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Mine Rescue Overview in the United States

Allen Dupree, Senior Vice President – Safety and Health

Underground Coal Mine Explosions

Coal dust explosions have been minimized by adequate ventilation and rock dust, but risk must be continually managed. Most coal dust explosions are first initiated by methane ignitions. The methane ignition creates a pressure wave, placing coal dust in suspension ahead of the flame front. Once coal dust is ignited, a chain reaction occurs and flame and forces may propagate over long distances underground, traveling up to 1,000 feet per second.

Bruceton Experimental Mine, Pittsburgh, PA

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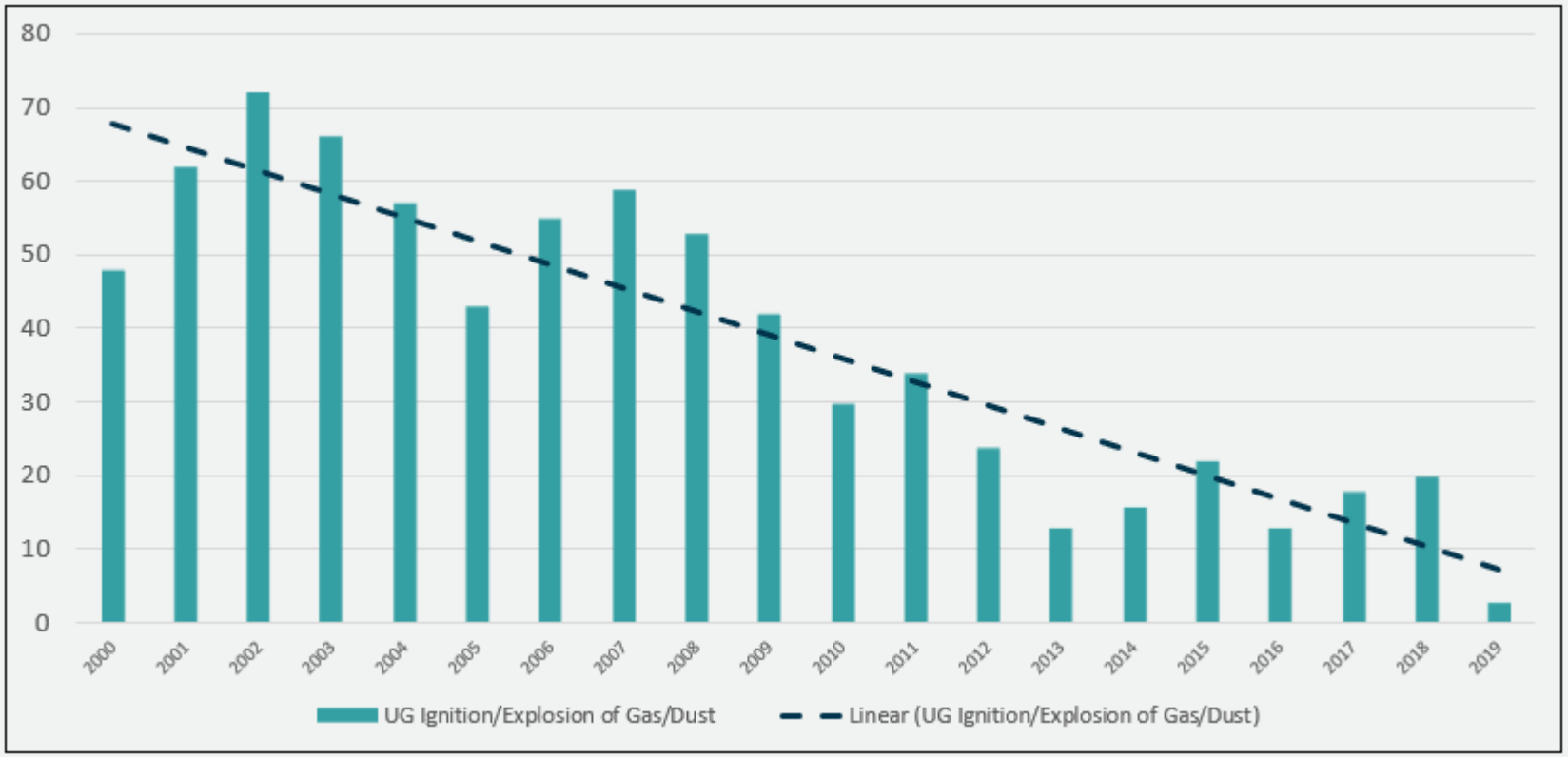
U.S. Coal Mines – Underground Ignitions/Explosions



Most ignitions are of short duration and involve methane ignited at the working face. The vast majority occur without personal injury.

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Underground Coal Mine Fires

In the past, most underground coal mine fires were caused by belt conveyors, electrical cables, cutting/welding, unattended electrical or mobile equipment.

Mine fires can spread rapidly due to volatile gases and tars pulled out of the coal seam by the heated air. A large fire can impact the mine's ventilation system, greatly reduce visibility, and spread contaminants throughout the mine.

Running Right Leadership Academy, Julian, WV

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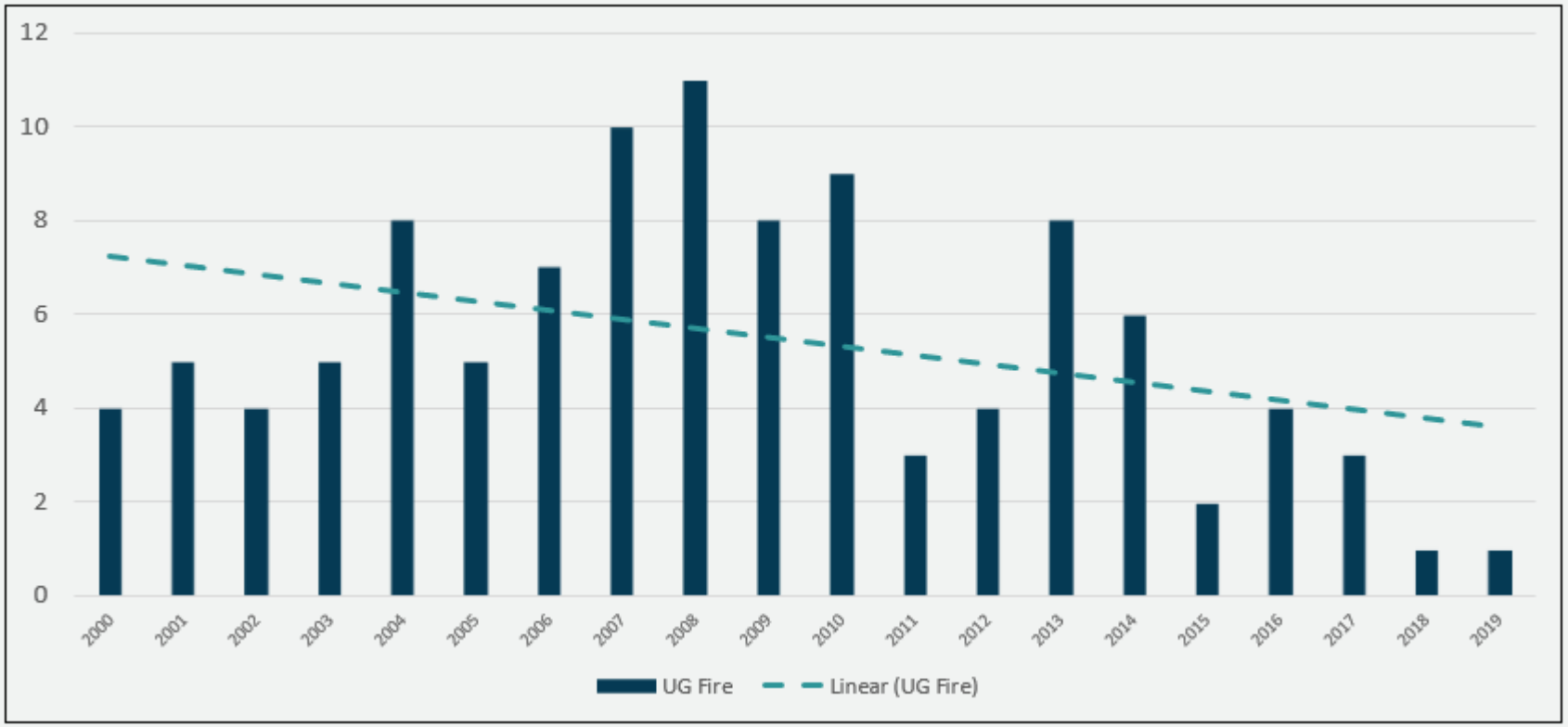
U.S. Coal Mines – Underground Reportable Fires



Underground belt conveyor fires have been practically eliminated since the introduction of improved flame resistant belt material.

2006 Coal Mine Disasters

On January 2, 2006 in West Virginia, an underground coal mine explosion at the Sago mine claimed the lives of **12 miners**, and 12 mine rescue teams participated in the rescue efforts.

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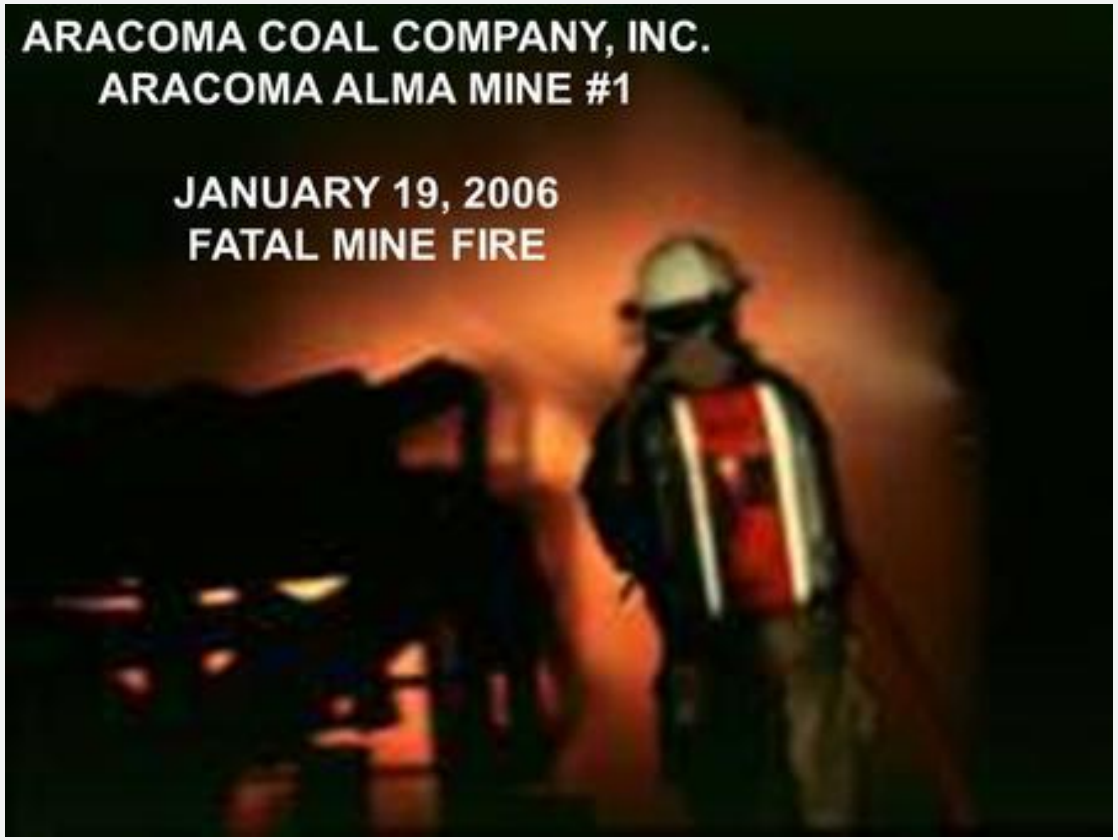
2006 Coal Mine Disasters

On January 19, 2006 in West Virginia an underground coal mine fire at the Aracoma mine claimed the lives of **two** miners, and 24 mine rescue teams participated in the rescue efforts.



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2006 Coal Mine Disasters

On May 20, 2006 in Kentucky, an underground coal mine explosion at the Darby mine claimed the lives of **five** miners.

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2006 MINER Act

Following these 2006 disasters, the Mine Improvement and New Emergency Response (MINER) Act was passed which required the establishment of emergency response plans, enhanced technology for two-way communication and tracking, stronger mine seals, and post emergency protections for miners including additional oxygen devices and refuge shelters.

2010 Coal Mine Disaster

On April 5, 2010, an underground coal mine explosion occurred at the Upper Big Branch Mine in West Virginia which claimed the lives of **29 miners**. Rescue efforts continued for eight days, and 29 mine rescue teams responded to the explosion.

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Regulatory Overview – Mine Explosion Prevention

MSHA regulations provide redundant layers of protection to prevent underground mine explosions including:

- Mine specific ventilation plans.
- Methane limits and machine mounted methane monitors.
- Rock dust application.
- Permissible equipment past the last open crosscut or return air courses.
- Water sprays maintained on mining equipment.
- Increased seal strengths.
- Smoking materials prohibited.

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Underground Mine Fire Prevention

Following the 2006 underground mine fire at the Aracoma mine, MSHA initiated numerous regulatory changes including:

- 30 CFR Part 14 flame resistant belts in all underground coal mines.
- Additional AMS training.
- Low level carbon monoxide sensors used for early warning fire detection.
- Escapeway standardization.
- Maintenance of belt conveyor entries.

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Emergency Response – Mine Rescue Teams

- At least two teams available for each underground mine.
- Station must be within one-hour ground travel time from the mine.
- Team training required at each mine covered by team.
- 96-hours training required annually.
- Participate in at least 2 mine rescue contests annually.

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Preparedness – Mine Rescue Teams

Our teams maintain a list of items to be checked prior to going underground including:

- Questions to be asked by team during briefing by command center.
- Equipment and personnel checks team captain should perform prior to travel inby the fresh air base.
- Information about all missing miners.

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Mine Specific Information for Rescue Teams

Brooks Run West
Kielty Energy
MSHA ID 46-08808
State ID U-5019-96-1
Phone # (304) 475-4683
Latitude 37.776738 Longitude -82.150021

Superintendent – Dave Cantrell
Mine Location – Scarlett Road, Mingo County, WV
Number of Employees – 144
Seam Name - #2 Gas
Average Mine Height – 72″
Number of Working Sections – 2
Fan Size and CFM – 8′ Blowing fan, 495,000 cfm
Refuge Shelter Location – Within 1,000′ of section
5 Belt CC 24, 7 Belt CC 44, 8 Belt CC 44, 8B Belt CC 43, 8B4 Belt CC 10
SCSR Type/Cashe Locations – CSE SRLD, # Belt head, 5 Belt 24 CC, 7 Belt CC 44 44, 8 Belt Head CC 8 and 44.
Seals – 8 sets (92 total), (Minova and Jennmar 120 psi)
Highest elevation – 8A belt head drive
Lowest elevation – Return Air Shaft
Waterline – 6″ diameter
Methane Inspection – 10-day spot

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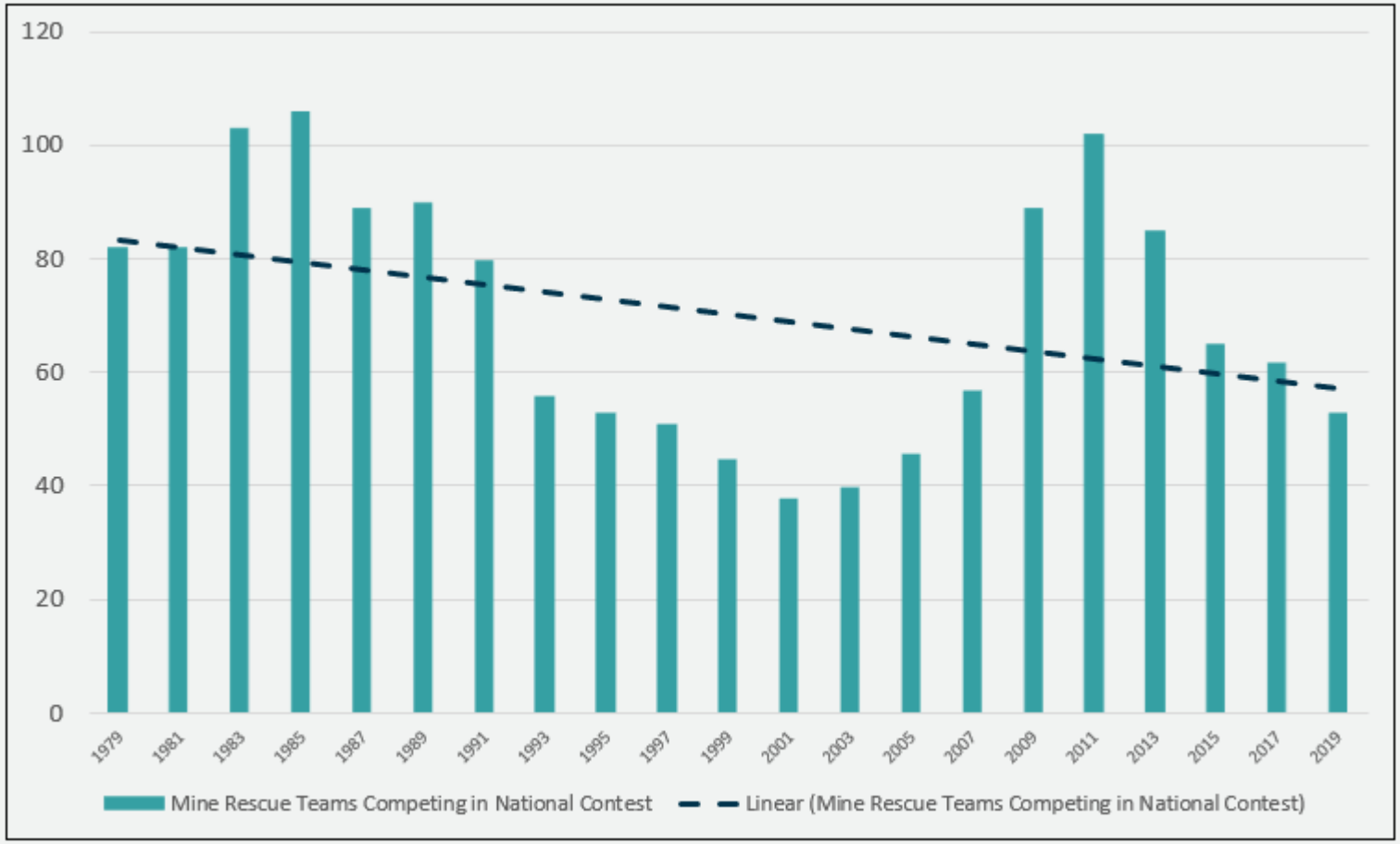
Mine Rescue Teams – National Coal Competition



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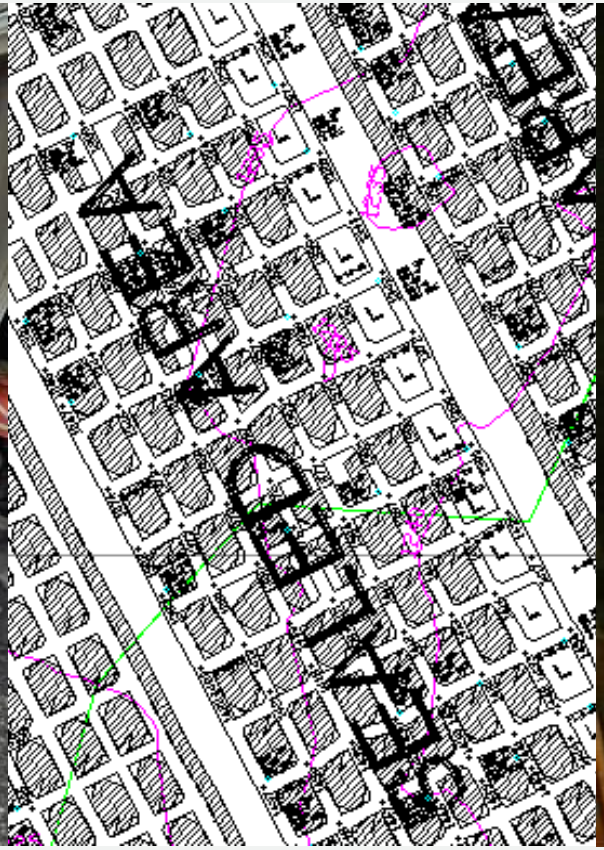
Emergency Preparedness – Managers/Decision Makers

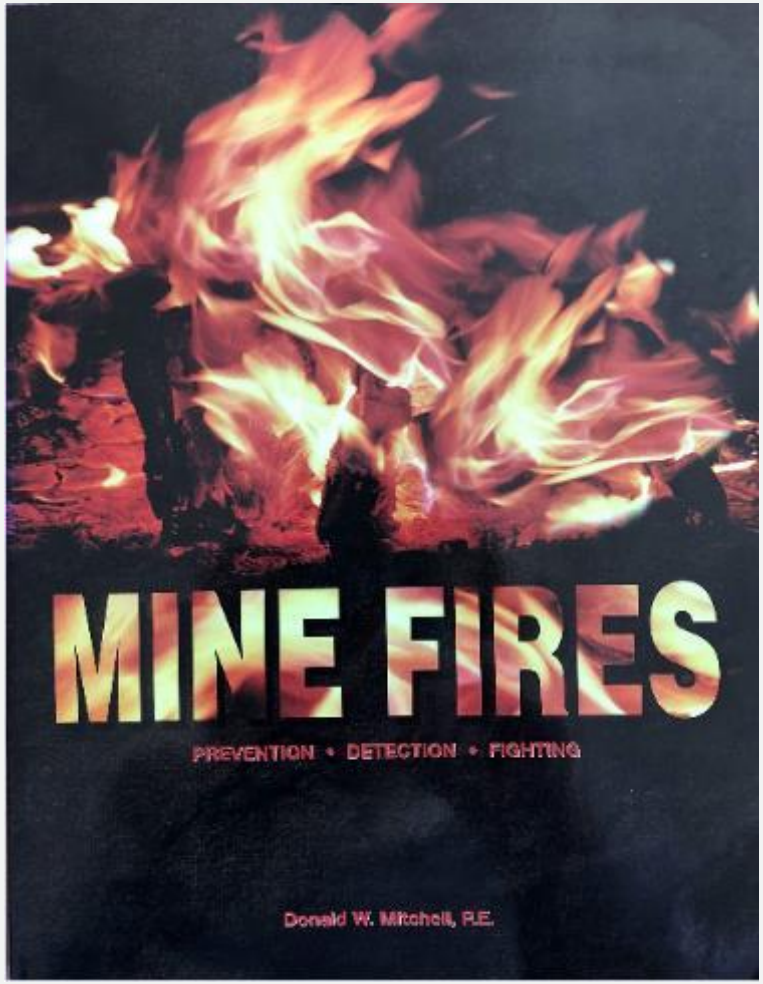
Mine rescue teams train monthly to prepare for emergency response. Many mine managers and corporate managers do not always get the same level of training. These managers may be responsible for making initial decisions when an emergency occurs.

Institutional Knowledge – Managers/Decision Makers



Emergency Preparedness – Managers/Decision Makers

Retirements of experienced disaster experts in the U.S. coal industry, combined with fewer actual events, has left a void of knowledge regarding managing a prolonged mine emergency. Knowledge of mine gas ratios, when to evacuate, when to seal, are all critical to proper oversight.



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Emergency Preparedness – Managers/Decision Makers

One of the most common mistakes made during emergencies is failure to properly brief mine rescue teams prior to entry and failure to properly de-brief teams upon exiting the mine.

Initial Decisions - MSHA Required Responsible Persons

For each shift that miners work underground, MSHA requires a responsible person designated to take charge during a mine emergency and is required to be trained annually in the following:

- Organize command center;
- Coordinate firefighting;
- Coordinate mine rescue;
- Establishing fresh air base;
- Deploy mine rescue teams;
- Provide mine gas sampling;
- Establish security;
- Initiate mine evacuation;
- Contact emergency personnel.

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Emergency Preparedness – Managers/Decision Makers

Our incident response plan outlines specific duties for both mine management and corporate personnel.

Mine Superintendent

DO

- Ensure Incident Response Action Plan procedures are being executed
- Brief oncoming senior management
- Continue in command until relieved by more senior manager
- Obtain prepared statement from Corporate Communications
- Restrict all

Step 1	**Travel to Incident site immediately and assume command**
Step 2	**Obtain briefing from senior person on-site:** **Status of personnel in danger** ☐ Serious injuries ☐ Entrapment ☐ Rapid rescue likely ☐ Prolonged rescue effort needed ☐ Fatalities ☐ Single ☐ Multiple **Evacuation follow-up** ☐ Address ongoing dangers, including fire ☐ Follow up to isolate evacuated and involved personnel for debriefing ☐ **Critical:** to obtain info from personnel exiting mine
Step 3	**Notifications status:** ☐ Have all Regulatory Agencies been notified? ☐ Have mine supervisors and upper management (GM, VP) been

Emergency Response Preparedness Manager Training

Annual mine management and command center training focused on decision-making.

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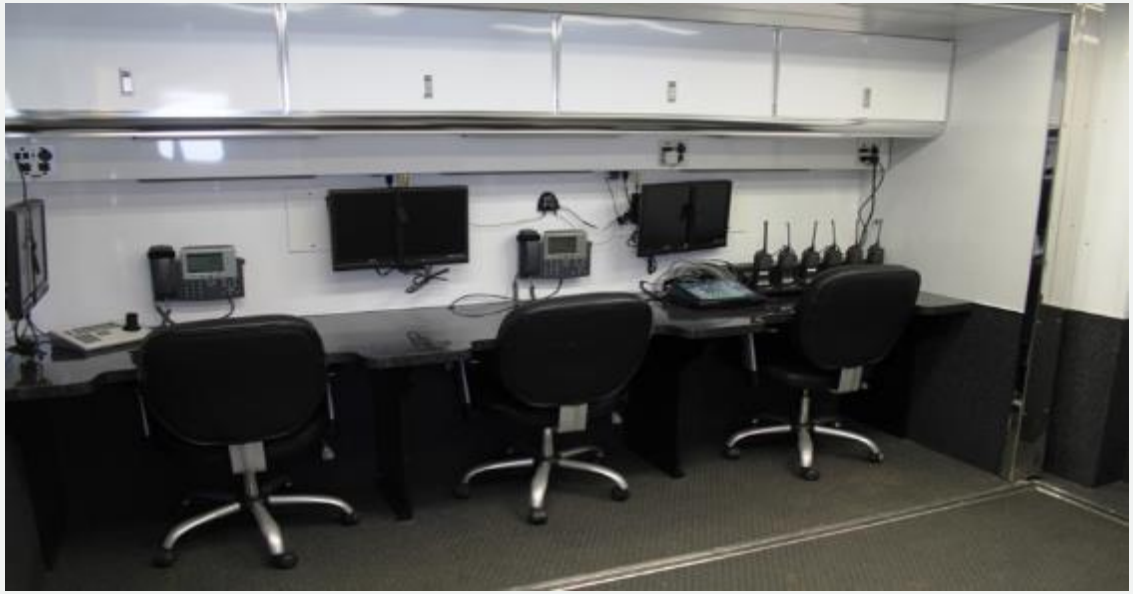
Contura Mobile Communications Center

Satellite equipped Mobile Communications Center- allows for company personnel to monitor and control emergency situations from remote mine sites.



Mine Employee Fire Brigade Training

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Mine Employee Smoke Training

Escape training in a simulated nontoxic smoke filled environment for all underground employees.

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Knowledge and Wisdom

As an manager, rely on others around you for advice.

The Three Pillars of Profitability

A successful mine must manage to all three factors:

- **SAFETY**
- **COST**
- **PRODUCTION**

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Thank You!

People acting together as a group can accomplish things which no individual acting alone could ever hope to bring about.
-Franklin D. Roosevelt

The true test of Leadership is how well you function in a crisis.
-Brian Tracy

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