



Exposibram 2019

Belo Horizonte, Brazil

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# U.S. Mine Safety & Health: A Record of Steady Improvement

David G. Zatezalo, Assistant Secretary

US Mine Safety and Health Administration

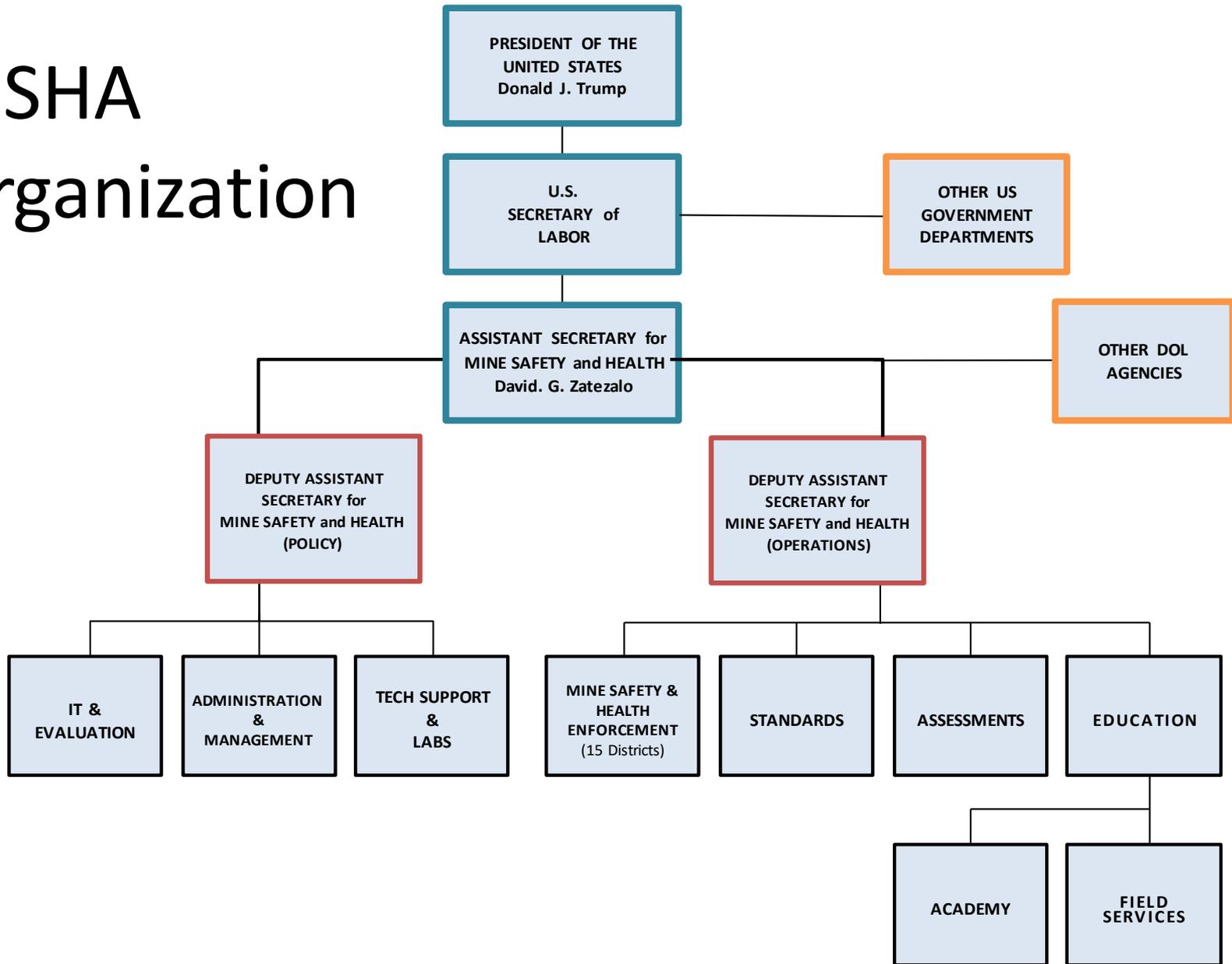


# The MSHA Mission

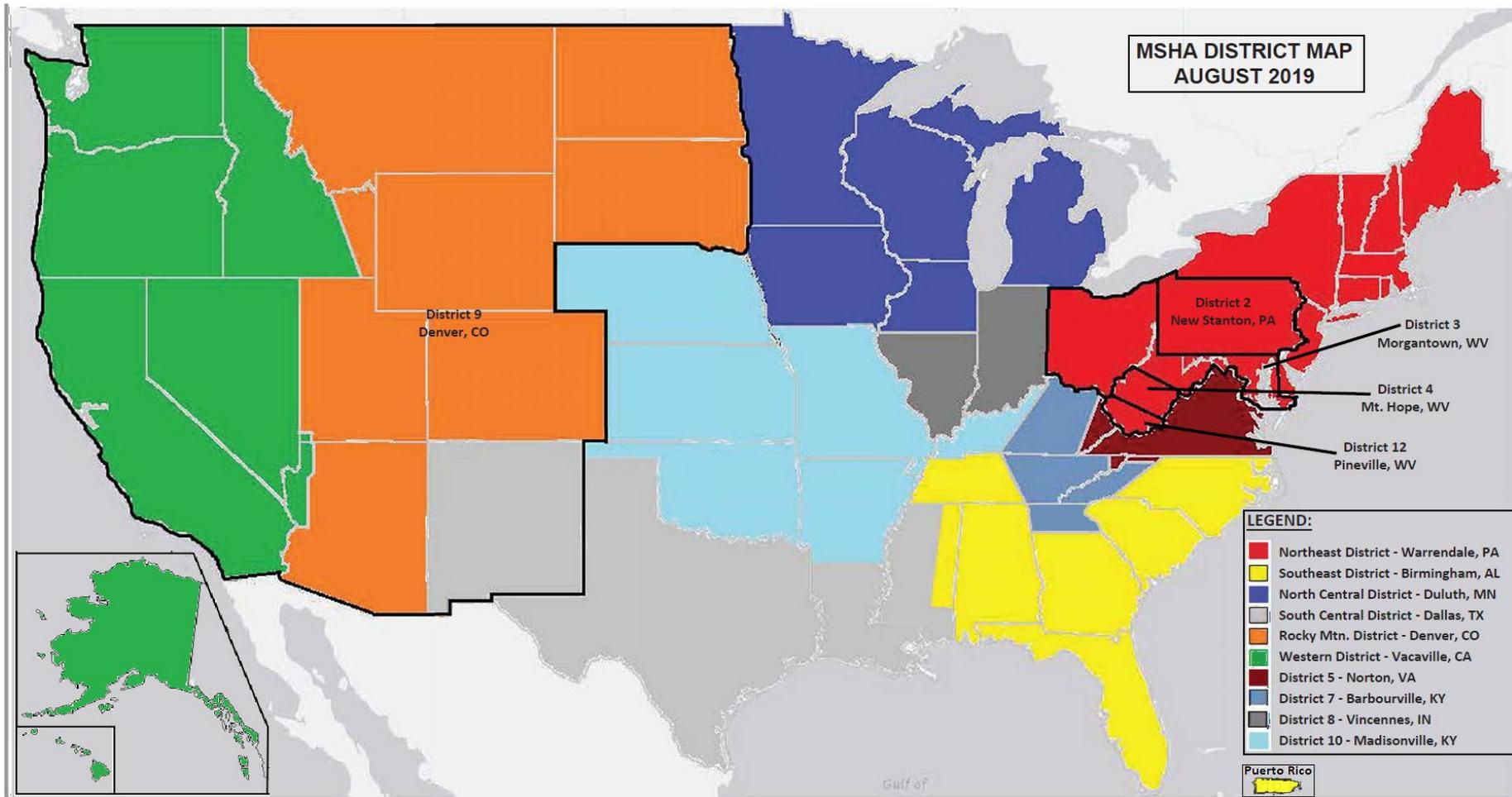
“to prevent death, illness, and injury from mining and promote safe and healthful workplaces for U.S. miners”



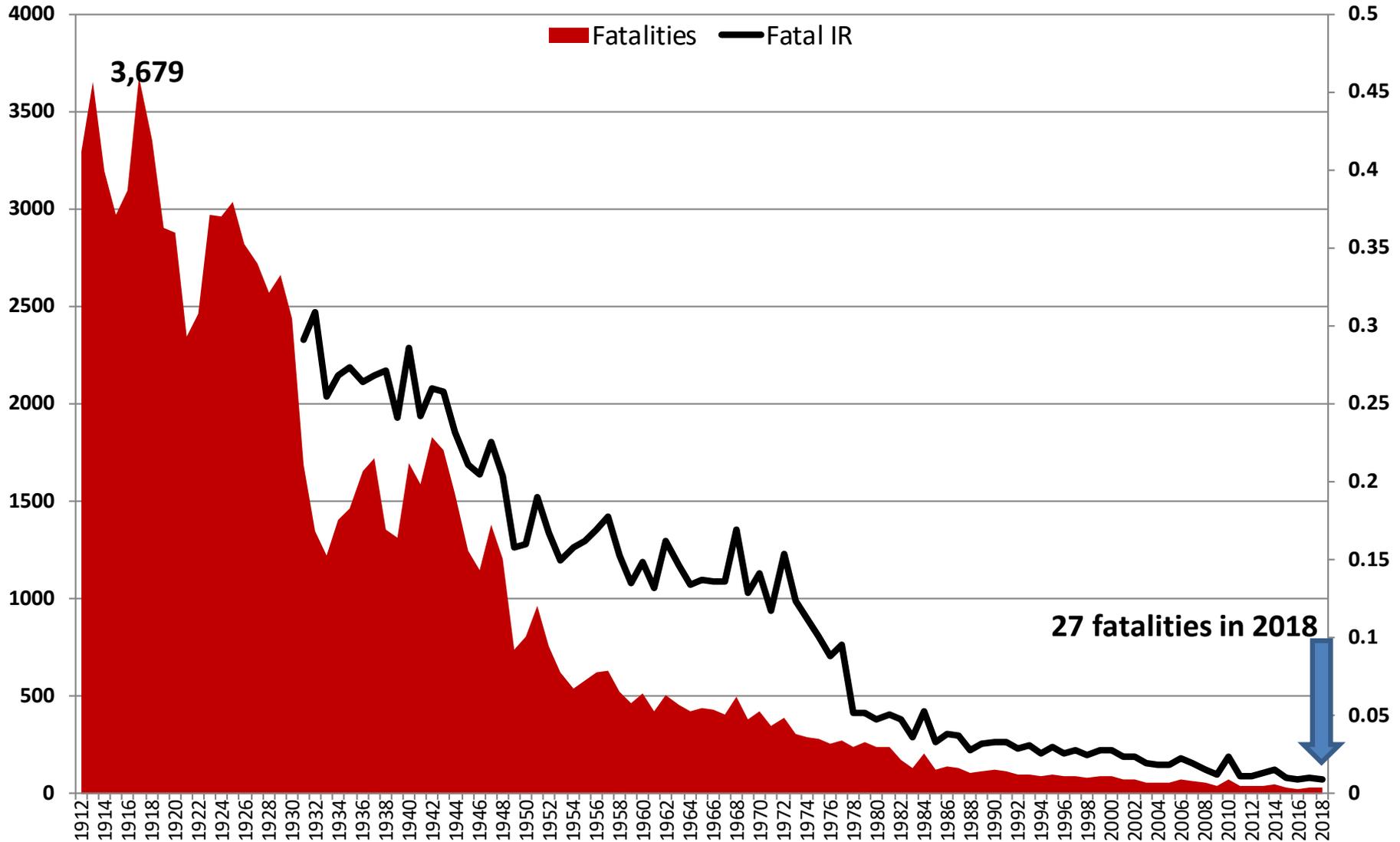
# MSHA Organization



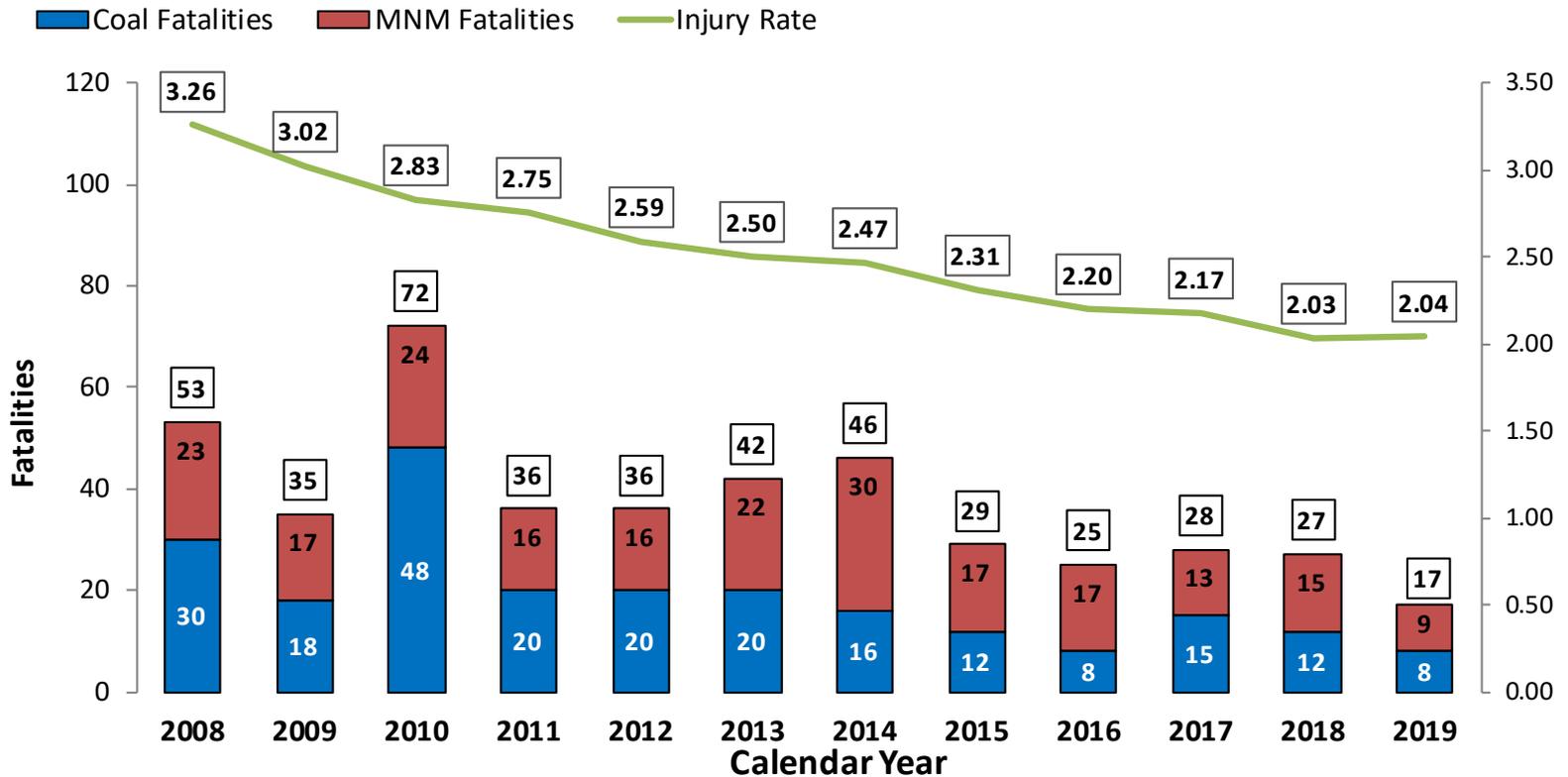
# MSHA District Offices (15)



# U.S. Mining Fatalities 1912-2018



# Mining Injury Rates & Fatalities 2008-2019



Fatality data as of 8/30/2019

Injury rate data as of 6/30/2019 – 200,000 hour basis



# Federal Mine Safety and Health Act of 1977 (Mine Act)

- Created MSHA as an agency of the U.S. Department of Labor. MSHA primarily conducts Enforcement and Emergency Operations, not research (NIOSH) or environmental regulation
- Consolidated all federal mine health and safety regulations
- Created the independent Federal Mine Safety and Health Review Commission to provide review of MSHA enforcement decisions. FMSHRC is Presidentially nominated, Senate confirmed, varying term lengths
- Established Training Academy for mine inspectors
- Increased emphasis on health standards
- Strengthened miners' rights
- Established the right of entry (no search warrant needed)



# Federal Mine Safety and Health Act of 1977 (Mine Act)

## Required:

- Two (2) annual inspections of surface mines and four (4) annual inspections of underground mines
- Additional inspections of mines with especially hazardous conditions such as excessive methane
- Mine rescue teams for all underground mines
- Investigation of all fatal accidents, hazard complaints and discrimination complaints
- Miner training, including task, and annual retraining



# Mine Improvement and New Emergency Response Act of 2006 (MINER Act)

Amended Mine Act to provide greater protections to miners

## **Strengthened:**

- Coal mine rescue team requirements
- Requirements for design and repair of seals used to close abandoned areas of coal mines
- Requirements regarding flame retardant properties of conveyor belts and use of belt air in coal mines
- Penalties for repeat violations



# Mine Improvement and New Emergency Response Act of 2006 (MINER Act)

## Required:

- Written emergency response plan for each coal mine
- Wireless two-way communications and electronic tracking systems for emergencies in coal mines
- Notification to MSHA within 15 minutes of a death or life-threatening injury at a mine
- A family liaison between MSHA and the victims of mine tragedies
- Refuge alternatives to protect coal miners when escape is impossible



# MSHA Data for 2018

<b># of Mines Reporting Employment</b>	<b>13,055</b>
<b>- Coal Mines Only</b>	<b>1,192</b>
<b>- Metal/Nonmetal Mines Only</b>	<b>11,863</b>
<b>Total Industry Employment</b> (including contractors)	<b>331,933</b>
<b>MSHA Inspections/Employees</b>	<b>37,000/1900</b>
<b>Citations &amp; Orders Issued</b>	<b>97,788</b>
<b>Dollars Assessed (millions)</b>	<b>\$54.5</b>



# MSHA's Mine Portfolio

Trailing 4 Quarters, 2018 Q3 – 2019 Q2

Mine Type	Number of Mines	Share of Total
UG Coal	411	3.1%
UG MNM	239	1.8%
UG Total	650	5.0%
All Surface	12,405	95%
Facilities Only	852	6.5%

**Total number of mined commodities produced: 84**



# National Mine Health & Safety Academy Beckley, WV



# Academy Features

- One of eight academies operated by the U.S. government
- 20 classrooms, auditorium with 300-person capacity
- 3 computer labs
- Electrical lab with power to operate heavy mine equipment
- Underground mine simulation laboratory for training in mine rescue, firefighting, and mine ventilation
- Simulated surface mine with heavy equipment
- Residence hall with 174 single-occupancy rooms
- Full video, photography and graphic design capabilities
- Open for others – an invitation to attend



# Compliance Assistance

- **Educational Field and Small Mine Services** provides training and compliance assistance from offices across country; visited 10,842 mines in FY2018
- Safety and health materials and videos are posted to website and emailed to stakeholders
- Targeted outreach as appropriate. For example, more than 4,000 pieces of equipment were inspected following failure of fire suppression on several pieces of equipment during last year



# Powered Haulage Safety Initiative

Powered Haulage accidents were responsible for 50% of fatalities in recent years; 13 of 27 (48%) in 2018

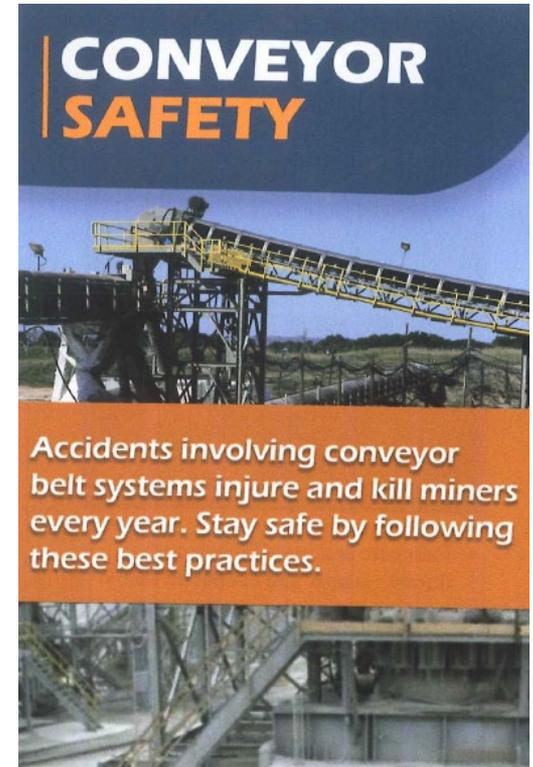
Preventing these accidents is a priority for MSHA, with a focus on:

- Mobile Equipment
- Belt Conveyors
- Seat Belt Safety



# Powered Haulage Outreach

- 100,000 brochures distributed
- 200,000 hard hat stickers to miners
- 6,800 views of new videos
- 8,900 visits to Powered Haulage webpage in 2019



# Powered Haulage Website



Apps

MSHA HOME > NEWS & MEDIA > SAFETY INITIATIVES > **POWERED HAULAGE SAFETY INITIATIVE**

## Powered Haulage Safety Initiative

About half of all U.S. mining fatalities in recent years – including 13 of the 27 fatalities in 2018 – were due to accidents involving powered haulage. That classification includes mobile equipment, conveyor systems, and anything else under power that hauls people or materials. MSHA has made the prevention of powered haulage accidents a priority, with an initial focus on three areas: mobile equipment at surface mines, seat belt usage, and conveyor belt safety. Materials on this and related web pages support the powered haulage safety initiative.



### Mobile Equipment at Surface Mines

Surface mining vehicles can be several stories tall and are capable of destroying smaller vehicles that cannot be seen by the operator. Traffic controls, training, and avoiding distractions are key to enhancing safety. Collision warning and avoidance systems can also help.



### Seat Belt Usage

MSHA engineers estimate that three to four miners' lives could be saved each year if adequate seat belts were provided and worn. Warning systems such as chimes can remind drivers to buckle up, while interlock systems can prevent the vehicle from moving if the belt is unbuckled.



### Conveyor Safety

Belt conveyors and their components pose serious risks to miners working on or around them. It's important to install adequate guarding to prevent contact, provide and use crossovers and crossunders, and lock out energy sources and block motion whenever performing maintenance.

### QUICK LINKS

#### VIDEO: Introduction to Powered Haulage



Learn about powered haulage equipment used at mines and why safe operation is so important.

[April 30, 2018 Stakeholder presentation on Powered Haulage](#)

[Comments Submitted to formal Request for information](#)

[Blog: Seeking Mine Safety Solutions Through Technology](#)

### TRAINING PRESENTATIONS

- [Collision warning and avoidance systems](#)
- [Dump point safety – equipment considerations](#)

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# Technical Support Group

Provides engineering and technical aid, approves equipment and materials for safe mining use, and assists in mine emergencies and accident investigations.

- **Approval and Certification Center** in Triadelphia, WV provides testing and evaluation for mining industry products, and houses electrical safety, applied engineering, mechanical and engineering safety divisions
- **Safety and Health Technology Center** in Pittsburgh, PA, houses eight (8) divisions including dust, ventilation, roof control, and mine emergency assistance
- **National Air Lab** in Mt. Hope, WV tests samples collected by MSHA inspectors



# Mine Emergency Operations

- MSHA responds to every mine emergency
- Maintains mine emergency response vehicles in five (5) locations for command and control, mobile laboratories, ventilation support, seismic detection and more
- All underground mines must have two rescue teams available
- MSHA assists in mine rescue plans and training contests, which sharpen skills and inform teams of new technology
- MSHA participated in more than 30 U.S. mine rescue contests in 2018
- MSHA Academy to hold International Mine Rescue Contest September 2020



# Impoundments



Ft. Knox Gold Mine, Alaska



# Impoundments

- Approximately 1,640 dams in MSHA's impoundment inventory
- Classified into low, significant, and high hazard potential, reflecting projected damage of a failure
- More than 400 dams are classified as high hazard
- High hazard dams are expected to withstand extreme precipitation and earthquake events, as their failure could cause loss of human life



# Impoundments

- MSHA reviews and approves designs for dams at coal mines that meet certain criteria
- MSHA personnel regularly inspect all dams at mining operations, investigate construction and operation issues, and conduct training in dam safety



# Technical Collaboration: MSHA and Agência Nacional de Mineração (ANM)

August 6, 2019, videoconference

- Discussed ways to improve dam monitoring and inspection efficiency, including:
  - Automation of monitoring data
  - Remote monitoring of instrumentation
  - Drone inspections
  - Satellite (SAR) interferometry
  - Potential regulatory requirements to hold the operator responsible for the design, inspection, and operation of the dam.



# Technical Collaboration: MSHA and Agência Nacional de Mineração (ANM)

Next steps:

- Exchange regulatory requirements. MSHA will provide the Inspection Handbook and Engineering and Design Manual for Coal Refuse Disposal Facilities
- MSHA may review draft regulations from ANM
- Brazilian staff invited to visit US to view dams and meet with regulators





# Questions?

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