NIOSH Mining Program

May 2016

What are our priorities?

The National Institute for Occupational Safety and Health (NIOSH) Mining Program works with partners in industry, labor, trade associations, professional organizations, and academia. The program focuses on these areas:

- Reducing exposures to harmful mine dusts, airborne pollutants, and noise
- Reducing machine-related traumatic injuries
- Preventing multiple-fatality events
- Preventing injuries and fatalities from rock falls and failures in underground mining operations

What do we do?

- Develop state of the art dust and noise control technologies and best practices.
- Develop monitoring techniques that empower workers and mine operators to take corrective actions before an overexposure to hazardous aerosols and noise occurs.
- Develop and make available new technologies and recommended practices that will reduce injuries and fatalities involving powered haulage equipment and machinery.
- Enable a robust and resilient disaster prevention system by developing innovative control technologies, practices, and procedural changes.
- Develop design criteria and engineering solutions for ground support systems that protect underground miners during seismic events or failure of weak rock.

What have we accomplished?

- Performed field studies on a prototype standalone dry scrubber that reduces respirable dust concentrations by over 90%.
- Beta tested software (Evade 2.0) that incorporates video and real time noise data to allow the identification of tasks resulting in elevated noise exposures.
- Adoption of NIOSH recommendations on proximity detection systems by the Mine Safety and Health Administration (MSHA). These systems (which detect when a worker is near a hazard for continuous mining machines) were incorporated into regulation through a final MSHA rule.
- Added smoke rollback to NIOSH mine fire simulation software (MFIRE 3.0), available free on the web. Smoke rollback (back-layering or smoke reversal) can be a dangerous threat to miners and firefighters in an underground mine fire, preventing firefighters from getting close enough to effectively fight the fire.
- Application of NIOSH data in mine design and miner evacuation decision-making. NIOSH installed seismic networks near a deep vein metal mine and the data are providing useful planning information for mine operators.
- Evaluated energy absorbing properties of comprehensive roof support systems for increased protection of miners. Some underground mines in western U.S. States have adopted these new support systems.

What's next?

- Complete laboratory testing of a NIOSH shield-mounted water spray system to reduce respirable dust exposures on longwall mining sections.
- Develop and demonstrate a retrofit package to reduce underground haul truck noise by 3-5 dB(A) and more than double allowable exposure time.
- Incorporate NIOSH-developed next generation technology into proximity detection systems for underground coal mining equipment and machinery starting in 2016 to comply with MSHA rule.
- Complete field study of hydrophobic rock dust for use in reducing the risk of a propagating coal dust explosion.
- Complete laboratory and field evaluation of geologically driven, electro-chemical corrosion mechanisms on metal and cement underground support systems. Corrosion weakens metal ground support systems installed in mines to protect miners from roof falls.

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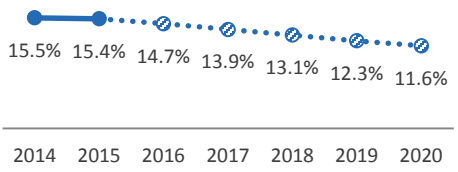
At-A-Glance

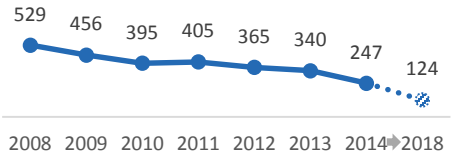
The Mining Program's mission is to eliminate occupational diseases, injuries and fatalities among workers in the mining industry. This snapshot shows recent accomplishments and upcoming work.

Percent of tailgate shearer operator samples that exceed new 1.5 mg/m³ exposure limit



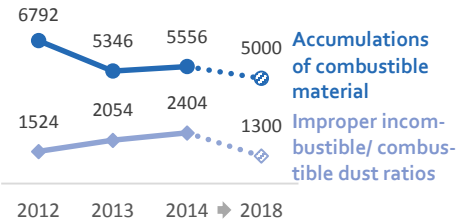
Source: Mine Safety and Health Administration (MSHA) compliance data; Data points are calculated using four-year averages

Lost-time injuries related to machinery and powered haulage in underground coal mines



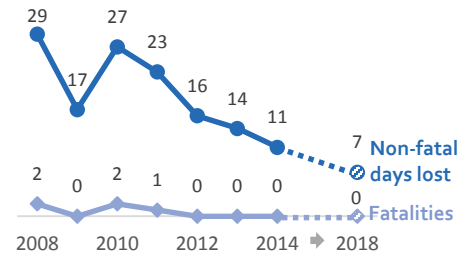
Source: Mine Safety and Health Administration (MSHA) Accident Injuries Data Set

Number of MSHA Violations



Source: Mining Safety and Health Administration (MSHA) compliance data.

Ground fall accidents in underground metal mines



Source: Mine Safety and Health Administration Accident Injuries Data Set