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VIA FACSIMILE
202-693-9441

MSHA
Office of Standards, Regulations, and Variances
1100 Wilson Blvd., Room 2313
Arlington, Virginia 22209-3939

Re: RIN 1219-AB44 Underground Mine Rescue Equipment and Technology Comments

Dear Sir/Madam:

These comments are submitted on behalf of the Potash Association of New Mexico ("PANM") in response to the Request for Information published by the Mine Safety and Health Administration ("MSHA") in the Federal Register on January 25, 2006. [71 Fed. Reg. 4224 (Jan. 25, 2006] seeking comments on underground mine rescue equipment and technology.

PANM is an association of underground mine operators with potassium leases and underground mining operations in the Secretary's designated "Potash Area" [see Order of the Secretary, 51 Fed. Reg. 39425, 39426, October 28, 1986] near Carlsbad, New Mexico. Its membership includes Mosaic Potash Carlsbad, Inc. and Intrepid Potash NM LLC, both of which have extensive underground mining operations in the Potash Area and together employ in excess of 1,000 employees. Collectively, these mine operators own over 90% of all potassium leases in the Potash Area, including Federal and New Mexico State leases. They produce 100% of the potash mined in New Mexico and over 80% of all potash mined in the United States.

We fully support MSHA's efforts to collect and review all new, relevant data on methods, equipment, and technology that are currently available, or may become available in the future, to improve both the safety of underground miners and the rescue of miners in the event of a mine accident. In doing so, however, one of the most important factors, we believe, is the recognition that what may work in one mine or one industry may not work in another. This distinction extends beyond the well known differences between coal mines and non-coal mines. A perfect example of this is the current Gassy Mine Regulations found at 30 C.F.R. § 57.22001. In adopting these regulations, as you know, MSHA recognized that there are significant differences in the hazards encountered in underground mining, not only between coal and non-coal mines, but in underground

metal and non-metal mines themselves, depending upon numerous factors, including whether the ore body is combustible and liberates methane gas, whether the ore body is combustible but does not liberate methane gas, whether dust generated by mining is volatile and, if so, how volatile, whether the ore body is prone to outbursts of methane gas, and whether the ore body is non-combustible and the mine does not encounter methane gas in concentrations that are or may become explosive.

The recognition of these distinctions, and the tailoring of regulatory requirements based upon the actual hazards faced by each type of mine based upon its own unique characteristic, we believe, resulted in a much higher level of safety to miners than any attempt to develop gassy mine regulations applicable to all mines, coal and non-coal, as well as metal and non-metal without regard to the combustibility of the ore bodies being mined.

We urge MSHA to follow this same approach when considering any changes in current regulations concerning mine rescue. Ore bodies like those mined by members of PANM, which are non-combustible, generate no dust that is volatile, and which do not liberate methane gas in concentrations that are or which may become flammable, face far different issues in terms of accidents and mine rescue than either coal mines or other metal and non-metal mines with combustible ore bodies, volatile dust, or which encounter methane gas in dangerous concentrations. To do otherwise, we believe, would not only fail to improve safety but, even worse, could actually impede the adoption and implementation of more effective mine rescue measures specifically designed for the types of dangers actually faced by underground miners.

Consistent with this approach, we provide the following comments and responses to the questions asked by MSHA in its Request for Information:

A. Rapid Deploy Systems

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

   There are no such systems we are aware of that are reliable and sensitive enough to accurately locate individual miners from the surface. Systems available today only give general locations of employees, unlike GPS on surface.

2. How would such a system work?

   Communication to and from (most importantly <u>from</u>) the miner is required to accurately determine his/her location. Radio signals capable of traveling through the ground need to be VLF (very low frequency) and require a very large antenna not suitable to be carried by individuals. PANM believes the best way to determine someone's location is by training miners, if they are unable to reach the surface, to go to designated gathering points where at least two separate communication systems (with battery or generator backup) will be

maintained.

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?

See comments above.

B. Breathing Apparatus

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?

The only two suppliers of breathing apparatuses we are aware of are Draeger and Biomarine. We have confidence in their units, if properly maintained, and make them quickly available at the mine site.

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

See comments above.

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

See comments above.

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

See comments above.

C. Self-Contained Self-Rescuers (SCSR)

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

Yes, at least in our mines. Although PANM members will be providing SCSR's for underground miners as required by recent amendments to the New Mexico Mining Act, we do not believe they should be required nation wide for all mines. Unlike coal, no combustible gasses or dust exist in a potash mine and therefore CO is the only likely life threatening product of combustion of the limited quantities and types of combustible materials brought underground . Standard Self-Rescuers (FSR's) are sufficient to protect miners exposed to smoke from fires in potash mines. Although not required, PANM

members plan on keeping a cache of SCSR's at strategic locations that are within a walking distance of one hour (the operational parameters of the FSR) from each working section.

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?

   See comments above.

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?

   See comments above.

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?

   See comments above.

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?

   See comments above.

D. Rescue Chambers

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?

   These questions are limited to coal mines and we believe, for the reasons stated earlier, that

the answers are dependent upon the unique characteristics and hazards presented by coal mining and should, therefore, come from those familiar with and experienced in coal mining safety issues.

In an underground potash mine, where the ore body is not combustible, PANM believes miners should be trained to escape the mine, not retreat to a rescue chamber. To the extent that rescue chambers (as opposed to the refuge areas currently required in some instances for metal and non-metal mines) are required, they should be a semi-permanent area constructed by erecting an airlock that allows access to a drift that has been sealed off from the mine general. We believe this chamber should be capable of supporting the maximum number of miners reasonably expected to be working in an area, and support those miners for at least 36 hours. These chambers, at least in potash mines, should be located no more than a 1-hour walking distance from the working face and have additional self rescuer units and duplicate communications.

E. Communications

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

   Communication is the most important part of a mine emergency of any kind. Our mine rescue teams currently use sound powered telephones to communicate a short distance from the team to the fresh air base and the existing distributed antenna system (DAS) radios for long range discussions, sometimes using the radio/telephone interface to call the surface. Battery powered pager telephones and the regular telephone system are also available. One mine is also installing a coax wireless communication system that will give underground miners the capability to communicate with each other as well as to the surface.

   No particular system should be required over another. Any communication system needs to be optimized to the mine where it will be used. During an emergency, no reports should be made from the command center to anyone outside (MSHA headquarters, district offices, mining companies, or media) until the rescue team that gathered the information has returned to the fresh air base and reported fully. Radio microphones should be used that are not affected by the breathing apparatus, such as throat or in-ear microphones. One-way communication has only a very limited value and all available resources should be used establish reliable two-way communication systems.

2. Current systems include permissible hand-held radios, hand-held radios using small diameter wires, pager systems, sound powered telephone, 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?

   See comments above.

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

   See comments above.

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?

   See comments above.

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?

   See comments above.

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

   See comments above.

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

   See comments above.

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 eve though they can only transmit signals to miners and are not bi-directional?

   See comments above.

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

   See comments above.

F. *Robotics*

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?

Due to the distances involved in underground potash mines (up to 6 miles in one mine and more than 10 miles planned), a robot's effectiveness is currently unproven and the rescue effort would, for the present, be better served using conventional rescue techniques.

G. *Thermal Imagers and Infra-Red Imagers*

1. What "thermal imagers" and "infrared 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?

Infrared imagers, once technologically proven in a mining environment, might be of value in those instances where heavy smoke is encountered.

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?

Because of the nature of potash mining, which is non-gassy, there is no need for this equipment to be permissible.

3. What are the costs associated with these devices?

We believe a helmet mounted camera with a heads-up display would be the most useable, at a cost of about $50,000.

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

Only if the technology has been successfully proven useable and reliable in an underground mining environment.

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?

While these questions are directed to equipment manufacturers, we believe one major improvement would be to make breathing apparatuses smaller, lighter, and/or cooler. Also, because communication is the most critical element to a successful rescue effort, if the communication system supports digital data flow (such as Ethernet over the DAS), bi-directional communication with the rescue team would be greatly improved if the rescue team had a tablet PC that allowed the fresh air base and command center to view the map as the team progressed and were otherwise thereby able to utilize written communications. Helmet video and thermal imaging video feeds back to the base could also be extremely useful in certain conditions.

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

1. What equipment should an effective team have?

It depends on the type of mine involved.

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

For underground potash mines, the number of breathing apparatuses, cap lamps, and gas meters at the mine rescue station is quite adequate.

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?

See comments above.

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?

Yes.

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?

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

The standardized training module MSHA currently uses for mine rescue teams should be updated (it still uses flame safety lamps). An additional training module should be created for command center operations. A joint MSHA/Industry commission should be formed to review and update mine rescue policy on a regular basis about every five years.

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

5. What non-regulatory initiatives should we explore?

Funding should be made available so that NIOSH could continue inquiries into improving mine rescue technology.

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

Once a technological goal is conceived and defined, we suggest MSHA hold a competition with an appropriate cash prize that will draw upon the imagination of many others to solve

a given problem. The most ingenious ideas often come from the most unlikely sources. MSHA should take the leadership in mine rescue team/command center training and standard curriculum.

PANM hopes these ideas and suggestions will be of use to MSHA in providing the mining industry valuable and useable guidance.

Yours very truly,

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