

PROXIMITY NOTES

There is very little difference between the mobile equipment rule and the continuous miner rule, but there is a significant difference in the equipment being regulated

We have seen no current technology that will operate effectively on mobile equipment in all mine environments,

In late 2010, a coal hauler and continuous miner located on the surface at Peabody Energy's Willow Lake Mine in Southern Illinois were fitted with Frederick Mining Controls proximity detection systems. (System is now known as Strata Hazard Avert) Tests were conducted on the surface in a controlled environment. Testing soon exposed that it is not possible to provide full coverage on the rear section of the hauler without creating a shutdown zone where the continuous miner operator needed to stand. A work around was added to allow the miner operator to shrink the shutdown zone as the car backed into the loading position, after the car had slowed to a pre-determined speed. Due to the shape of the zone, this action would remove protective coverage of the rear corners of the coal hauler. Tests were considered reasonably successful and the decision was made to install the systems on a miner and four coal haulers at Peabody Energy's Gateway mine in 2011. At some point the system was programmed to shrink the rear field automatically when the car was below a pre-determined speed, eliminating the requirement of the operator to press a button to take this action. The cars continued to operate in this manner until the mine was recently idled.

The following comments are based on our experience from two years of testing using the Joy Smartzone proximity system on two Joy BH18AC coal haulers at Peabody Energy's Wildcat Hills underground mine in Southern Illinois and limited testing with one Joy BH18AC coal hauler at Peabody Energy's Francisco Underground mine in Southern Indiana. When production tests were conducted the coal haulers were operated behind a Joy 14CM15 continuous miner also fitted with a Joy Smartzone proximity system.

- Because the Continuous Miner travels slower, zones are smaller and less affected by the environment
- Battery powered coal hauler zones must be much larger due to the size of the machine and the speed that it travels. The larger you make the zone, the more the system is affected by the environment and electromagnetic interference
- System is influenced by the pyritic content of the coal seam, wire mesh that is used to support the roof, and energized power cables that are used to provide power to the continuous miner and roof bolting machines.

(The 9/1/2015 MSHA fact sheet said the rule would require the system to “Prevent adverse interference with or from other electrical systems”. The proposed rule does not contain the words “or from”)

- These influences do not allow the system to locate the miner wearable component with any accuracy or consistency, making it nearly impossible for the hauler to work in close proximity to the continuous miner operator.
- The proposed rule makes no allowance for the act of loading a car, an action that both the coal hauler driver and continuous miner operator are aware of each other’s position and activity.
- The Joy Smartzone system can be shaped around the equipment to allow “operator zones”, but this technology is more susceptible to interference and it does not allow the system to accurately locate the miner wearable component.
- For either type of system to work, the rule would have to be modified to allow for reduced coverage when backing into the continuous miner to load.

In May of this year, a one day trial of Strata’s Vector technology system was tested on a JoyBH18AC coal hauler at Wildcat Hills underground mine. The system performed as advertised, however, the single generator that is used with this technology did not have the needed power to provide a large enough field to protect the entire car.

Based on our experience, the rule as it is currently proposed cannot be met. Modifications to the rule to allow the continuous miner operator to work in close proximity to the coal hauler are a must. Additional time is needed to allow technologies to be developed that are not adversely impacted by the underground environment. Current systems cannot provide accurate detection of people in a hazard areas, this requires shutdown zones to be much larger than they should be to provide an acceptable safety factor, creating an unacceptable number of nuisance trips.

We have invested a lot of time and resources and we want proximity detection to work, but current technology has not been proven on mobile equipment operating in varying underground environments. Our efforts will continue with or without this rule. Gateway North Mine has recently fitted four Joy BH20AC coal haulers with Joy Smartzone proximity detection and will begin testing before the end of the year. Coal Hauler testing will resume at Wildcat Hills as soon as a new software release is available, currently being tested by Joy.

Arrangements have been made to ship a Joy BH18AC coal hauler to a Strata facility for additional testing of Strata’s Vector technology.

Peabody has not conducted trials on Scoops. We believe we will experience similar results as with the coal hauler, with the issues being exaggerated due to the areas they travel. The Scoop will travel in entries where high voltage cables are routed in addition to being exposed to the same issues as the coal hauler when the Scoop is working on the loading section.