From: Geosteering@aol.com [mailto:Geosteering@aol.com]
Sent: Friday, April 02, 2010 10:17 PM
To: zzMSHA-Standards - Comments to Fed Reg Group
Cc: Chirdon, David C - MSHA; Retzer, Patrick E. - MSHA; Porter, Kenneth - MSHA
Subject: Comments to RIN 1219-AB65

2010 APR -2 P 10:17

Please see attached response.

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AB65-COMM-13

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April 1, 2010

Mine Safety and Health Administration
1100 Wilson, Boulevard
Room 2350
Arlington, VA 22209-3939

Attention: Mr. Joseph A. Main

Comments on RIN 1219-AB65, Proximity Detection Systems for Underground Mines

Dear Mr. Main,

Frederick Mining Controls hereby submits comments in response to your requests for information dated January 27, 2010.

Comments given below are based on experiences with Proximity Detection Systems (PDS) on RCCMs in five coal mines in the USA as well as on various types of machines in mines within South Africa and Australia.

Any moving vehicles or machinery may potentially pose a safety threat to personnel working in close proximity to those machines. In our opinion, a formal systematic risk assessment should be performed on all moving equipment in a mine to determine if a significant safety risk is present. If so, utilization of a PDS should be considered as a control for that risk. If a PDS is selected as a control then the performance and functional requirements for the PDS should be derived from the results of the risk assessment. Using this approach can significantly reduce false starts and reduce wasted effort by all parties and will also tend to lead a more successful PDS implementation program.

Thank you for inviting us to comment on such an important safety initiative.

Sincerely,

Larry D. Frederick, President
Frederick Mining Controls, LLC

If you have questions please contact Dwayne Towery, USA Field Operation Manager
Phone: 256-655-9023 or DTowery0223@FrederickMining.com

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Responses to MSHA questions:

The numbering for the responses below corresponds to the numbering of your questions.

1. The best protection for underground coal mine personnel is to stop the motion of the equipment when personnel are dangerously close. For faster moving machines such as shuttles cars or LHDs it has proven to be effective to first slow and then to stop the machine. The size and shape of the safety zones should be adjusted at the time of installation to be most effective for that type and size of machine, and the work areas required..

For trucks, front loaders or other vehicles used in some types of hard rock mines, that typically operate at higher speeds, the sizes and shapes of the safety zones should be automatically adjusted depending upon speed and direction of motion, when that is possible.

2. No comment

3. Some PDS have already proven to be highly reliable and require no special reliability testing. During development, use of a formal reliability analysis and testing methodology may be helpful.

4. PDS systems that are used within underground coal mines should be designed such that their failure will automatically slow and/or stop the machine.

Vehicles moving at higher speeds should, as a minimum, give a clear warning to the machine operator that a failure of PDS has occurred.

PDS failures that will result in these responses should include reduction in the size of zones, degraded communication between system elements, loss of power, and broken cables.

5. Proper operations should be verified at the beginning of each shift by use of procedures that are approved by mine management, based on recommendations from the manufacturer. A typical test that may be included is to intentionally enter the danger zone and observe the response of indicators on the PDS systems, verifying that the person performing the test enters the Danger Zone at the distance specified by mine management. Provisions should be made so that these tests do not endanger personnel performing the test. Verification of proper zone sizes should be independently verified on a weekly basis by responsible, approved personnel.

6. PDS systems must not produce nuisance alarms that stop the machines. The size of the zones should be kept small to also minimize nuisance warnings by non-operator personnel in the area, but not so small to allow a dangerous condition.

7. The size and shape of the safety zones should primarily be determined by size, speed and operation of the machines, following a risk assessment. For faster moving vehicles such as haul trucks, scoop, front loaders and LHD's the size and/or shape of the zones may be automatically adjusted based on the speed

and direction of machine motion. On slow moving machines such as the RCCMs, a constant zone size has proven to be effective.

8. The PDS system for a RCCM should keep all personnel at a safe distance from the periphery of the machine except for the operator who should be allowed to approach the machine at designated locations to perform cutting operations, such that if the operator fails to stay in the designated locations the machine will immediately be stopped.

The operator should be able to move freely into and out of the provided silent zones (anti zones) without stopping the machine.

9. Some maintenance tasks require access to machine parts while the machine is activated. A PDS system cannot prevent access to the machine and at the same time allow access to the machine. Special, approved maintenance procedures should be used while performing such tasks.

Examination of serious accidents during maintenance reveals that some accidents happen because two personnel are present, with one not being aware of the presence of the other. The PDS can help to eliminate some of those incidents. A portable silent zone "anti-zone" device can be provided so that the PDS system remains active while the maintenance operation is being preformed and so that the Personnel Alarm Device used by the maintenance person will not produce warnings or stop the machine. Keeping the PDS active during maintenance will result in an alarm if an unexpected person enters the warning zone and will result in stopping movement of the machine if an unexpected person enters the danger zone. This portable silent zone (anti-zone) should be designed so that personnel will not be prone to use it as a by-pass during normal operations.

10. There are situations where a bypass should be provided. For example, in a deep cut a rock fall may damage a magnetic field generator causing the PDS to stop the RCCM in its fail safe condition. In this situation the RCCM may be beneath unsupported roof and cannot be removed. A temporary bypass is required to extract the RCCM to a safe location for repair. Those generators that are still working properly should continue to be used.

11. Most electrical noise will be rejected by a properly designed PDS system; however, there has been at least one case where it was necessary for the OEM of the RCCM to add capacitors to suppress the known high level of electrical noise on the VFD tram circuit.

12. No comment

13. Proximity detection can be provided for most moving equipment and can provide active warnings about hazardous locations within the mine.

14. Approvals and certifications for PDS to be used on RCCMs should be applicable for use on other types of machines, as is the case in South Africa. PDS systems have been used in production or demonstrated in mines on Shuttle Cars, LHDs, Roof Bolters, Feeder Breakers, Haul Trucks, Light Duty Vehicles and other machinery. Other areas which can benefit from the use of PDS include: blind

intersections, vehicle around intersections, vehicles behind brattice cloths, and vehicle to vehicle collisions.

15. A silent zone (anti-zone) should be provided for the machine operators work station or cab/canopy area so that they will not be warned and so that the machine will not be stopped while they are at their normal work stations.

16. All personnel working around RCCM's, shuttle cars, roof bolters, rotary breakers, LHD's, scoops and other machines should be protected from each and all those machines in any combination. Each individual should be warned if they are threatened by any machine and the appropriate type of warning should be given for the highest priority or greatest danger to them. In addition any machine operator should be warned if their machine is a potential threat to any other personnel. If that person or persons is/are within the danger zone, the machine should automatically be stopped or be slowed down then be stopped.

17. No comment

18. No specials skills required

19. Experience has shown that providing a few hours of class room instruction and approximately 1 hour of underground training for operators has proven to be adequate, the exact amount depends on the situation. Maintenance training typically requires about 4 hours.

20. Safety awareness has been increased by the use of PDS systems.

If all machines are equipped with PDS then Proximity detection will exist for all personnel at all locations.

21. No comment.

22. A PDS system should be expected to have a useful life that is as long as the life of the equipment upon which it is installed.

23. A record should automatically be made for all personnel working in the vicinity of a machine. The record should show movement of those personnel in and out of safety zones and other information that may be important such as battery voltage or activation of switches on their Personal Alarm Device/Cap Lamp. This data should be automatically transmitted to the surface on a real time, or near-real-time basis or, at least, should be performed manually on a reasonable periodic basis.

24. Any moving machinery may potentially pose a safety threat and should be subjected to a formal, systematic risk assessment.

25. No comment

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