SEAT BELT USE ON MOBILE EQUIPMENT

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Overview

- Regulations and Violation History
- Fatal Accident Data Analysis
- Fatal Accident Examples
- Awareness Campaigns
- Stakeholder Roles
- Potential Solutions
- Seat Belt Saves
- Best Practices

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REGULATIONS
AND
VIOLATION HISTORY

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30 CFR Seat Belt Regulations

- 56/57.14130 Roll-over protective structures (ROPS) and seat belts [for surface equipment].
- 56/57.14131 Seat belts for [surface] haulage trucks.
- 77.403-1 Mobile equipment; rollover protective structures (ROPS).
- 77.1606 Loading and haulage equipment; inspection and maintenance.
- 77.1710 Protective clothing; requirements.

§56/57.14130 Roll-over protective structures and seat belts [for surface equipment].

(a) Equipment included. Roll-over protective structures (ROPS) and seat belts shall be installed on—

(1) Crawler tractors and crawler loaders;

(2) Graders;

(3) Wheel loaders and wheel tractors;

(4) The tractor portion of semi-mounted scrapers, dumpers, water wagons, bottom-dump wagons, rear-dump wagons, and towed fifth wheel attachments;

(5) Skid-steer loaders; and

(6) Agricultural tractors.

§56/57.14130 Roll-over protective structures and seat belts [for surface equipment].

(g) Wearing seat belts. Seat belts shall be worn by the equipment operator except that when operating graders from a standing position, the grader operator shall wear safety lines and a harness in place of a seat belt.

(h) Seat belts construction. Seat belts required under this section shall meet the requirement of SAE J386, “Operator Restraint System for Off-Road Work Machines” (1985, 1993, or 1997), or SAE J1194, “Roll-Over Protective Structures (ROPS) for Wheeled Agricultural Tractors” (1983, 1989, 1994, or 1999).

(i) Seat belt maintenance. Seat belts shall be maintained in functional condition, and replaced when necessary to assure proper performance.

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§56/57.14131 Seat belts for [surface] haulage trucks.

(a) Seat belts shall be provided and worn in haulage trucks.

(b) Seat belts shall be maintained in functional condition, and replaced when necessary to assure proper performance.

(c) Seat belts required under this section shall meet the requirements of SAE J386, “Operator Restraint System for Off-Road Work Machines” (1985, 1993, or 1997), which are incorporated by reference.

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Citations for Parts 56 & 57 Seat Belt Regulations

2007 – 2017

	56.1413									56.14131			
Event Type	**a**	**b**	**c**	**d**	**e**	**g**	**h**	**i**	**j**	**a**	**b**	**c**	**TOTAL**
E01 - Regular Inspection	326	1	116	2	41	2144	605	1415	3	513	523	161	5850
E03 - Written Hazard Complaint						4		3			2		9
E04 - Verbal Hazard Complaint	1		2		1	14	1	22		17	15		73
E06 - Fatal Accident	1					2				13			16
E07 - Non-fatal Accident						7				14	1		22
E08 - Non-injury Accident													0
E13 - Reopening Inspection													0
E12 - Willful or Knowing Violation						5		2		1			8
E14 - Compliance Assistance						1							1
E15 - Compliance Follow-Up	6					46	2	15		4	3		76
E16 - Spot Inspection	14			1	2	117	5	22		27	11	2	201
E17 - Special Emphasis Program					1	5		1		2			9
E18 - Major Constr. Spot Inspection													0
E20 - Roof Control Tech. Investigation													0
E21 - Vent. Tech. Investigation													0
E23 - Impoundment Spot Inspection													0
E28 - Mine Idle Activity						1							1
E30 - Accident Reduction Program								1		1			2
TOTAL	**348**	**1**	**118**	**3**	**45**	**2346**	**613**	**1481**	**3**	**592**	**555**	**163**	**6268**

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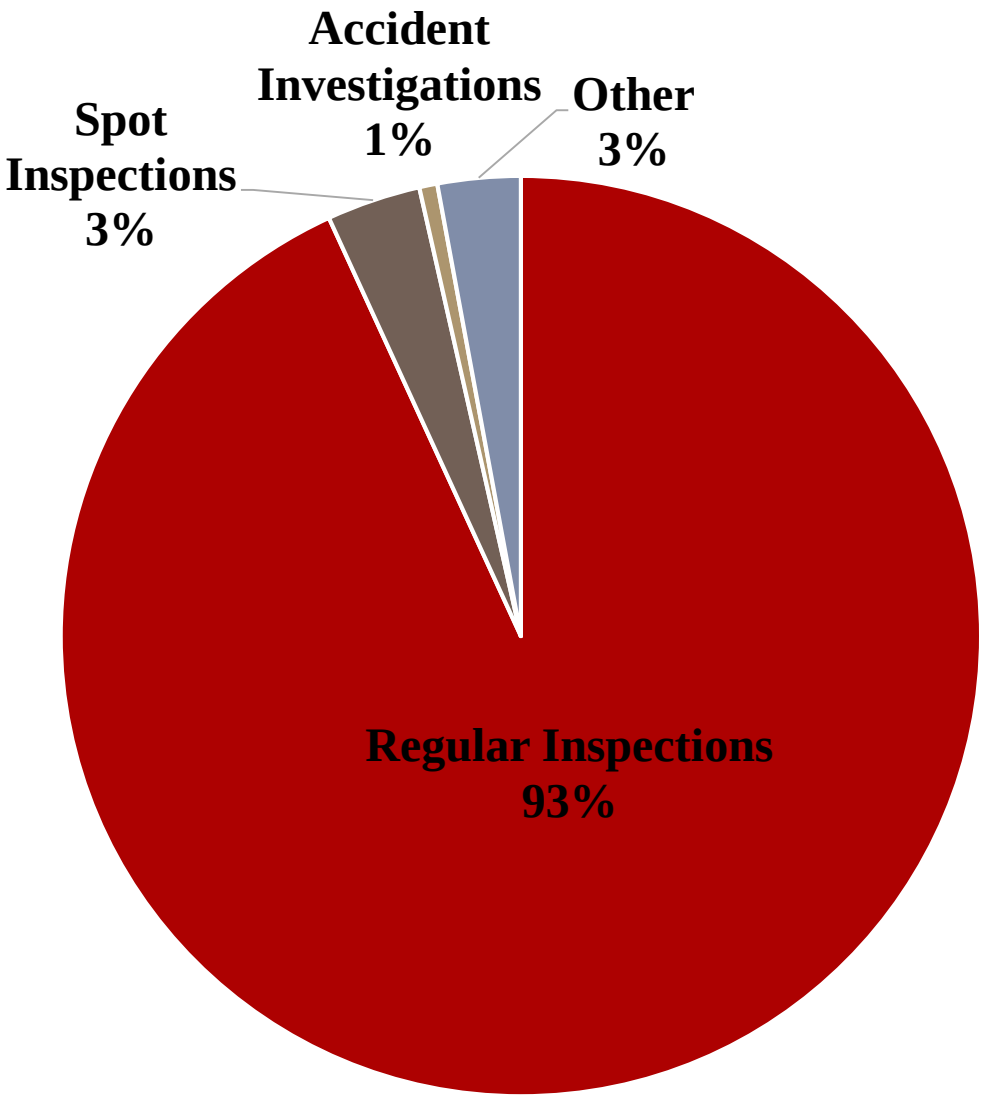
Citations for Parts 56 & 57 Seat Belt Regulations

2007 – 2017



§77.403-1 Mobile equipment; rollover protective structures.

(a) All rubber-tired or crawler-mounted self-propelled scrapers, front-end loaders, dozers, graders, loaders, and tractors, with or without attachments, that are used in surface coal mines or the surface work areas of underground coal mines shall be provided with rollover protective structures (hereinafter referred to as ROPS) in accordance with the requirements of paragraphs (b) through (f) of this section, as applicable.

(g) Seat belts required by §77.1710(i) shall be worn by the operator of mobile equipment required to be equipped with ROPS by §77.403-1.

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§77.1710 Protective clothing; requirements.

Each employee working in a surface coal mine or in the surface work areas of an underground coal mine shall be required to wear protective clothing and devices as indicated below:

(i) Seatbelts in a vehicle where there is a danger of overturning and where roll protection is provided.

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§77.1606 Loading and haulage equipment; inspection and maintenance.

(a) Mobile loading and haulage equipment shall be inspected by a competent person before such equipment is placed in operation. Equipment defects affecting safety shall be recorded and reported to the mine operator.

(c) Equipment defects affecting safety shall be corrected before the equipment is used.

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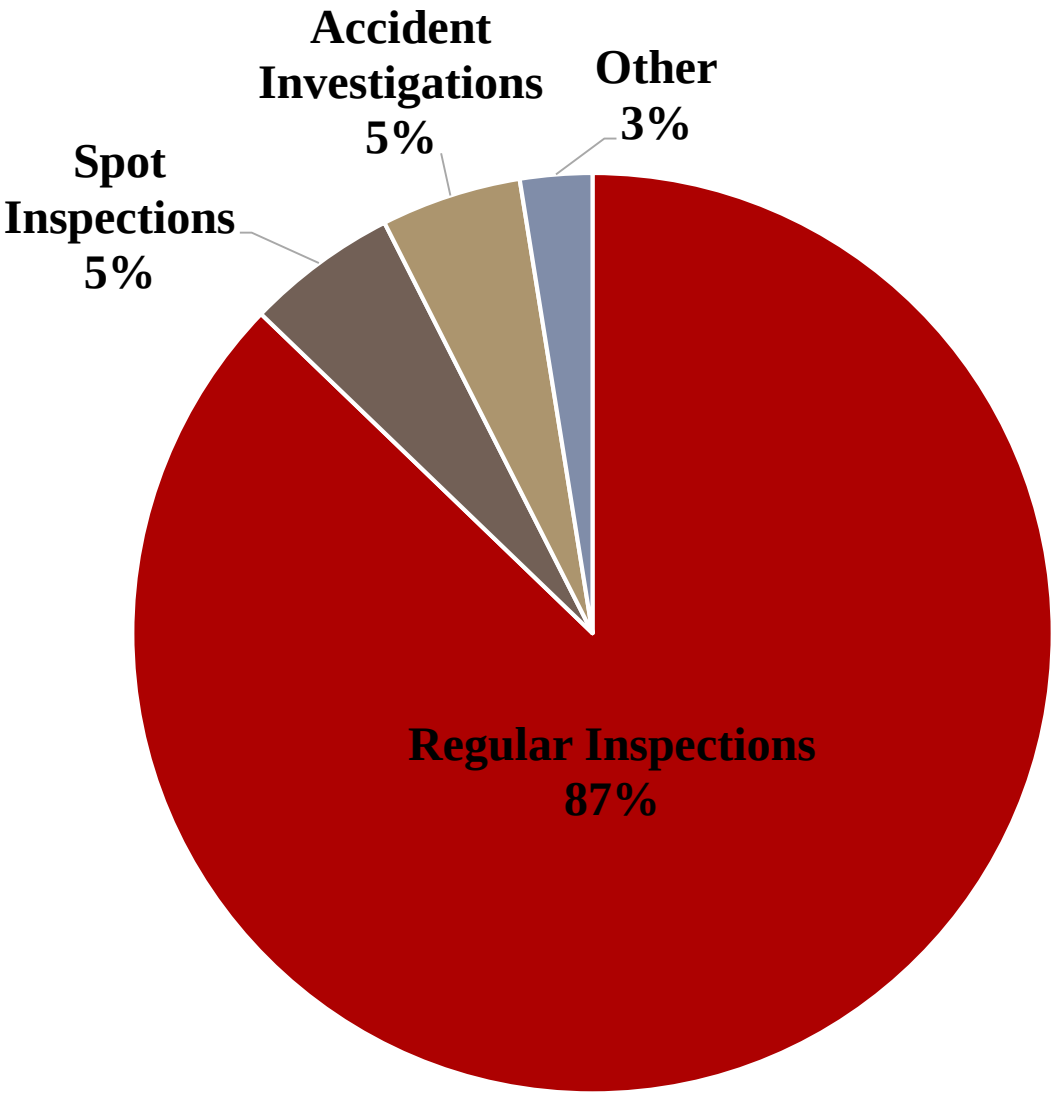
Citations for Part 77 Seat Belt Regulations

2007 – 2017

	77.403-1		77.1606		77.171	
Event Type	**a**	**g**	**a**	**c**	**i**	**TOTAL**
E01 - Regular Inspection		56	32	174	392	654
E03 - Written Hazard Complaint				2	3	5
E04 - Verbal Hazard Complaint			1	1	2	4
E06 - Fatal Accident		4	4	3	7	18
E07 - Non-fatal Accident		4	3		10	17
E08 - Non-injury Accident					2	2
E13 - Reopening Inspection					1	1
E12 - Willful or Knowing Violation						0
E14 - Compliance Assistance						0
E15 - Compliance Follow-Up						0
E16 - Spot Inspection	1	1	2	7	29	40
E17 - Special Emphasis Program						0
E18 - Major Constr. Spot Inspection		2	1		2	5
E20 - Roof Control Tech. Investigation					1	1
E21 - Vent. Tech. Investigation		1				1
E23 - Impoundment Spot Inspection				1	1	2
E28 - Mine Idle Activity						0
E30 - Accident Reduction Program						0
TOTAL	**1**	**68**	**43**	**188**	**450**	**750**

Citations for Part 77 Seat Belt Regulations

2007 – 2017



FATAL ACCIDENT DATA ANALYSIS

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2007 - 2017 Mobile Equipment Fatalities

- 38 fatal accidents involving the victim not wearing a seat belt (NSB) while operating mobile equipment.
- With few exceptions, victims had a greater chance of survival had they been wearing an adequate seat belt.
- 34 had an adequate seat belt provided, 2 were defective, and 2 were not provided.

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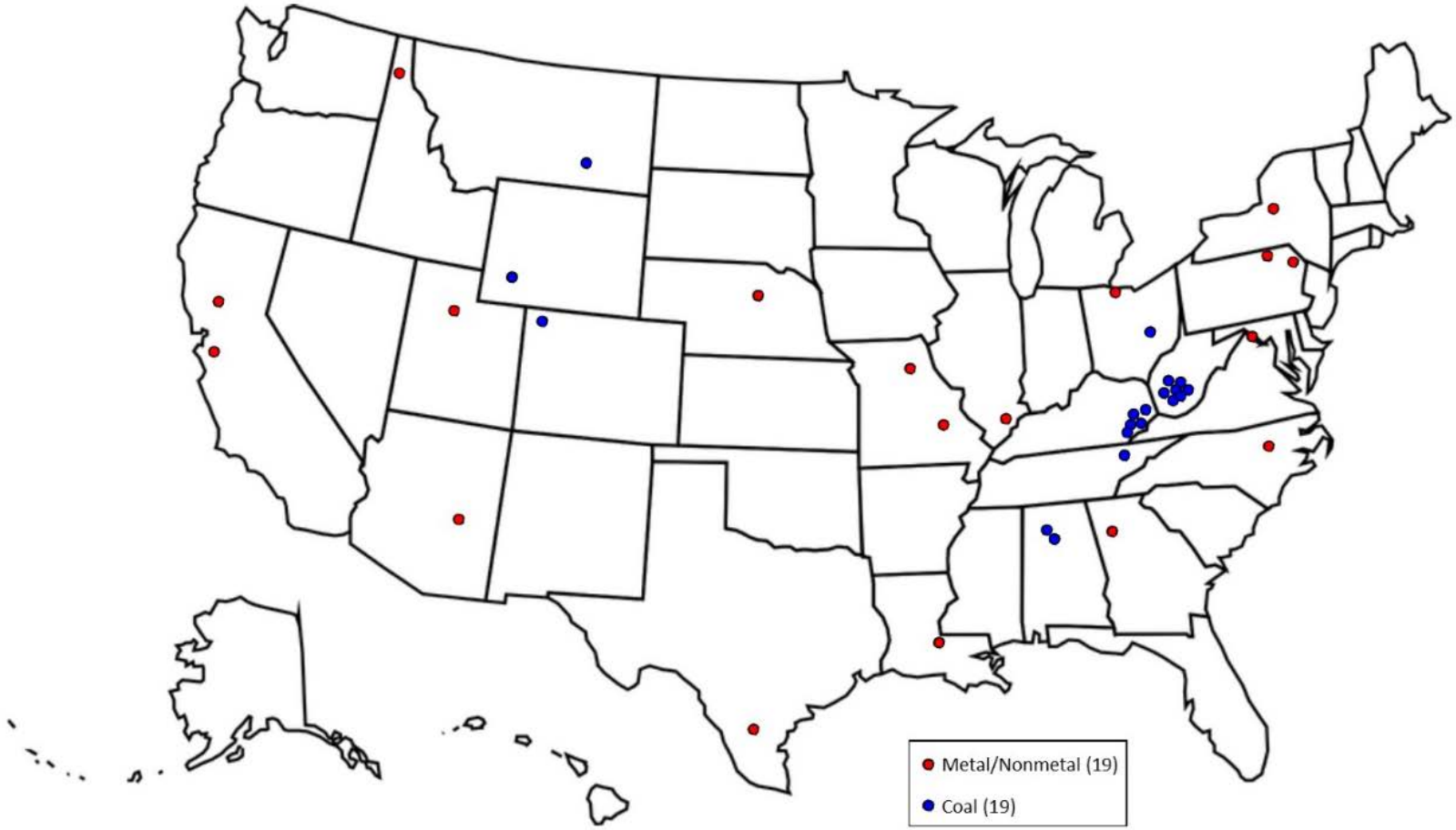
2007 - 2017 NSB Fatalities Map



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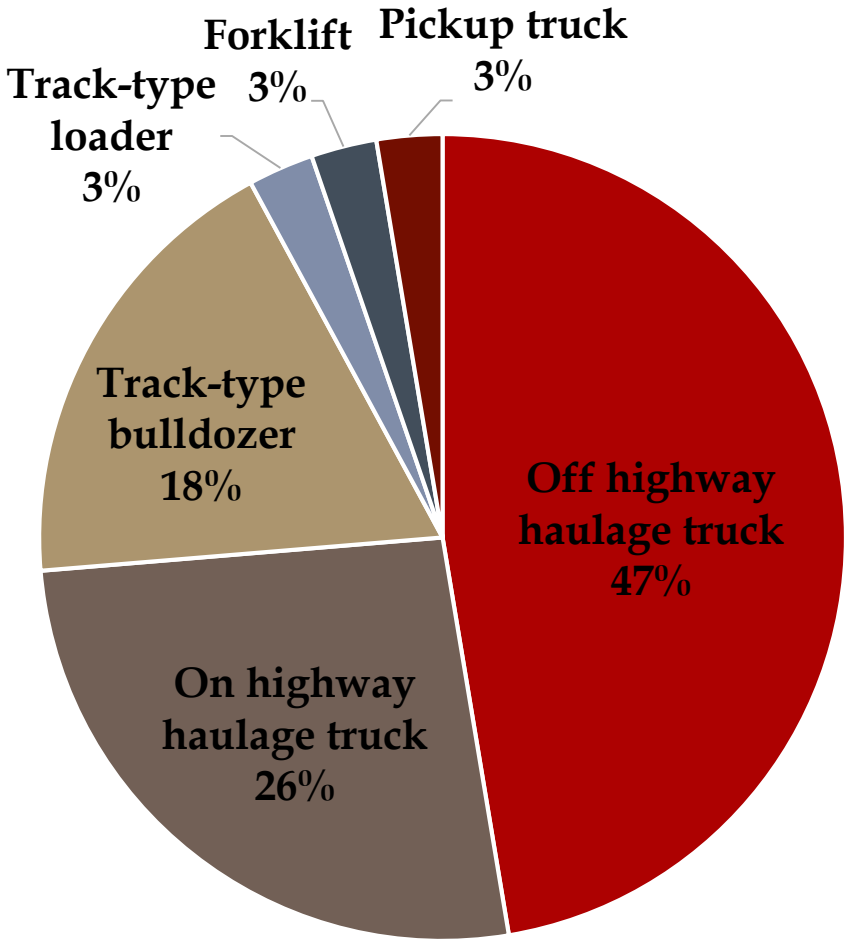
2007 - 2017 NSB Fatalities by Equipment Type

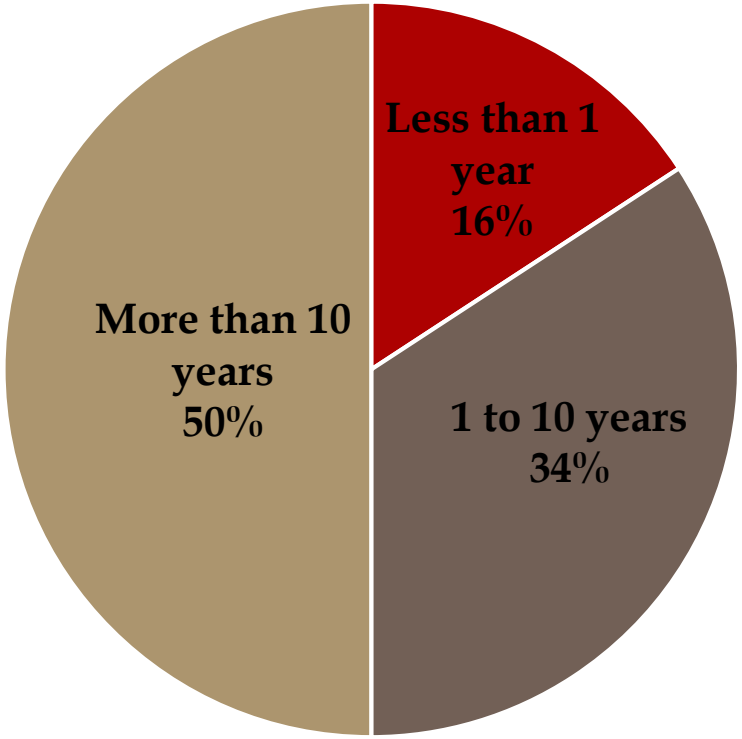
Equipment Type	Fatalities
Off highway haulage truck	18
On highway haulage truck	10
Track-type bulldozer	7
Track-type loader	1
Forklift	1
Pickup truck	1
Total	**38**

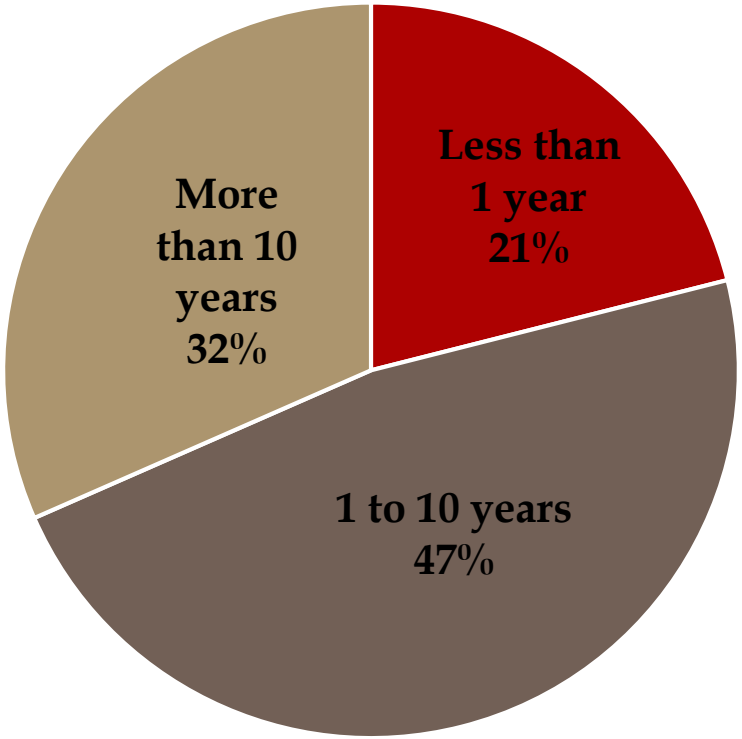


2007 - 2017 NSB Fatalities by Experience

Mining Experience	Fatalities
Less than 1 year	6
1 to 10 years	13
More than 10 years	19
Total	**38**

Job Experience	Fatalities
Less than 1 year	8
1 to 10 years	18
More than 10 years	12
Total	**38**





FATAL ACCIDENT EXAMPLES

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Coal Fatality #11 for 2012

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MNM Fatality #8 for 2014

AWARENESS CAMPAIGNS

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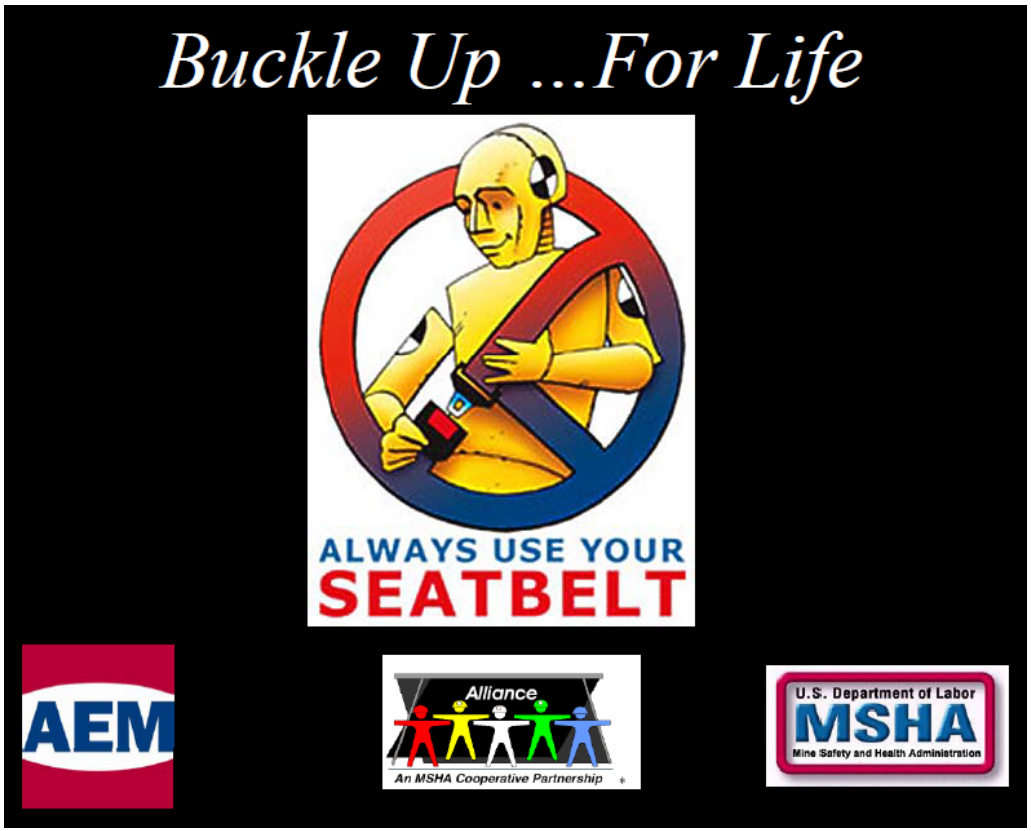
Previous Campaigns



Current Awareness Campaign

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

Powered Haulage Safety Initiative

Print

Far too many miners have been injured or killed in accidents involving powered haulage. The category, which covers the haulage of materials and personnel, accounted for half of the 28 US mining fatalities in 2017. MSHA has made the prevention of powered haulage accidents a priority for 2018 and beyond, with an initial focus on three areas: large vehicles striking smaller ones; seat belt usage; and conveyor belt safety. Materials on this and related web pages support the powered haulage safety initiative.

Large Vehicles Hitting Small Vehicles

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 Belt Safety

Conveyor belts 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 cross unders, and lock out energy sources and block motion whenever performing maintenance.

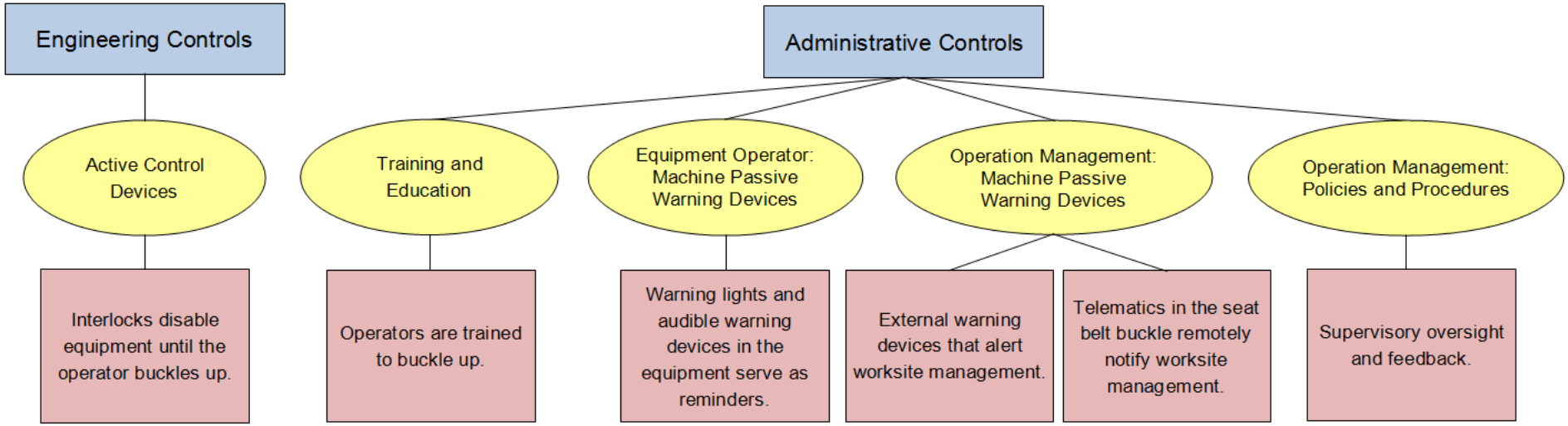
Learn More

https://www.msha.gov/news-media/special-initiatives/2018/05/31/powered-haulage-safety-initiative

Seat Belt Tampering Alert

https://www.msha.gov/sites/default/files/Alerts%20and%20Hazards/seat-belt-tampering-alert-oct-2016.pdf

Seat Belt Safety Alert



https://arlweb.msha.gov/alerts/Seat%20Belt%20Alert%20Oct%202016.pdf

Seat Belt Safety Tip

Best Practices:

- Always wear a seat belt.
- Examine and maintain seat belts according to regulations and manufacturer recommendations.
- Never jump from a moving piece of equipment. Remain in the cab with the seat belt secured.
- Wear seat belts **to** the job, **at** the job, and **from** the job.

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Additional Seat Belt Resources

- MSHA/AEM Seat Belt Use on Mobile Equipment Report
  - https://www.aem.org/AEM/media/docs/Safety/Seat-Belt-Use-Mobile-Equipment.pdf
- Stay in the Cab & Keep it on
  - http://www.msha.gov/MSHAVIDEOS/safety/stayinthecab.wmv
- Catalog of Training Products
  - https://arlweb.msha.gov/TRAINING/prodintr.htm
- NHTSA Expanding the Seat Belt Program Strategies Toolbox
  - https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/812341_seatbeltprogramstrategies.pdf

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STAKEHOLDER ROLES

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Stakeholder Roles

- Original Equipment Manufacturer (OEM)
  - Design, testing, manufacturing
  - Provide training materials and manuals
- Equipment Dealer
  - Interface between OEM and mine operator
- Regulatory Agencies
  - Enforce regulations
  - Distribute safety and awareness material
- Mine Operator
  - Implement and enforce policies and procedures
- Equipment Operator
  - Has the ultimate decision whether or not to use the seat belt provided

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POTENTIAL SOLUTIONS

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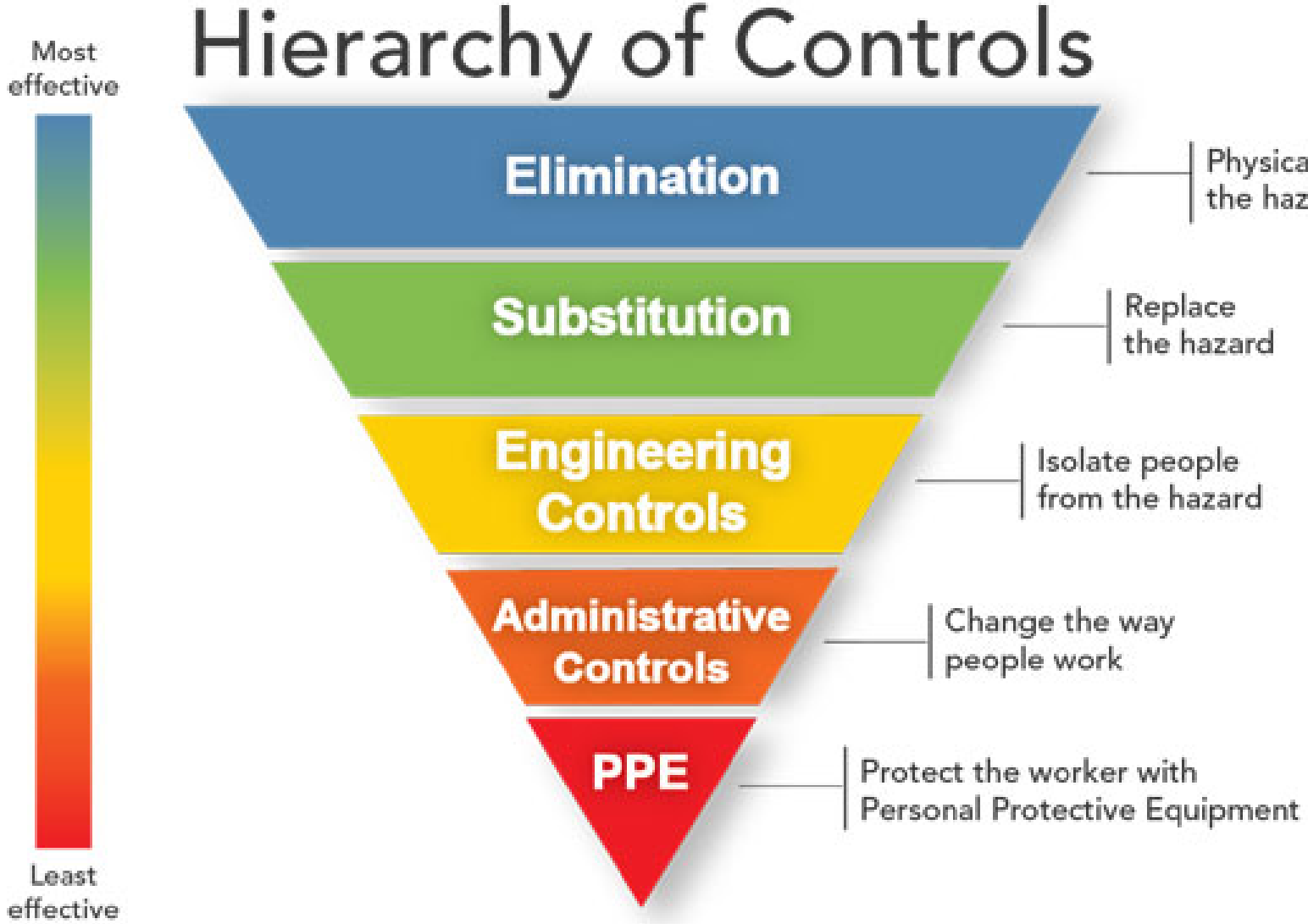
Hierarchy of Controls



Source: NIOSH

Administrative Control Solutions

- Passive warning devices
  - Nuisance alarm, warning lights
- High visibility and rigid seat belts
- Remote telematics
- Training and education
- Regulations, policies, procedures
- *Advantages*
  - Ease of implementation and training
  - Requires minimal resources and cost
- *Disadvantages*
  - Ineffective for equipment operators who refuse to wear seat belts

Engineering Control Solutions

- Active control interlocks
  - Seat switch
  - Ignition switch
- *Advantages*
  - Difficult to defeat
  - Requires seat belt usage to operate machine
  - Minimal management oversight
- *Disadvantages*
  - Possible unintended consequences
  - Design complexity may increase cost

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SEAT BELT SAVES

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Articulated Haul Truck

September 19, 2016

https://arlweb.msha.gov/Alerts/Seat%20Belt%20Save.pdf

Water Truck

January 19, 2018

https://www.msha.gov/sites/default/files/Alerts%20and%20Hazards/Surface-Truck-Feb15.pdf

Front End Loader

March 13, 2018

https://dol-msha-peir-mshagov-prod.s3.amazonaws.com/s3fs-public/Alerts%20and%20Hazards/Surface-Seat%20Belt%20Save_0.pdf

BEST PRACTICES

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Best Practices for Trainers

- Suggest implementation of a “condition of employment” seat belt policy
  - Zero tolerance for nonuse or misuse
- Provide effective training
  - Orientation programs that set expectations of seat belt use
  - Personal stories to engage the miners
  - Stickers, handouts, best practice cards
  - Meaningful incentives
- Ensure miners understand that seat belts are proven to save lives and they are ultimately responsible for buckling up

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QUESTIONS?

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