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Comment from Will Dando, Pennsylvania Coal Alliance

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General Comment

See attached file(s)

Attachments

PCA Proximity Comments

AB78-COMM-20

December 15, 2015

Mine Safety and Health Administration Office of Standards, Regulations and Variances 1100 Wilson Boulevard Arlington, VA 22209

Re: Proximity Detection Systems for Mobile Machines in Underground Mines RIN 1219-AB78

To Whom It May Concern:

The Pennsylvania Coal Alliance ("PCA") offers the following comments to the Mine Safety and Health Administration ("MSHA") concerning its Proposed Rule entitled "Proximity Detection Systems for Mobile Machines in Underground Mines," 80 Fed. Reg. 53070 (September 2, 2015).

PCA is an association that represents the majority of bituminous underground and surface coal mine operators in Pennsylvania. The mines of our members are routinely inspected by MSHA inspectors and receive enforcement actions with accompanying civil penalties.

I. Introduction

On September 2, 2015, MSHA published a Proposed Rule Proximity Detection Systems for Mobile Machines in Underground Mines. 80 Fed. Reg. 53070. The deadline for submitting comments has been extended to December 15, 2015. The proposed rule seeks to require coal mine operators to equip proximity detection systems on coal hauling machines and scoops on working sections using continuous mining machines. The proposed rule also includes a progressive compliance phase-in period of 8-36 months depending upon the date of manufacture and installation of proximity technology in advance of the final rule. MSHA requests comment on numerous items not specifically included in the proposed rule, including the application of proximity detection systems in underground metal/non-metal mines. For these comments, the PCA focuses only on the proposed rule's application to underground coal mines.

II. Section-by-Section Analysis.

A. 30 C.F.R. § 75.1733(a), which would require proximity detection on equipment other than continuous mining machines is premature and requires significant testing, research and development before implementation.

The proposed rule would require coal mine operators to equip coal hauling machines (shuttle cars, ramcars, and continuous haulage systems) and scoops on working sections using continuous mining machines with proximity detection systems. The proposed rule recognizes that the terms "proximity detection" encompasses technology whereby electronic sensors detect motion or the location of one object relative to another, but the proximity detection systems proposed by the rule are similar to those implemented on continuous mining machines and include machine mountable and miner-wearable components. The proximity detection systems contemplated by the proposed rule would provide a warning and stop equipment.

In support of requiring proximity detection systems on coal hauling machines and scoops the proposed rule relies on data from 1984 to 2014, related to accidents and fatalities purportedly caused by such equipment. Additionally, the preamble states that in 2010 MSHA observed the use of proximity detection systems in three underground mines in the Republic of South Africa. Additionally, the preamble relies on a few instances of anecdotal evidence regarding the successful use of proximity detection systems on equipment other than continuous mining machines.

While PCA supports the eventual implementation of proximity devices in underground coal mines, PCA opposes the application of a proposed rule requiring proximity detection systems on coal hauling machines and scoops in underground coal mines at this time. Based on PCA's experience and discussions with its member mines, considerable uncertainty exists as to the adequacy of proximity detection technologies for equipment other than continuous miners. PCA is aware of no reliable data indicating current proximity detection technologies will suitably operate as intended on such equipment, especially considering the variables of underground mining. PCA believes it is imprudent on the part of MSHA to implement a rule without first conducting adequate testing and research. It is unduly burdensome both operationally and financially to require proximity detection on coal hauling machines and scoops before determining that the technology is adequate, dependable and consistent.

PCA is aware that the National Institute for Occupational Safety and Health ("NIOSH") has recently begun to work on developing information about proximity detection on coal haulage systems and scoops. NIOSH, in conjunction with academia, is in the early stages of development of basic criteria, such as stopping distances, necessary to provide guidelines for equipment manufacturers.

The proposed rule supports that the testing and research is currently inadequate. MSHA has not even observed, let alone researched or tested, the use of proximity detection systems on continuous haulage systems or diesel-powered machines although such equipment would be covered under the rule. See 80 Fed. Reg. 53074-53075. See 80 Fed. Reg. 53075. There is no meaningful discussion in the proposed rule regarding the mining industry's or MSHA's purported experience or observations of proximity detection systems in use on continuous haulage systems. The proposed rule merely states that MSHA is "aware" of one instance that a manufacturer installed machine mounted proximity detection on a continuous haulage system and then demonstrated it to a mine operator. See 80 Fed. Reg. 53074. The proposed rule places no context for the demonstration or whether it was successful. Yet, MSHA concludes that it anticipates challenges with "adapting proximity detection systems to continuous haulage systems" due to the unique characteristics and use of the machines.

MSHA's knowledge of proximity detection systems on equipment other than continuous mining machines appears to come primarily from visits outside of the United States. In 2010, MSHA observed the use of proximity detection systems in three underground mines in South Africa. PCA questions the significance of the observations made during the trip to South Africa given that a system observed by MSHA during that trip is not used in the United States, and would not be approved for use under the proposed rule. See 80 Fed. Reg. 53072. MSHA provides only two other anecdotal examples (September 2011 and June 2013) in which the use of proximity detection systems on equipment other than continuous mining machines was observed. See 80 Fed. Reg. 53072. The PCA also finds the reliance on comments from a "representative of a South African mining company" that it did not experience a "reliability" problem for eighteen months, to be unpersuasive. See 80 Fed. Reg. 53073. The preamble does not state the type of mine or proximity detection system referenced by the commenter, nor does the comment provide any context as to the meaning of "reliability." Also, such visits from foreign officials often involve "showcasing" the equipment or process and may not represent the actual day-to-day experience.

PCA agrees that the implementation of proximity detection should be a long-term goal given the potential safety benefits, but PCA cautions implementing a

premature rule. PCA is aware that mines in the United States that have tested proximity detection on equipment other than continuous mining machines have experienced issues with the consistency and dependability of proximity detection. Because continuous mining machines travel at slower speeds than coal haulers, scoops, and other equipment, the detection zones are required to be much smaller. But the larger the detection zone, the more the system is adversely affected by the mine environment and electromagnetic interference. Further, there is little to no exposure to sensors, other than the one worn by the continuous miner operator when a continuous mining machine is operating. Unlike continuous mining machines, however, coal haulers, scoops and other equipment would encounter sensors much more frequently during operation. Thus, there is an increased potential for nuisance tripping caused by inadvertent exposure into the detection zone of coal haulers, scoops, and other equipment.

In addition to inadvertent travel into the detection zone, the operation of equipment during the mining process requires equipment to operate often in close proximity. PCA understands that equipment interaction can result in cross zone interference and nuisance tripping. For instance, one mine experienced nuisance tripping due to cross zone interference when loading coal onto shuttle cars. The mine had to install additional equipment to help alleviate the zone issue, but even then had to do extensive testing. The proposed rule fails to consider cross zone interference and makes no allowance for the act of loading coal, or other similar actions where equipment operators may be aware of each other's position.

PCA understands that the consistency and dependability of proximity detection systems are also affected by the geology of underground workings, including but not limited to, the pyritic content of the coal seam. Further, PCA is aware that energized power cables and the use of wire mesh as roof support have caused interference with proximity detection systems resulting in a failure of the system to locate the miner-wearable component with a satisfactory level of accuracy or consistency.

Current technology has not proven adequate or dependable for use on mobile equipment operating in varying underground environments. And imposing a rule prior to proper testing, research and development of even basic guidelines promotes the stagnation of developing technologies and increases the potential for equitable waste in an already troubled coal market. By implementing a final rule without further research and development, companies that manufacture proximity detection systems have little incentive to further develop systems beyond what is already in place. Operators will be left with few, if any, other options beyond the two currently approved systems available for use.

Further, to the extent technologies are developed to account for issues encountered after a rule is implemented, it will require piecemeal adjustments or additions rather than a seamless, comprehensive system. PCA seeks to avoid the same issues mine operators experienced with the promulgation of the rule requiring proximity detection on continuous miners. MSHA proposed the rule on proximity detection systems for continuous mining machines in 2011, which was preceded by a request for information in 2010. A public comment period on the proposed rule closed in November 2011. After MSHA had published the proposed rule, mine operators invested millions of dollars on proximity detection technology that addressed crushing/pinning hazards. But the promulgation of the final rule in January 2015 rendered much of the equipment previously installed on continuous mining machines obsolete. Thus, mine operators may be reluctant to purchase and further test proximity detection systems here for the same reason. Any rule should let operators develop, test and implement the technology and then include requirements that address the technology that has been proven effective, without adding additional "bells and whistles."

PCA is also aware that MSHA has recently requested manufacturers of proximity detection systems for continuous mining machines to implement additional technologies not previously required by the recently promulgated rule, or face MSHA decertification of their products. PCA would like to see assurances from MSHA that it will not attempt to impose additional requirements on equipment manufacturers after the promulgation of a rule.

The proposed rule requests a comment about what modifications to machines already equipped with proximity detection need to be completed, but this type of information is such that MSHA should already know before proposing a rule. Further, it assumes that the technology already implemented by mine operators is not adequate and that the systems required by the proposed rule are, which as described above, is not the case. It would be sensible for MSHA to determine whether equipment currently fitted with proximity detection addresses the hazards contemplated by the preamble prior to imposing technologies that would force a modification or render otherwise useful proximity detection obsolete.

PCA agrees with exploring alternatives to proximity detection. Under the proposed rule, however, there are currently only two systems to choose from and both use the electromagnetic field in design, which conforms to the systems implemented on continuous miners. Because of the miner-wearable component, systems used will likely be standardized, which in turn will limit the available types of proximity detection systems. PCA recommends promoting a performance

driven field open to new technologies, rather than implementing the proposed rule that will stifle research and development.

1. <u>Longwall working sections should be exempt from any proximity rule.</u>

The proposed rule excludes longwall working sections. PCA agrees that requiring proximity detecting devices on scoops and haulage equipment should exclude longwall working sections. In PCA's experience, the hazards proximity detection seeks to address do not exist on longwall sections.

MSHA also solicited comments on whether the proposed requirements should apply to any mobile machines, other than coal hauling machines and scoops, in use on or off the working section. PCA submits that any rule should only apply to mobile coal haulage machines and scoops on working sections. The statistics provided in the preamble do not support the massive effort and costs to equip all mobile equipment, including coal haulage machines and scoops, in outby areas of mines. Further, as detailed above, the technology is not sufficiently developed.

2. Statistics, data and common-sense do not support the massive effort and cost to equip all mobile equipment with proximity detection systems.

Like the above, the statistics provided in the preamble do not support the massive effort and costs to equip all mobile equipment with proximity detection. Specifically, the hazards proximity detection seeks to address do not exist on longwall sections. Further, equipment such as feeders moves slowly, infrequently and can be moved using remote control. Roof bolting machines do not typically pose a risk for pinning people during use or when moving into position for use. And the data relied upon to support the implementation of proximity detection systems do not indicate a need for such equipment. Further, requiring the implementation of proximity detection on equipment MSHA has not even observed, let alone researched or tested, (continuous haulage systems and diesel powered equipment) is staunchly opposed by the PCA. See 80 Fed. Reg. 53074.

Further, MSHA based its cost assessments by estimating that the average working section consists of seven miners. In PCA's experience, that number is low. Most member mines have sections consisting of approximately 11-15 persons per section. Some of PCA's members utilize supersection crews, plus additional people that may be assigned to a section, which increases the number of persons

per section to greater than 20 – over double MSHA's cost assessment. Because many miners perform multiple duties during a given shift, mine operators will have to purchase extra mine-wearable components. The PCA believes it is foreseeable that despite the rule's applicability to sections with a continuous mining machine, operators will have to purchase units for each miner in the mine to ensure compliance. The estimated number of persons that will likely be required to don a miner-wearable proximity sensor must be reassessed to evaluate accurately the cost associated with the rule.

3. The proposed phase-in schedule should not differentiate between equipment previously installed with proximity detection or that can be fitted underground.

The proposed rule provides that the final rule will be phased-in over a period of 8-36 months depending upon the date of manufacture and installation of proximity technology in advance of the final rule and whether the equipment can be worked on underground. To the extent the final rule applies only to mobile coal haulage equipment (minus continuous haulage systems) and scoops, PCA believes that the timeframe is generally feasible, except that the PCA proposes to not differentiate between equipment (whether systems can be modified underground, or if they are already fitted with proximity detection). Instead, PCA suggests revising the phase-in schedule to require all equipment covered by the rule, except newly manufactured equipment, to be fitted with proximity detection systems no later than 36 months after the publication of the final rule. The sheer number of pieces of coal haulage equipment and scoops potentially affected by the rule makes any timeframe less than 36-months not feasible. In fact, two member mines could potentially have to install proximity detection on at least thirty scoops per mine. And one member with approximately 30 pieces of continuous haulage equipment potentially affected by the rule has expressed that even 36-months to comply with the rule is not feasible.

PCA also notes that the proposed rule provides no data or statistics concerning the number of machines covered by the rule, nor does the preamble provide data or statistics concerning the availability of functioning, rule-compliant systems. Further, because each miner would potentially need to be fitted with a sensor the time to train miners on utilization will be onerous. Depending on the applicability of the rule mines could have to install proximity detection on as many as 75 pieces of equipment, with coal haulage and scoops making up at least fifty percent of the total number of machines. Moreover, differentiating between equipment already installed with proximity detection may provide a disincentive

for future testing of proximity detection systems before the promulgation of a final rule.

The proposed rule is also silent as to who determines whether a piece of equipment can be equipped with proximity detection underground. PCA proposes that mine operators are best suited to determine what equipment can and cannot be modified underground. Further, PCA believes that all mine operators should have the option to install proximity detection underground or outside, without differentiating between the two. Providing both options ensures that proximity detection systems are properly installed and will reduce the risk of improper installation, whereas differentiating between above versus below ground creates confusion regarding compliance.

4. <u>Task-training for the machine mounted component</u> should be integrated into task training for the machine.

PCA agrees that each miner responsible for operating equipment with proximity detection should have task training, but anticipates that the training will be integrated with the task training to operate the machinery. No separate rule requiring task training is needed. Further, PCA expects that miners fitted with sensors will need to understand how the system functions and how to assure the wearable component is functioning properly; PCA, however, does not view this as necessary separate task training. And typically, vendors provide this type of training.

5. PCA takes no position on whether proximity detection should be included in underground Metal and Nonmetal mines.

Although the PCA takes no formal position with respect to whether proximity detection should be included in underground Metal and Nonmetal mines, the PCA notes that similar to other types of equipment (roof bolting machines, feeder breakers, continuous haulage systems, etc.,) in underground coal mines, there is no data suggesting that the particular hazard proximity detection addresses exist in metal/nonmetal mining.

6. There is no need for a rule requiring reflective clothing.

Reflective clothing has been a voluntary process in coal mining accepted by the overwhelming majority of underground mining companies. PCA's members all require reflective clothing to be worn by persons underground. PCA would encourage MSHA to poll mine operators to see if any underground coal or metal/nonmetal operations do not have a reflective material policy. PCA believes that imposing a restrictive rule with specific guidelines for reflective material would unnecessarily place limitations on such policies by limiting the types of reflective material that can be used by operators. It may also create unnecessary costs to mine operators to replace otherwise adequate reflective material.

Requiring specific measurements for reflective material would also place a burden on mine operators to ensure that every miner working underground had enough reflective material to comply with the standard. Mine operators would be forced to inspect each and every miner before the miner heads underground. Such a requirement is overly burdensome given the potential benefit, which in the PCA's opinion is minimal.

B. The questions presented in proposed rule, 30 C.F.R. § 75.1733(b), demonstrate the need for additional testing and research.

The proximity detection systems proposed by the rule are similar to those implemented on continuous mining machines and include machine mountable and miner-wearable components. The proposed rule states that proximity detection systems will provide both a warning and will stop all movement of the machine. The machine would remain stopped while a miner is within a programmed "stop zone."

PCA agrees with the commenter that one specified "stop zone" is not feasible and must be based on both a mine-by-mine basis and on the type of equipment. PCA agrees with NIOSH that the functions of the proximity detection should be performance based. Utilizing a performance-based standard determined by the operator and equipment manufacturers would allow mine operators to establish the safest and most efficient use of proximity detection. PCA is aware that stop zones can vary based on the equipment and mine conditions. In fact, one member mine with entries typically below 60" stated that the entry height affects the consistency of the stop zone. PCA proposes for additional testing to be conducted before the implementation of a rule to determine the issues that may arise given the varying conditions of mines.

PCA agrees that sudden stopping of equipment presents additional hazards for onboard equipment operators. For example, a scoop can travel approximately 6 mph. If a miner suddenly steps into the stop zone, to avoid striking the miner, the scoop may need to stop abruptly, which may then injure the operator. Conversely, if the machine does not abruptly stop, it may strike the miner who has suddenly stepped into the zone. PCA believes that equipment should come to a gradual,

rather than abrupt stop, recognizing that in doing so may not prevent injuries such as the one described above. PCA has no specific recommendation on the distance equipment should stop before contacting a miner. PCA agrees that it should be performance-based, with a focus on specific mining conditions and types of equipment, which will require different stopping distances. PCA believes that additional testing and research is needed to determine adequate and safe stopping distances and whether the above scenario is avoidable. Of course, as PCA has previously stated, research should be conducted before a rule is promulgated.

Additionally, PCA finds no reason to require the total de-energization of all functions of the equipment. The hazards the proposed rule seeks to alleviate are crushing and pinning injuries. To the extent equipment functions do not contribute to such hazards, PCA sees no value in the proximity detection systems deenergizing such components. The use of smart technology, which would limit the number of machine functions, impacted by an excursion into a stop zone to those functions that impact the crushing and pinning risk should be encouraged.

As stated above, the PCA agrees that the operation of some equipment makes the use of proximity detection problematic. PCA believes that additional testing is needed to determine the appropriate stopping zones and to what effect overlapping stopping zones present other issues. That the preamble and the proposed rule presents questions about whether the technology could interfere with communication, how it interacts with multiple pieces of equipment, whether audible alarms and visual components would add to the effectiveness of the technology and other essential rudimentary functions such as stopping zones, demonstrates the need for additional testing and research.

C. The requirement for proximity detection checks under 30 C.F.R. § 75.1733(c) presents additional problems MSHA must resolve prior to the implementation of a rule.

The proposed rule would require that operators designate a person to perform a check on the machine mounted component to verify that the system is functioning at the beginning of the shift, or prior to use, whichever occurs first, and one hour prior to a shift change if miners are hot-seating. While the PCA agrees that it is important to check to ensure the proximity detection system is fully functioning, the PCA foresees several issues with adequately doing so.

First, while testing the onboard mechanism for such things as whether it has power or is engaged would not seem to be problematic, actually testing the system's functionality will be. In fact, to test whether the proximity detection will

function accordingly requires operating the equipment and exposing it to a sensor within the stopping zone to see if the machine alarms, slows and ultimately stops. Such testing, however, exposes equipment operators to unnecessary risk. Second, for each miner to test his/her wearable component to ensure it is adequately functioning would require miners to place the sensor within a machine's proximity zone. Further, given the multiple pieces of equipment on a section each miner would have to test his/her sensor on each piece of equipment. Each miner cannot, however, be expected to test each wearable sensor to each machine mounted component although functionality of the two is necessarily dependent upon the other. PCA is uncertain how miners can actually determine whether the device will work, and submits that adequate testing cannot be performed as outlined in the proposed rule.

Relying on a proximity detection system without the capability of sufficiently testing its functionality presents complications. Because of the very nature of proximity detection, PCA anticipates that both equipment operators and bystanders will depend greatly on the reliability of the technology. Coupled with the fact that mining conditions and variables affect the functionality of the systems, the PCA suggests that MSHA determine, prior to the implementation of a rule, how this could be done. PCA believes that MSHA should conduct additional testing and research to adequately determine a reliable way to check and test proximity detection systems.

D. Creating and retaining proximity detection check records each time equipment is used under proposed 30 C.F.R. § 75.1733(d) is illogical when weekly permissibility checks under 30 C.F.R. § 75.512 are adequate.

The proposed rule would require a certified person to check the equipment, provide a date, time and initial of such check, and record any defects and corrective measures. The rule would also require a record of defects and corrective actions for the miner-wearable component. Records would be required to be kept for a period of one year.

PCA agrees that examining the proximity detection systems to ensure proper functionality is important. PCA disagrees with providing a date, time and initials for each check, and recording the substance of the checks at intervals provided by Section 75.1733(c). Instead, PCA proposes for a weekly record to be made during electrical examinations required by 30 C.F.R. Section 75.512. Equipment operators and miners wearing sensors would still be required to conduct preoperational examinations of equipment prior to use, but examinations would

only be recorded during weekly permissibility examinations performed by certified electricians.

III. Conclusion

The PCA supports efforts to improve the safety of miners, but its greatest concern with the proposed rule is the lack of substantive testing and research on the use of proximity detection systems for machinery other than continuous mining machines. It is evident that there has been limited research on the use of noncontinuous mining machine proximity detection. NIOSH, the leading government research arm, is only in the incipient stage of its research activities. It is also evident that there has been minimal testing done in actual mining conditions at this time. In fact, certain types of equipment that would fall under the proposed rule, such as continuous haulage systems, have had no testing or design work done. Therefore, PCA opposes the adoption of the proposed rule until there has been adequate opportunity to review the performance of proximity detection systems on equipment other than continuous mining machines in coal mines.

The PCA appreciates the opportunity to provide its comments and looks forward to a continued role in improving the safety and compliance efforts of the mines of Pennsylvania.

Very truly yours,

Will Dando

Director of Government Affairs

Pennsylvania Coal Alliance