear before moving forward. The inoperable strobe light on the van also contributed to the accident, as it could have alerted the rock truck driver to the presence of the van.

# ENFORCEMENT ACTIONS

## Section 104(a) Citation for a violation of 30 CFR 77.1607(g)

On September 17, 2003, the operator of Euclid R190 Rock Truck, RT 729 (Serial No. 340SDC75593), did not make certain by signal or other means that all persons were clear before moving the truck in the 2500 Hitachi Pit and striking a portal van that was parked in front of the truck. Three miners riding in the portal van were injured during the accident, two fatally. Prior to moving the truck; the rock truck operator did not sound the horn, utilize the front camera view, confirm his understanding of the portal van location, or clearly communicate his intent by radio.

## Section 104(a) Citation for a violation of 30 CFR 77.404(a)

On September 17, 2003, the Ford 350 portal van, LT112, was not being maintained in safe operating condition. The Starbright Strobe Light, Model 913, which was provided on the van for safe operation around large mobile equipment during periods of low visibility, was not operating. Prior to September 17, 2003, two similar accidents demonstrated that the strobe light was necessary for safe operation at this mine. At approximately 6:00 a.m. (while it was still dark), the portal van was struck by a Euclid R190 rock truck as it delivered supplies and personnel to the 2500 Hitachi Pit. Three miners riding in the portal van were injured during the accident, two fatally. An investigation of the accident determined that the rock truck operator was not aware of the van's location and that the strobe light, if used, could have alerted the rock truck driver to the presence of the van. This condition existed for at least one shift prior to the accident and could have been detected during a pre-operational examination of the portal van.



# BEST PRACTICES

- Monitor work procedures to ensure that established safety program requirements are followed.
- Ensure, by signal or other means, that all persons are clear before moving equipment.
- When approaching large mobile equipment, do not proceed until you make eye contact with, or obtain approval from, the equipment operator.
- Minimize situations where smaller vehicles need to approach large haul trucks (e.g., arrange for haul truck drivers to have supplies available at the pre-shift meeting place, rather than having supplies delivered to the truck).
- Do not park smaller vehicles in a large truck's potential path of movement.
- Equip smaller vehicles with flags or strobe lights, positioned high enough to be seen from the cabs of haulage trucks.
- Equip larger vehicles with cameras to monitor blind spots and ensure that they are properly used.
- Stagger the times that vehicles leave assembly areas and separate the parking and travel areas for larger and smaller vehicles.