Active Training and Tabletop Exercises for Prevention and Preparedness

Center for Educational Technologies®

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Objectives

- The presentation will:
  - Discuss the use of active training strategies for effective mine training.
  - Allow participants find out about and take part in new available and upcoming training resources that use active training strategies:
    - Hazard Recognition: Degraded Images
    - Coal Dust Explosion Hazards
    - Ventilation
    - Tabletop Exercises

Active Training

- High levels of participation results in:
  - Increased knowledge.
  - Faster transfer of new knowledge or skills to the workplace because the information has been personalized.
  - A reduction in accidents, injuries, and illnesses associated with the training topic.
  - Increased skills in problem solving and decision making on the job.


ACTIVE TRAINING PORTAL
FOR MINE SAFETY
HAZARD RECOGNITION
DEGRADED IMAGES

Hazard Recognition: Degraded Images Objectives

- Improve miners' hazard recognition skills.
- Present more realistic images of hazards in order to accustom participants in new miner training to working mine conditions.
- Reinforce safe working practices for a variety of mining conditions.
- Review regulations that pertain to specific mine components, such as roof, ribs, or cribbing.
- Engage miners in active training discussions of hazard recognition.

Mine Cribbing

Mine Cribbing

Hazard

Post on the left side of crib looks unstable. It is unclear how roof support post is anchored to the roof. Wedges (like shims) are typically used to tighten support.

Means of Injury

Support could buckle under pressure and cause a partial roof collapse.

Safe Work Practices

- Observe and test the roof in working areas.
- Wear safety glasses when sounding the roof.
- Keep all coworkers informed regarding adverse roof and rib conditions.
- When a hazard is observed, eliminate the condition as soon as possible; do not depend on others.
- If the roof or ribs are hazardous, support them or remove the hazard by pulling down the hazardous material.

Belt Construction

Load Center

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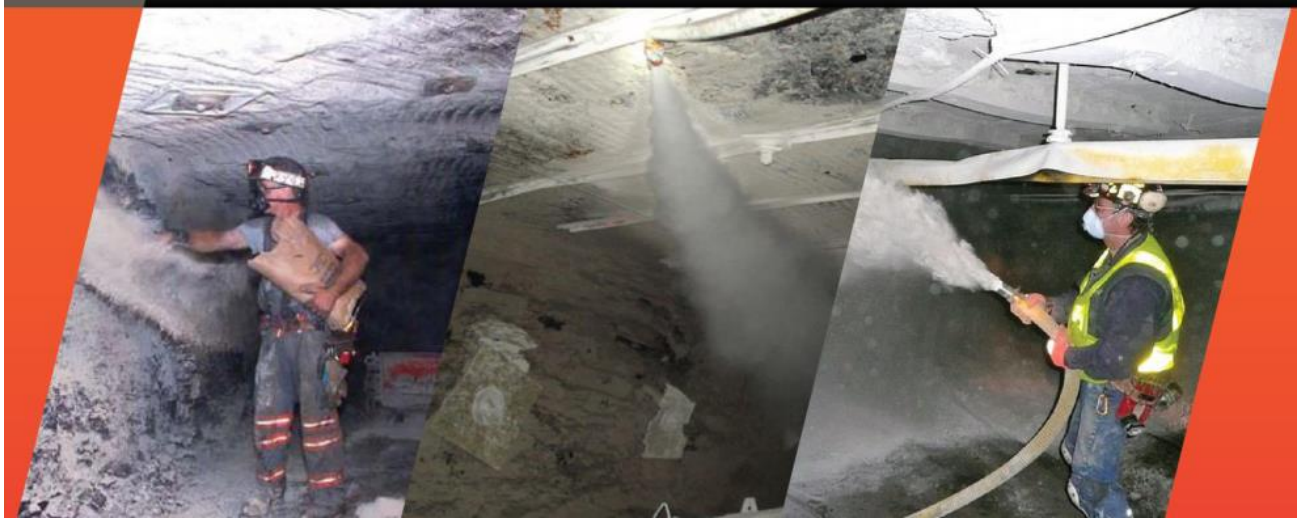
FOR MINE SAFETY

COAL DUST EXPLOSION HAZARDS



Coal Dust Explosion Hazards Objectives

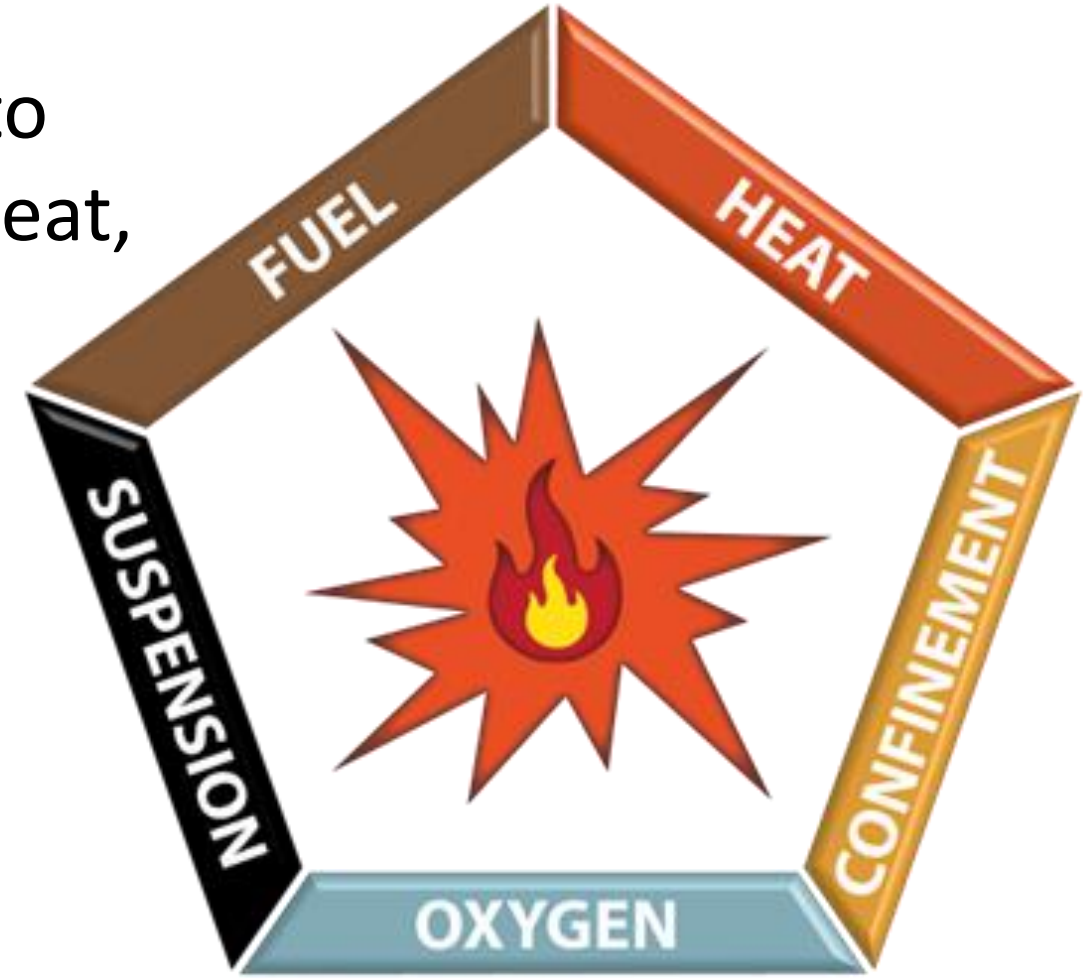
- Name common sources of heat and fuel in an underground mine.
- Give examples of how heat, fuel, and suspension of combustible coal dust can be eliminated to prevent coal dust explosions.
- Explain what areas of an underground mine must be rock dusted.

The coal dust explosion hazards module includes:

- Content on the anatomy of coal dust explosions, preventing explosions, and controlling explosions with rock dust.
- Pentagon Knockdown discussion activity
- Part 75, Subpart E – Combustible Materials and Rock dusting discussion activity.
- PowerPoint with illustrations, embedded videos, and links to regulations.
- Instructor notes for activities, review questions, and tips for effectively using video clips.

Pentagon Knockdown

For an explosion to propagate, fuel, heat, confinement, oxygen, and suspension must exist simultaneously.



A thick layer of rock dust on the floor won’t compensate for coal dust overhead.

ACTIVE TRAINING PORTAL

FOR MINE SAFETY

VENTILATION

Ventilation Module Objectives

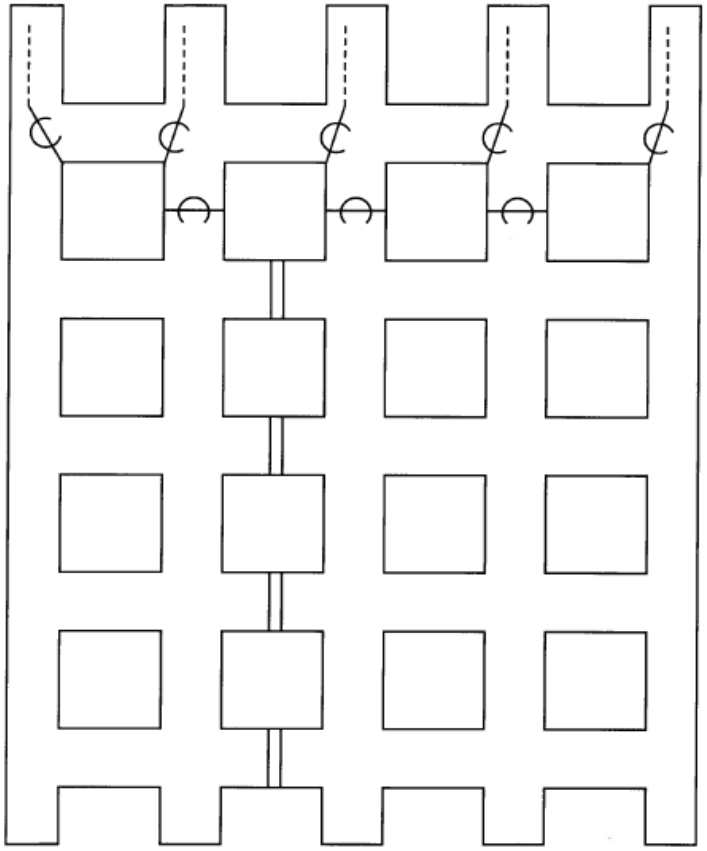
- Explain the purposes of underground mine ventilation systems.
- List the types of gases found in a mine, the amounts of some gases that are dangerous, and the amounts of other gases needed for healthy breathing.
- Emphasize the harmful effects of some gases in order to prevent overexposure.
- Describe methods of ventilation.

The ventilation module includes:

- Student ventilation content.
- Instructor version of module with notes.
- Mine map symbols table and blank for practice.
- Ventilation Case Reports discussion activity.
- Mine map and ventilation activities.
- PowerPoint presentation.

Example of ventilation mapping problem

Trace the flow of air through this section of the mine.



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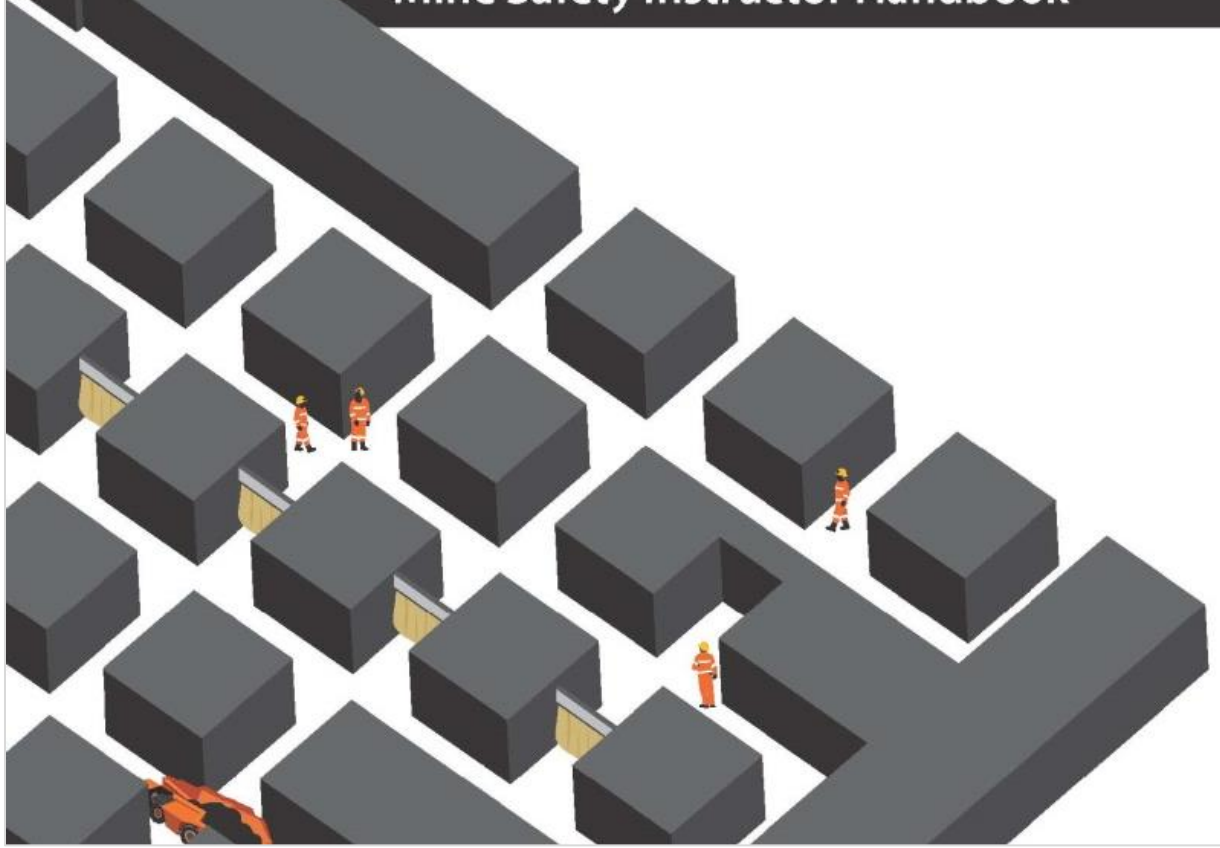
MINING AND INDUSTRIAL SAFETY
TECHNOLOGY AND TRAINING INNOVATION

TABLETOP EXERCISES

Mine Safety Instructor Handbook



Tabletop Exercises

- Are discussion-based exercises that offer a low-stress environment for examining roles and responsibilities.
- Acquaint personnel with emergency responsibilities and with one another.
- Take advantage of varied experiences and diverse perspectives.
- Are facilitated by a trainer who presents the scenario, moderates discussion, monitors pace, and poses questions.
- Ask participants respond based on plans and procedures as well as their knowledge and experience.

The tabletop exercise instructor handbook includes:

- Background information on tabletop exercises.
- Tips for successfully facilitating and evaluating a mine safety tabletop exercise.
- Scenarios and sample discussion questions.
- An exercise debrief summary form and a participant feedback form.

Eagle Creek Mine – Normal Day?

The Eagle Creek mining complex, owned by CoalCon Resources, has three bituminous coal mines in West Virginia. The Number 2 Mine began continuous miner development in April 2005 and longwall mining later that fall. The mine produces medium-sulfur coal from under its 8,900 acres and employs 650 miners.

It is 5:35 a.m. on a typical Sunday at work at the Number 2 Mine. You hear from another miner that the belt at Crosscut 54 is running rough, but still running.

Shortly after, you learn that an electrical problem has affected the ventilation flow on the operating longwall.

Normal Day? Sample Questions

- What do you do?
- What actions, if any, should be taken to correct the “rough running” conveyor belt? What are the hazards?
- What are the hazards involved in reduced ventilation flow on the operating longwall?
- How would miners know the ventilation has been affected?
- How would you find out what the ventilation flow requirements are on the operating longwall?
- What ventilation regulations apply to the situation?
- Who makes the decisions regarding the situation?
- What actions did your group decide to take? What steps, if any, should be taken next?

Incident and Injuries

- You expect to receive a report on the ventilation flow. Instead, you are told that a roof fall has occurred on the headgate end of the longwall, some 2.5 miles inby from the mains on the startup of the longwall. The resulting airblast injured miners working at the longwall section.

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The Active Training Portal® for Mine Safety
http://www.activetrainingportal.com

Mining and Industrial Safety Technology and Training Innovation
http://mistti.cet.edu/training-materials.html

Feedback

Thank you for participating in the Active Training Portal research study. Your feedback will be used to improve future mining training materials and presentations.

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Degraded images courtesy of Kelly Michals.
Rock dusting video courtesy of NIOSH.