
Subject:

RE: RIN 1219-AB78 Response to the Proposed Rule on Proximity Detection Systems
for Mobile Machines in Underground Mines Docket No. MSHA-2014-0019

From: Ruf, James (GE Transportation) [<mailto:james.A.ruf@ge.com>]**Sent:** Tuesday, December 15, 2015 8:45 PM**To:** zzMSHA-Standards - Comments to Fed Reg Group**Cc:** Davidson, James (GE Mining); McConnell, Sheila A - MSHA**Subject:** RIN 1219-AB78 Response to the Proposed Rule on Proximity Detection Systems for Mobile Machines in
Underground Mines Docket No. MSHA-2014-0019

To: Mine Safety and Health Administration (MSHA)

Attached are the comments of GE Mining Industrea / GE Transportation in response to ...

The Proposed Rule on Proximity Detection Systems for Mobile Machines in Underground Mines (RIN 1219-AB78).

Docket No. MSHA-2014-0019

Jim Ruf

Lead Systems Engineer, Mining Compliance
GE – Transportation

Phone (814) 875-5136

Mobile (814) 722-7721

Mobile (651) 775-3751

E-mail: James.A.Ruf@ge.com

2901 E. Lake Rd.

Erie, PA 16531

GE Imagination at Work

GE Mining Industrea

T +61 2 4336 1800
F +61 2 4336 1888

GE Mining Technology

3 Co-Wyn Close
Fountaindale
New South Wales, 2258
Australia

www.ge.com

15 December 2015

Re: Proximity Detection Systems for Mobile Machines in Underground Mines, Proposed Rule Docket No. MSHA-2014-0019, RIN 1219-AB78

Overview

GE Mining Industrea ("GE") appreciates the opportunity to respond to MSHA's request for comment on the proposed rule. GE Mining is a business within GE Transportation that provides products and solutions to the mining industry in the U.S. and around the world. GE Mining's products and services allow miners to generate and use power efficiently, manage water quality effectively, and improve productivity at the mine through deployment of advanced software monitoring systems.

GE supports MSHA's proposal to apply proximity detection systems to mobile equipment. We note below, however, several concerns that we believe should be addressed to ensure operators and suppliers are able to leverage innovative technology in a way that maximizes the net benefits of this rule.

In short, we believe MSHA should commence implementation in line with the proposed time-line outlined below. We are confident that this will allow adequate engagement between miners, PDS suppliers, and OEMs to roll-out the technology across the industry in a controlled manner.

Specific responses

MSHA should allow more phase-in time in the final rule

Although we believe the proposed phase in period is feasible as written, we suggest that MSHA consider extending this timeframe slightly for new equipment to 12 months. This extension would allow adequate time for PDS suppliers and OEMs to refine existing PDS technology to comply with the final rule and to address any integration challenges with diesel powered equipment before operators must transition to automatic vehicle control.

With respect to existing equipment, GE joins with other commenters who suggest MSHA consider extending this timeframe from 36 to 60 months to allow reasonable retrofit timeframes within the context of infrastructure, machine overhaul frequency, resource (i.e. installation) and operating equipment availability constraints. If MSHA extends this timeframe, we would support progressive execution across the existing fleet coupled with defined milestones. Such a framework would enable PDS suppliers and OEMs to put in place effective service and support structures capable of supporting an expected increase in end user demand.

MSHA should account for challenges in installing PDS for diesel powered machines

While GE understands there are significant challenges in integrating complex systems such as PDS technology to mobile equipment we are confident these challenges can be addressed. We encourage MSHA to fully consider the following issues:

- **The final rule should account for general market feedback regarding available PDS system integrity.** MSHA should carefully evaluate the fundamental integrity of existing systems based on the views of various end users. For example, market feedback on the generally accepted higher accuracy Electromagnetic-based ("EM") technology suggests there could be a field variance under certain environmental conditions underground driven by factors including:
 - Roof mounted wire mesh at 5ft clearance
 - High ore body metal content
 - Other equipment underground such as overhead conveyors

This challenge could be further magnified in situations where multiple vehicles and personnel are within close proximity to each other.

- **The final rule should account for the significant operating and integration differences between electric and diesel equipment.** Diesel equipment presents different system integration considerations (particularly within the context of potential automated vehicle control). These include challenges interfacing and providing electronic control and interlock for typically non-electronic equipment control systems (hydraulic and pneumatic) and additional considerations integrating with a power source that can be simple, unregulated or non-existent in the case of older diesel equipment.
- **The final rule should account for the fact that industry lacks a widely accepted standard interface protocol.** A standard interface protocol between OEMs and PDS suppliers could enable seamless data flow between the PDS and vehicle systems, but is not yet widely available. At present, OEMs have seen some progress in this area, and industry groups including EMESRT (Earth Moving Equipment Safety Round Table) have taken a lead role in bringing together industry participants to define a standard. Still, significant work remains to be done in this area.

MSHA should ensure that any requirements to slow or stop equipment are based on reasonably predictable technological advances

GE agrees in principle with MSHA's aspiration to implement vehicle control through PDS outputs. Doing so would likely reduce the risk of safety incidents underground. Industry will require additional time, compared to the proposed timelines, to successfully integrate this technology to optimize accuracy and reliability before transitioning to automatic equipment slowing and/or stopping.

GE recommends that PDS manufacturers, OEM's, and Mine Operators work together to define appropriate degrees of vehicle control based upon individual mine characteristics including the following:

- PDS Technology Capabilities
- Equipment Dynamics/Performance
- Mine Personnel
- Mine Operating Processes



MSHA should apply the requirements of the final rule to other equipment

MSHA should extend requirements to all underground vehicle and equipment types where potential for a vehicle-to-person collision exists. We recommend that the following broader equipment types be considered for inclusion within the scope of the proposed rule longer term:

- Shuttle Cars,
- Feeder breakers,
- Bolters,
- Longwalls, and
- Ancillary support equipment (personnel carriers, lifting equipment etc).

We believe MSHA's approach, with an initial focus on coal hauling machines and scoops, is reasonable given the fundamental challenges outlined earlier before expanding the mandate to other equipment. As mentioned, PDS suppliers and OEMs must undertake significant further work to develop interface protocols that will enable machine responses under different scenarios. This effort is non-trivial.

MSHA should expand this rule to cover both metal and non-metal mining

We encourage MSHA to take a phased approach focusing initially on coal (which we understand is MSHA's intention), because metal and non-metal mines present different challenges including greater numbers of diesel equipment and higher potential for multi-vehicle and personnel interactions. We believe it is essential that PDS suppliers are able to satisfy the fundamental requirements of the industry, including system integrity, accuracy, and reliability, and resolve any integration challenges before they are required to expand these systems into metal and non-metal mines.

Conclusion

GE Mining Industree fully supports MSHA's decision to mandate PDS solutions on mobile vehicles in line with the time-lines suggested above. We are committed to working collaboratively with end users, OEMs, and MSHA to deliver the required industry outcomes.

Please feel free to contact me with any further questions you may have regarding this letter or our technology and services.

Sincerely

James Davidson
Senior Product Manager
GE - Mining
james.davidson1@ge.com