From: Gary Hartsog [mailto:alphaeng@earthlink.net]
Sent: Monday, September 08, 2008 9:57 AM
To: zzMSHA-Standards - Comments to Fed Reg Group
Subject: RIN 1219-AB59 - Ventilation & Belt Comments

Please see the attached document re: RIN 1219-AB59.

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AB59-COMM-9

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September 8, 2008

Mine Safety and Health Administration
Attention: RIN 1219–AB59
Office of Standards, Regulations, and Variances
1100 Wilson Blvd., Room 2350
Arlington, Virginia 22209–3939.

Via e-mail to: zzMSHA-Comments@dol.gov

Re: **RIN 1219–AB59**
Safety Standards Regarding the Recommendations of the Technical Study Panel on the Utilization of Belt Air and the Composition and Fire Retardant Properties of Belt Materials in Underground Coal Mining

To Whom it may Concern:

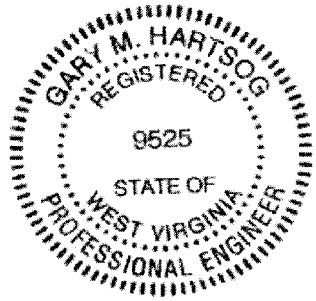
Alpha Engineering Services, Inc. is an engineering firm providing services to the mining industry in the United States. A large portion of our practice is providing mine ventilation and mine design services to the coal mining industry. As such we are involved in many ventilation and mine design problems involving engineering, mining and enforcement practices in the US.

Attached you will find comments on the above captioned proposed Regulations.

Should there be any question or clarification of any remarks be desired, please don't hesitate to contact me at the above addresses.

Sincerely,

Gary M. Hartsog, PE & PS
President
Alpha Engineering Services, Inc.
WV PE No. 9525



§ 75.333 Ventilation controls.

* * * * *

(c) * * *

(4) An airlock shall be established where the air pressure differential between air courses creates a static force exceeding 125 pounds on closed personnel doors along escapeways.

Pages 35035 and 35036 state: Section 75.333(c)(4)—Ventilation Controls Proposed § 75.333(c)(4) is a new provision that addresses Panel Recommendation 14 dealing with airlock doors. High pressure differentials on doors can lead to serious injuries to miners opening and closing these doors. Providing an airlock between entries provides a safe means for miners to travel between two air courses. An airlock consists of a pair of doors installed in ventilation controls between two air courses, which form a pressure equalizing chamber. A miner would open the first door, enter the airlock, and close the door. After equalizing the pressure, the miner can then open the second door and move into the adjacent entry.

The Panel stated that personnel doors along escapeways should be installed to establish an airlock when the static force created by the pressure differential exceeds 125 pounds.

MSHA agrees that there may be instances where the installation of an airlock is needed due to hazards associated with safely opening and closing personnel doors where high pressure differentials exist. The need for safe access is critical during a mine emergency evacuation when miners must move quickly to adjacent entries.

Proposed § 75.333(c)(4) would require an airlock be established where the air pressure differential between air courses creates a static force exceeding 125 pounds on closed personnel doors along escapeways. MSHA specifically solicits comments on other suitable pressures.

The Panel recommended a standard based upon the force on the personnel door of 125 pounds. This force on any specific door is dependent upon the pressure differential across the ventilation control, and the surface area of the personnel door. For the same pressure differential, the force required to open a personnel door increases proportionately with surface area. Mine operators may have alternatives to establishing airlocks, including reducing the size of a personnel door, providing a flap, or sliding door, which may reduce the static pressure to below 125 pounds. Reducing the size of a personnel door may lower the static pressure to below 125 pounds.

In order to calculate the force exerted by a pressure differential, the pressure differential and door dimensions must first be determined. As reflected in the Panel's example, a 125 pound force limitation on a 3-foot by 4-foot door would be created by a pressure differential of 2.0 inches of water. A 3-foot by 4-foot personnel door has an area of 1728 square inches (3' × 4' = 12 square feet × 144 in2/ft2 = 1728 square inches). For a force of 125 pounds, the distribution is 0.0725 pounds per square inch (125 lb/1728 in2= 0.0725 psi). Using the conversion factor, 1 psi = 27.68 inches of water, the equivalent

pressure differential can be calculated to be 2.0 inches of water (0.0725 psi × 27.68 in. H2O/psi = 2.0 inches of water).

The following table shows the door sizes and associated pressure differentials which create a 125 pound force:

Door area, Square feet,	*Pressure differential inches H2O*
4	*6.0*
6	*4.0*
9	*2.7*
10	*2.4*
12	*2.0*

The Agency solicits comments on the number of airlocks that would be required under this provision and the associated cost.

From Page 83 of the Final Report of the *Technical Study Panel on the Utilization of Belt Air and the Composition and Fire Retardant Properties of Belt Materials in Underground Coal Mining*, Recommendation 14:
Stoppings and doors (including personnel doors) along the escapeways should be clearly marked so that they can easily be identified. Consideration should be given to requiring that personnel doors along escapeways be structured to form an air lock when exceeding a certain force to open due to a pressure differential. For example when the pressure force on 3 ft x 4 ft personnel doors is greater than 125 lb, for safety reasons, these doors should be installed in pairs to form an airlock door (30 CFR § 75.333(d)(3)). Further, these should be clearly marked and posted on the ventilation maps.

Comments:

The proposed changes to 75.333 leave certain aspects of the requirement open to interpretation.
First: This will be a requirement for all mines irregardless of their use of belt air in the working faces. As such it is outside the stated purpose of the revisions to Part 75 (i.e. the use of belt air in the working faces). Many persons will not realize this proposal has been made until it becomes law because they expect these revisions to apply only to those mines using belt air in the working faces.
Recommendation: Make this requirement apply only to those mines using belt air in the working faces and the subject of future rulemaking where it is clear that the requirement will apply to every mine.

Second: The Belt Air Panel, Federal Register Commentary and the Final Rule all use the verbiage "along escapeways". The strict interpretation of the proposed rule requires that all personnel doors which allow egress from or access to an escapeway (both primary and alternate) must have an airlock installed where the air pressure differential causes the opening force to be greater than 125 pounds even if the door leads into a return or other less desirable airway for escape.

Recommendation: If this is the intension – not just to have such airlocks between escapeways but also on all applicable personnel doors into/ out of every escapeway – the regulation should be more explicit. For example, instead of "on closed personnel doors along escapeways", use "on closed personnel doors providing access to or from escapeways".

Third: Is this door/ airlock is intended to be a part of the escapeway system? For example, must it facilitate the passage of injured or disabled persons? Must the crosscut where the airlock is located be clear of obstructions like an escapeway? If the airlock leads to a belt heading, must there be a constructed belt crossing at the airlock over the belt?
Recommendation: There should be more guidance in the enforcement intensions instead of leaving this to local inspector's or district's policy. For example, instead of "on closed personnel doors along escapeways", use "on closed personnel doors providing access to or from escapeways and are not a part of the escapeway".

Fourth: A reading of the commentary indicates that the rule may be complied with by reducing the size of the door to as small as 24 inches x 24 inches, which would not allow many of today's miners in their normal dress to pass, much less an injured person on a stretcher or back-board. It should be noted that West Virginia Mining Law as contained in WV Code: **§22A-2-8. Duties; ventilation; loose coal, slate or rocks; props; drainage of water; man doors; instruction of apprentice miners.**
(a) . . . . . .
(b) After the first day of July, one thousand nine hundred seventy-one, hinged man doors, at least thirty inches square or the height of the coal seam, shall be installed . . . . .
Recommendation: MSHA may want to consider requiring a similar minimum size for personnel doors.

Fifth: The installation of air locks in older portions of a mine may be a very difficult task where roof support structures (e.g. posts, cribs) preclude using mechanical equipment to deliver material for building the airlock. Since the purpose involves higher pressures, the commonly used lighter and easier to handle material for stoppings (e.g. metal panels, Omega blocks, hollow core block) may not be adequate to the pressure and the stopping will require solid concrete blocks. There also may be remedial work (e.g. cleaning ribs, removing extraneous material (gob) supporting roof and/ or ribs, rehabilitating access or walk-ways) required before such airlock can be constructed.
Recommendation: The best case would be to allow a period of time (e.g. one year) from the effective date of the Rule before this provision is placed in force to allow an orderly evaluation and construction period for the work and to allow the District Manager to temporarily or permanently exempt certain personnel doors from compliance with this new rule when local conditions and mine circumstances support such exemption.

Sixth: MSHA requested information on the number of airlocks that would be required in existing mines. A survey of 14 mines located is several MSHA districts where airlock doors would be required under the proposed regulation are described below.

Analysis of Pressure Differentials -- Estimated No. of Airlocks or Mitigating Devices Required Under Proposed Regulation								
Mine	Age <5 yr	Age 5-10 yr	Age >10 yr	CM Units	LW present	30" x 30" door	36" x 36" door	42" x 42" door
						> 3.8" Pressure	> 2.6" Pressure	> 2.0" Pressure
1		x		6		2	3	5
2	x			2		0	0	0
3	x			2		0	0	0
4		x		3		5	8	11
5			x	4		0	0	0
6			x	5	x	5	31	51
7		x		6		19	23	27
8		x		8		9	11	27
9	x			6		0	0	3
10			x	3	x	0	0	0
11			x	6		9	15	20
12			x	6		0	0	0
13		x		4		0	0	0
14	x			3		0	0	0

The table above lists the results of an informal survey of 14 underground mines of various ages, sizes and conditions. The mines are described by age and units operating. Three door sizes are listed: 30-inch square, 36-inch square and 42-inch square. The 30-inch square and 36-inch square represent a large portion of the standard personnel doors in service. The differential pressures listed underneath the door sizes represent the minimum pressure for that size door that requires an airlock or similar mitigating structure/ device under the proposed regulation.

Section 75.323—Actions for Excessive Methane

In Recommendation 18, the Panel stated that methane liberated from ribs along the belt, or from the broken coal on the belt, can present significant safety hazards. The Panel stated that if methane levels in the belt air course are too high to provide dilution of methane liberated at the working sections, then the use of the air from the belt entry to ventilate a working section should be discontinued. To address the Panel's concern, MSHA is considering adding a new provision concerning methane levels in the belt entry.

Comment: These concerns are already addressed in the existing regulations. There is a maximum (<1.0% CH_4) methane level already in place and applicable to the working section and is not affected by this proposal. There are already limits on the level of methane allowed in the conveyor belt entry (<1.0% CH_4) and in the intake air (<1.0%

CH_4). Keeping the airflow below the concentrations is already a part of managing the section and the mine. Finally, there is constant and multiple sampling of the atmosphere in the working section at multiple locations by multiple miners and devices that will immediately take action should concentrations greater than 1.0% be detected anywhere.

Methane concentrations and flows entering the working section from the belt and intake aircourses may change significantly in a short period of time and at times be controlled in part by administrative controls. There are also times when the belt air must be used in the working sections for reasons other than just increased flow – such as length of aircourses, proximity to pressure sources – and the concentration of methane in the belt must be dealt with using dilution from the intake air courses.

In an example, if there was 20,000 CFM at 0.7% CH_4 from the belt entry and 75,000 CFM at 0.2% CH_4 from the belt entry, the intake air to the working faces would be 0.3% CH_4. This is not an unreasonable concentration in a mine with high methane liberation. One should recall that the maximum allowable methane at 1.0% is $1/5^{th}$ the explosive level of methane and was set not by considered scientific thought but by the capabilities of the flame safety lamp.

Recommendation: This additional control is unnecessary and constitutes additional, unneeded administrative and bureaucratic controls on a system that is constantly changing, constantly monitored and is already highly regulated by MSHA.

§ 75.350 Belt air course ventilation.
(d) (7) Where point-feeding air from a primary escapeway to a belt entry designated as an alternate escapeway, point-feed regulators must be equipped with a means to remotely close the regulator or any other means to isolate the two escapeways. The AMS operator, after consultation with the responsible person and section foreman, must be capable of performing this function from the designated surface location.

Comments: The ability to manually close point feed regulators is already a part of the existing regulations except that the action must be performed at a location near the point feed regulator but outside of portions of the airflow through the regulator. The expansion of this ability to close and/or open the regulator from the surface by a computer or similar method is fraught with several potential problems.

First: In some mines, as noted in the Commentary, there may be significant methane liberation at the faces when intake air is removed. This does not take into consideration the potential for significant accumulations of methane in belt entries when the airflow is removed. This may be from not only the broken coal on the belt but also from the coal ribs. Simulations of ventilation systems and experience shows that the methane may layer in the exceptionally low velocities, reverse in random directions due to leakage and potentially create bodies of explosive mixtures. Then, if the point feed is reopened, the bodies of explosive mixture may travel toward the face. If the reason for the point-feed regulator is to be closed in the first place is a fire or "hot-spot", the explosive mixture may cross that zone with disastrous results.

Second: Many of the ventilation systems where belt air is used in the working faces are the more complicated systems. Closing or opening a point feed may well affect more than just one working section. It may affect gob areas, bleeders, other working sections, etc., and result in far reaching ventilation changes. In addition, experience is that in such mines only a very small group of persons – maybe 2 or 3 – will actually know and understand the anticipated results of such a change. Therefore more than just the responsible person, AMS operator and a section foreman should be involved in the decision of when to make such a change. And moreover, these three persons may not have the contemporaneous information and knowledge of the system to make such a decision in an emergency.

Third: During many emergencies, one of the concerns is always everyone's location, current regulations and modern technology notwithstanding. Making air changes with persons underground who may be in the affected area of the changes may result in injury, incapacitation or death.

Recommendation: The provisions for remotely closing and/or opening the point feed regulator should be removed entirely from the regulations.