

Health and Safety

# RESOURCE

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**7** Everything you need to know about Oregon OSHA's lighting rules

**11** Get tips on staying safe amid winter darkness

**15** Learn to protect against the hazards of carbon monoxide

# Resource

Oregon Health and Safety Resource is published every other month by the Oregon Occupational Safety and Health Division of the Department of Consumer and Business Services.

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# Don't miss.....

## Education:

Workshop classes will be held virtually until further notice.

A minimum of five registrants is needed to hold a virtual workshop.

Registered participants will receive an email if a cancellation is necessary.

## Register and attend

Using the [secure online registration portal](#), you can find classes. The workshop schedule changes every three months.

For more information, visit the [classroom workshops page](#).

Find more information about education resources by visiting Oregon OSHA's [education and training page](#).

Mark your calendar for these workplace safety and health conferences:

**Mid-Oregon Construction Safety Summit**

Jan. 30-31, 2023 • Bend

**Oregon GOSH Conference**

March 6-9, 2023 • Portland

**Northwest Safety & Health Summit**

May 16-18, 2023 • Kennewick, WA

**Blue Mountain Occupational Safety & Health Conference**

June 5-6, 2023 • Pendleton

**Central Oregon Occupational Safety & Health Conference**

Sept. 25-26, 2023 • Bend

**Southern Oregon Occupational Safety & Health Conference**

Oct. 17-19, 2023 • Ashland

**Western Pulp, Paper, & Forest Products Safety & Health Conference**

Nov. 28-Dec. 1, 2023 • Portland

**Cascade Occupational Safety & Health Conference**

March 2024 • Eugene



To receive conference registration materials, exhibitor information, or sponsorship information, contact the Conference Section: [oregon.conferences@dcbs.oregon.gov](mailto:oregon.conferences@dcbs.oregon.gov) | 503-947-7411 | [osha.oregon.gov/conferences](https://osha.oregon.gov/conferences)

## Did you know?

Oregon OSHA offers a free online course on accident investigations in English and Spanish. The course is designed to provide training in the principles of investigating workplace accidents. It fulfills a training requirement for safety committee members.

The [Accident Investigation online course](#) is part of the [Safety Committee Suite](#), which also includes Safety Committees and Hazard Identification online courses.

The Accident Investigation course covers several topics, including gathering information, analyzing event facts, and implementing solutions.

[Check out the course now](#). For more information about other online courses, visit Oregon OSHA's [online learning webpage](#). ●



### Quotable

*One of the greatest lessons many companies and individuals have learned over the past three years is that we need to change before we have to, not because we have to.*

- **Joe Estey**,  
senior performance improvement specialist for Lucas Engineering and Management Services, who delivered the keynote presentation during the Nov. 29-Dec. 2, 2022, Western Pulp, Paper, & Forest Products Safety & Health Conference in Portland.



# Datapoints

## 2021 – Safety violations

Top 10				
Rank	Rule violated	Rule Name	Total violations	Total initial penalties
1	OAD 437-003-1501(1)	Fall protection: General requirements	237	\$770,745
2	OAD 437-001-0765(1)	Rules about safety committees or safety meetings	110	\$9,765
3	29 CFR 1926.1053(b)	Requirements for use of ladders	96	\$72,355
4	OAD 437-003-0503(2)	Certification of fall-protection training	95	\$5,470
5	OAD 437-001-0765(13)	Documentation of safety committee meetings	88	\$3,850
6	29 CFR 1910.178(l)	Training for operators of powered industrial trucks	51	\$8,910
7	OAD 437-002-0221(4)	Rules for handling materials: Storage of material, location	48	\$15,180
8	29 CFR 1910.305(g)	Wiring requirements for flexible cords and cables	44	\$5,600
9	OAD 437-003-0503(1)	Fall protection training program	36	\$21,615
10	OAD 437-003-0134(8)	PPE - Requirements for eye and face protection	33	\$7,885

Serious violations			Repeat violations			Willful violations			Other violations		
#	Violations	Initial penalties	#	Violations	Initial penalties	#	Violations	Initial penalties	#	Violations	Initial penalties
1	174	\$182,525	1	62	\$547,595	1	1	\$40,625	1	0	\$0
2	38	\$9,565	2	1	\$200	2	0	\$0	2	71	\$0
3	86	\$55,580	3	10	\$16,775	3	0	\$0	3	0	\$0
4	6	\$2,670	4	10	\$2,800	4	0	\$0	4	79	\$0
5	5	\$835	5	10	\$3,015	5	0	\$0	5	73	\$0
6	23	\$8,910	6	0	\$0	6	0	\$0	6	28	\$0
7	10	\$3,180	7	2	\$12,000	7	0	\$0	7	36	\$0
8	18	\$5,600	8	0	\$0	8	0	\$0	8	26	\$0
9	34	\$20,640	9	2	\$975	9	0	\$0	9	0	\$0
10	30	\$7,070	10	3	\$815	10	0	\$0	10	0	\$0

Violations have been summarized to the rule or first paragraph level.

The violation data for the 2022 calendar will not be complete until July 1, 2023.

## 2021 – Health violations

Top 10				
Rank	Rule violated	Rule Name	Total violations	Total initial penalties
1	29 CFR 1910.1200(e)	Written hazard communication program	282	\$29,880
2	OAR 437-001-0765(1)	Rules about safety committees or safety meetings	89	\$5,890
3	29 CFR 1910.134(c)	Respiratory protection program	66	\$4,545
4	29 CFR 1910.1200(h)	Hazard communication: Employee information and training	60	\$7,590
5	29 CFR 1910.1200(g)	Hazard communication: Safety data sheets	48	\$1,350
6	29 CFR 1910.1030(c)	Bloodborne pathogens: Exposure control requirements	26	\$7,310
7	OAR 437-002-0161(5)	Emergency eyewash and shower facilities	20	\$3,540
8	OAR 437-002-0134(1)	Personal protective equipment: Requirements for hazard assessment and equipment selection	19	\$3,225
9	29 CFR 1910.134(e)	Requirements on the selection of respiratory protection	18	\$3,195
10	OAR 437-001-0765(4)	Requirements for members of safety committees	12	\$330

Serious violations			Repeat violations			Willful violations			Other violations		
#	Violations	Initial penalties	#	Violations	Initial penalties	#	Violations	Initial penalties	#	Violations	Initial penalties
1	183	\$29,385	1	0	0	1	0	0	1	99	\$495
2	30	\$5,790	2	0	0	2	0	0	2	59	\$100
3	31	\$4,545	3	0	0	3	0	0	3	35	\$0
4	30	\$7,590	4	0	0	4	0	0	4	30	\$0
5	3	\$1,350	5	0	0	5	0	0	5	45	\$0
6	20	\$7,310	6	0	0	6	0	0	6	6	\$0
7	18	\$3,540	7	0	0	7	0	0	7	2	\$0
8	16	\$3,225	8	0	0	8	0	0	8	3	\$0
9	15	\$3,195	9	0	0	9	0	0	9	3	\$0
10	2	\$330	10	0	0	10	0	0	10	10	\$0

Violations have been summarized to the rule or first paragraph level.

The violation data for the 2022 calendar will not be complete until July 1, 2023.

# Everything you need to know about Oregon OSHA's lighting rules

By Ellis Brasch



Oregon OSHA offers free resources to employers to help them maintain safe and healthy workplaces, including addressing proper lighting in the workplace. Those resources include:

- Technical specialists can answer questions about how to apply Oregon OSHA's requirements to your workplace: <https://osha.oregon.gov/Pages/Contact-Technical.aspx>
- Consultants can conduct a confidential evaluation of all or part of your worksite to help you improve your health and safety programs and processes: <https://osha.oregon.gov/consult/Pages/index.aspx>
- A-to-Z topic page about illumination: <https://osha.oregon.gov/Pages/topics/illumination.aspx>

## How much light does a workplace need?

It's complicated. Without enough light, we can't clearly see what we are doing. But too much light has the same effect. Ideally, workplace lighting should strike a balance between quantity and quality. The quantity factor is relatively easy to measure: a good light meter will do the job. Determining quality is more challenging because other factors such as flicker, glare, and contrast come into play.

A [lighting survey](#) done by a trained industrial hygienist, ergonomist, or other lighting professional is the best way to ensure that your workplace strikes the proper balance between lighting quantity and quality.

## What are Oregon OSHA's lighting rules?

Oregon OSHA has adopted more than 30 lighting-related rules (the complete list starts on Page 9), but just a few rules apply to most workplaces. They include:

### Rules for general industry workplaces

- 437-002-0041(8)(d) and (8)(e) Exits and routes. Exit routes must have adequate lighting. Each exit must be clearly visible and have a distinctive sign reading "Exit."
- 437-002-0144(1)(a) and (1)(b) Additional Oregon Rules for General Environmental Controls. Adequate lighting must be provided for rooms, buildings, and work areas when they are used. "Adequacy" is based on the quantity of light specified in American National Standard ANSI All.1-1965, American Standard Practice for Industrial Lighting. Lighting must also be free from glare and extreme contrasts. All skylights, side windows, and lamps must be clean and in working order.



## Rules for construction workplaces

1926.56(a) and (b) Illumination. Construction areas, ramps, runways, corridors, offices, shops, and storage areas must be lighted to at least the intensities listed in Table D-3 while work is in progress.

**Table D-3. Minimum illumination intensities in foot-candles**

Minimum intensity	Area or operation
3 foot-candles	General construction areas, concrete placement, excavation and waste areas, access ways, active storage areas, loading platforms, refueling, and field maintenance areas.
5 foot-candles	General construction area lighting.
5 foot-candles	Indoors: Warehouses, corridors, hallways, and exit ways.
5 foot-candles	Tunnels, shafts, and general underground work areas. (A minimum of 10 foot-candles is required at tunnel and shaft headings during drilling, mucking, and scaling. Bureau of Mines approved cap lights must be acceptable for use in the tunnel heading.)
10 foot-candles	General construction plants and shops (such as batch plants, screening plants, mechanical and electrical equipment rooms, carpenter shops, rigging lofts and active storerooms, barracks or living quarters, locker or dressing rooms, mess halls, and indoor toilets and workrooms).
30 foot-candles	First aid stations, infirmaries, and offices.

Refer to the American National Standard A11.1-1965, R1970, Practice for Industrial Lighting, for areas or operations not covered in Table D-3.

## Rules for agricultural workplaces

- 437-004-0405(i) Exits and emergency action plan. Exit routes must have adequate lighting.
- 437-004-1140 (1)(a) and (1)(b) Lighting. Rooms, buildings, and work areas must have adequate lighting based on the guidelines in the American National Standard A11.1-1965, Practice for Industrial Lighting. Lighting must also be free from glare and extreme contrasts.

## What is American National Standard A11.1, Practice for Industrial Lighting?

American National Standard A11.1, Practice for Industrial Lighting is a voluntary standard developed by the American National Standards Institute (ANSI) and the Illuminating Engineering Society (IES) in 1965. The IES now has the role of developing such standards; the IES uses the word “standard” to mean any IES technical document that has gone through an [approval process](#) developed by ANSI.

Oregon OSHA’s lighting rules refer to the original A11.1, Practice for Industrial Lighting published in 1965 and to revisions published in 1970 and 1990. These rules include:

### ANSI A11.1-1965, Practice for Industrial Lighting

- 1910.262, Textiles
- 1910.265, Sawmills
- 437-002-0144, Additional Oregon rules for general environmental controls
- 437-004-1140, Lighting

### ANSI A11.1-1965, R1970, Practice for Industrial Lighting

- 1910.219, Mechanical power-transmission apparatus
- 1910.265, Sawmills
- 1926.56, Illumination

ANSI/IES RP-1990, Practice for Industrial Lighting applies to 437-002-0312, Oregon rules for pulp, paper, and paperboard mills.

Note that the IES revised and updated all its lighting standards in 2020 and 2021; you can access them through its [Lighting Library](#) (subscription required). The IES publication that comes closest to the Practice for





- Industrial Lighting is ANSI/IES RP-7-20, Recommended Practice: Lighting Industrial Facilities; check out this and other IES lighting standards in the IES Lighting Library's Lighting Applications Standards Collection.
- **Foot-candles, lux, and lumens – what do they mean?**
- Most of Oregon OSHA's lighting rules use "foot-candles" as a measure of how much light should illuminate a surface. One foot-candle equals the amount of light on a surface one foot away from a single candle.
- Another term called "lux" also measures illumination on a surface; the difference between the two terms is that foot-candles

are based on Imperial measurements and lux are based on metric measurements. So, one lux is the amount of light that falls on a surface one meter away from a candle, and one foot-candle equals 10.764 lux.

Only one Oregon OSHA rule uses the term "lumens" as a lighting requirement: 1910.178, Powered industrial trucks ("Where general lighting is less than 2 lumens per square foot, auxiliary directional lighting shall be provided on the truck."). Unlike foot-candles and lux, lumens measure the total amount of light emitted in all directions from a single source.

## Oregon OSHA rules that have lighting requirements

### Division 2 – General occupational safety and health

#### Subdivision E – Means of egress

437-002-0041 Exits and routes

#### Subdivision F – Powered platforms

1910.68 Man lifts

#### Subdivision H – Hazardous materials

1910.103 Hydrogen

1910.120 Hazardous waste operations and emergency response

#### Subdivision J – General environmental controls

437-002-0144 Additional Oregon Rules for General Environmental Controls

437-002-0146 Confined spaces

#### Subdivision N – Material handling and storage

1910.178 Powered industrial trucks

1910.179 Overhead and gantry cranes

437-002-0221 Additional Oregon rules for handling materials

437-002-2225 Vehicles for highway and road operations, characteristics, and maintenance

#### Subdivision O – Machinery and machine guarding

1910.219 Mechanical power-transmission apparatus

#### Subdivision R – Special industries

1910.262 Textiles

1910.265 Sawmills

1910.268 Telecommunications

437-002-0312 Oregon rules for pulp, paper, and paperboard mills

**Subdivision RR** – Electrical power generation, transmission, and distribution

437-002-2311 Working on or near exposed energized parts

437-002-2322 Special conditions

**Subdivision S** – Electrical

1910.303 Electrical – General requirements

1910.308 Electrical – Special systems

1910.333 Selection and use of work practices

**Division 3 – Construction**

**Subdivision A** – General

1926.6 Incorporation by reference

**Subdivision C** – General safety and health provisions

1926.26 Illumination

**Subdivision D** – Occupational health and environmental controls

1926.56 Illumination

**Subdivision O** – Motor vehicles, mechanized equipment, and marine operations

437-003-3225 Vehicles for highway and road operation characteristics and maintenance

**Subdivision S** – Underground construction, caissons, cofferdams, and compressed air

1926.800 Underground construction

1926.803 Compressed air

**Division 4 – Agriculture**

**Subdivision E** – Exits/Plans

437-004-0405 Exits and emergency action plan

**Subdivision F** – Manlifts

437-004-0570 Manlifts

**Subdivision J** – Work environment

437-004-1120 Agricultural labor housing and related facilities

437-004-1140 Lighting

**Subdivision N** – Material handling

437-004-1680 Storage of hazardous chemicals

437-004-1700 Forklifts and other powered industrial trucks

**Division 7 – Forest activities**

**Subdivision C** – Planning, first aid, and work conditions

437-007-0240 Night logging ●



# It's dark out there

By Ellis Brasch

Darkness is not only a playground for scary things that haunt our imagination at night. It's also a hazard that makes safely accomplishing many real-world activities difficult or impossible – especially this time of the year as our daylight hours continue to wither. Our depth perception, color recognition, and peripheral vision are all compromised in the dark. And we have even more difficulty seeing in darkness as we get older.

We see best in daylight because our eyes are most sensitive to high contrast objects, their color, their size, and how they move in their surroundings. But, as the days get shorter through the winter solstice, we will be spending more time in darkness. What to do? Here are a few tips on dealing with darkness this winter.

## Slow low down and watch the road when you're driving

The low contrast between light and dark at night makes it especially challenging when you're driving. On a dark road, you can see only as far as your headlights – with high-beam headlights on, that's only about 400 feet. If you're driving too fast, you won't have time to avoid anything that happens to wander across your path – especially if you're encountering foul-weather hazards such as rain, snow, or fog.

Keep in mind that using high beam headlights during bad weather can also make it difficult for oncoming drivers to see. Generally, you should use high beams at night when other vehicles are not present, and the weather is fair.

Tips for driving at night:

- Focus only on the task of driving.
- Stay alert; drowsy driving and impaired driving are leading causes of vehicle crashes and fatalities.



- Make sure your headlights, taillights, and turn signals are working and the lenses are clean; it is illegal to drive at night or in bad weather with only the parking lights on.
- Watch out for pedestrians, cyclists, and wildlife.
- Look slightly to the right of headlights from an oncoming vehicle and watch the road edge or fog line to lessen the blinding effect of glare.
- Turn on your parking lights or emergency flashers when you are stopped on a road or shoulder and visibility is limited.
- Drive defensively and slow down.

### Be visible when you're working outdoors

It's a good idea to ensure that everyone who will be working outdoors at night or when visibility is poor wears appropriate high-visibility reflective clothing. It's also a requirement – day or night – for employees who work in a street or highway right-of-way and are exposed to traffic or construction equipment.

When you must wear a high-visibility upper-body garment, Oregon OSHA rules require that the high-visibility colors (such as strong red, orange, yellow, and yellow-green or fluorescent versions of these colors) contrast sufficiently with other colors in the area to make you stand out. The garments must also reflect from all sides for 1,000 feet during hours of darkness.

Check out Oregon OSHA's fact sheet, "[High-visibility safety apparel – unraveled](#)," for more information.

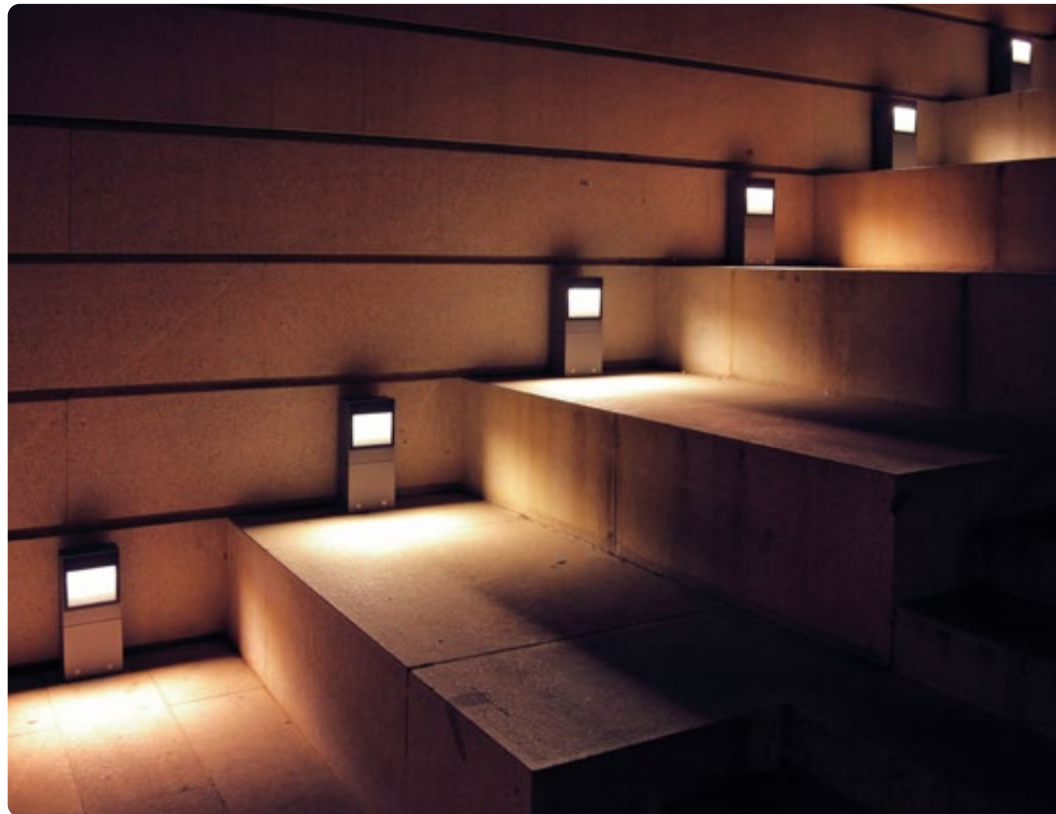
### Check for broken lights and replace them promptly

Many of the complaints that Oregon OSHA receives about unsafe workplaces during the winter come from employees who have difficulty seeing where they are going or what they are doing because existing lights are not working. Typical complaints:

- "Lights are out and there is dim lighting in the stairwell."
- "Broken lights in the parking lot make it unsafe at night."
- "Light bulbs burned out at the back of the warehouse make it hard to see when we're working at night."

- "We come in for the night shift at 10 p.m., but the lights automatically turn off at 11 p.m."
- "The path has no lighting exposing us to slips, trips, and falls."
- "The work area is not adequately lit at night. Only six of the 12 lights under the awning are working."

Most of these complaints could be resolved simply by ensuring that existing lights in the workplace are not broken and sufficiently bright. Oregon OSHA's lighting rules require that exits and exit routes have adequate lighting and exit signs be clearly visible. And adequate lighting must be provided for rooms, buildings, and other work areas. How much lighting is adequate? Check out "[Everything you need to know about Oregon OSHA's lighting rules](#)" in this issue to learn more. ●



# Safety Data Sheets for Hazardous Chemicals Information sheet

In accordance with the REACH Regulation (Regulation (EC) No. 1907/2006), a safety data sheet (SDS) provides useful information on chemicals, their uses, their hazards, the chemical presents, and giving information on handling, storage and emergency measures in case of an accident. Over the coming years, SDSs may include further information on safe handling, in the form of appropriate statements. REACH requires users of hazardous chemicals to follow the advice on risk management measures given in the SDS.

**Safety Data Sheet must contain the following 16 headings:**

6. Accidental release measures
7. Handling and storage
8. Exposure controls/personal protection
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological information

12. Ecological information
13. Disposal considerations
14. Transport information
15. Regulatory information
16. Other information

**A Safety Data Sheet must be:**

- Prepared by a competent person
- In an official language(s) of Member State where the chemical is being placed on the market
- In the required 16 heading format
- Specific to the chemical
- Clear and understandable
- Provided free of charge, either on paper or electronically
- Provided no later than when the chemical becomes available
- Updated when necessary

## Ask OSHA | Oregon OSHA

Department of Consumer and Business Services

### We are a small company that keeps our safety data sheets in a binder. Does Oregon OSHA have any requirements covering when we must update them?

As you are probably aware, Oregon OSHA's key requirements for safety data sheets are covered in its [Hazard Communication Standard](#), but there is no requirement in the standard covering when employers such as yourself must update them.

However, there are such requirements for chemical manufacturers, importers, and distributors:

- Chemical manufacturers or importers must ensure that distributors and employers are provided with an updated safety data sheet with the first shipment after a safety data sheet is updated.

- Distributors must also ensure that updated safety data sheets are provided to other distributors and employers with the first shipment after a safety data sheet is updated.
- If a chemical manufacturer or importer preparing the safety data sheet becomes newly aware of any significant information regarding the hazards of a chemical, or ways to protect against the hazards, this new information must be added to the safety data sheet within three months. If the chemical is not currently being produced or imported, the chemical manufacturer or importer shall add the information to the safety data sheet before the chemical is introduced into the workplace again.

When you purchase hazardous chemicals from a manufacturer, distributor, or importer, each container must have a label and include a safety data sheet that classifies the chemical and provides specific information about its hazards.

As an employer, you are responsible for keeping a safety data sheet in the workplace for each hazardous chemical that your employees use – a binder is acceptable. Just make sure that that the binder is readily accessible during each work shift to employees when they are in their work areas. Electronic access and other alternatives to maintaining paper copies of the safety data sheets are also permitted, as long as there are no barriers to immediate employee access. ●

## Short take

# Oregon OSHA hosts second Spanish-language conference

By Aaron Corvin

Building on its ongoing efforts to expand outreach to the most vulnerable workers, Oregon OSHA held its second Spanish-language conference on Nov. 8 at the Oregon State Fairgrounds. The event drew more than 180 participants and covered a variety of workplace health and safety topics entirely in Spanish.

The all-day event addressed workers' rights while on the job and how workers can assert their rights to a safe workplace. The event also addressed protecting workers' health and safety at work and at home, and protecting against wage theft.

The event featured presentations by safety and health professionals, other experts, and lunch and exhibits.

### The event's topics included:

- Asserting your right to a safe workplace
- Protecting your health at work and at home
- Identifying and addressing common workplace hazards
- Safety and health in:
  - Agriculture
  - Construction
  - Food processing
  - Manufacturing
  - Hospitality
  - Caregivers

- Role of the supervisor in workplace safety
- Protecting yourself from wage theft
- Whistleblower Protection Program

The conference underscores Oregon OSHA's commitment to bolstering its outreach efforts, breaking down language barriers, and connecting with more workers and employers about workplace health and safety resources.

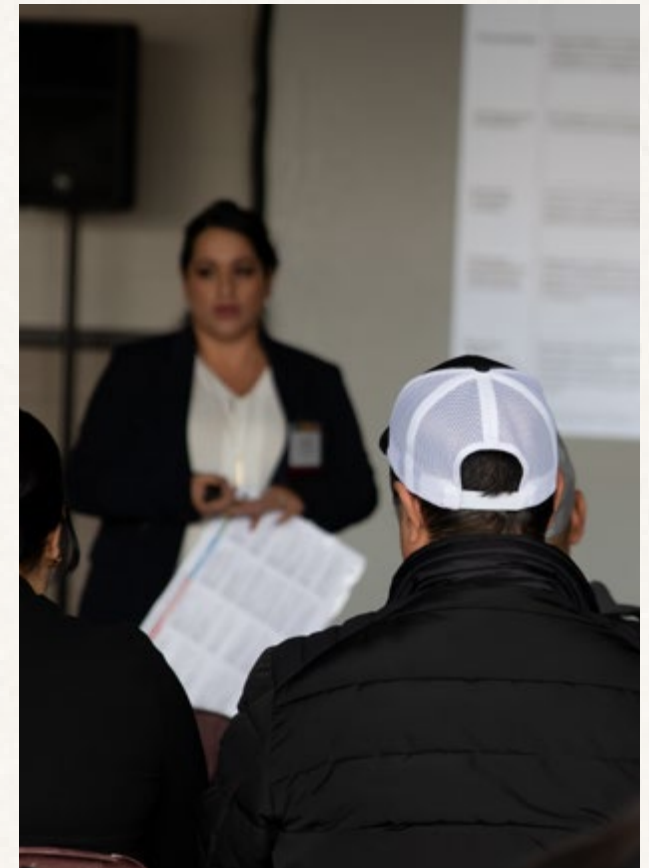
Visit Oregon OSHA's [Spanish-language online training courses](#) and learn about the division's [PESO program](#), a bilingual program that helps English-speaking employers train and talk about workplace safety and health issues with Spanish-speaking workers.

Workers have a [right to a safe and healthy workplace](#). That includes the right to raise concerns [free from retaliation](#) and to [file a complaint](#) with Oregon OSHA, which advances safety for all Oregon workers through [enforcement](#), [consultation](#), [technical](#), and [public education and training](#) services. The [Ombuds Office for Oregon Workers](#), an independent advocate, offers workers help in understanding their rights within workplace safety and health rules, and their rights within the workers' compensation system. The office's toll-free phone number is 800-927-1271.

Moreover, the [Department of Consumer and Business Services \(DCBS\) Multicultural Communications Program](#) provides outreach to

communities with limited English proficiency. That outreach includes information about on-the-job safety and health. The program includes a toll-free phone number for Spanish-speaking Oregonians: 800-843-8086.

For more information about Oregon OSHA conferences, [visit the division's conferences page](#), send an email to [oregon.conferences@dcbs.oregon.gov](mailto:oregon.conferences@dcbs.oregon.gov) or call 503-947-7411. ●



## Short take

# Winter brings an increased risk of carbon monoxide poisoning at home and work

By Ellis Brasch

Although carbon monoxide's reputation as a silent killer is well known, it continues to find unsuspecting victims – especially during the winter. While home furnaces and heaters are responsible for many victims of carbon monoxide poisoning, it is also a threat in the workplace.

Too many workers still don't know that small gas-powered engines produce large quantities of carbon monoxide that can have deadly consequences when they are operated in poorly ventilated areas.

### What's the problem with carbon monoxide?

Carbon monoxide robs oxygen from your blood when it enters your lungs. That means there's less oxygen for your heart, brain, and other vital organs – and without oxygen, they will shut down. Aside from subtle warning signs – headache, fatigue, dizziness, and drowsiness – you won't know you are ill because carbon monoxide is colorless and odorless.

Large amounts of carbon monoxide can overcome you without warning, causing you to lose consciousness and suffocate. [The National Institute for Occupational Safety and Health](#) (NIOSH) notes that carbon monoxide levels above 1,200 parts per million could cause death or irreversible health effects within 30 minutes, known as "immediately dangerous to life and health."

### Know the risks

Your risk of becoming a carbon monoxide victim depends on a number of factors, including the concentration of carbon monoxide in the air, how long you are exposed, and your exertion level. Oregon OSHA doesn't allow a worker to be exposed to more than 50 parts per million averaged over an eight-hour time period (carbon monoxide is measured in parts per million or "ppm").

However, other safety and health organizations have established guidelines at lower exposure levels. For example, the [American Conference of Governmental Industrial Hygienists](#) (ACGIH) has assigned carbon monoxide a threshold limit value or "TLV" of 25 ppm for an eight-hour workday.

Those numbers aren't likely to help you, however, unless you have access to personal air monitoring equipment. If you are using gas-powered equipment, play it safe and stay away from poorly ventilated areas – even in places you might consider safe, such as parking garages and warehouses.

### Tips for staying safe

- Know the sources of carbon monoxide poisoning and its symptoms (gasoline, natural gas, oil, propane, coal, and wood all produce carbon monoxide).





- Keep internal-combustion equipment in good operating condition.
- Prohibit the use of gasoline-powered tools and engines in poorly ventilated areas.
- Test the air regularly in poorly ventilated areas and use mechanical ventilation when possible to keep carbon monoxide levels below safe levels.
- Provide personal CO detectors for workers in areas where carbon monoxide exposure is possible.
- Consider converting from gasoline-powered equipment to equipment powered by electricity or batteries when possible.
- Educate workers on the dangers of carbon monoxide poisoning and the symptoms and control of CO.

#### Do not

- Run a car or truck inside a garage attached to your house, even if you leave the door open.
- Burn anything in a stove or fireplace that isn't vented.
- Heat your house with a gas oven.

- Use a generator, charcoal grill, camp stove, or other gasoline or charcoal-burning device inside your home, basement, or garage or outside within 20 feet from a window, door, or vent.

#### Install a carbon monoxide detector in your home

Carbon monoxide detectors are essential for any home with fuel-burning appliances such as a furnace, water heater, range, cooktop, or grill. All-electric homes should have carbon monoxide detectors, too, because carbon monoxide can leak into a house from an attached garage or from a nearby backup generator used during a power outage.

Consider buying a detector with a digital readout, which can also tell you the highest level of carbon monoxide concentration in your home.

Replace your carbon monoxide detector every five years.

#### More information

Check out Oregon OSHA's A-to-Z topic page on [carbon monoxide](#) for more information about carbon monoxide. ●





## Short take

# Contest promoting young worker safety in Oregon is open to high school students; submissions due Feb. 17, 2023

By Aaron Corvin

High school students across Oregon are encouraged to let their video or graphic design skills shine by engaging in a competition held for a good cause: increasing awareness about workplace safety for young workers.

They will have the opportunity to do so using updated contest rules. Those rules empower them to choose a key message, theme, or tagline for their video or graphic design piece. This is different than previous contests that featured a predesignated tagline.

The 2023 media contest, organized by the [Oregon Young Employee Safety Coalition](#) (O[yes]), is now open for submissions.

The contest calls on participants to capture the attention of high school teens and persuade them to take the O[yes] online Safety Awareness Training to boost their knowledge of how to stay safe and healthy while on the job.

Contestants may do so by either creating a video that is between 30 to 90 seconds in length or by crafting a graphic design piece.

They get to choose a key message, theme, or tagline to help make their media project stand out and effectively reach their audience.

The top three entries in each of the two media categories will take home cash prizes ranging from \$300 to \$500. In each category, the first-place winner's school, club, or organization will receive a matching award.

Some contestants may dream up a bold, splashy graphic design to get their message across. Others may grab a smartphone or camera and develop a video that captivates their audience with documentary-style seriousness. Either way, contestants are expected to choose their key message, theme, or tagline in a wise manner as they work to persuade teens to take positive action by using the [O\[yes\] online Safety Awareness Training](#).

While they carry out their projects, contestants must ensure the health and safety of their team. No one should be endangered while creating their video or graphic design project.

**The deadline for submissions is 5 p.m. Friday, Feb. 17, 2023.**

Contestants are encouraged to submit entries online. Submissions may also be mailed on a USB thumb drive. All participants will be invited to a live-streamed event in which all finalist submissions will be shown and the top three winners in each category will be revealed.

For more information about the entry form and rules, contest expectations, and resources – including graphic design and video examples, and the entries that won in 2022 – visit the O[yes] [online contest page](#).

The contest sponsors are local Oregon chapters of the American Society of Safety Professionals, Construction Safety Summit, Central Oregon Safety & Health Association, Hoffman Construction Company, Oregon Institute of Occupational Health Sciences at OHSU, Oregon OSHA, SafeBuild Alliance, SAIF Corporation, Oregon SHARP Alliance, and the Oregon Utility Notification Center. ●



## Short take

# Oregon OSHA's Micah Ashby: Forever a Hero Scholarship winner

By Ellis Brasch

Oregon OSHA senior safety compliance officer Micah Ashby accepted Columbia Southern University's 2022 [Forever a Hero Scholarship award](#) at Oregon OSHA's Bend field office on Dec. 9.

Columbia Southern University awards the scholarship annually to a military veteran for outstanding contributions to their community. The scholarship will cover up to \$26,100 of Ashby's master's degree program in occupational safety and health at the university. He expects to graduate in 2025.

Ashby enlisted in the U.S. Navy as an aircraft structures mechanic in 2005. In 2006, he volunteered to serve in Iraq and spent a year at Camp Bucca with Naval Provisional Detainee Battalion 2. When that tour ended, he returned to the United States, where he was based at Naval Air Station Whidbey Island, Wash., before his final deployment to Okinawa, Japan. He received two Navy Commendation Medals, one Army Commendation Medal, and the Iraq Campaign Medal for his military career. ●

*Andrew M. Roman, director of the Department of Veteran Initiatives at Columbia Southern University, presents the award certificate to Micah Ashby at Oregon OSHA's Bend Field Office.*

*Photo credit: Barto Watkins.*





# Incident Alert! .....

Company ..... Recycled rubber products manufacturer  
 Hazard..... Pinch point  
 Employee ..... Maintenance technician  
 Incident date ..... December 2021

## What happened?

Three toes on a maintenance technician's right foot were amputated while he was performing routine maintenance on a tire shredding machine.

## How did it happen?

The 42-year-old maintenance technician started his shift at 6 a.m. His first job was to do "bed-knife flip" maintenance on a Grizzly M80 tire shredding machine. The machine, more than 19 feet long, was powered by a 300-horsepower motor that turned a large rotor with 50 replaceable knives and 10 stationary "bed knives" built into the housing. The machine could process up to five tons of material per hour into small granules after it passed between the stationary bed knives and the rotating knives.

The bed-knife flip – a task that involved turning the bed knives over and adjusting them – had to be done every 20 hours. Before starting that task, the technician locked out the motor, used the machine's hydraulic unit to raise the guard that covered the knives, then secured the hood, and locked out the hydraulic unit.

After locking out the machine and the hydraulic unit, the technician stepped onto the housing. He stood on the end of the rotor and prodded it with the steel-toed boot on his right foot, trying to loosen tire debris. He took two steps on the rotor then slipped and started to fall. As he fell, the tip of the boot on his right foot caught between a

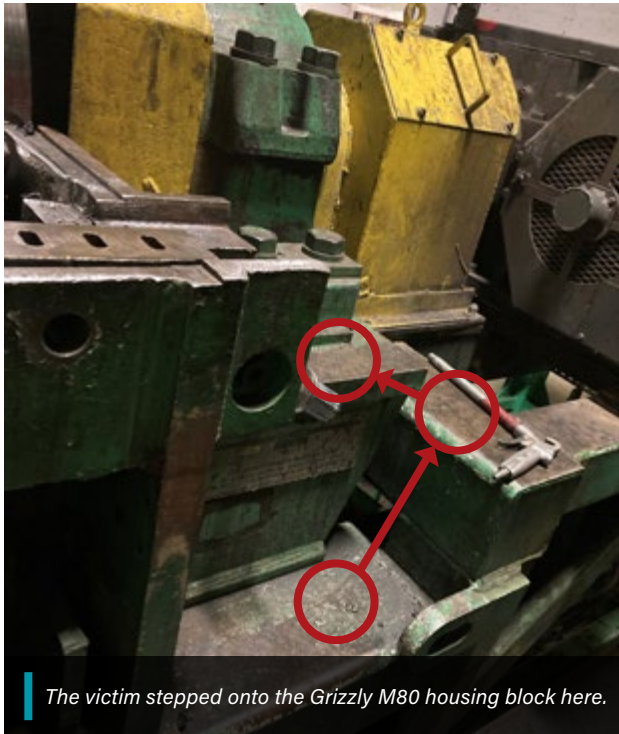
stationary knife and the knife bed, which sliced through the boot and three of his toes.

## Key findings

- Employees were allowed stand on the rotor and to turn it with their feet to remove tire debris. The company had a written procedure that required employees to use a special tool to turn the rotor and prohibited them from standing on the rotor or turning the rotor with their feet. But employees
- thought that the tool was not effective, and they also been trained to stand on the rotor to remove debris and to turn it with their feet. The plant manager said he knew that employees were not following the written procedure, but he was trying to determine a safer, effective way for employees to do the bed-knife flip.
- There were at least four other documented incidents associated with the bed-knife flip between 2018 and 2021, but the company



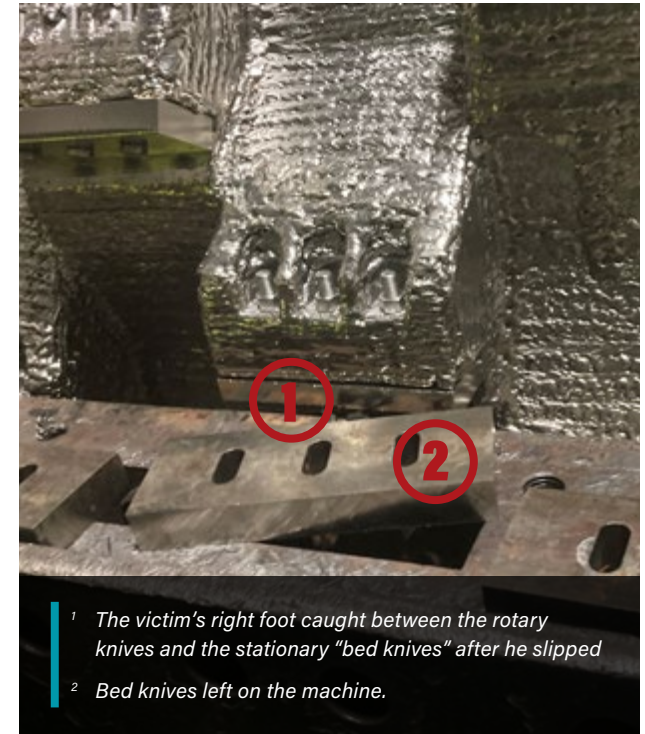
The Grizzly M80 tire shredding machine



The victim stepped onto the Grizzly M80 housing block here.



The victim turned the rotor here with his right foot to loosen tire debris.



<sup>1</sup> The victim's right foot caught between the rotary knives and the stationary "bed knives" after he slipped  
<sup>2</sup> Bed knives left on the machine.

did not follow up on corrective actions for some of them. Reports provided by the company did not indicate that corrective actions were requested by management or the safety committee.

- The company's disciplinary policy was not effective. Employees said that the company's "Disciplinary Action Plan" was never explained to them or enforced. Employees who had a history of working unsafely received verbal and written warnings, but they were not disciplined as the plan required.
- Supervision was not adequate. The maintenance technicians worked the

weekend shift (from 6 a.m. to 6:30 p.m., Friday through Sunday) without much supervision and did the bed-knife flip task without assistance.

#### What did the company do to prevent the incident from happening again?

- The company revised its written bed-knife flip procedure; the revision prohibited employees from standing on the machine bed and required them to use a tool to turn the rotor.
- The company formally reviewed the new procedure with all affected employees and trained them.

- The company regularly observed employees following the procedure and coached them when necessary.
- The company changed the maintenance technician's weekend shift to Monday through Friday to increase management supervision.

#### Violations

OAR 437-001-0760(1)(a) – Rules for all Workplaces, Employers' Responsibilities: The employer did not see that workers were properly instructed and supervised in the safe operation of any machinery, tools, equipment, process, or practice which they were authorized to use or apply. ●