

# MACHINERY MIGHT



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## 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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# Administrator's message: Oregon OSHA will cite what we find

By Michael Wood

**In mid-January, Oregon OSHA issued the fourth highest initial penalty in our history. The \$740,400 penalty issued to Americold Logistics for issues related to managing the safety and maintenance of ammonia systems used in commercial refrigeration also is the largest penalty issued in more than a decade.**

Given the national discussions about the need for higher penalties, and my own suggestions that we need to evaluate our penalty structure to determine if we're using it effectively, it is understandable if some see the citation as heralding a "new era" of high penalties and significant cases here at Oregon OSHA. But that's really not the most accurate reading.

The citation was issued using the same penalty rules we have had in place for years. It was the number of willful violations, and the severity of the underlying hazards, that drove the penalty amount. And it was not, in fact, the highest penalty we could have issued – had we considered the violations "egregious," the penalty would likely have been much higher. I don't want to address the specifics of the citation, which has been appealed, but I do want to offer some general observations about how we got to this point.

The direction repeatedly given to Oregon OSHA staff is that we "cite what we find" in our enforcement visits. In contrast to at least some of the national discussions, we also have emphasized the importance of characterizing violations, not based on the actual *outcomes* such as fatalities and hospitalizations, but based on the *risks* created by the violations, regardless of whether or not our worst fears were realized in the particular case. At our best, we identify and correct such risks and such violations *before* any fatality. It's what we demand of employers, and it's why we don't rely on accident reports alone to trigger our own activity.

That's what happened in the recent citation. A total penalty approaching three-quarters of a million dollars can hardly be described as routine. But it was the result of our routine enforcement activity. The site was selected for a programmed inspection, and the assigned industrial hygienist set out to do an inspection of the facility's process safety management practices. We looked at the site in 2007 when a small ammonia compressor exploded, but that accident investigation was limited, particularly compared to the comprehensive inspection we just completed.

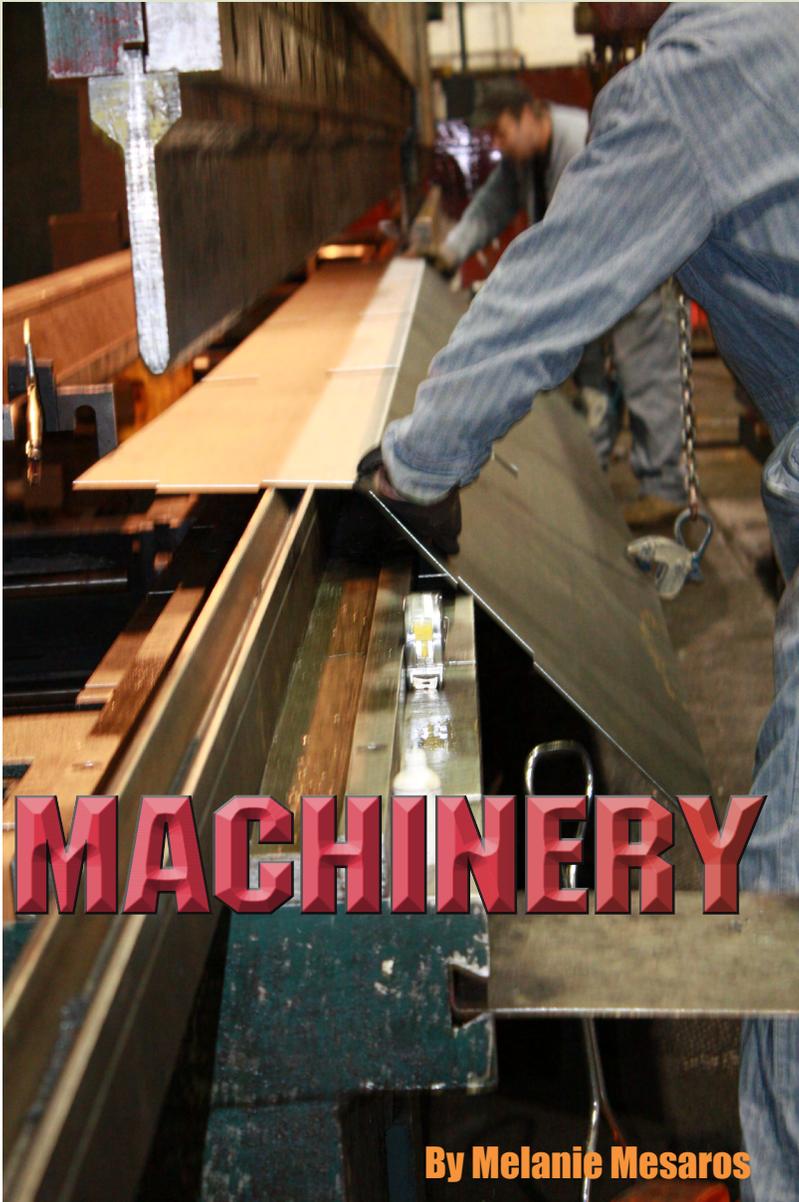
The compliance officer did the job the way it's supposed to be done. She looked at records, she looked at the physical plant, and she interviewed workers and managers about conditions she found and why they were allowed to persist. As it became clear that she was finding significant problems, she kept digging. And that thorough investigation led to the violations and the resulting penalty.

This is not a declaration that "things have changed" in some dramatic fashion, but it should be a reminder that we have always declared our readiness to use significant enforcement tools when the situation demands it. Our stated approach is that we rely upon relatively modest penalties for routine violations but that we pursue stiff penalties for the more severe and flagrant violations, including (but not limited to) repeated violations. If the circumstances suggest a violation may be willful, we will look more closely. And if we determine that one or more violations are indeed willful, we will assess penalties accordingly.

continued on page 9



Michael Wood, Administrator



Laz Smith lost his middle finger when a plasma-cutting machine gear snagged his glove.

# MACHINERY

# MIGHT

## Metal worker loses finger after accident

By Melanie Mesaros

Laz Smith and a co-worker knew something didn't sound right in the gearbox of the plasma-cutting machine Smith was operating. Smith put his head down to listen as the machine rolled along the track but he still couldn't tell what was wrong. That's when he reached his right hand in to remove some dust or lint from the drive pinion.

"I just took a swipe at it and before it even registered, that gear was in my palm. It snagged my glove and pulled me right in," he said.

Smith's middle finger was amputated and the damage extended down into his palm. Now, more than a year later, he still deals with chronic pain.

"It hurts," Smith said. "Every day I do something with my right hand and I think, 'I can't do that very well.'"

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**"I just took a swipe at it and before it even registered, that gear was in my palm. It snagged my glove and pulled me right in."**

**– Laz Smith**

---

Smith had two surgeries on his hand and spent about 10 months in physical therapy before he could return to work at H.W. Metal Products in Tualatin, a steel parts fabricator. The hardest part has been his struggle with everyday tasks, from brushing his teeth to grabbing things, even picking up his 10-year-old daughter.

“If you underestimate the machinery you work with, even for a second, that’s all it takes,” he said. “I’ve been here 10 years and you get comfortable. The steel is unforgiving and I will never forget this.”

Jack Suter, owner of H.W. Metal Products, said the accident was an eye-opener for all of the employees.

“We pride ourselves on having a safe work environment and this stimulated a re-examination of the hazards,” Suter said. “This isn’t a florist shop. It’s a dangerous job.”

The company’s safety committee conducted a thorough walkthrough of the shop and discussed other potential hazards. They also reviewed CPR and first-aid training as it related to the response following the accident.

Smith said he should have waited for a maintenance person at the shop to address the problem. But he feels very lucky to be back on the job.

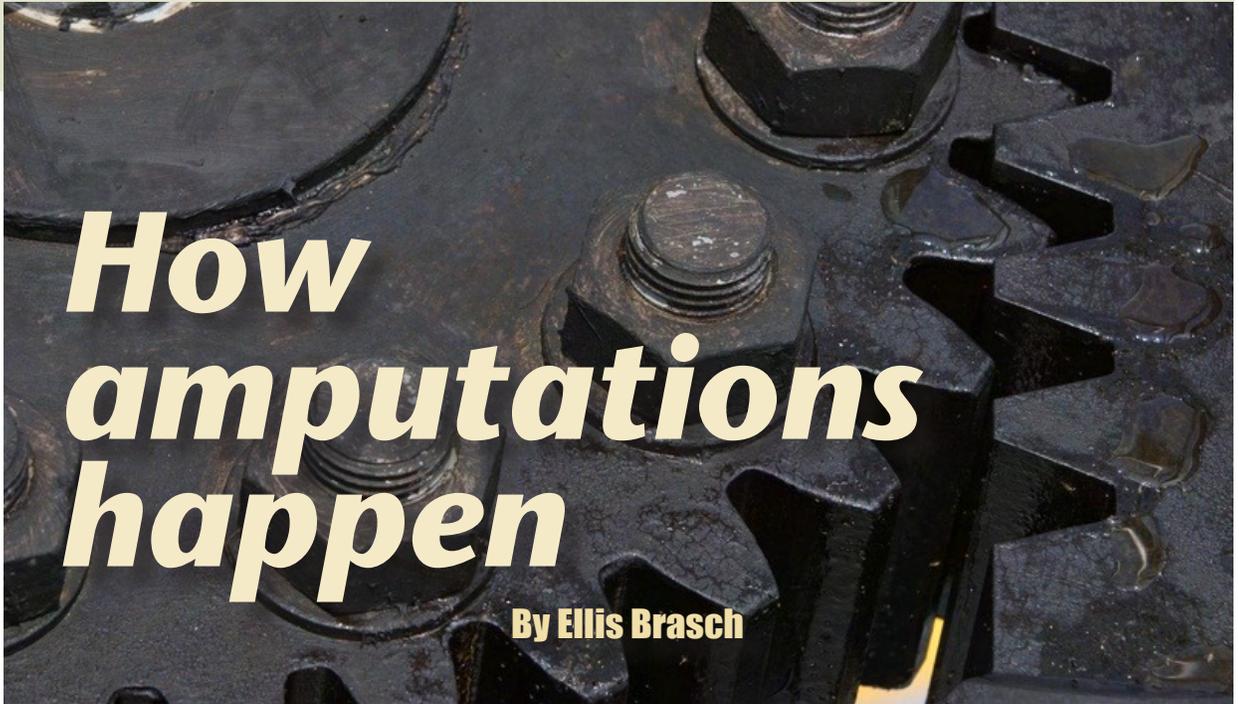
“I use my hands to make money and I have to work twice as hard with my good hand now,” he said. “I put my whole career at risk. The more I think about it, it could have been prevented.” ■



Smith has returned to work but still endures daily pain from nerve damage.



While he doesn’t have flashbacks like some amputation victims, Smith said he feels uneasy about watching gory movies that may depict an amputation.



# How amputations happen

By Ellis Brasch

*“We shape our tools and thereafter they shape us.” – John M. Culkin*

**M**achines that have moving parts and workers who operate them have an uneasy relationship. Machines make workers more productive and enable them to form, shape, and cut material in ways that would be impossible with manual hand tools. However, moving machine parts – rotating shafts, gears, cogs, flywheels – and the mechanisms for cutting, shearing, bending, and drilling material often keep moving regardless of who or what gets in their way. Technology can make machines safer, but as long as workers need machines to help them process material, they’ll be exposed to moving parts that can harm them.

Machinery was the source of more than half of the accepted workers’ compensation claims for amputations in Oregon from 2004 to 2008, and powered hand tools added another 9 percent to the total. Not surprisingly, nearly all of those amputations – 98 percent – were fingers. But all of the injuries were preventable.

## How workplace amputations happen

Amputations account for less than 1 percent of disabling workplace injuries in Oregon but the consequences can be devastating for victims. Consider how the following happened in Oregon in 2009:

- A saw operator reached under a moving band saw blade to remove material.
- A worker reached out to clear a piece of plastic hung up behind a saw blade in the throat of the vacuum waste hose.
- A cabinet installer, cutting a one-inch strip from cabinet-grade plywood, did not have a hood guard on the saw and was cutting the plywood from the wrong side of the blade. (See photo on page 7.)
- A worker cleaning near a moving drive-chain and sprocket for an airlock caught his right hand in the sprocket.
- While evaluating a possible air leak in a dust collector, a maintenance supervisor put her right hand in the airlock below the dust collector.

This saw, now guarded in this picture, left a cabinet installer with three amputated fingers because he attempted to lift the strip of plywood. That caused kickback, which drew his hand across the moving blade.



- A worker was using a circular saw to cut a small piece of wood without a sawhorse or other support when the saw kicked back.
- A machine operator was trying to remove product from a jam in a compression machine while the machine was running.
- A worker reached into a chute to clean food residue near a continuously rotating valve.

There is a common thread to these accidents. Most workplace amputations happen when workers are doing the following:

- Adjusting a machine
- Cleaning a machine
- Clearing jams or removing material
- Servicing or maintaining a machine
- Using a machine without an appropriate guard

They're doing these activities while the machine is running and where the machine's moving parts are most dangerous:

- *At the point of operation* – where the machine does work such as cutting, shaping, boring, and forming.
- *Near power-transmission apparatus* – such as flywheels, pulleys, belts, chains, couplings, connecting rods, spindles, cams, and gears.

## How to prevent workplace amputations

The best way to reduce the risk of workplace amputations is to use machine guards and safety devices and to follow lockout/tagout procedures.

- *Guards* are physical barriers that keep body parts away from a machine's hazardous mechanical components and motions. Guards should be secure, strong, tamperproof, and should not block the machine operator's view.
- *Safety devices* prevent worker contact with points of operation during the hazardous portion of a machine's cycle and may replace or supplement guards. These devices keep operators from reaching into moving machine parts or stop the machine cycle when the operator's hands get too close to the machinery.
- *Lockout/tagout procedures* ensure that machines do not start or move unexpectedly when workers are servicing or maintaining them.

For more information about Oregon OSHA's general industry and construction rules that can prevent amputations, look under these headings at [www.orosha.org](http://www.orosha.org).

### General industry

- *Personal Protective Equipment* [Subdivision I]
- *General Environmental Controls* [Subdivision J]
- *Material Handling and Storage* [Subdivision N]
- *Machinery and Machine Guarding* [Subdivision O]
- *Hand and Portable Powered Tools* [Subdivision P]
- *Special Industries* [Subdivision R]

### Construction

- *Personal Protective and Life Saving Equipment* [Subdivision E]
- *Tools — Hand and Power* [Subdivision I]

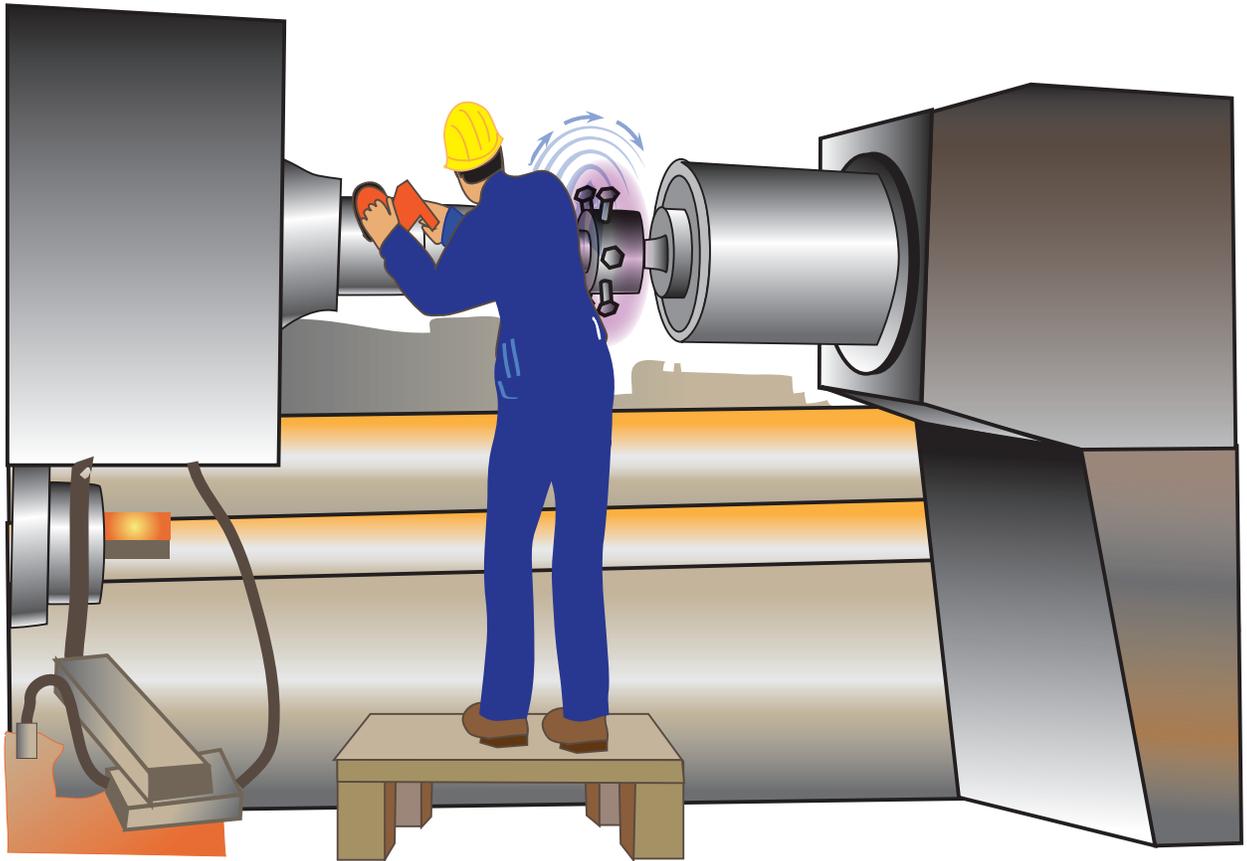
Many of Oregon OSHA's machine safeguarding rules are based on *The American National Standards Institute* (ANSI) B11 series of safety standards. ■

## Accident Report

Accident type | Caught in/Fatality

Industry | Paper Industry Machinery Manufacturing

Employee job title | Machinist

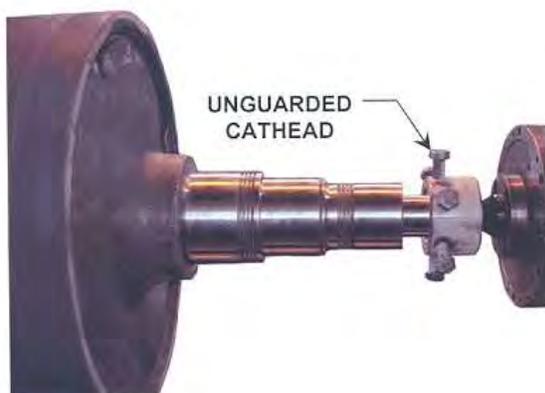


A shop machinist was conducting an inspection of a 24-inch diameter by 33-foot paper roll. The work process was to tool and polish the radii on the shaft to remove cracking and then tool/polish the “highs” in the damaged seal area of the paper roll.

The employee located a “cat head” or centering device to be applied to the roll before moving into the lathe. After applying and securing the cat head into the coupling fit end of the drive side of the roll, he applied rigging straps to the roll. The roll was then moved into the large lathe. The controls were put into fast mode for the tooling process.

After moving or grinding down imperfections, the machinist continued the work process by using a hand-held grinder with different sized cutting and polishing heads. This would allow him to remove spots with different grades of emery cloth. It was at this time when the employee was observed reaching over the flare ends of the rotating shaft using the hand grinder. At some point when the employee was alone in the area, his coveralls caught the unguarded bolt heads of the cat head and he was pulled into the shaft. A fellow employee who found the machinist called for help as he was not breathing. The employee didn’t survive the accident.

After this fatal accident, the plant designed and installed guards for their lathes to prevent a re-occurrence of this event. One of the guards is shown in the bottom photo.



### Quill-mounted guard to enclose cat head

(Note: Photos taken as fabricated; guards will be painted safety yellow when completed.)



### Applicable standards:

1910.212 (a)(1): Machine guarding was not provided to protect operator(s) and other employees from hazard(s) created by rotating machine parts.

### Administrator's message, *continued from page 3*

There will always be some judgment in identifying willful cases, both in deciding that we need to take a closer look at a case that the facts suggest might be willful, and in determining whether the overall circumstances really justify using one of our most potent regulatory weapons. But those cases start with the inspection and with the nature of the violations identified by the compliance officer, not with some predetermined quota or goal. That's what happened in this case. And that's what will happen in future cases. ■

## Jeff Bell tells Pulp and Paper Conference the story of his son's death



Jeff Bell

**J**eff Bell shared details of his son Brian's death during a moving and powerful presentation at the annual Western Pulp and Paper Workers Conference held in Portland in December 2009.

Brian was a college student with less than a week left on his summer job building condominiums in Florida. He was an avid sportsman who loved to hunt, fish, and play football. Bell told the audience he was at home watching "The Price Is Right" when he got the phone call that changed his life.

"There's been an accident," Bell said he remembers being told. "I could hear the helicopter over the phone. It was Life Flight in the background."

Bell met with a team of doctors and medical staff at the hospital, where he asked, "Is my son OK?" The answer was, "No, your son is dead," he said.



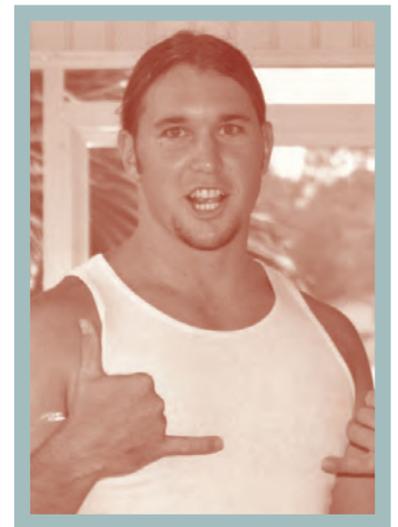
Brian Bell with his parents.

Brian had been pinned by a form table weighing 16,000 pounds after a mechanical jack broke. The investigation showed the jack bolts hadn't been inspected in years.

"I'd do anything, anything to help another family from getting the call I got that day," Bell said.

Because of Brian's death, Bell has rededicated himself to working in safety and became the facilitator of his paper plant's Behavioral Based Safety process. By sharing "Brian's Story" he hopes to inspire employees to get involved in a safety culture that works to prevent such tragedies. He spoke at 15 different facilities and conferences last year and will be the keynote speaker at the VPPA Region IV conference in Biloxi, Miss., in June.

For more information, go to Bell's Web site: [www.stepupforsafety.com](http://www.stepupforsafety.com). ■



Brian Bell

## Employers encouraged to develop emergency plan

**I**f an earthquake, flood, or fire struck while you were at work, would you have a plan? In early January, a power outage left a good portion of downtown Portland in the dark and just a few days later, a 6.5 magnitude earthquake rattled Northern California. Those recent examples highlight the need for businesses to develop an emergency plan.

While it's not an Oregon OSHA requirement to have a plan, it does make good business sense, said Penny Wolf-McCormick, an Oregon OSHA health manager.

"It's a really, really good idea to have a plan," said Wolf-McCormick. "It's not just about being able to protect workers, but it's also about the business continuity. How does the business stay in business if there's an earthquake and your only supplier can't get product to you? Do you have a back-up plan?"

A 2003 study done by the Hartford Insurance Company, Loss Control Services, found that 43 percent of employers without a plan never reopened after a disaster. In addition, most companies without computers for more than 10 days never fully recover.

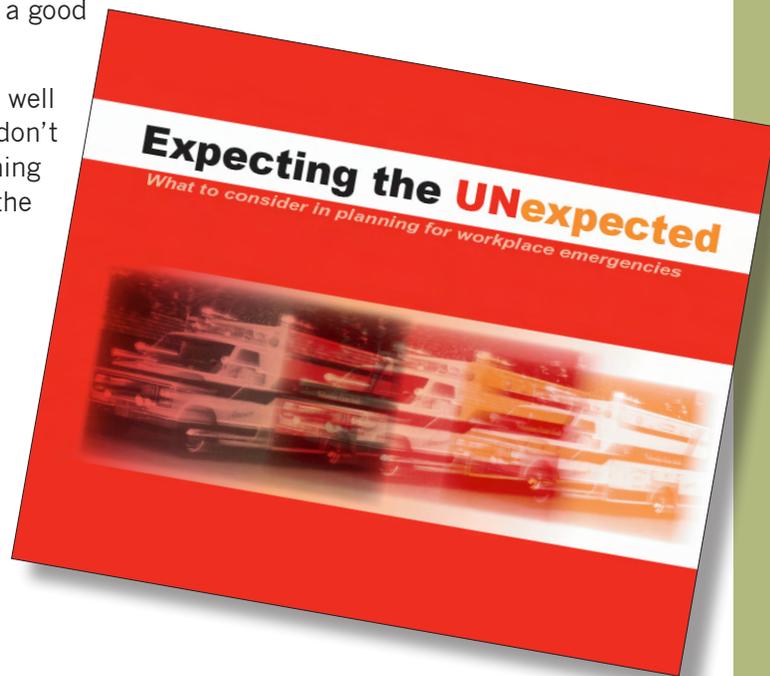
Wolf-McCormick said employers should identify what the critical tasks are and what they need to do to keep their businesses running.

"If a critical worker is gone because they have to take care of their family, who else can do it?" Wolf-McCormick said. "If that person is gone, whether it's because of an earthquake, a flood, or flu pandemic, who else is trained to take over that task?"

Once a plan has been developed, it's also a good idea to practice with a drill.

"The time for coming up with your plan is well before a disaster strikes," she said. "You don't want to be trying to come up with something in the middle of the emergency. Plan for the worst and hope for the best."

Find out more about how to prepare for emergencies with the Oregon OSHA publication "Expecting the Unexpected," available at [www.orosha.org](http://www.orosha.org). ■



## **Oregon OSHA fines Americold Logistics \$740,400 for safety violations in Milwaukie**

**O**regon OSHA has fined Americold Logistics a total of \$740,400 for extensive safety and health violations found during a Sept. 16, 2009, inspection at the company's Milwaukie facility. By not having proper safeguards in place to contain ammonia, the company was putting workers in serious danger of injury or death due to a major chemical release or explosion.

"Ammonia carries significant risks to workers, particularly in large quantities," said Michael Wood, Oregon OSHA administrator. "Due to the size of this facility, there is the potential for a large-scale release."

Oregon OSHA cited Americold Logistics, a national refrigerated warehouse operation, for 10 willful violations, four serious repeat violations, and 22 other serious violations of the Oregon Safe Employment Act. The bulk of the violations are related to the company's system for handling the hazardous chemical anhydrous ammonia, which is common in commercial warehouses and can be explosive. Ammonia can also cause severe alkaline chemical burns to skin, eyes, and the respiratory system. If a chemical leak occurs, ammonia released from such a system will expand rapidly, making it difficult to contain.

Among other issues, the inspection identified excessive ice build up, creating the potential for system damage. In some cases, the ice-encased valves make it difficult, if not impossible, to close them in the event of an emergency. The inspection also identified significant corrosion of pipes and missing drain valve plugs, making ammonia release more likely.

Oregon OSHA previously conducted an accident investigation at the Milwaukie location in 2007, after two employees were sent to the hospital following an ammonia compressor explosion. As a result of that inspection, which was limited in scope, 18 violations were issued. ■



One of several ice-encased valves found in the facility.



An example of one of several corroded pipes in the plant.

# Ask Technical

**Q:**

We use a scissor lift to access an overhead pipe gallery. Our management tells us we do not have to have training before we operate the lift. Is this correct?

**A:**

No. Employers are responsible for providing employees training on any and all equipment prior to use. In some cases, there are specific rules related to training. Absent any specific training requirements, we rely on the generic training rules in Division I. Employers are also responsible for ensuring the operator's manual is available and reviewed by an employee operating any equipment. There are a number of hazards associated with scissor lifts that an operator must understand.

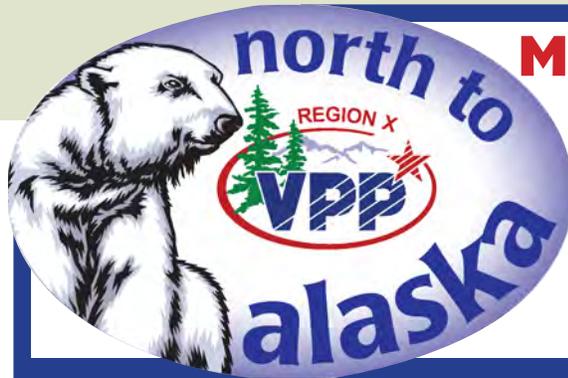


You can find the rule requiring your employer to provide training on the Oregon OSHA Web site: [www.orosha.org](http://www.orosha.org) under "Division I." Rule OAR437-001-0760(1)(a) states all employers are required to supervise and train their employees.



## *Congratulations to these new SHARP companies:*

- Warner Creek Correctional Facility, Lakeview
- Erickson Air-Crane Incorporated, Portland



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 A dark background advertisement. On the left, a flashlight beam illuminates a diamond-shaped sign. The sign has a yellow border and a red center. The text on the sign reads 'SAFETY BREAK' in large black letters, 'for Oregon' in smaller black letters, and '2010' in white letters at the bottom. To the right of the sign, the text reads: 'Save the date!' in orange, 'Participate in Safety Break on' in white, 'Wednesday, May 12' in large yellow letters, and '“Shine a light on safety”' in white. At the bottom right, it says 'Details to come at' in white and '[www.orosha.org](http://www.orosha.org)' in orange.

# Going the distance

Meet a leading Oregon health and safety professional



**Company:** SawStop

**Health and Safety Professional:**  
Steve Gass, president and founder

**Workforce:** 40

**Product features:** Table saw with system to detect accidental human contact

## What is your background and safety philosophy?

I am a lifelong woodworker with a Ph.D. in physics and also went to law school and became a patent attorney. I'm an odd person to be running a safety-related company. I probably need the product more than most people so it was somewhat self-serving.

I feel the best safety solutions are ones that don't rely on users to be perfect. Historically, that's how it worked with table saws. You can't make a mistake, and if you do, you lose a finger. Our product gives users a second chance when they make a mistake.

## How did you come up with the idea for SawStop?

In 1999, I was out in my shop and the idea sort of came to me. I started thinking about whether you could stop the blade fast enough to prevent a serious injury if it made contact with your finger.

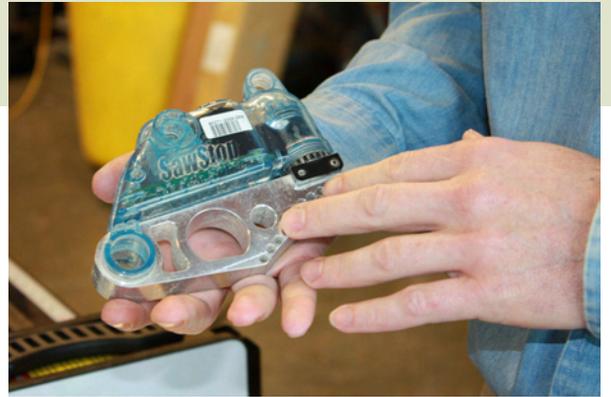
I think people always thought it was impossible because it was too late once you contacted the blade, that it just wouldn't be possible to stop the blade fast enough at that point.

continued on page 16

**Going the Distance**, *continued from page 15*

My physics training came into play and I started weighing the blade, calculating the angular momentum, and figured out how fast the blade would have to stop to result in a minor injury in most cases. I figured the typical injury should be less than 1/8 of an inch; otherwise, it's too significant of an injury. Over the course of a month I built a working prototype.

The detection system works with a brake cartridge that is mounted directly underneath the blade. The cartridge applies a small electrical signal to the blade. The human body is an excellent conductor of electricity and wood is not. When wood is touching the blade, there is no absorption of electricity so the signal remains on the blade and the saw operates as it should. However, if you were to touch the blade while it's running, your body, being conductive, absorbs some of the electricity and sets off the reaction process. The computer chip sends a message to trigger the brake, which is a chunk of aluminum that gets shoved into the teeth of the blade, stopping it in just a few thousandths of a second.



Steve Gass shows how a mounted cartridge works inside the table saw.



As a patent attorney, one of the first things I did was to see if anyone else had already come up with the idea. It was a little surprising no one had thought of anything like it yet.

**Your original plan was to license the technology to other table saw manufacturers but negotiations fell apart. What happened and why did you decide to do it yourself?**

Ultimately, I believe the saw manufacturers couldn't figure out how to make money from it. They aren't the ones paying for all the injuries that occur. They would have had to redesign their products and pay SawStop royalties for the technology.

When we finally realized that the existing manufacturers weren't going to willingly adopt this kind of technology, SawStop was just three patent attorneys and my assistant working out of my barn. None of us had any experience in business, let alone designing and building saws. But, as the inventor of the technology I felt a responsibility to bring the



technology to the market. It was clear that if we didn't do it ourselves, it wouldn't happen. So, we raised money, designed the saws, and found a manufacturer who could build it for us.

Today we have over 20,000 of our saws in the field. We sell quite a few to schools across the country. We've had hundreds of finger saves and we get lots of calls and e-mails.

**What is the response you have received from the infamous “hot dog demonstration” as it relates to the product?**

One of the challenges with the technology in the beginning was we had to find a way to test it. I thought a hot dog would be just like a finger so the first tests were all done with hot dogs. From a marketing standpoint, we have been very fortunate because that demonstration conveys instantly the whole idea behind the technology. Everyone gets it once they see it.

Eventually I did stick my finger in front of the blade to make sure it worked and that it behaved just like a hot dog. It did, but the test was certainly unpleasant.



Photos courtesy of SawStop

**Do you have any memorable examples of customers who were saved from serious injuries because of your product?**

We average a reported finger save each day now. We have had over 600 total. The first ones were the most memorable.

I got a call about the first finger save from a guy who in a stern voice said, “Somebody ran their hand in the saw,” and then there was a long pause (while I was fearing the worst) and finally he continued to say happily that all he got was a little nick. In another instance, a shop teacher sent a picture of a kid holding up two thumbs with a note that said, “Tommy got to go home with both thumbs today because of your saw.” That meant a lot to me.

Saving fingers is what makes this a great job. What we've done prevents people from suffering devastating, life-changing injuries and that's a neat thing. I am very proud of what we do here. ■

2010  
Save a friend. Work safe.

PUBLIC SERVICE ANNOUNCEMENT

# video contest

Contest open to all Oregon high school students

Deadline:  
February 15, 2010

[www.orosha.org/psacontest/](http://www.orosha.org/psacontest/)



## **Workers' Memorial scholarship applications being accepted**

Oregon OSHA presents scholarship awards annually to assist in the postsecondary education of spouses or children of permanently and totally disabled or fatally injured workers. The scholarship application deadline is **March 1, 2010**, for students interested in applying for scholarships for the 2010-2011 academic year. Applicants who submit their applications by the early bird deadline of **Feb. 16, 2010**, will receive a priority review with an opportunity to submit corrections if errors are found.

**For more information or to apply, please visit the Oregon Student Assistance Commission Web site: [www.osac.state.or.us](http://www.osac.state.or.us)**

*The 1991 Legislature established the Workers' Memorial Scholarship at the request of the Oregon AFL-CIO, with support from Associated Oregon Industries.*