
Subject:

Docket No. MSHA-2014-0019

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Sent: Monday, November 30, 2015 5:30 PM

To: McConnell, Sheila A - MSHA

Cc: Barry Hill

Subject: Docket No. MSHA-2014-0019

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<http://www.regulations.gov/#!documentDetail;D=MSHA-2014-0019-0001>

RE: MSHA -2014-0019-001 1 (Proximity Detection Systems for Mobile Machines in Underground Mines)

To Whom It May Concern:

I am submitting supportive comments on the above proposed ruling. The email address provided on the [regulations.gov](http://www.regulations.gov) site does not work and I am left to submit in this fashion.

The hopeful objective of this ruling is that between applying proximity detection sensors on the miners, and on the mining machines, the rate of accidents - including fatality accidents – will diminish. To summarize, the introduction to the proposed ruling is as follows:

“The Mine Safety and Health Administration (MSHA) is proposing to require underground coal mine operators to equip coal hauling machines and scoops with proximity detection systems. Miners working near these machines face pinning, crushing, and striking hazards that result in accidents involving life threatening injuries and death. The proposal would strengthen protections for miners by reducing the potential for pinning, crushing, or striking accidents in underground coal mines. MSHA is, also, interested in the application of these proposed requirements to underground metal and nonmetal mines¹.”

Additionally, “Proximity detection systems consist of machine-mounted components and, if applicable, miner-wearable components. For proximity detection systems with miner-wearable components, the mine

operator would be required to provide a miner-wearable component to be worn by each miner on the working section¹. “

As stated before, I am writing in support of this ruling as a private citizen, whose great grandfather worked in the coal mines of Pennsylvania, and as a law student. For the purposes of explanation, the latter is more salient than the former, as this response forms part of a class assignment on public commenting. I selected this proposal for analysis due to my professional interest in safety topics and as a function of my professional work as a military member and a safety officer in a military battalion. Ground accidents with heavy machinery occur in the military and, although, there are many differences in category between military ground accidents and mining operation machine accidents, all mechanical accidents have commonalities – most specifically, human factors. In this analysis, I have applauded the use of proximity detection sensors and recommended that the MSHA consider broadening the use of proximity detection sensors to include roof-bolting machines.

The MSHA proposal covers two categories of underground coal mining machines – coal hauling machines and scoops¹. The reason for choosing these machines appears to be that “more than 40% of the most serious injuries (fatalities and permanent disabilities, 2000–2007) in the mining industry involve accidents classified as struck-by or caught-in machinery and powered haulage equipment².” Furthermore, of all mining, coal mining has the highest rate of accidents in the mining industry³.

Coal hauling machines and scoops are two, common types of highly mobile, very large, coal moving/scraping machines used in underground coal mining operations that are not “longwall,” operations. They could be loosely described as a cross between a bull-dozer and a dump truck, but longer and flatter. Operator visibility in this kind machine and environment – dark, low, and close - is severely challenged, both in the character of the terrain and the presence of workers, on foot, in the vicinity of the machine path⁴.

Proximity detection sensors offer two types of warning in this situation. In the simplest terms, through the generation of very low frequency magnetic fields, proximities from 5 – 15 meters are detectable⁴. In the first application, operators, with on board sensor detection equipment, are warned of encroaching foot traffic – also sensor enabled. In the second, workers on foot, wearing sensors, are warned of the approaching machine’s path⁴. The efficacy of such systems are sufficiently studied to allow a conclusion that, even with limitations due to terrain, tunnel architecture and geological matrices, a working, underground mining environment with sensors has fewer accidents than one without⁵.

However, when assessing the above data, it is unclear why similar technology could not be applied to other, more hazardous activities, such as roof-bolting, thus broadening the rule to include a phase-in of proximity detection sensors in these types of machinery as well.

Although, the MSHA has stated that it “does not have accident data that justifies applying the proposed requirements to other mobile machines on the working section, such as roof bolting machines¹,” it appears that there are MSHA based statistics that have contributed to readily available studies that would suggest a review of that conclusion. For example, a 2007 document titled “Preventing Equipment Related Injuries in Underground U.S. Coal Mines,” authored by Burgess-Limerick and Steiner, reports that United States coal mining accident statistics, submitted to the MSHA, in 2004, led to the conclusion that “one of the contributors to this elevated risk [*sic* underground mining operations] is working with or near underground coal mining equipment. Roof

bolting machines and continuous miners have been consistently identified as high risk equipment.⁶” Furthermore, in another study by T. Ruff et al, based on analysis of MSHA data, it was reported that “*roof bolting machines*, haul trucks and front-end loaders were most frequently involved in accidents involving mobile machines³.” In fact, a NIOSH study, by C. Jobes et al, noted that several mines, in Australia, as well as South Africa, have successfully applied the use of proximity sensor detection to roof bolters, as well as continuous mining machines⁷.

Thus, it appears there are several sources of established research that would support a broader ruling from the MSHA that could include roof bolting machines as well as hauling and scoop machinery. An extension of protection can only benefit a mining operation, curtailing the losses associated with operation stoppages and employee absences.

Thank you for the opportunity to comment on this proposal.

Sincerely,

Karin R. DeWitt

1. *Proximity Detection Systems for Mobile Machines in Underground Mines*, Proposed rule, DEPARTMENT OF LABOR, Mine Safety and Health Administration, 30 CFR Part 75, [Docket No. MSHA-2014-0019] RIN 1219-AB78
2. *Mining Topic: Proximity Detection*, National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, (last accessed 29 November 2015)
<http://www.cdc.gov/niosh/mining/topics/ProximityDetection.html>
3. T. Ruff, P. Coleman, L. Martini, *Machine-related Injuries in the US Mining Industry and Priorities for Safety Research*, National Institute for Occupational Safety and Health, Office of Mine Safety and Health Research, 315 E. Montgomery Ave., Spokane, WA 99207, USA <http://www.cdc.gov/niosh/mining/userfiles/works/pdfs/mriit.pdf>
4. D. Kent (Mine Site Technologies – Business Development Manager) and B. Schiffbauer (Frederick Mining Controls – Manager Mining Technologies), *White Paper: Proximity Detection Systems in Underground Mines*, Australia
5. T. Horberry and T. Cooke, *COLLISION DETECTION AND PROXIMITY WARNING SYSTEMS FOR MOBILE MINING EQUIPMENT: A HUMAN FACTORS EXPLORATION*, Minerals Industry Safety and Health Centre University of Queensland Brisbane, QLD 4072, Australia
6. R. Burgess-Limerick and L. Steiner, *Preventing Equipment Related Injuries in Underground U.S. Coal Mines*, Australian Coal Association Research Program,

7. C. Jobes et al, *Evaluation of an Advanced Proximity Detection System for Continuous Mining Machines*, The National Institute for Occupational Safety and Health 626 Cochran's Mill Road, Pittsburgh, PA 15236