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Protecting Miners' Safety and Health Since 1978

## REFUGE ALTERNATIVE SAFETY ALERT

On January 1, 2014, underground coal mine operators were required to have MSHA approved refuge alternative components (breathable air, harmful gas removal, and air monitoring). These MSHA approved components give miners additional protections such as:

**Breathable Air Component:** Backup regulators have been added to provide miners with oxygen if one regulator fails. Compressed oxygen systems have been redesigned to reduce the risk of an oxygen fire.

**Harmful Gas Removal Component:** Scrubbing and airlock purging systems have passed performance tests and ensure miners are not exposed to dangerous levels of carbon dioxide or carbon monoxide while occupying the refuge alternative.

**Air Monitoring Component:** These instruments allow miners to measure the levels of oxygen, methane, carbon monoxide, and carbon dioxide outside of the refuge alternative, in the airlock, and in the main chamber. The instruments are readily accessible from outside the refuge alternative.

### Changes to Procedures and Training

**Self-Contained Self-Rescuers (SCSRs):** Recently completed National Institute for Occupational Safety and Health (NIOSH) research has shown that carbon monoxide can exceed safe levels inside the airlock, and therefore miners must continue to use their SCSRs while purging the airlock. Miners must not remove their SCSRs until all miners are in the main chamber and the air monitoring devices indicate that it is safe to do so.

**Training:** Mine operators must train miners on the benefits provided by breathable air, harmful gas removal, and air monitoring components; the location and use of air monitoring components; and the use of SCSRs when entering a refuge alternative.

**Purging the Airlock:** Refuge alternative manufacturers are revising airlock purging procedures based on the number of air changes rather than targeting a specific carbon monoxide level in the airlock. NIOSH research has shown that waiting for the carbon monoxide concentration to reach a specific level may result in insufficient air for purging the airlock when subsequent groups of miners enter the airlock. MSHA is working with refuge alternative manufacturers to update their training manuals to address these changes to the purging procedures. Mine operators must train miners in the revised purging procedures when they receive the updates from refuge alternative manufacturers.

**Only enter a refuge alternative if escape from the mine is not possible.**