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Sent: Monday, August 11, 2008 10:39 AM
To: zzMSHA-Standards - Comments to Fed Reg Group
Cc: Doug McKenna; Tom McKenna; Vince Suddard; billkennedy@kennedymetal.com
Subject: RIN 1219-AB58; COMMENTS TO MSHA REGARDING PROPOSED RULE FOR REFUGE ALTERNATIVES FOR UNDERGROUND COAL MINES (RH CONTROL)

Section 7.506 (f) This section requires qualification testing of carbon dioxide absorbents at specified conditions of temperature, pressure and relative humidity (RH). The acceptable testing tolerance for temperature is set to ± 5 degrees F (approximately ± 7.5%). The stated tolerance for relative humidity control is only ± 0.5%. Control of relative humidity to these extremely tight tolerances (± 0.5% equal to 5 parts in 1000) will add to cost, cause unnecessary testing failures and add little or no value to absorber performance characterization.

There are 3 significant drawbacks in attempting to control relative humidity to 5 parts in 1000.

1. With an established temperature tolerance of ± 5 degrees F, the relative humidity will vary for the required test condition as indicted below:

- At 55^{O}F and 50% RH a ± 5 degree temperature variation produces a relative humidity variation of 42% to 60%
- At 55^{O}F and 100% RH a ± 5 degree temperature variation produces a relative humidity variation of 83% to 100%
- At 90^{O}F and 50% RH a ± 5 degree temperature variation produces a relative humidity variation of 43% to 58%
- At 82^{O}F and 100% RH a ± 5 degree temperature variation produces a relative humidity variation of 85% to 100%

2. In addition to the relative humidity fluctuation caused by temperature changes, there is an instrument error for RH measurement. Compounding the difficulty of controlling humidity to these extremely tight tolerances is the difficulty of measuring relative humidity to the required level of precision. Very high quality chilled mirror humidity sensors are typically unable to measure 100% relative humidity to 5 parts in 1,000.

3. In addition to the effects of temperature and measurement error, chemical carbon dioxide absorbents add water vapor to the refuge chamber. If humidity control adds excess water to the chamber it will unnaturally affect the scrubber performance. Excess water may enhance or retard the performance of chemical scrubbers.

If the regulation is left unchanged, attempting to control relative humidity in a dynamic system to 5 parts in 1,000 is difficult and costly. The cost and complexity of controlling humidity in full sized rescue chambers is a technical challenge.

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Controlling humidity to this extremely tight tolerance is best accomplished by testing carbon dioxide absorbent systems in small scale, glove box facilities. Glove box testing in the range of 1:1,000 to 1:100 may be able to control humidity to 5 parts in 1,000. Unfortunately these small scale tests may not adequately demonstrate performance of real life, full scale systems.

Micropore recommends that the testing tolerance for relative humidity be changed from ± 0.5% to ± 8.0%; additionally recommend that the requirements specify that any addition of water vapor to the testing chamber be maximized at the metabolic rate being simulated.

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