



## FACT SHEET

### MSHA's Final Rule on Proximity Detection Systems for Continuous Mining Machines in Underground Coal Mines



Since 1984, there have been 35 deaths where miners have been pinned, crushed, or struck by tramming or repositioning continuous mining machines on the working section in underground coal mines. The Mine Safety and Health Administration's (MSHA) final rule will strengthen protections for miners by reducing the potential for pinning, crushing, or striking accidents.

#### Highlights of the Rule

- This rule requires operators of underground coal mines to equip place-changing continuous mining machines with proximity detection systems.
  - Proximity detection technology uses electronic sensors – on both mining machines and miners – to detect motion or the location of one object relative to another.
- The rule is performance-oriented, allowing for innovations in technology. It no longer requires a prescribed warning or stopping distance, but rather requires that certain operational standards be met. This flexible approach is responsive to comments MSHA received during the rulemaking process.
- To meet the standards set in the rule, a proximity detection system must:
  - Cause tramming or repositioning continuous mining machines to stop before contacting a miner;
  - Provide audible and visual warnings on the miner-wearable component and a visual warning on the machine before the machine stops;
  - Provide a visual signal on the machine that indicates the machine-mounted components are functioning properly;
  - Prevent movement of the machine if any machine-mounted component is not functioning properly (except limited movement for repairs);
  - Prevent electrical interference that adversely affects the performance of other electrical systems in the mine; and
  - Be installed and maintained in proper operating condition by a trained person.
- In addition, operators must check the systems before they are used and make and retain records of the checks and any corrective actions.

#### Feasibility

- This final rule is technologically and economically feasible. The final rule is not technology-forcing and does not involve new scientific or engineering knowledge.
- As of January 2015, based on manufacturer information, 425 of approximately 863 continuous mining machines are equipped with proximity detection systems.
  - The majority of these machines will meet the provisions of the final rule with only minor system changes, such as adding warning signals.

## Compliance Dates

- The rule takes effect March 16, 2015 and will be phased in over 8 to 36 months to give mine operators the time they need to:
  - Obtain MSHA approvals,
  - Modify continuous mining machines to meet the new requirements, and
  - Provide training to miners.
- The phase-in periods were based on:
  - The availability of four MSHA-approved proximity detection systems;
  - The estimated number of continuous mining machines that would be rebuilt or replaced by new machines during the phase-in periods; and
  - Manufacturers' capacity to produce and install proximity detection systems.
- The compliance dates are:
  - Continuous mining machines manufactured after March 16, 2015 must meet the requirements in this rule no later than November 16, 2015.
  - Continuous mining machines manufactured and equipped with a proximity detection system on or before March 16, 2015 must meet the requirements in this rule no later than September 16, 2016.
  - Continuous mining machines manufactured and not equipped with a proximity detection system on or before March 16, 2015 must be equipped with a proximity detection system that meets the requirements in this rule no later than March 16, 2018.

## Costs and Benefits

- The final rule is not economically significant. MSHA estimates that the annualized net benefit of this rule is \$1.3 million: approximately \$4.7 million in costs and approximately \$6.0 million in benefits.
- MSHA projects that the rule will prevent 49 injuries and 9 deaths over the next ten years.

## Background

- Since 2002, MSHA has actively worked with the mining community to identify and investigate proximity detection technologies for preventing accidents in the red zone. MSHA partnered with two manufacturers to develop and test proximity detection systems in underground coal mines.
- The proposed rule was published on August 31, 2011.
  - MSHA received comments and held four public hearings.
  - The final rule is responsive to the comments.
- The final rule is also compatible with the West Virginia and Virginia proximity detection requirements.
  - West Virginia issued a rule, effective July 1, 2014, that requires mine operators to install proximity detection systems on continuous mining machines in underground coal mines.

- Virginia issued guidance, effective October 1, 2014, that requires mine operators to install proximity detection systems on remote-controlled continuous mining machines or use a spotter during equipment moves.
- The following systems have been approved by MSHA to meet the "permissibility" requirements in Title 30 CFR Part 18. (MSHA approval indicates only that MSHA has determined that the system is not a spark or thermal ignition hazard in a potentially explosive atmosphere.)
  - Strata Mining Products HazardAvert® System
  - Nautilus International Coal-Buddy System
  - Matrix Design Group M3-1000/Joy Global SmartZone® Gen 1
  - Matrix Design Group Intellizone™/Joy Global SmartZone® Gen 2