NIOSH Mining Program

June 2017

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, heat, and noise
- Reducing machine-related traumatic injuries
- Preventing injuries and fatalities from rock falls and failures in underground mining operations
- Enhancing rescue and miner survivability if disaster strikes

What do we do?

- Develop state-of-the-art dust, heat, 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?

- Released EVADE 2.0 software to depict noise, dust, and other hazard data alongside video streams so that mine safety staff can work with miners to identify and avoid hazardous exposures.
- Released the ErgoMine mobile app that guides safety audits of haul truck operations, bagging, and maintenance and repair.
- Completed a technology partnership leading to continuous personal dust monitoring (CPDM) technology as a mandated solution to help prevent black lung.
- Published design documents for improved LED illumination technology for cap lights and machine area lights.
- Released a web application for brief safety and health training sessions as "toolbox talks."
- Issued an extensive review of rock dusting practices to prevent coal mine explosions, including proactive approaches to improve how this critical safety operation is performed.
- Demonstrated through field studies that rock dust can be treated to resist caking, allowing it to remain powdery and dry even in wet conditions and thus limit the risk of coal dust explosions in underground mines.
- Completed laboratory testing demonstrating the effectiveness of shield-mounted water spray systems to reduce respirable coal dust during longwall mining.
- Published findings from laboratory and field evaluations of electro-chemical corrosion mechanisms on metal and cement underground support systems.

What's next?

- Release fact sheets and new training modules on preventing heat stress. Release the *Safety Pays in Mining* web application, which will allow mines to assess the eco-nomic benefits of preventing injuries.
- Conduct laboratory testing of engineering noise controls for jumbo drills used in metal/nonmetal mines.
- Provide recommendations to industry on improving ventilation of longwall faces.
- Conduct experiments to compare the effectiveness of an untreated rock dust to that of a rock dust treated to resist caking. Rock dust is used to reduce the risk of coal mine explosions.
- Complete development of an end-of-shift silica monitoring procedure and application to help prevent silicosis.
- Develop NIOSH "Saturn" LED area light to improve visibility around underground coal mining equipment.

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 the new 1.5 mg/m³ exposure limit

- 2014: 15.50%
- 2015: 15.40%

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
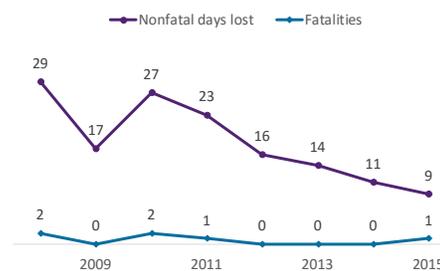

2008	2009	2010	2011	2012	2013	2014	2015
559	503	432	444	386	357	272	225

Source: MSHA Accident Injuries Data Set

Number of MSHA Violations

- Accumulations of combustible material
- Improper incombustible/combustible dust ratios

	2012	2013	2014	2015	2016
Accumulations of combustible material	6792	5346	5556	4220	3567
Improper incombustible/combustible dust ratios	1524	2054	2404	1663	1285

Source: MSHA compliance data

Ground fall accidents in underground metal mines

- Nonfatal days lost
- Fatalities

Year	Nonfatal days lost	Fatalities
2009	29	2
	17	0
	27	2
2011	23	1
	16	0
2013	14	0
	11	0
2015	9	1

Source: MSHA Accident Injuries Data Set

To learn more, visit https://www.cdc.gov/niosh/mining/index.html