



Environmental & Safety Mines

College of Petroleum & Mining Eng.

Mining Engineering Dept.

4th Class

Lecture No. 1 – Chapter 15 - PART-I

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Mine Monitoring

- Monitoring is an area of technology that has been rapidly changing and improving as new electronics and computer technology are implemented.
- It's an important part of safety & Protection
- Over 70% of fires detected during the first 15 min cause little or no damage to the mine
- Programmable logic controllers (PLCs), helping to make the systems more versatile and better designed for each mine's application

Mine Monitoring

- Controlling of methane, carbon monoxide, carbon dioxide, air velocity, and other indicator variables of the mine environment.
- The detection of a fire in its early stages may be the most important task of the mine wide monitoring system.
- A number of types of sensors are available for monitoring.
- Three main principles of operation are employed to detect fires:
 1. optical field of view
 2. thermal
 3. products of combustion

Mine Monitoring

Sensors Disadvantages

1. Excessive number of false alarms
2. Difficulty of discriminating an actual fire from the exhaust of diesel engines.

These problems can normally be solved by

1. A correct choice the fire sensors
2. Proper placement of the sensors in the mine layout
3. Optimal setting of the alarm level

RESPONSES TO FIRES AND EXPLOSIONS

- All activities stops when fire occurs

The four emergency phases are

1. Escape of the miners
2. Rescue of trapped miners
3. Recovery of bodies
4. Recovery of the mine

Mine Communications

1. A paging-type telephone system is used to communicate with each section.
2. Electrical Power off
3. In non-coal mines, A stench warning system is used
4. If a mine is long. A stench warning system with multiple points of injection is recommended.

Ventilation Management

- Disaster management team is responsible on V.M.
- Excavation of Miners
- Don't Change the air direction because it can send explosive gas mixtures into a fire zone
- Using mine fire simulators like, M-FIRE and PCVENT

END OF PART-I