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Docket: MSHA-2008-0007
Refuge Alternatives for Underground Coal Mines.

Comment On: MSHA-2008-0007-0001
Refuge Alternatives for Underground Coal Mines

Document: MSHA-2008-0007-0015
Comment from Ed Roscioli, ChemBio Shelter, Inc.

Submitter Information

AB58-COMM-36

Re: RIN 1219–AB58

Key: Red = Text of Concern in Proposed Regulation
Blue = Comment

In a previous submission, I recommended using a minimum of 9 square feet per person for the floor area of a refuge shelter and eliminating the volume requirement.

This is the rationale for this recommendation.

Text of previous submission:

"Section 7.505 Structural Components Proposed § 7.505 Addresses the Structural Components Required for Refuge Alternatives Paragraph (a)(1) would require that refuge alternatives provide a minimum of 15 square feet of usable floor space and a minimum of 60 cubic feet of usable volume per person. MSHA

The amount of useable floor space of 15 square feet is excessive. We have found that 9 square feet of usable floor space per miner is sufficient. As can be seen by the photographs of the shelter and shelter outline with 35 people in them, 9 square feet per miner allows ample room. There is no basis for requiring volumetric requirements in this application. MSHA should lower the required usable floor space to 9 square feet per miner and eliminate the volume requirement."

A. Rationale for 9 square feet:

1. Review of other shelters and corresponding stay time:

    a) The proposed 15 square feet per person is the same number used in a 1958 Civil Defense Report for bomb shelters. The Civil Defense Report applies to a shelter with a stay time of 14 days.

    b) Refuge chambers already in use in South Africa have 6.1 square feet per person. The designed maximum stay time of these shelters is 1 day.

    c) A linear interpolation between these data points indicates that a 4-day stay time should require no less than 8.15 square feet per person. We have added some additional margin by rounding the 8.15 to 9.00 square feet per person.

2. Deployment of shelter and putting the rated number of occupants in it:

    a) We deployed one of our 35 person shelters and put 35 people in it. There was adequate room to operate the shelter even with all of the carbon dioxide scrubbing curtains in place. Pictures of this demonstration were submitted with my verbal comments at the Charleston, WV public comment meeting.

B. Rationale for eliminating the volume requirement:

When people are in the shelter, any volume of atmosphere above each miner is not useable space. Nothing can be placed there. Therefore, once the area on the floor is determined, no further requirements are necessary. For example, a shelter with a height of 6 feet and the same square feet per person as a shelter with a height of 4 feet would be the same operationally. The air processing equipment will maintain the oxygen and carbon dioxide levels independent of the volume of atmosphere in the shelter.

If the miners can work in the mine, then the miners can wait for rescue in the same height mine. In fact, it should require less height to wait for rescue than to remove coal. Therefore, specifying the floor area is all that is needed.