**DEPARTMENT OF LABOR**

**Mine Safety and Health Administration**

**30 CFR Part 49**

**RIN 1219–AB44**

## Underground Mine Rescue Equipment and Technology

**AGENCY:** Mine Safety and Health Administration (MSHA), Labor.

**ACTION:** Request for information.

**SUMMARY:** The Mine Safety and Health Administration is requesting data, comments, and other information on issues relevant to underground mine rescue equipment and technology. Over the last several years, improvements have been made to communication devices, sensors and other forms of technology in general industry. As such, continuous development and deployment of mine rescue equipment and technology are crucial to enhancing the effectiveness of mine rescue operations and improving miners' survivability in the event of a mine emergency. Responses to this request for information will assist the Agency in determining an appropriate course of action as necessary to improve mine rescue capabilities.

**DATES:** Comments must be submitted on or before March 27, 2006.

**ADDRESSES:** Comments may be submitted by any of the following methods:

- Federal eRulemaking Portal: *http://www.regulations.gov.* Follow the instructions for submitting comments.
- E-mail: *zzMSHA–Comments@dol.gov.* Include the Regulatory Information Number (RIN) for this rulemaking (RIN 1219–AB44) in the subject line of the message.
- Fax: (202) 693–9441. Include RIN 1219–AB44 in the subject line of the fax.
- Mail/Hand Delivery/Courier: MSHA, Office of Standards, Regulations, and Variances, 1100 Wilson Blvd., Room 2313, Arlington, Virginia 22209–3939. If hand-delivered in person or by courier, please stop by the 21st floor first to check in with the receptionist before continuing on to the 23rd floor.
- Instructions: All submissions must reference MSHA and RIN 1219–AB44.

*Docket:* To access comments electronically, go to *http://www.msha.gov* and click on ''Comments'' under ''Rules and Regulations.'' All comments received will be posted without change at this Web address, including any personal information provided. Paper copies of the comments may also be reviewed at the Office of Standards, Regulations, and Variances, 1100 Wilson Blvd., Room 2350, Arlington, Virginia.

**FOR FURTHER INFORMATION CONTACT:** Robert Stone, Office of Standards, Regulations, and Variances, MSHA, 1100 Wilson Boulevard, Room 2350, Arlington, Virginia 22209–3939. Mr. Stone can be reached at *Stone.Robert@dol.gov* (Internet E-mail), (202) 693–9444 (voice), or (202) 693–9441 (facsimile). The documents also are available on the Internet at *http://www.msha.gov/currentcomments.asp.* MSHA maintains a listserve on MSHA's Web site that enables subscribers to receive e-mail notification when MSHA publishes rulemaking documents in the **Federal Register**. To subscribe to the listserve, visit the site at *http://www.msha.gov/subscriptions/subscribe.aspx.*

**SUPPLEMENTARY INFORMATION:**

### I. Background

When mine accidents occur, effective mine rescue operation can play a crucial role in ensuring the safe withdrawal of affected miners. Specialized rescue equipment and technology are important components of that effort. Section 501(a) of the Federal Mine Safety and Health Act of 1977 directs the Secretary of Labor and the Secretary of Health and Human Services ''as appropriate'' to ''conduct such studies, research, experiments, and demonstrations as may be appropriate—(2) to develop new or improved methods of recovering persons in coal or other mines after an accident; and (3) to develop new or improved means and methods of communication from the surface to the underground area of a coal or other mine.'' In addition, section 502(b) of the Federal Mine Safety and Health Act of 1977 (Mine Act) requires that the Secretary of Labor, to the greatest extent possible, provide technical assistance to mine operators in meeting the requirements of the Mine Act and in further improving the health and safety conditions and practices in the mines. The Mine Act also requires in Section 115(e) that the Secretary publish regulations for the availability of underground mine rescue teams.

We accordingly test, evaluate and approve certain technologies and equipment for use in mines (see, Title 30, Code of Federal Regulations (CFR), Subchapter B). We also promulgated requirements for underground mine rescue teams in part 49, 30 CFR, covering, among other things, team equipment, equipment maintenance, and training.

### II. Current Status of Mine Rescue

The Sago Mine accident in West Virginia on January 2, 2006, that claimed the lives of 12 miners, has underscored the vital role that mine rescue operations play in response to catastrophic mine incidents. An MSHA investigation into the cause or causes of this accident, along with a detailed evaluation of the emergency response, is underway. Therefore, the role that the mine rescue played has yet to be determined and evaluated. We believe, however, that regardless of the outcome of the investigation, the role of equipment and technology in mine rescue efforts merits a separate review so that we can better assure that the best and most practicably available equipment and technology are being deployed—and continuously upgraded—to maximize mine rescue responses and miner survivability in the wake of mine accidents.

### III. Key Issues on Which Comment Is Requested

We are requesting comments, data, and other information on topics relevant to underground mine rescue equipment and technology. Public comment is invited in response to the specific questions posed below. Persons may comment on any other relevant aspects, issues, or questions relevant to mine rescue equipment or technology.

Commenters are encouraged to include any related cost and benefit (*e.g.*, lives saved) data with their submission to this request for information. Any specific issues related to the impact on small or remote mines should also be identified.

When answering the questions below, please key your responses to the specific topic and number of the question, and explain the specific reasons supporting your views. Please identify and provide relevant information on which you rely, including, but not limited to, episodes of past experience, as well as data, studies and articles, and standard professional practices.

#### *A. Rapid Deploy Systems*

Rapid Deploy Systems are systems which are easily transportable for use in mine emergencies and which can be quickly set up to provide emergency service. An example would be a seismic sensing system for detecting movement underground, or an electromagnetic sensing system to detect signals transmitted by trapped miners. These systems may employ advanced technology and may be under development.

1. What kinds of rapidly deployable systems could be used to locate miners who are trapped by a mine emergency?

2. How would such a system work?

3. Is the system currently available? If not, what obstacles are there to the development and implementation of this type of system? How long would it take to develop the system?

*B. Breathing Apparatus*

A mine rescue breathing apparatus is a device which provides oxygen for a mine rescue team member to use in contaminated mine atmospheres.

1. U.S. mine rescue teams use devices by Draeger and Biomarine. What other types of breathing apparatuses are currently in use by foreign mine rescue teams?

2. Are these other types of breathing apparatuses the best available for quick response in mine emergencies?

3. Do these apparatuses incorporate the best available technology? Can they be readily obtained? Do they meet U.S. approval and certification standards?

4. How can they be improved? How long would it take and at what cost?

*C. Self-Contained Self-Rescuers (SCSR)*

SCSRs are devices that provide miners with an MSHA required one hour of useable oxygen to be used for a mine emergency escape. Currently, SCSRs rely on two different technologies. One type uses a chemical reaction to generate oxygen. The other type uses compressed oxygen.

1. Is there more effective technology to protect miners than the SCSRs currently available? If so, please describe.

2. Should an SCSR be developed that provides more than one hour duration of oxygen? What duration is feasible considering that miners must carry the SCSR? Would it be desirable to require smaller and lighter SCSRs with less oxygen capacity to be worn on miner's belts while at the same time requiring longer duration SCSRs to be stored in caches?

3. MSHA standards require each mine operator to make available an approved SCSR device or devices to each miner. Should mines be required to maintain underground caches of SCSRs for miners to use during an emergency, or should each miner have access to more than one SCSR?

4. SCSRs are currently required to be inspected at designated intervals pursuant to 30 CFR 75.1714–3. Should SCSRs be inspected more frequently than the current requirements?

5. SCSR service life is determined by MSHA, NIOSH and the device's manufacturer. The service life can range from ten to fifteen years depending on the type of SCSR. Should the service life of SCSRs be reduced to five years or a different time limit?

*D. Rescue Chambers*

A rescue chamber is an emergency shelter to which persons may go in case of a mine emergency for protection against hazards. A rescue chamber could provide, among other things, an adequate supply of air, first aid, and an independent communication system.

1. Should rescue chambers be required for coal mines?

2. What characteristics should they have? Should they be mobile? Should the rescue chamber be semi-permanent, or built into the mine?

3. How long should they support a breathable environment?

4. How many people should they support?

5. How many rescue chambers should be required—how far apart should they be located?

*E. Communications*

1. What types of communication systems can be utilized in an emergency to enhance mine rescue?

2. Current systems include permissible hand-held radios, hand-held radios using small diameter wires, pager systems, sound powered telephones, leaky feeder systems that ''leak'' radio signals out of and into special cables, and inductive coupled radios that use existing mine wires as a carrier for radio signals. Are there other systems?

3. Should a particular system be required over another? If so, which system and why?

4. What new communication devices or technology may be well suited for day-to-day operations and also assist miners in the event of an emergency?

5. How should information be securely, reliably, and quickly transmitted during emergencies from remote locations to the mine rescue Command Center, or from MSHA headquarters to District offices? What technology should be used to quickly and securely transmit information from the mine site to or from MSHA headquarters, to District offices, mining companies, and the media?

6. How can the number of relay points be minimized in a rescue situation so that communications do not get garbled or misunderstood?

7. How can communications be improved when a rescuer is wearing a breathing apparatus and talking through a speaking diaphragm in the mask?

8. PEDs are one-way communication devices that transmit text messages through the earth to receivers which are carried by miners. PEDs are currently being used in nineteen mines throughout the U.S. Should PEDs be used even though they can only transmit signals to miners and are not bi-directional?

9. Can PEDs be developed into 2-way systems? If so, how long would it take and at what cost?

*F. Robotics*

A robot is a remote controlled device that can obtain and transmit information relative to the underground environment during mine emergencies. MSHA has pioneered the use of robots in mine emergency operations.

1. Besides providing video, gas readings and temperature readings, what other uses can be made of robotics in mine emergencies?

2. What could be the role of a robot in mine rescue operations?

3. What information could the robot supply to the Command Center?

4. What tasks could robots be built and programmed to perform?

5. Should individual mines use robots for emergency situations?

*G. Thermal Imagers and Infra-Red Imagers*

Thermal imagers are devices which provide video pictures of the heat emitted by objects underground. Infra-red imagers provide similar information through the use of the infra-red light spectrum.

1. What ''thermal imagers'' and ''infra-red imagers'' outside of those currently available in the U.S. are in use in other countries, and how can these be deployed in a mine rescue?

2. Permissible equipment is equipment which is approved by MSHA to be safely used in gassy atmospheres. Should thermal and infra-red imagers be permissible equipment?

3. What are the costs associated with these devices?

4. Should all underground mining operations be required to have one of these devices available on-site?

*H. Developing New Mine Rescue Equipment*

1. What are the technological or economic problems in developing new equipment such as mine communications equipment or other mine rescue technology?

2. Do manufacturers of such equipment have problems with making the equipment permissible for use?

3. What are the specific problems?

4. Should the approval process for such equipment be streamlined or otherwise changed? Do current approval

standards allow the flexibility for developing new technology?

5. How can equipment manufacturers be encouraged to invest in new technologies for mine rescue equipment?

*I. Mine Rescue Teams*

Mine rescue teams are specially equipped and trained miners who enter mines during mine emergencies to rescue trapped miners and help recover mines. Teams are equipped with self-contained breathing apparatuses, gas detectors, mine rescue communication systems, and other specialized equipment.

1. What equipment should an effective team have?

2. Should the number of required breathing apparatuses per station be changed? How and why?

3. Each mine rescue station is required to have twelve permissible cap lamps and a charging rack. Each station is also required to have two gas detectors. Should the number of cap lamps and detectors per station be changed? How and why?

4. Where and how should that equipment be maintained?

5. MSHA requirements for mine rescue teams are found in 30 CFR part 49. These requirements cover such topics as type of equipment, equipment maintenance, team membership and training. What other equipment, technology, membership requirements and training would facilitate or would better facilitate team preparedness?

6. Should each team be familiar with the operation of the transportation equipment maintained at all the mines the team covers?

7. Some mine rescue teams are using breathing apparatus which, according to the equipment manufacturer, will soon become obsolete. How can existing mine rescue teams be encouraged to update the equipment and technology they use?

8. Should any new technology be used to assist mine rescue teams at mine emergencies?

*J. Government Role*

1. What equipment and technology should be promoted to improve mine rescue?

2. How should a mine's status (small, remote or operating under special circumstances) be taken into account in developing new or different equipment requirements?

2. How could our standards and implementation regarding mine equipment and technology be improved?

3. What training, instruction and procedures should be provided to miners to better enable them to survive an underground emergency?

4. What types of emergency supplies (timbering materials, ventilation materials, sealing materials, etc.) should be maintained at each mine site?

5. What non-regulatory initiatives should we explore?

6. What further steps should we take to improve the capability, availability and effective use of mine rescue equipment and technology?

Dated: January 20, 2006.

**David G. Dye,**

*Acting Assistant Secretary for Mine Safety and Health.*

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