

Rising Barometric Pressure

Wintertime is known as being especially dangerous for coal mines because of the changing weather and dropping barometric pressure. As the barometric pressure drops during the colder weather, more methane seeps from the coal into the mine atmosphere, creating a greater explosion risk. What about other seasons of the year and rising barometric pressure?

First of all, what is barometric pressure? It is the force that is exerted on objects by the weight of the atmosphere above them. While most of us don't think of gas as "weighing on anything", as matter, it does in fact have mass. Because of this and the effect of gravity upon gas, the air above us and around us does "weigh down" on us. When it is measured, this force is referred to as barometric pressure. Barometric pressure is measured in terms of the downward force that the atmosphere exerts per unit of a certain area. This reading is measured with a barometer.

A rising barometer is an indication of rising atmospheric pressure. The higher atmospheric pressure tends to reduce the methane liberation from the coal seam into the active mine atmosphere. Although methane liberation in the face area is reduced, other potentially hazardous conditions can be created. As the atmospheric pressure rises, air from the active area of the mine will tend to migrate or "in-gas" towards sealed areas and into gobs. This introduces oxygen into those areas of the mine. A zone with explosive methane/air mixture could exist behind seals or on the fringes of the gob. Mines with coal that is prone to spontaneous combustion could experience elevated carbon monoxide levels from heating as coal reacts with oxygen in the air moving into gob areas.

Best Practices

- Sample the atmosphere behind seals and check for explosive mixtures when they are in-gassing because of a rising barometer.
- Have a plan for creating an inert atmosphere behind seals if explosive mixtures are present.
- Monitor the Atmospheric Monitoring System (AMS) for signs of elevated carbon monoxide concentrations indicating possible heating in the gob.
- Increase monitoring of gobs when the barometer rises.
- Establish the mine's action levels for gases resulting from heating in gob areas.
- Maintain a recording barometer at the mine and check the trending of the barometric pressure each shift.
- Obtain a regional barometer forecast that will indicate expected changes and alert miners of the potential hazards associated with the changing barometric pressure.

Stay safe under pressure...even rising barometric pressure.

Source: Mine Safety and Health Administration (MSHA). MSHA's Accident Prevention Program Safety Idea - AP2010 – 98379. www.msha.gov

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