

Forklift Operator Struck by Other Forklift

INCIDENT

Tragically, Thanksgiving Day was the last day of McKithen Carter's life. She was one of 900 people employed at the shopping network's facility. She was 30 feet in the air on her forklift reaching for something overhead when it was struck by another forklift.

Her forklift overturned which caused her to fall despite the fact that she was wearing a safety harness. She died later that day in the hospital.

NEED TO KNOW

Agnes Ann McKithen Carter, a 45 years old warehouse worker was a forklift operator. She was assigned to work on Thanksgiving Day at the Florence South Carolina facility. It ships 1000 packages an hour and 1.7 million in a year.

BUSINESS / REGULATIONS

Modern industrial experience in the warehouse revolves around the role of the forklift. The forklift is the underpinning of the operation of a warehouse. There is a glaring statistic – 80% of forklift injuries are caused by human error and miscalculation.

There is one immutable principle in the operation of forklift.

That is a forklift operator must be both qualified and authorized to operate a forklift. Many accidents occur when untrained personal drive a forklift. Forklifts operate different from an automobile.

Florence County Coroner Keith Von Lutcken and the South Carolina Occupational Safety and Health Administration (OSHA) are investigating the tragedy.

Transportation and warehousing are among the most dangerous

industries in the United States, with a fatality rate of 14 deaths for every 100.000 workers in 2013 – 733 deaths overall. One hundred people die each year while operating forklifts, according to federal OSHA.

“Forklifts turnovers,” OSHA says, “account for a significant percentage of these fatalities.”

The family and personal story is especially heartfelt. She had married 8 months before the tragedy.

The news reached her husband, Charles Carter, Jr., as he was preparing dinner for their first thanksgiving together.” Never expected this,” Carter told WPDE.

“like I said when she left that morning, it was our first thanksgiving. You know and I’m sitting here looking at the clock and 2:45 never came. Not for us to start our first thanksgiving. Never came. What did come was tragedy, heartbreak, disappointment.”

In addition to her husband, McKithen Carter is survived by her four children; her parents James and Ruth; her two children; six reminding sisters; five brothers; two godchildren; and one of her grandparents.

STATISTICS

There are a number of reasons why forklifts can be such a workplace hazard.

They can weigh up to 9.000 pounds, which is three times heavier than many cars. They can travel up to 18 mph unlike a car, forklifts only have brakes in the front, making them harder to stop. Forklifts are heavier in the rear to compensate for the heavy loads being carried in the front. This uneven weight distribution can make a forklift is turned by the rear wheels, causing the rear end to swing outward. This increases the chance of tipping over during tight turns. Loads are carried in the front of a forklift, which can obstruct the view of the driver. Forklifts are often used to raise hefty loads to considerable

heights, a combination that is always dangerous.

Extreme caution in the operation of a forklift is necessary.

- Forklifts account for around 85 deaths every year.
- Forklifts accidents that result in serious injury total 34.900 annually.
- Non-serious injuries related to forklifts accidents reach 61.800 each year.
- A forklift overturning is the most common incident, accounting for 24% of all forklift accidents.
- If companies implemented more stringent training policies, the Occupational Safety and Health Administration (OSHA) estimates that about 70% of forklift accidents in the US could be prevented.
- A forklift is a dangerous piece of machinery. There are some pretty grim accidents statistics to back up that notion. In reality, forklifts account for only 1% of all warehouse or factory accidents. But the accidents tend to be more serious than others, accounting for 10% of all physical injuries in those workplaces.

PREVENTION

Prevention of forklift incidents will take shape and form if the following points are implemented in the operation of forklifts.

- You must be both authorized and qualified before operating a forklift.
- Inspect the vehicle before operating it. The controls, brakes, tires, lights, horn and other parts must be functioning correctly. Follow the manufacturer's checklist for these daily inspections.
- Check the load capacity of the forklift. Know the load capacity of any floors, elevators, ramps or trailers which you will be driving onto.
- Drive within the speed limit.
- Stop as required at intersections, sound the horn before proceeding around blind corners.
- If you can't see around a load, drive backwards.

- Most forklifts are designed as one person vehicles. Do not pick up passengers.
- Never allow anyone to walk under the raised forks, and never leave a load suspended in the air without being at the controls.
- Be aware of the danger of carbon monoxide poisoning around gasoline – powered forklifts.
- Proper maintenance of engines will help prevent carbon monoxide accumulations.
- Follow all precautions for safe refueling of a forklift.
- When travelling up or down an incline with a loaded forklift, keep the load uphill from you.
- Travel slowly on ramps.
- Keep your head, hands and feet inside the operator's compartment. Never reach through the uprights.
- Look before you back up.
- Keep the load low. Stop before you raise the load.
- Be aware of maximum height clearances.
- Watch for slippery surfaces, potholes and other hazards. Use the correct forklift for the surface on which you will be travelling. If a forklift is designed for indoor travel on smooth surfaces, it is hazardous to use it on outdoor terrain.

By following through with the preventative procedures and cautions, “an ounce of prevention will yield a pound of cure”

Near Miss In Hospital

INCIDENT

A Near-Miss lethal accident case in a Tertiary Care Hospital.

Case History:

A fifty-five-year-old man was taken up for MRI of the lumbosacral

spine for detecting metastases from bronchogenic carcinoma of the lung. He was accompanied by his son a government security officer) who was allowed with him for assistance in the MRI scanner room. Both the patient and accompanying person were verbally asked to remove all ferromagnetic unsafe objects, from their possession. The accompanying person wore a jacket with a pistol in the inside pocket, which was inadvertently forgotten and not removed. As a result, when the patient's son neared the magnet, he felt a strong pull towards the magnet of the scanner. He was frightened and quickly pulled off his jacket which flew to the magnetic bore where it was lodged. The examination was abandoned at the time. Fortunately, the jacket could be removed along with the pistol by a careful and sustained pull, without quenching the magnet without damage to all the persons in the magnet room, computer room, or the equipment. Otherwise, quenching the magnet would have been required as suggested by engineering department.

In the case under discussion, although the pistol of the officer was dual locked, the magnetic pull could have unlocked the pistol and a potentially fatal accident could have occurred.

NEED TO KNOW

A near miss is a chain of events that very nearly results in property damage, serious injury, or death, but not quite. The official definition of a near miss is: "an unplanned event that had the potential to result in an injury or physical damage (but did not)."

A near miss is not a lucky break. A near miss is an indication of a problem, either systematic or mechanical, that has very real potential for hazard. It's a red flag calling for change to ensure that a similar situation in future doesn't result in worker injuries or deaths.

A near miss can occur in virtually every industry. Many incidents of property damage, injury or death can be predicted by near misses. Engaging a near miss as a preemptive problem-solving opportunity is crucial.

BUSINESS / REGULATIONS

The conclusions set out very clearly the limitations and shortcomings of the policies and procedures of MRI in place at the time incident described.

- Faulty design and consequent improper zoning of the MRI section of the hospital,
- unrestricted access of patients and their attendants,
- incomplete screening partly due to
- inadequate training of the personnel, including doctors and technologists, and
- absence of signage and posters.

These conclusions drawn about the incident reveals a system of near-miss reporting.

STATISTICS

- According statistics provided by Safety Unlimited INC, about 3 billion “close calls” or “near misses” occur annually in the U.S workplaces. Statistics show that for every 300 near misses, 29 minor injuries occur, along with one injury serious enough to keep the injured out of work.
- Report by Houston Business Bureau, Cll and Exxon Chemical estimates about 1,000 near miss events for every fatality. According to the Bureau of Labor Statistics, 4,836 people died in workplace accidents in 2015 – which equates to nearly five million near misses.

Even though 85.66% of companies track near misses and 71% of employees say safety training was part of their new employee orientation, the vast majority of near misses go unreported.

- The National Safety Council provided a recent survey that 50% of workers said they were afraid to report safety issues.
- The National Safety Council survey said 76% of workers agreed with management that they care about employee safety.
- Researchers estimate that near misses cost organizations over 6 trillion dollars which is twice as much as serious

incidents or fatalities.

PREVENTION

Specifically, the incident was an eye opener regarding potential adverse events lurking in the relatively safe MR environment and provides an opportunity to rectify the inadequacies in MR safety. It is recommended that guidelines should be followed, MR safety manual developed and used. Adequate screening and warning systems should be established. A system of reporting of the near-miss/adverse incidents should be established in the hospital.

Generally, several solutions can be put forward to achieve a culture-based safety system:

- Define expectations that all employees report unsafe conditions or perceived risks
- Provide employees with safety training
- Provide measurement for how near-miss reporting has improved safety performance
- Recognize and reward employees and crews for pro-active safety actions.
- Close call incidents trigger the fact that something is seriously wrong. They allow us the opportunity to investigate and correct the situation before the same thing happens again and causes an injury or death.
- Experience has proven that if the causes of accidents are not removed, the potential for an accident will occur again and again. Unfortunately, a typical story told after many accidents is; "Yeah, that happened to Jim as well – just last week!"
- Why are close call incidents not reported? Typical reasons are: fear of reprimand or repercussions, red tape, not being aware of their importance in controlling future accidents, embarrassment, the spoiling of a safety or production record or lack of feedback when similar issues have previously been raised.
- If you keep silent about a close call – you may avoid having to deal with it. But try to explain that to a co-worker who ends up in a wheelchair because of a hazard that you knew

existed but were too proud to talk about.

- Controlling close call incidents is really the secret to reducing the overall frequency of accidents. One survey of 300 companies discovered that for every 600 close call incidents, they had 30 property damages, 10 minor accidents and 1 very serious accident.
 - Close call incident reporting is a very valuable tool in helping us all manage an effective safety program.
 - But the vital part is to apply corrective action immediately. The only way this can be done is if a close call is reported immediately after it has occurred. This way we can learn as much as possible.
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Temporary Young Worker Pulled Into Mixer

INCIDENT

David Eleidjian, a 26-year-old Marine and Iraq War veteran, was mixing industrial adhesive last April at his new job at the Henkel Corporation, a manufacturing plant in Bay Point. Eleidjian was a temporary worker, hired through a staffing agency. He was assigned to use a 55-gallon mixer instead of the manufacturer-recommended 300-gallon mixer.

He was instructed to scrape adhesive from the mixing equipment that was just 12 inches from an unguarded shaft spinning at up to 350 rotations per minute. The coveralls he had been provided were too big, and the sleeves hung loose on his arms.

When one of his sleeves caught on the exposed rotating shaft, he was pulled into the mixer and crushed. He was rushed to a hospital, where he died from his injuries.

NEED TO KNOW

Workers between the ages of 15 and 24 are the largest percentage of part-time, temporary, contract, casual and seasonal workforces. They're a tremendous asset to many organizations, tackling jobs with energy and enthusiasm. Unfortunately, though, these workers also face unique and substantial risks for work-related illnesses and injuries.

It's not necessarily the age of young workers or temp worker that puts them at risk of workplace injury. They're at risk because of their inexperience. Many hesitate to ask questions and many don't recognize workplace dangers. If a young worker isn't certain how to perform a task safely, they may try to reason it out without asking for help.

BUSINESS / REGULATIONS

For a century new worker are at an increased risk for occupational injury and fatality. That higher risk is due to a lack of safety training and experience at that worksite.

Just a few decades ago, temporary work was relatively rare and concentrated in white-collar professions.

But in recent years their numbers have grown dramatically, and temporary workers are now commonplace in virtually every type of workplace.

Securing temporary workers often lowers costs (the temporary workers are paid as much as 30 percent less than permanent workers) and increases flexibility by enabling host employers to increase their workforce without making a long-term hiring commitment.

As the economy picks up steam, these numbers are rising again, and more employers are filling jobs with temporary workers. As their numbers grow, many more will be injured or killed.

Why is this happening? Many employers decide to forego important safety training for their temporary employees that would normally be given to permanent employees.

They bring in “temps” for a few days, weeks or even months, and the employer’s commitment to these workers’ safety mirrors that “temp” status.

The reason? Employers hire temps to save money. Safety training is a cost of doing business, so some employers just skip it or erroneously assume that the staffing agency has conducted the training – gambling not only with their own bottom lines, but with the lives of these men and women who want nothing but to do an honest day’s work and come home safely to their families at the end of the day.

As the number of temporary workers rises, is it inevitable that injuries and fatalities will rise as well.

Workers are getting hurt and we know how to stop it. The Occupational Safety and Health Act is very clear.

Staffing agencies and their client employers who host temporary workers share the legal obligation to provide workplaces free of recognized hazards.

This includes providing required safety training in a language and vocabulary workers can understand.

Cutting corners on safety can result in both terrible tragedy and stiff OSHA penalties. Following the investigation into David Eleidjian’s death, Cal/OSHA fined the employer \$200,000.00 of fatal injuries.

OSHA has embarked on a national initiative to protect temporary workers in order to halt this rising toll of fatal.

OSHA inspectors will determine, in every inspection, if every temporary worker on the site has received the safety training and protections required by law for the job.

Labor staffing agencies, must insist that their employees are not put at risk of injury or death while working at a client employer’s worksite.

And finally, every worker in the country must understand that they

have the right to safe workplaces, and all workers, including temporary workers, have the right to contact OSHA, if they face workplace hazards.

Perhaps, Eleidjian thought he should overlook the signs of danger because he trusted that his supervisor would never assign him a life-threatening task.

This would have been a reasonable assumption for a Marine, who had learned to trust fellow Marines with his life.

No penalty will bring Eleidjian back to his mother, his stepfather, or his 3-year-old daughter, but perhaps that the penalty will cause other employers to think twice before they try to dodge safety laws.

STATISTICS

According to the American Staffing Association there were almost 3 million temporary workers in the nation's workforce with many doing highly hazardous construction and manufacturing work in 2013.

Over the last year, the U.S Department of Labor's Occupational Safety and Health administration received many reports of temporary workers killed on the job. Some were on the first few days at work.

Historically, in 2008, more than 139,000 American youth between the ages of 14 and 24 were injured at work; 436 died. Every year in Canada, more than 48,000 young workers are injured seriously enough to require time off from work. Also, in 2007, 38 young Canadian workers died from work-related injuries.

PREVENTION

When it comes to safety, knowledge is power. Young, new and temporary workers should be encouraged to ask questions about workplace safety, even if they feel they're asking something that might be obvious.

Before tackling a new job, be sure to get answers to these

questions.

1. What are the hazards of this job?
2. Will I be working with equipment or machinery that could put me at risk for injury?
3. What safety training will I receive?
4. Will I need personal protective equipment (PPE)? If so, will it be provided to me or must I purchase it?
5. What's the company's fire safety program?
6. What do I do if I find myself in a violent situation?
7. Who should I talk to if I don't understand how to perform one of my job's tasks?
8. How do I recognize and report unsafe conditions?
9. What do I do if I'm injured on the job?
10. What's my role in the company's safety program?

A safe workplace is a team effort. If you're an experienced worker, speak up if you observe young workers committing unsafe acts or failing to wear appropriate PPE. If it appears that your young coworker has not received adequate training or hasn't understood it, tell a supervisor. And set a good example. Show new workers the right way to perform a job: The safe way.

Forklift Operator Pinned Under Forklift

INCIDENT

The incident happened at an agricultural cooperative (co-op). The co-op's retail store was connected to the co-op's tire shop and a warehouse. Also, on the grounds was an equipment storage shed, a fertilizer shed, and an outdoor storage area where 200-pound molasses animal licks were stored. A large flat concrete parking lot extended in front of the store entrance and around one side of the warehouse where a loading dock and ramp were located.

At the time of the incident a customer was helping the victim as he loaded a molasses lick into another customer's trailer using a forklift. Approximately 5 minutes later, the customer heard a loud crashing sound. He ran over to the area where the victim had been operating the forklift and saw the forklift tipped over on its side. The victim was lying face down and pinned under the cage of the forklift and with one leg extended and the other leg doubled up under him.

The customer ran to get help. While he and a co-worker ran back to assist the victim, another coworker ran into the company's store to call 911. The customer and co-worker were unable to lift the forklift manually and told another co-worker to get a front-end loader. As co-workers lifted the forklift off the victim using the front-end loader, the customer pulled the victim clear. The victim was conscious but having difficulty breathing.

The police and fire department responded to the scene at 2:00 p.m., the ambulance was dispatched at 2:08 pm. and responded at 2:09 p.m. EMS personnel examined the victim and inserted an endo-tracheal tube at 2:18 p.m. followed by a needle chest decompression immediately after, to help the victim breathe.

A medical helicopter was dispatched to transport the victim to a trauma center, but while the ambulance was in route to meet the helicopter, the victim's condition deteriorated, and the victim was transported instead to a local hospital. The victim arrived at the hospital at 2:32 p.m. and was pronounced dead at 3:16 p.m. in the hospital's emergency room.

NEED TO KNOW

A 17-year-old warehouse worker was fatally injured in forklift incident when he was crushed to death. He was employed under a work-based learning program. He had been working for 3 months in this program at the time of his death.

BUSINESS / REGULATIONS

The entrance/exit of the warehouse was narrow, measuring 70 inches in width. A post and an abandoned grain feed dispersal bin located

inside the entrance left just enough room for the forklift to pass through.

- Old scrape marks on the forklift and on the post and grain bin inside the warehouse were likely indicators of a tight fit.
- The local manager said that forklift operators had to speed up to make it up the ramp and then had to slow down at the entrance to fit through the narrow passage after passing through the warehouse door.
- The ramp's surface was patched and rough where the ramp joined the flat, level parking lot.
- The co-op was being relocated so the rough pavement in the transitional area where the level parking lot met the ramp, and the confined areas in the warehouse had not been changed because of the planned move.
- It is worth noting these issues were known and identified as problematic.
- A well-developed safety and training program were lacking.

STATISTICS

This young warehouse worker had only been working for 3 months in an apprentice program. Yet, he was apparently qualified to drive and manipulate one of the most dangerous vehicles in the warehouse scenery – the forklift.

Forklifts accidents cause many deaths in the warehouse workplace across North America for inexperienced and experienced workers alike.

Workers between the ages of 15 and 24 are the largest percentage of part-time, temporary, contract, casual and seasonal workforces. They're a tremendous asset to many organizations, tackling jobs with energy and enthusiasm. Unfortunately, though, these workers also face unique and substantial risks for work-related illnesses and injuries. In 2008, more than 139,000 American youth between the ages of 14 and 24 were injured at work; 436 died. Every year in Canada, more than 48,000 young workers are injured seriously

enough to require time off from work. Also, in 2007, 38 young Canadian workers died from work-related injuries.

PREVENTION

“an ounce of prevention will yield a pound of cure.”

The following procedures, policies and precautions will help prevent similar accidents:

To help prevent similar occurrences:

- Conduct periodic inspections and frequently remind equipment operators to use seat belts provided and never try to jump from an overturning sit-down type forklift.
- Check travel routes used by forklifts are free of obstacles and other unsafe conditions.
- Establish work policies that comply with child labor laws prohibiting youths less than 18 years of age from performing hazardous work, including operating power-driven hoisting equipment such as forklifts. All employees should be aware of this policy.
- Develop, implement, and enforce a comprehensive written safety program for all workers which includes training in hazard recognition and the avoidance of unsafe conditions.
- A written training plan should require training for all forklift operators that includes the equipment manufacturers' recommendations for safe equipment operation.
- Identify and label equipment not to be operated by workers under 18 and only provide keys to trained and authorized operators.

Fatality File: Outdoor Animal

Hazards

INCIDENT

There was a fatal mauling of a zoo intern by a lion that escaped from a locked pen.

Alexandra Black, 22, was attacked while cleaning an animal enclosure with other staff members. It was at least the 10th instance of an escape or attack by an animal at a privately-run North Carolina wildlife facility since 1997, according to the Humane Society of the United States.

Officials said the lion somehow escaped from a nearby pen and killed the recent college graduate just two weeks after she started working at the Conservators Center near Burlington, about 60 miles northwest of Raleigh. Sheriff's deputies shot and killed the animal before retrieving Black's body.

Before deputies fired on the lion, officials made several attempts to tranquilize it or hold it at bay with fire hoses, the Caswell County Sheriff's Office said.

It was not immediately clear how the lion escaped or whether it got out of the enclosure that was being cleaned. Staff said the lion never made it beyond the park's perimeter fence. The park was closed indefinitely as part of an investigation.

NEED TO KNOW

There are a host of problems for workers who work outside and in proximity to all sorts of animals. Some of these animals from spiders, snakes, lions are dangerous and obviously are capable of killing workers.

Protections, precautions and procedures must be in place to safeguard employees working amidst animals.

BUSINESS / REGULATIONS

In a statement the Centre said the lion named Matthai was a 14-

year-old male born at the Centre shortly after his mother was placed there following a 2004 confiscation assisted by the U.S. Department of Agriculture.

No problems were found at the non-profit nature Center during inspections by the USDA in January 2017 or April 2018. A government inspector counted 16 lions, three tigers and two leopards among 85 total animals during the 2018 site visit.

A 2016 federal tax filing shows the Centre earned about \$711.000 from gifts, grants and contributions while spending about \$600.000 operating the Centre that year. An online public records search indicates the Centre faced state tax liens totaling thousands of dollars in 2017.

While the Centre is USDA-licensed, animal welfare advocates note that it's not accredited by the Association of Zoos and Aquariums, which requires facilities to meet strict animal safety and security standards.

The Humane Society has urged North Carolina to go beyond the USDA licensing standards, arguing that it's among four states with particularly lax laws on private ownership of dangerous wild animals.

The organization pushed for a 2015 bill to make it illegal to own lions, tigers and other wild carnivores unless a facility was accredited by AZA or met other strict standards. The bill passed the state House but not the Senate.

"The longer North Carolina does nothing as other states continue to pass stricter and stricter laws, North Carolina is going to see people coming into the state with their collections of dangerous wild animals, and the problem is simply going to grow," Lisa Wathena, the Humane Society's director of captive wildlife protection, said in an interview.

The Centre was founded in 1999 as an "educational non-profit dedicated to providing a specialized home for select carnivore species," according to its website. The site says it houses 21 species and gets more than 16,000 visitors annually after starting

public tours in 2007.

A Centre spokeswoman, was not available to discuss safety and security. The Centre acknowledges its lack of AZA accreditation on the site.

Black, who was from New Palestine Indiana, graduated from Indiana University in May with a degree in animal behavior. She had also recently worked at a research and education centre in Battleground, Indiana, known as Wolf Park, which is home to wolves, bison and foxes.

A bright, promising life was tragically ended. There were numerous heartfelt comments about Alexandra Black.

As she tried to narrow down her interests to a specific field, she became intrigued with animal husbandry, said Wolf Park Managing Director Dana Drenzek.

“What made her a really good fit was her passion and intelligence,” Drenzek said. Black would do research on her own and come back with questions.

Black’s “passion was the zoological industry. This person wanted to spend a lifetime around these animals, and I believe that the family was very supportive of that,” said Mindy Stinner, executive director of the facility.

Cara Wellman, director of IU’s Center for the Integrative Study of Animal Behaviour, recalled that Black was an undergraduate teaching assistant for introductory biology.

“She was very energetic and committed to animal behavior and pursuing a career in animal husbandry.”

STATISTICS

Animal attacks are a cause of human injuries and fatalities worldwide. According to the 2012 U.S. Pet Ownership & Demographics Sourcebook, 56% of United States citizens owned a pet. In the United States in 1994, approximately 4.7 million people were bitten by dogs. The frequency of animal attacks varies

with [geographical](#) location. In the United States, a person is more likely to be killed by a domesticated dog than they are to die from being [hit by lightning](#) according to the [National Safety Council](#).

Animal attacks have been identified as a major [public health](#) problem. “Unprovoked attacks occur when the animal approaches and attacks a person(s) who is the principle attractant, for example. In 1997, it was estimated that up to 2 million [animal bites](#) occur each year in the United States. Injuries caused by animal attacks result in thousands of fatalities worldwide every year. All causes of death are reported to the [Centers for Disease Control and Prevention](#) each year. Medical injury codes are used to identify specific cases. The [World Health Organization](#) uses identical coding, though it is unclear whether all countries keep track of fatalities caused by animals. Though animals, excluding some tigers, do not regularly hunt humans, there is concern that these incidents are ” ...bad for many species ‘public image’.”

PREVENTION

This was clearly an “accident” that was “preventable”. Alexandra Black did not need to die. It was clear that USDA licensing standard in North Carolina were far too lax on private ownership of dangerous wild animals.

It is also noteworthy that the Centre was not accredited by the Association of Zoos and Aquariums. This association requires facilities to meet stricter animal safety and security standards.

Had the Centre been subject to more strict regulation per AZA standards, there is a likely probability that Ms. Black would be still working today at the Centre.

Watch Out For Overhead Risks

INCIDENT

A comparison in real time between a **Near-Miss/Close Call** and a **fatality**.

See a video online in which workers in Rio de Janeiro are repairing the 125-foot-high Christ the Redeemer statue after it was struck by lightning. In the video, the workers are tied off but are using a hammer and chisel that are not tied off and below is a crowd of people. In the middle of the video, one of the workers answers a call from his son on his cell phone, which also is not tied off.

In another example, a man delivering sheet rock to a construction site in Jersey City was killed by a tape measure. The independent contractor for a trucking company was leaning into a car window to speak with someone and when he pulled his head out, he was struck by a one-pound tape measure that had slipped out of a worker's hands 50 stories above.

Needless to say, if that worker on the statue in Rio de Janeiro had dropped his hammer and it had hit a visitor below, it likely would have caused a fatality.

NEED TO KNOW

The focus for all objects at heights should always be on preventing objects from falling rather than a catching object, or on limiting the damage after they fall.

BUSINESS / REGULATIONS

Fewer than 25% of construction workers think that all accidents are preventable. What is clearer that workers often view themselves as victims of accidents and not as the cause of accidents.

We expect workers at height to wear a fall protection harness and be tied off because we're trying to prevent people from falling.

But we need to stop things from falling in the same way we have worked diligently towards preventing people from falling.

To determine what kind of force an object falling from a certain height generates, calculations can be done around the physics of gravity. For example, an eight-pound wrench dropped 200 feet would hit with a force of 2,833 pounds per square inch – the equivalent of a small car hitting a one-square-inch area.

Most organizations have deployed a fall protection program for workers but have not deployed a drop prevention program for tools and equipment. Expanding a fall protection program to include tools and equipment is far easier for companies and employees than creating a new program for drop prevention.

The difference between a fall protection program for humans and fall protection program for tools is only a matter of perspective: The first saves you; the second saves others.

While the most obvious person at risk when objects are dropped is the one underneath, the worker using the tool also can be at risk, as his knee-jerk reaction may be to catch or go after the falling object, which could cause him/her to lose balance and fall.

People are not designed to work at height. That's why they wear a fall protection harness. Tools are not designed for use at height either. That's why we also need to provide a fall protection harness and connection point for tools – so they easily can be tied off.

A harness for a person acts as the primary component of a personal fall protection system. However, for tools, we typically rely on secondary, passive systems, such as debris nets. We rarely deploy a primary system for tools and equipment.

STATISTICS

The third largest cause of death in the workplace, behind transportation incidents and workplace violence, is contact with objects and equipment, the majority of which are being struck by a falling object.

There are more than 52,260 recorded incidents of people being struck by falling objects in the last recording period, according to OSHA. This number likely is much lower than the actual number, of course, but this would mean that, on average, nearly 143 objects strike people every day – including Saturdays and Sundays – in the United States alone.

PREVENTION

An ounce of prevention, will yield much more than a pound of cure in Overhead Hazards with other objects.

Dropped Objects Prevention – Best Practices and Solutions

1. Expand fall protection programs to include tools and equipment.
2. Provide a competent person to manage the expanded program.
3. Raise awareness of drop hazard identification and mitigation techniques within the workforce.
4. Require risk assessments before performing work with drop hazards.
5. Consider regularly scheduled “hazard hunts” to drive awareness of drop hazards.
6. Consider using tethered tools. These tools either have built-in connection points placed by the manufacturer or can be retrofitted with connection points. Next, the tools are connected to a lanyard. This solution not only applies to small hand tools, but also can be used for tools and small pieces of equipment that weigh up to 80 pounds, such as rivet busters, portable generators, etc. Tethered tools mostly are used by larger construction companies and are not in wide use yet. But this may change, as younger workers tend to be more concerned with safety than veterans.
7. Consider using energy-absorbing lanyards, which will reduce the force associated with the dropped tool. Tools either can be connected to a worker through a tool belt, harness or wristband, or anchored to a fixed structure.
8. Tools that weigh more than five pounds should never be tied-off to a person. If a heavy object gets loose, the weight and force could dislocate a wrist or shoulder or even pull a

worker over a ledge or scaffolding.

9. If a worker has a tool attached to him and needs to pass it off to a colleague, that colleague can connect to the tool before the passing worker disconnects from it, ensuring the tool is 100 percent tied off and never has the opportunity to become a drop hazard.
10. Employees should be properly trained on how to use tethered tools. They must be taught how to attach a connection point to the tools, use the lanyards properly and respect the weight rating of the lanyards.
11. As a best practice, workers at height should only bring up the tools they need to do their job.
12. Hoist up items and then transfer them over with different lanyards to the workers themselves or to static anchor points. This can be done in a bucket, which can then house the extra tools. But many popular plastic buckets present other safety concerns, as they frequently fall over, spilling their contents.
13. There are many buckets, bags and pouches available on the market with closure systems to dramatically reduce the likelihood of items falling out. Some even close automatically when turned upside down.
14. A secondary solution to dropped objects are toe boards. Toe boards should be capable of withstanding a force of at least 50 pounds in any downward or outward motion.
15. Debris nets are another secondary solution and provides a way to catch dropped objects. Green netting that goes over buildings when they are being refaced in areas where there are a lot of pedestrians is the most recognized form, but there also is netting that is put up within the construction project, such as directly under work being done, to help stop objects from falling on workers below. However, nets can't be the only solution, as objects often don't fall straight down or are small enough to go right through the debris netting.

Why is all the Preventive Procedures necessary?

OSHA can use the General Duty clause to cite companies when

dropped objects have caused injuries or are a hazard, but OSHA rarely cites a company for dropped objects under the General Duty clause. The clause says there must be a hazard; the hazard must be recognized; the hazard causes or is likely to cause injury or death; and the hazard must be correctable.

Patient Lifting Injuries

INCIDENT

Tove Schuster raced to help a fellow nurse lift a patient at Crozer-Chester Medical Center near Philadelphia in March 2010.

While working the overnight shift, she heard an all-too-common cry: “Please, I need help. My patient has fallen on the floor.”

The patient was a woman who weighed more than 300 pounds. So, Schuster did what nursing schools and hospitals across the country teach: She gathered a few colleagues, and they lifted the patient as a team.

“I had her legs – a corner of one of the legs, anyway,” says Schuster, who was 43 years old at the time. “And as we swung her up onto the bed, I felt something pop. And I went ‘ooo.’ ”

She finished the shift in pain and drove straight home to bed.

But after Schuster woke up late that afternoon, her husband, Matt, heard her shouting. He says he ran to the bedroom and found her crawling across the floor. “I thought it was a joke at first,” he says. “And she says, ‘I can’t walk.’ ”

NEED TO KNOW

Patient handling is the top cause of injury among care workers. Care workers who move people are at significant risk of sprains and strain injuries. Physically dependent people need to be

assessed, taking into account the task being performed and the space in which the work will take place. Controlling the risk involves providing appropriate mechanical equipment, and training workers on safe work procedures and use of equipment.

BUSINESS / REGULATIONS

Schuster had injured her back moving the patient, which the hospital acknowledged. And today, X-rays of her back show how a surgeon repaired a damaged disk in her spine using a metal cage and four long, sharp screws.

“I can finally walk and sit again without being in excruciating pain,” Schuster says. “But the career I had as a floor nurse is over.”

It’s no secret that America’s healthcare workers are in danger of injuries sustained from improperly lifting and moving the patients they tend to every day in U.S. hospitals. And if workers can’t safely move patients, it places the patients at risk as well.

Despite this, says OSHA, hospitals still are not employing enough assistive devices to help move patients, and that’s a major reason why healthcare workers have one of the highest rates of occupational musculoskeletal injuries in the U.S. A recent study found that such devices can help cut down on these injuries and improve patient care at the same time.

The problem has gotten so bad that OSHA was forced to create an entire website devoted to lifting injuries in hospitals and to solutions that facilities can employ, including training tips and advice. However, OSHA still does not have any published mandate or standards related to reducing patient-handling injuries, just a recommendation that hospitals take steps to reduce them.

STATISTICS

One major source of injury to healthcare workers is musculoskeletal disorders (MSDs). In 2017, nursing assistants had the second highest number of cases of MSDs. There were 18,090 days away from work cases, which equates to an incidence rate (IR) of

166.3 per 10,000 workers, more than five times the average for all industries. This compares to the all-worker days-away from work rate of 30.5 per 10,000 workers.

The consequences of work-related musculoskeletal injuries among nurses are substantial. Along with higher employer costs due to medical expenses, disability compensation, and litigation, nurse injuries also are costly in terms of chronic pain and functional disability, absenteeism, and turnover. As many as 20% of nurses who leave direct patient care positions do so because of risks associated with the work. Direct and indirect costs associated with only back injuries in the healthcare industry are estimated to be \$20 billion annually. In addition, healthcare employees, who experience pain and fatigue, may be less productive, less attentive, more susceptible to further injury, and may be more likely to affect the health and safety of others.

In 2011, U.S. hospitals recorded 253,700 work-related injuries and illnesses, a rate of 6.8 work-related injuries and illnesses for every 100 full-time employees. This is almost twice the rate for private industry as a whole.

[The National Institute for Occupational Safety and Health](#) reports that there are 75 lifting-related injuries for every 10,000 full-time hospital workers, and 107 injuries for every 10,000 workers at nursing homes and residential facilities. Hospital rates are nearly twice the national average for all industries, and nursing home rates are nearly three times as high.

According to surveys by the Department of Labor's Bureau of Labor Statistics (BLS), there are more than 35,000 back and other injuries among nursing employees every year, severe enough that they have to miss work.

Nursing assistants and orderlies each suffer roughly three times the rate of back and other musculoskeletal injuries as construction laborers.

In terms of sheer number of these injuries, BLS data show that nursing assistants are injured more than any other occupation,

followed by warehouse workers, truckers, stock clerks and registered nurses.

PREVENTION

An ounce of prevention yields more than a pound of cure.

Transfer, Reposition and Lifting Services

Industries where patient handling tasks are performed include:

- Long-Term Care (includes facilities that provide skilled or non-skilled nursing care);
- Acute Care – (includes hospitals, out-patient surgical centers, and clinics);
- Home Healthcare workers; and
- Others – such as physical therapists, radiologists, sonographers, etc.

Some examples of areas of a facility that may be identified as high-risk include: bathing rooms, extended care wings, and diagnostic units (e.g., radiology, emergency department, spinal unit, orthopedics department).

It is clear the healthcare industry must rely on technology to make patient handling and movement safe. Patient transfer and lifting devices are key components of an effective program to control the risk of injury to patients and staff associated with lifting, transferring, repositioning or movement of patients. Essential elements of such a program include management commitment to implement a safe patient handling program and to provide workers with appropriate measures to avoid manual handling; worker participation in the assessment and implementation processes and the evaluation and selection of patient handling devices; a thorough hazard assessment that addresses high risk units or areas; investment in equipment; care planning for patient handling and movement; training for staff; and program review and evaluation processes. The education and training of healthcare employees should be geared towards assessment of hazards in the healthcare work setting, selection and use of the appropriate patient lifting equipment and devices, and review of research-

based practices of safe patient handling.

The use of assistive patient handling equipment and devices is beneficial not only for healthcare staff, but also for patients. Explaining planned lifting procedures to patients prior to lifting and enlisting their cooperation and engagement can increase patient safety and comfort, and enhance their sense of dignity.

Knife Injuries Are Commonplace

INCIDENT

Mandolines, the paddle-like slicers are good for turning potatoes into French fries, cabbage into coleslaw, zucchini into noodles and a block of cheese into a spaghetti condiment. They're also good at turning hands into thumb less, blood-gushing appendages.

It's unlikely that mandolines alone are to blame but emergency rooms are seeing more and more kitchen wounds. The number of patients injured by slicers or choppers nearly doubled between 2001 and 2011, when an estimated 21,699 people sought treatment for cuts, according to the [U.S. Consumer Product Safety Commission](#).

NEED TO KNOW

To glove or not to glove – that is the question!!!

BUSINESS / REGULATIONS

Martha Stewart, Bon Appetit and Buzzfeed say that mandolines and knives belong to every wedding registry!!!

Traditional restaurant culture has lately become notorious for incubating verbal abuse, sexual harassment, addiction and wage theft. But in addition to the emotional and financial toll of kitchen labor, workers also have to cope with physical danger at a

rate that rivals highway construction and transportation equipment manufacturing.

In a [recent story](#) outlining how to reduce common workplace accidents, the trade magazine Restaurant Hospitality advised operators concerned about the threat of cuts and lacerations to coach employees on proper slicing techniques, and to “keep a first aid kit handy, and regularly replenish bandage supplies.”

Professional chefs have refused to adopt and accept the use of gloves almost universally much to the chagrin of the safety glove industry.

Safety glove sellers point out that there was also a time when hockey players shunned helmets and baseball players took the field without caps. They stress the cost benefits of keeping employees whole, citing lawsuits and time lost to injuries.

But this has not deterred professional chefs like Prohibition chef Analisa La Pietra.

La Pietra says “When injuries occur, it’s people who are not paying attention or using a paring knife to cut a butternut squash: There’s a reason it didn’t go well”.

A knife, LaPietra says, shouldn’t end up anywhere the person holding it didn’t intend for it to go. Construction workers wear hard hats because they can’t control what might fall on their heads, but chefs should have total authority over where a knife alights.

“If you’re in control of your knife, you shouldn’t need to be protected from it,” LaPietra says. Wearing safety gloves is, “almost like admitting you don’t know how to use your knife.”

LaPietra prefers bare hands when cooking, because she relies on touch to determine if a steak is cooked to the right temperature or a tomato is past its prime. “When you have gloves on it dulls your sensitivity. How can you connect with something when you’re not touching it? If you can’t feel it, you can’t put love into it.”

LaPietra concedes if it might make sense for some novices to glove up, since she's seen too many of them trash perfectly good potato ends and squash nubs. They're afraid to get close to the blades of the mandoline.

The debate over glove use in the kitchens of restaurants continues.

STATISTICS

Three out of every 100 South Carolina food service workers in 2017 suffered a non-fatal occupational injury, [according to the Bureau of Labor Statistics](#). That adds up to 4,700 instances statewide. At the Medical University of South Carolina, which doesn't distinguish between home and commercial kitchens in its record-keeping, close to 500 people have shown up with injuries related to knife contact or food preparation since 2014.

Under federal law, restaurants are required to take basic measures to keep their employees safe, such as mopping up spills and properly labeling chemicals used for cleaning. The [U.S. Occupational Safety and Health Administration](#) doesn't have any specific standards for restaurants, though, so it's largely up to restaurant owners to take steps to prevent injuries.

PREVENTION

Much like the transition that occurred in the macho hockey world where formerly no players wore helmets to now where all players wear helmets, we will see changes in the folk lore of professional chefs to accept safety gloves.

Since then, a number of companies have introduced cut-resistant safety gloves, often accompanied by a promotional online video showing a wearer trying and failing to slice off his finger. While there isn't any evidence to suggest new glove technology has made a serious dent in kitchen injury stats, more than 10,000 Amazon customers have left [favorable reviews for an \\$11 lightweight glove hailed as life-changing](#).

"There were, of course, versions of cut-resistant gloves before,"

says Anna Selecka, spokeswoman for the company, which in 2014 launched the [NoCry](#) glove. “But the gap was the cheap gloves were quite bad quality, and the other option was very expensive cut-resistant gloves for shucking oysters. Home cooks turn to us after an accident.”

Worker Hit On Head While On Scaffold

INCIDENT

A 51-year-old man was suspended on a scaffold as he did facade repair work on a brick building in Manhattan when he was hit in the head by a heavy stone slab.

There was a cry for help from this man.

“I’m going to fall!” a man repeatedly said in Spanish as he clung to the scaffolding that dangled against a building on East 50th Street in Manhattan.

The man had been struck in the head and bloodied by a heavy piece of molding while repairing the building’s masonry. Although authorities rescued him from the scaffold, he would die later at a hospital at 51 years old.

Amid New York’s towering buildings, where scaffolding is so common it seemingly blends into the design, the man’s death offered a reminder of the risks faced by workers in a city under constant construction.

The man had been outside the 14-story residence at 311 East 50th Street when he was struck by a coping stone that had been removed to anchor the suspended scaffold, a Fire Department official said.

Witnesses saw the man clinging to the structure and heard his

shouts.

“He was holding on for his life,” said Rodrigo Galindo, 52, who was delivering food nearby. “I was rooting for him.”

Firefighters climbed a ladder to reach the man, who by that point appeared to have lost consciousness, Mr. Galindo said. They broke a window and pulled the man inside, as a co-worker on the scaffold stood motionless, a witness said.

Jimmy Khan, 50, an employee at a nearby deli, watched as the man was carried away on a gurney. “I had to look away,” Mr. Khan said.

The man was taken to NewYork-Presbyterian Hospital, where he died. His name was not released, pending family notification. **It was unclear if he had been wearing a hard hat or harness.**

A second worker on the scaffolding at the time of the incident was not injured but was taken to the hospital for observation.

NEED TO KNOW

A cry for help came from seven stories high. Passers-by could only watch frozen and powerless. They were watching a person dinging to scaffolds that was dangling in the air.

BUSINESS / REGULATIONS

The owner of the building was granted a permit to repair the building’s exterior facade, a \$48,000 project that focused on mending window structures and repointing, a process of fixing weathered mortar, according to an application filed with the Department of Buildings. A sign outside the building identified the construction company as VLAD Restoration.

Last year, the company and its owner, Vlad Tomczak, settled a lawsuit with six demolition workers who said they were entitled to unpaid overtime wages and claimed more than \$290,000 in damages, according to court records. They settled for \$129,000.

A woman who said she works for the building’s management company called the incident a horrible accident.

“We’ll do an investigation as to the cause of the accident and make a determination of any liability and what they did right or did wrong,” said Timothy E. Hogan, deputy commissioner of enforcement for the Department of Buildings.

Shortly after the incident, the Fire Department requested an inspection of the building, citing a “partial facade collapse,” and noted that the site conditions were endangering workers.

Eleven years ago, the building was among those [damaged by a crane that snapped from its anchors and smashed into an apartment](#), leaving a disaster zone of twisted metal and rubble. Seven people were killed, including six construction workers.

There were no apologies to the family of the deceased. No mention on Facebook or social media. This was a person under the radar who last words were uttered in Spanish who is part of the invisible and vulnerable.

The grim memories of that day were on the minds of residents on the block and likely will continue indefinitely.

“So many people died,” said Susan Manuel, 70, who lives nearby. “It is very upsetting to people here. It makes me sad that workers are still vulnerable.”

STATISTICS

The records show that it was unclear whether the dead worker was wearing a helmet. Had he had been wearing a hard hat (helmet) his chances for survival would have been much greater.

PREVENTION

Hard Hat Standards have been established by Canadian Standards Association (CSA) and the American National Standards Institute (ANSI).

Hard Hats must protect the wearer’s head against impact and against small flying or falling objects. It must be able to withstand an electrical contact equal to 20,000 volts phase-to-ground.

The wearer and the employer need to know the use and care of employee hard hats.

- Inspect the shell, suspension, and liner every day before you use it. Look for cracks, dents, cuts, or gouges. Replace damaged or worn hats and liners immediately.
- If a hard hat is struck by an object, do not keep using it.
- Don't store your hard hat in direct sunlight—it will age quicker and can become brittle.
- Clean the shell, suspension, and liner regularly with mild soap and water.
- Never alter your hard hat by painting it, making holes in it, etc.
- Don't carry things inside your hard hat.
- Don't wear a baseball cap under your hard hat.
- Use a hard hat with a chinstrap when working at heights or in windy conditions.
- Check the service life of your hard hat by contacting the manufacturer or reading the manufacturer's instructions.
- Putting retroreflective stickers or tape on a hard hat can help workers be seen by moving vehicles and equipment in conditions where visibility is reduced. However, the stickers or tape must be compatible with the surface material, not adversely affect the material, and not interfere with the ability to inspect the hard hat for defects. Place them at least 13 mm (1/2 in) above the edge of the brim.

Railroad Workers Killed By Passing Train

INCIDENT

Two experienced railroad workers who were performing their usual

duties during the course of the day were killed by a passenger train. The police said the two workers had not been aware of a passenger train approaching them. The police also said that the two workers were “wearing ear defenders” or in common parlance, devices hearing protection devices (HPD’s).

A third person was treated for shock at the scene but was injured.

NEED TO KNOW

A tragic accident but clearly preventable accident occurred when two rail workers were killed. The workers were wearing P.P.E equipment. Were they wearing the appropriate (P.P.E) combined with the requisite training and education for the specific tasks of the workers?

BUSINESS / REGULATIONS

The British Transport Police said the two railway workers had been wearing ear defenders and had not been aware of the passenger train approaching.

Supt Andy Morgan of the British Transport Police said: “Following a number of urgent inquiries into this tragic incident, it has been established that the three people were railway workers who were working on the lines at the time.

“The initial stages of the investigation suggest that the two men who died had been wearing ear defenders at the time and, tragically, could not hear the passenger train approaching.”

Police said officers would continue to investigate and that the men’s families had been informed.

The transport secretary, said there would be an investigation into how the incident occurred.

Network Rail’s Wales route director, Bill Kelly, said it was “shocked and distressed” by the “dreadful accident” and was fully cooperating with investigators.

“Our thoughts are with the families of our colleagues and our

members of staff who will be affected by this tragic loss, and we will provide all the support we can," he said.

Union leaders called for a full investigation into the deaths. Manuel Cortes, the TSSA general secretary, said: "It's too early to speculate about what has happened here, but clearly something has gone badly wrong. There must now be a full investigation because it is simply not acceptable that in the 21st century, people go out to work and end up losing their lives.

"Our Network Rail members, together with everyone else at the company, do so much to keep our railways running smoothly. They must be able to do this in a safe environment.

"Safety on our railways is paramount and sadly, as today's tragic events show, it can never be taken for granted."

Mick Cash, the general secretary of the RMT union, said: "This is shocking news. RMT is attempting to establish the full facts, but our immediate reaction is that this is an appalling tragedy and that no one working on the railway should be placed in the situation that has resulted in the deaths that have been reported.

"As well as demanding answers from Network Rail and a suspension of all similar works until the facts are established, the union will be supporting our members and their families at this time. Our thoughts are with those involved in this incident and their loved ones."

A man who said he worked at the nearby Tata steelworks said: "I didn't see a great deal. By the time I got close paramedics were giving one of the workers CPR, but he sadly passed away. The other worker had already passed away."

The incident resulted in cancelled trains, with replacement buses being put on for rail passengers.

STATISTICS

THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH) HAS ILLUMINATED REVEALING AND DISTURBING FACTS ABOUT OCCUPATIONAL

HEARING LOSS (OHL).

Problems:

- In the United States, hearing loss is the **third-most common** chronic physical condition among adults after hypertension and arthritis.
- About **12%** of the U.S. working population has hearing difficulty.
- About **24%** of the hearing difficulty among U.S. workers is caused by occupational exposures.
- About **8%** of the U.S. working population has tinnitus ('ringing in the ears') and **4%** has both hearing difficulty and tinnitus.

Causes of Occupational Hearing Loss (OHL):

- OHL can occur when workers are exposed to loud noise or ototoxic chemicals.
- **Noise** is considered loud (hazardous) when it reaches 85 decibels or higher, or if a person has to raise his/her voice to speak with someone 3 feet away (arm's length).
- **Ototoxic chemicals** can cause OHL, make the ear more susceptible to the damaging effects of hazardous noise, or both. For example, a person taking certain ototoxic pharmaceuticals may lose hearing, become more susceptible to noise, or both. Ototoxic chemicals (and examples) include:
 - solvents (styrene, trichloroethylene, toluene)
 - metals and compounds (mercury compounds, lead, organic tin compounds)
 - asphyxiants (carbon monoxide, hydrogen cyanide)
 - nitriles (3-Butenenitrile, cis-2-pentenenitrile, acrylonitrile)
 - pharmaceuticals (certain antineoplastic agents)

Exposed Workers:

- About **22 million workers** are exposed to hazardous noise each year.
- About **10 million workers** are exposed to solvents and

an **unknown number** are exposed to other ototoxicants.

PREVENTION

Most industrial and plant operations in our modern industrial society emit and produce noise, some more than others. All this noise has an impact on the hearing of its workers.

Noise Exposure Hazards

Over time, exposure to noise can cause the following problems:

- Noise-induced hearing loss (NIHL)
- Tinnitus (ringing in the ears)
- High blood pressure
- Fatigue

Noise-induced hearing loss is the most common occupational disease suffered by worker. It often happens gradually, so workers may not realize that loud noise from their job is damaging their hearing. By the time they do realize it, it's too late—the damage is permanent and can't be reversed.

Hearing Loss

Any reduction in the normal ability to hear is referred to as a loss of hearing. A hearing loss can be either temporary or permanent.

Other prime causes of permanent hearing loss are age, traumatic injuries (such as from explosions or gunfire), and infection. Noise, however, is the major identifiable cause of hearing loss.

Hearing Protection Devices

Hearing protection devices (HPDs) should only be provided when engineering and administrative controls to reduce noise at the source or along the path cannot be implemented or while such controls are being put in place. HPDs are barriers that reduce the amount of noise reaching the sensitive inner ear. Fit, comfort, and sound reduction or “attenuation” are important considerations in choosing HPDs. The types of HPDs used most commonly are

earplugs or earmuffs. Earplugs attenuate noise by plugging the ear canal. Earmuffs cover the external part of the ear, providing an “acoustical seal”.

Effectiveness

The effectiveness of HPDs depend on the amount of time they are worn. What is not obvious to most wearers is that the effectiveness of HPDs can be reduced by as much as 95% or more if the protectors are not worn for as little as three or four minutes in noisy environments. It is therefore important to wear HPDs during the entire period of exposure in order to achieve the maximum protection available.

Comfort

Comfort is an important consideration in selection. An HPD that isn't comfortable will simply not be worn or will be worn improperly. With earplugs, several factors affect comfort. Since some plugs are relatively non-porous, they can often create a pressure buildup within the ear and cause discomfort. Dirty plugs may irritate the ear canal. Because of the shape of an individual's ear canals, certain plugs may not fit properly. Earmuffs should be made of materials that do not absorb sweat and that are easy to maintain and clean. The earmuff cup should be adjustable to conform to various head sizes and shapes. Headband tension and earcup pressure should be adjusted so that they are effective without being uncomfortable. Weight may also be a factor.

Work Environment/Procedures

HPD selection is sometimes dictated by the constraints of the work area or work procedures. For example, large volume earmuffs may not be practical in confined work situations with little head room or clearance. In that case, flat-cup muffs or earplugs may be more practical. Where work is necessary near electrical hazards, it may be desirable to use non-conductive suspension type muffs. The choice of protector may also be affected by the nature of work, as in welding where certain types of earmuffs may interfere with the

welder's helmet. The attenuation of the muff-type hearing protector may be considerably reduced when worn with spectacle-type safety glasses. (The head configuration of the wearer and the type of glasses worn will determine the reduction in attenuation.)

Where safety glasses must be worn, cable-type temples should be used in order to allow the smallest possible opening between the seal of the protector and the head. Otherwise earplugs should be worn, provided they are adequate.

Consideration should be given to hearing protectors that can be attached to hard hats where exposures to noise may be high but intermittent and where hard hats must be worn at all times. Periodic adjustments may be necessary because movement of the hard hat may break the seal of the HPD.

Consideration should also be given to work involving oils, grease, and other products that may soil hands. Ear infections may occur when earplugs are inserted by dirty hands.

Overprotection

Workers wearing HPDs that provide too much attenuation may feel isolated from their surroundings. Sounds may be heard as muffled. Speech or warning sounds may be unrecognizable. Overprotection can lead workers to resist wearing HPDs. Protectors should be chosen to provide sufficient, but not excessive, attenuation.

Where communication is critical and hearing protection is required, communication headsets can be considered. These devices provide protection against harmful levels of noise, yet allow for important communication to be heard.

Fit, Care, and Use

An employer who provides a worker with an HPD must provide adequate **training and instruction** to the worker in the care and use of the device.

Summary

Control of noise in workplaces is of growing importance as a

result of increasing hearing loss claims.

This is a convenient way of understanding the overall problem and a useful approach for putting control measures in place. The three components can usually be treated in isolation, although sometimes all three must be considered together in order to control unacceptable noise levels.

1. At the source, measures are aimed at reducing or eliminating the noise being generated.
2. Along the path, barriers can be introduced to reduce the amount of noise reaching the worker.
3. At the worker, measures involve personal protective equipment being properly selected, fitted, and worn. This PPE must be used in high noise environments all the time.

Failure to provide preventive or control measures will result in temporary and ultimately permanent hearing losses.

Foot Injuries Abundant In Workplaces

INCIDENT

There are two major categories of work-related foot injuries. The first includes foot injuries from punctures, crushing, sprains and lacerations. The second includes injuries resulting from slips, trips and falls. Slips and falls do not always result in a foot injury but lack of attention to foot safety plays an important role in their occurrence.

NEED TO KNOW

Foot injuries are among the most common workers' compensation injuries, including breaks, fractures and heel injuries. The human foot and ankle contain 26 bones, 33 joints and more than a hundred

muscles, tendons and ligaments, so it's no wonder injuries to the foot can be especially painful – and slow to heal.

BUSINESS / REGULATIONS

OSHA plays a significant role in standardizing Foot Safety in industry.

- Workers must wear protective footwear when working in areas where there is a danger of falling or rolling objects or objects piercing the sole. [[29 CFR 1915.156\(a\)](#)]
- Protective footwear must meet ANSI Z41 or equivalent design requirements [29 CFR 1915.156(b)]. Note: All ANSI-approved footwear has a protective toe and offers impact and compression protection. But the type and amount of protection is not always the same. Different footwear protects in different ways. Check the product's labeling or consult the manufacturer to make sure the footwear will protect users from the hazards they face.
- Safety shoes or boots may be required to provide special electrical conduction or insulation to prevent electric shock or static electric spark.
- Chemical-resistant boots may be required to provide protection from caustic, reactive, toxic, or corrosive materials during cleaning, or surface preparation.
- Slip-resistant soled shoes should be worn when working on slippery surfaces.

OSHA has identified six common work-related foot injuries and causes:

- Safety shoes required when using pallet jack sign
- Crushed or broken feet, amputation of toes or feet – Falling objects, moving vehicles, feet trapped between objects or caught in a crack, conveyor belts
- Punctures of the sole of the foot – Loose nails, sharp metal or glass objects
- Cuts or severed feet or toes – Chain saws, rotary mowers, unguarded machinery
- Burns – Molten metal splashes, chemical splashes, contact

with fire, flammable or explosive atmospheres

- Electric shocks – Static electricity, contact with sources of electricity
- Sprained or twisted ankles, fractured or broken bones during slips, trips or falls – Slippery floors, littered walkways, incorrect footwear, poor lighting

ADDITIONAL FOOT INJURY HAZARDS EXIST IN MANY OUTDOOR JOBS SUCH AS LOGGING, HYDRO LINEWORK AND FISHING.

STATISTICS

A study of over 250,000 workers' compensation claims found that the average final settlement for a foot injury is more than \$17,000.

Typical Costs of Workplace Foot Injuries

[Workers' compensation cases in Maryland](#) found that broken foot, stress fractures, broken toes and severe heel injuries are among the more common foot injuries. In 700 cases, the average foot injury was shown to be worth nearly \$11,000 and the average permanent partial disability (PPD) award was just over \$8,500. The average full and final settlement was \$17,435 – but that increased more than \$6,000 if it included an ankle injury. However, the actual costs vary widely case-by-case. The largest PPD award was \$89,910 and the largest final settlement was \$250,000.

PREVENTION

Prevention of workplace foot injuries makes good sense for workers and employers. But safety shoes and [foot PPE reminder signs](#) aren't enough.

The first step to reducing foot injuries is to identify and address relevant hazards in the workplace, and taking steps to eliminate or reduce those hazards through job and/or workplace design, including identifying proper foot and leg protection. Foot and leg protection choices include:

- Leggings to protect the lower legs and feet from heat

hazards such as molten metal or welding sparks. Safety snaps allow leggings to be removed quickly.

- Metatarsal guards to protect the instep area from impact and compression. Made of aluminum, steel, fiber or plastic, these guards may be strapped to the outside of shoes.
- Toe guards that fit over regular shoes to protect toes from impact and compression hazards. They may be made of steel, aluminum or plastic.
- Combination foot and shin guards that protect the lower legs and feet, and may be used in combination with toe guards when greater protection is needed.
- Safety shoes with impact-resistant toes and heat-resistant soles to protect feet against hot work surfaces common in roofing, paving and hot metal industries.

Job and Workplace Design can also Increase Foot Safety and Prevent Unnecessary Injury

- Separating mobile equipment from pedestrian traffic and installing safety mirrors and warning signs can decrease the number of incidents that might result in cut or crushed feet or toes.
- Proper guarding of machines such as chain saws or rotary mowers can avoid cuts or severed feet or toes.
- Effective housekeeping reduces the number of incidents. Loose nails, other sharp objects, and littered walkways are hazards for foot injury.
- Using color contrast and angular lighting to improve depth vision in complicated areas such as stairs, ramps and passageways reduces the hazard of tripping and falling.
- Post [safety signs](#) in conspicuous places where safety footwear is required when there is a potential hazard from falling objects, sharp objects, etc.

The metal insoles of some safety shoes protect against puncture wounds.

Some safety shoes are specially designed for foundry hazards or to prevent buildup of static electricity or to protect employees from workplace electrical hazards.

Workers Responsibilities:

- Wear the correct footwear. Boots with toecaps and puncture proof soles are required in many industrial work settings. Other jobs may call for non-slip soles, chemical-resistant materials, insulation and other protective qualities. Make sure the shoes meet required safety standards.
- Practice good housekeeping. Keep the area free of clutter which can cause falls and foot injuries. Store tools and materials safely so they will not fall off work surfaces or shelves.
- Clean up spills promptly.
- Pay attention to what you are doing. Accidents causing foot injuries tend to happen when the worker is distracted or in a hurry.
- Handle chemicals with care to avoid accidental contact.
- Keep your feet, socks and safety shoes clean and dry.

General Maintenance

As with all protective equipment, safety footwear should be inspected prior to each use. Shoes and leggings should be checked for wear and tear at reasonable intervals. This includes looking for cracks or holes, separation of materials, broken buckles or laces. The soles of shoes should be checked for pieces of metal or other embedded items that could present electrical or tripping hazards. Employees should follow the manufacturers' recommendations for cleaning and maintenance of protective footwear.

Overwork/Fatigue

INCIDENT

After one 14-hour shift, being “worked to death” took on a whole different meaning for Robert Dietz and his family. Dietz worked for the Lower Bucks County Joint Municipal Authority in Pennsylvania. He put in over 20 years of service as a maintenance worker. Even with his higher status, Dietz found himself regularly working long hours doing manual labor: jack-hammering, repairing water main breaks, cutting tree roots.

Nearing the end of an especially grueling day, Dietz collapsed. First responders could not resuscitate him. Shortly after, he was pronounced dead.

Some doctors explained that Dietz’s [preexisting conditions](#) put him at high risk for a heart attack, while others stated his conditions paired with extraneous physical labor caused his death.

The workers comp judge agreed with the latter.

Despite the outcome of the workers’ comp claim filed by Dietz’s widow, it’s important to see how fatigue and individual worker health plays a huge role in worker safety. Dietz’s fatal heart attack may have been prevented had Dietz’s employer been more invested in work/life balance and wellness.

NEED TO KNOW

Workers suffering from fatigue—physical and mental—are not only less productive and more prone to illness but also more distracted and thus more likely to be involved in a safety incident.

Fatigue can be broadly defined as a feeling of weariness, tiredness or lack of energy. Fatigue is a common complaint but, medically speaking, it’s recognized more as a symptom or cause of other conditions than as a condition itself. The best way to understand fatigue is along a continuum. On one end of the spectrum is the fatigue that most of us occasionally experience in the course of our lives when we get physically or mentally overburdened. This kind of fatigue isn’t serious and can usually be resolved simply and quickly, such as by getting extra rest. On the other end is a less common but more serious form of fatigue that’s symptomatic of a more chronic and disabling condition, such

as major depressive disorder or chronic fatigue syndrome. This form of fatigue is an acute and/or ongoing state of tiredness that leads to mental or physical exhaustion and prevents people from functioning as usual.

Fatigue clearly impairs work ability. Studies have shown that workers with fatigue are significantly more likely to miss work and experience long-term work absences than workers without fatigue

You're an accident waiting to happen if you are not alert at work. This applies to most high-risk jobs, trucking and transport jobs, repetitive jobs, such as sorting logs in a lumber mill, and a host of other jobs – regardless of the inherent risk level.

What's the Danger?

The risk of making mistakes at work increases dramatically if workers sleep for less than seven to eight hours or are awake for more than 17 consecutive hours.

- Fatigue reduces your ability to make decisions and to do complex planning.
- Communication skills and your ability to respond to and remember directions and recall details also suffer.
- Fatigue slows your reaction time, and your ability to respond to changes in surroundings or information provided.
- It also shortens your attention span, especially during boring or mundane tasks.
- Fatigue lowers your productivity and performance and your ability to handle stress.
- It makes it hard to stay awake, increases forgetfulness and increases errors in judgment.

Experiencing one or more of these factors can make you dangerous to work with, because it increases the chances for incidents and injuries.

Electricity, toxic chemicals, bone-crushing machines, fall hazards and fire are just some of the dangers the 20th century workplace health and safety programs were designed to root out.

The safety program of the new millennium must deal not just with these old enemies but new threats that are still not fully recognized or understood—**ERGONOMICS, WORKPLACE VIOLENCE, MENTAL STRESS AND WHAT MAY BE THE NEWEST OF THE NEWFANGLED HAZARDS**—Fatigue.

BUSINESS/REGULATION

Fatigue increases the risk of injuries or other accidents. As an employer, ensure your workers are not experiencing signs or effects of fatigue on the job. You can help make your workers and your business safer by including information on fatigue and sleep in your safety guidelines and orientations. You can also develop a fatigue management plan.

Fatigue is a state of feeling very tired, exhausted, weary, or sleepy. Fatigue results from a lack of sleep and can be heightened from prolonged mental activity or long periods of stress or anxiety. Boring or repetitive tasks can also intensify feelings of fatigue.

Fatigue can be acute or chronic.

Acute fatigue results from a sudden onset of short-term sleep loss, such as getting less sleep than normal before a work shift. Adequate sleep is necessary to reverse the effects of acute fatigue. Chronic fatigue is a long-term state that results from an extended loss of necessary sleep. A sleep debt can build over weeks or months from a reduction or disruption of a normal sleep routine.

How to help your workers stay safe

Create shift schedules that give workers enough time

If the job requires long hours or overtime, consider that your workers will need enough time for other daily activities, such as commuting, preparing and eating meals, socializing, and relaxing.

Provide a work environment that has good lighting, comfortable temperatures, and reasonable noise levels.

Ensure that jobs provide some variety, with work tasks that change throughout the shift. Be flexible when assigning tasks – assign workers who may be fatigued to tasks that aren't safety sensitive.

If your workplace has long shifts or frequent overtime, consider providing amenities, such as the following:

- Prepared meals
- On-site accommodations
- Facilities where workers can nap either during the shift or before driving home

What Can Employers Do?

Employers can reduce the risk of worker fatigue in the workplace by:

- Examining staffing issues such as workload, work hours, understaffing and worker absences, scheduled and unscheduled, which can contribute to worker fatigue.
- Arranging schedules to allow frequent opportunities for rest breaks and nighttime sleep.
- Making adjustments to the work environment such as lighting, temperature and physical surroundings to increase alertness.
- Providing worker education and training addressing the hazards of worker fatigue, the symptoms of worker fatigue, the impact of fatigue on health and relationships, adequate quality and quantity of sleep and the importance of diet, exercise and stress management strategies to minimize the adverse effects of fatigue.
- Consider implementing a Fatigue Risk Management Plan under which, like other risk factors, fatigue can be managed.

What is a Fatigue Risk Management Program?

Several federal agencies and national organizations have developed fatigue risk management program information. Some federal agencies and states have laws restricting the number of hours a worker can be on the job. These resources can assist your company in developing guidelines for work hours and for a Fatigue Risk Management Program.

The [Federal Aviation Administration Fatigue Management Toolbox](#) provides fatigue awareness tools, training and education programs, assessment tools and tips for implementing a fatigue management system in the workplace. The toolbox contains colorful downloadable posters to display in the workplace.

The [United States Coast Guard Crew Endurance Management Practices Guide](#) outlines a program for controlling risk factors that affect crew member performance and shipboard safety in the commercial maritime industry.

The [United States National Response Team Technical Assistance Document](#) designed for disaster workers, includes practical information about incident-specific fatigue management plans to assist organizations to address fatigue issues among disaster workers.

The American Petroleum Institute issued “[Fatigue Prevention Guidelines for Personnel in the Refining and Petroleum Industries \(Standard RP 755\)](#)” in response to the 2005 Texas City BP refinery explosion.

IPIECA (formerly the International Petroleum Industry Environmental Conservation Association) issued “[Managing Fatigue in the Workplace](#)” to assist oil and gas industry supervisors and occupational health practitioners understand, recognize and manage fatigue in the workplace.

The American College of Occupational and Environmental Medicine (ACOEM) published “[Fatigue Risk Management in the Workplace: 2012 Guidance Statement](#)” to provide background, key concepts and references needed to promote a Fatigue Risk Management System.

OSHA FATIGUE POLICY

While there is no specific OSHA policy on extended or unusual shifts, the **Fair Labor Standards Act (FLSA)** states that, “**Any work over 40 hours in a 168-hour period is counted as overtime.**” The FLSA applies to employees who work in interstate commerce, hospitals, schools, day workers, chauffeurs, cooks, housekeepers,

and full-time babysitters.

Workplace fatigue has been studied in other fields, such as aviation, the military, law enforcement, firefighting, healthcare, transportation, and emergency rescue.

According to experts, employers act to mitigate the risk of fatigue in the working environment. Not surprisingly, the federal agencies mentioned above also describe actions that individuals also can take to make sure they do not fall victim to fatigue and inflict injury on themselves, the public or their co-workers.

WHERE TO GET TRAINING

OSHA has produced a [10-HOUR SAFETY TRAINING COURSE](#) that teaches managers and their employees how to maintain a safe working environment. Aimed at electricians, mechanics, environmental health and safety personnel, maintenance technicians, owners & managers, and a host of others, the course explains which **OSHA Rules** are most frequently violated and how companies can reduce instance costs by avoiding citations.

Signs and symptoms of fatigue

Train supervisors and workers to recognize the immediate signs and symptoms of fatigue, which include the following:

- Tiredness or sleepiness
- Memory lapses
- Difficulty concentrating
- Slower reaction times

STATISTICS

workplace safety and a worker's ability to perform efficiently. Here are seven statistics relating to fatigue in the workplace

1. There are three causes of fatigue: sleep loss, disruption of a person's body clock, and prolonged mental or physical activity.
2. Fatigue can reduce a worker's alertness, leading to errors

and an increased possibility of injury under these two conditions: either when operating equipment or vehicles, or when performing important tasks requiring considerable concentration.

3. Seven long-term health effects of fatigue include increased risk for heart disease, high blood pressure, gastrointestinal disorders, diabetes, anxiety, depression, and reduced fertility. (Safe Work Australia)
4. A University of Pittsburgh School of Medicine study found that fatigued workers had nearly twice the risk for injury compared to non-fatigued workers.
5. Five symptoms indicating that a worker is experiencing fatigue include excessive yawning or falling asleep at work; impaired decision-making ability; short-term memory impairment and reduced concentration; slowed reflexes and reduced hand-eye coordination; and a noticeable decrease in one's ability to communicate clearly.
6. One major cause of fatigue is a work schedule that limits the amount of rest time a worker has before starting the next shift, because of issues such as overtime on the previous shift.
7. Three things supervisors can do to reduce fatigue among their workers are: allowing workers to vary their work tasks to avoid monotony; allowing workers to take short power-nap breaks, especially on the night shift; and encouraging workers to manage their fatigue risk factors. Risk factors include cutting sleep time short to complete tasks or to read, use a computer or watch TV, and consuming excessive nicotine, alcohol or caffeine, especially in the hours close to bedtime.

Bottom Line Analysis

- It is estimated that workers with fatigue cost U.S. employers \$136.4 billion a year in health-related lost productivity time \$100 million more than workers without fatigue.
- Individually, fatigue reduces productivity to the time of 1,961 per worker each year.

Workplace Fatigue Statistics and its Staggering Costs (2019)

Occupational fatigue is a frightening yet mostly overlooked health condition that affects a majority of the labor force in North America. Because of the lack of awareness, people tend to misunderstand it as a normal part of working and underestimate it. But, there's more to workplace fatigue than just being tired.

To have a better understanding of what occupational fatigue is and its effects, here are some statistics to be aware of.

1. More than 69% of workers feel fatigued at work

According to a 2018 survey report by the [National Safety Council](#) (NSC), two-thirds of the US labor force experiences workplace fatigue. This means that almost 107 million out of the 160 million US workers are affected by occupational fatigue.

Fatigue, **which can be either acute or chronic**, is defined by the NSC as "feelings of tiredness, sleepiness, reduced energy, and increased effort needed to perform tasks at a desired level."

2. Losing even two hours of sleep is similar to the effect of having three beers

The [Canadian Centre for Occupational Health and Safety](#) expands on those numbers with the following:

- Staying awake for 17 hours is equivalent to having a blood-alcohol content (BAC) of 0.05
- Staying awake for 21 hours is equivalent to having a BAC of 0.08
- Staying awake for 24 hours is equivalent to having a BAC of 0.10

3. Fatigued people are 3 times more likely to be in a car crash

In 2005, the [American Sleep Foundation](#) statistics reported that:

- 60% of adult drivers, or 168 million people, reported driving while feeling drowsy.
- 37%, or 103 million people, have fallen asleep while driving.
- 13% of adult drivers confessed to driving while drowsy at least once a month.
- 4%, or 11 million people, had or almost had an accident due to fatigued driving.

4. 59% of night shift workers sleep less than 7 hours a day

[Night shift workers](#) are at a higher risk of developing occupational fatigue because they tend to sleep less than day workers.

5. The risk of injury on night shifts is 30% higher than day shifts

[Fatigue-related safety risks](#) peak during night shifts, particularly between 2 am and 6 am.

Sleep debt is the cumulative effect of regular lack of sleep. For example, after losing two hours of sleep every day for ten days, your performance on the eleventh day will be as if you didn't have any sleep at all.

6. 97% of fatigued workers have reduced cognitive performance

Cognitively demanding tasks include:

- **Monotonous tasks**-These are unstimulating and monotonous tasks like driving on the highway.
- **High alert tasks** -These are tasks like assembly line work

wherein vigilance is a must.

- **Repetitive tasks** –Tasks that only use a limited number of muscles groups like data entry are repetitive tasks.

7. Workers with sleep problems are 1.62 times more likely to get injured than workers with no sleep issues

According to statistics released by the [National Institute of Neurological Disorders and Stroke](#), about 40 million Americans suffer from chronic long-term sleep disorders. An additional 20 million people experience occasional sleep problems.

Since sleep disorders can lead to lack of sleep or poor quality sleep, it can also contribute to occupational fatigue and, ultimately, a higher risk of injuries. **To resolve this, employers should screen their employees for sleep disorders and establish programs for their treatment.**

8. 13% of all workplace injuries are caused by fatigue.

9. Up to 93% of all employers feel that fatigue is a safety issue, though only 72% of employees agree

Because of the effects of [occupational fatigue](#) on the body, it is truly a safety issue. At 93%, most employers agree with this statement. However, only 72% of employees recognize fatigue as a safety issue.

10. Only 20% of employees understand what occupational fatigue is

According to the NHS, [80% of employees](#) are not aware of the causes and risks of occupational fatigue.

- Only 41% of workers believe that there should be a rest break when driving for more than 1.5 to 2 hours.
- 73% of workers failed to identify all the signs of drowsy

driving.

- 89% of people failed to identify the high-risks of shift work.

Because of this lack of awareness on the employees' part, it is the employers' duty to educate their workers about occupational fatigue.

11. Fatigued workers lose 5.6 hours of productive time per week

Healthy workers only have a productivity loss of 26%. On the other hand, fatigued workers have a [66% rate of lost productivity](#) due to cognitive decline and inability to focus.

12. Fatigue costs employers about \$136 billion a year in health-related lost productivity

Interestingly, out of the \$136 billion spent on lost productivity, 84% is due to presenteeism rather than absenteeism, according the statistics.

13. The cost of fatigue is approximately \$80 million per year for an average-sized company with 52,000 employees

14. Up to 2.5 million Americans are estimated to have chronic fatigue syndrome

15. **Chronic fatigue syndrome is most common in the 40 to 60 age group, which is over 33% of the working population**

16. The top 2 causes of occupational fatigue are sleep deprivation and work environmental factors

Other Noteworthy Workplace Fatigue Statistics

To give you an even clearer idea about the effects of occupational fatigue, here are some other important statistics about workplace fatigue, particularly from the perspective of employers:

- 47% of employers have experienced productivity loss in their company due to fatigue.
- 50% of employers have had an employee fall asleep on the job.
- 57% of employers report absenteeism due to fatigue.
- 32% of employers report injuries and near misses due to fatigue.

RECOMMENDATIONS

Experts say effectively combating workplace fatigue requires changes in both the personal lives of employees, plus good workplace policies. **Some recommendations:**

- Practice good sleep hygiene. Avoid using your computer or cell phones 1-2 hours prior to sleeping. Avoid stimulants like caffeine, and go to bed at a consistent and regular time.
- Stay Hydrated. Drinking adequate amount of water daily has been shown to have a [major effect](#) on brain function and energy levels.
- Move often (for office workers). Frequent movements encourage blood circulation and helps ward off fatigue. Incorporate [ergonomic exercises](#) every few hours that can be performed right at your desk.
- Eat Smarter. Food is the fuel to our bodies, and what you put in directly affects your output. Avoid overeating and

foods high in artificial sugars. Pick fruits and high energy snacks instead.

- Alternate between sitting and standing. Prolonged sitting slows down our metabolism and makes us feel more sluggish. The golden ratio between sitting and standing for maximum health benefits [according to research](#) lies between 1:1 to 1:3, such as sit for 15 minutes and stand for 45 minutes (maximum). Use a [tall chair optimized for standing desks](#) to allow you to switch between the two positions easily.
- Introduce a Fatigue Risk Management System ([FRMS](#)). For employers, a proven method for helping fight workplace fatigue is to have a well thought out Fatigue Management System in place. This creates a process for monitoring, reporting, and dealing with workplace fatigue that everyone in the company can get on board with.

PREVENTION

Fatigue – A Safety Hazard

Fatigue is more than simply sleepiness. It's the body's response to sleep loss and/or prolonged physical or mental exertion, e.g., as a result of working nights or rotating shifts. Over time, this can result in physical and mental damage.

But it's the immediate effects of fatigue that make it such a significant safety risk. Fatigue does things to workers' minds and bodies that make them more likely to get hurt on the job, such as:

- Slowing their reaction time;
- Reducing their level of vigilance;
- Impairing their judgment and ability to make decisions;
- Making them more distractible; and
- Causing them to lose awareness in critical situations.

Managing Fatigue In The Workplace

Progressive companies have been quick to grasp the danger and develop systems to manage fatigue.

The Fatigue Risk Management System

Such systems are similar to OHS systems and can be incorporated into an organization's existing OHS system. The guide lists the key elements of a Fatigue Risk Management System, Including:

A fatigue management policy spelling out how the company plans to address fatigue in the workplace and lists the roles and responsibilities of all stakeholders.

Fatigue risk management which involves collecting and analyzing relevant data to assess fatigue hazards and implementing controls to minimize identified risks. The ACOEM identifies 5 types of controls:

1. Balancing workload and staffing;
2. Shift scheduling;
3. Worker fatigue training and sleep disorder management;
4. Workplace environment design; and
5. Fatigue monitoring and alertness for duty.

Fatigue reporting system that workers can use to report when they feel unfit to work safely as a result of fatigue or report workplace incidents caused by fatigue.

Fatigue incident investigation which should basically parallel standard incident investigation but also focus on the role played by fatigue, why the worker was fatigued and why any fatigue-control mechanisms in place failed.

Fatigue management training and education of both management and workers on the fatigue risk management system, including:

- Hazards of working while fatigued and the benefits of being well rested;
- Impact of chronic fatigue on personal relationships, mental/physical well-being and general happiness;
- Recognition that while fatigue can't be eliminated, it can be managed;
- The key role quantity and quality of sleep play in managing fatigue;

- Basics of sleep physiology and circadian rhythms;
- Sleep hygiene, i.e., how to get adequate sleep;
- The potential results of sleep disorders and how to manage them;
- Importance of diet, exercise, stress management and management of other health conditions;
- How to recognize fatigue in themselves or co-workers; and
- Alertness strategies to use at work, e.g., caffeine, rest or exercise breaks.

Sleep disorder management programs that screen workers for sleep disorders and help them get appropriate treatment.

System auditing on a regular basis to ensure that it's effective, identify weaknesses and implement corrections or improvements.

What Can Employers Do?

Employers can reduce the risk of worker fatigue in the workplace by:

- Examine staffing issues such as workload, work hours, understaffing and worker absences, scheduled and unscheduled, which can contribute to worker fatigue.
- Arrange schedules to allow frequent opportunities for rest breaks and nighttime sleep.
- Make adjustments to the work environment such as lighting, temperature and physical surroundings to increase alertness.
- Provide worker education and training addressing the hazards of worker fatigue, the symptoms of worker fatigue, the impact of fatigue on health and relationships, adequate quality and quantity of sleep and the importance of diet, exercise and stress management strategies to minimize the adverse effects of fatigue.
- Consider implementing a Fatigue Risk Management Plan under which, like other risk factors, fatigue can be managed.

Look Out for the Symptoms of Fatigue

Train your managers and supervisors to recognize the signs of fatigued workers, including:

- excessive yawning;
- irritability;
- bloodshot eyes;
- poor performance;
- lack of focus

If you have identified any fatigued workers in your workplace, discuss the issue of fatigue with them as soon as practicable. You may also choose to discuss the issue with other workers who could be at risk of fatigue.

Direct a worker to take leave

Following discussion with a fatigued worker, you may:

- direct a worker to take paid personal or annual leave if they have any paid leave entitlements;
- allow a worker to take unpaid leave if they wish to do so; or
- choose to grant a worker paid leave if they have exhausted all of their leave entitlements.

Better Recommendations

It's also recommended that you include a clause in your workers' employment contracts that states that you reserve the right to send a worker home from work if you believe that the worker is not fit to perform their duties.

Driving while fatigued could be dangerous, so if you decide to send a fatigued worker home, arrange a safe method of travel for them, e.g. a taxi or colleague, and check that they have arrived home safely.

What can workers do?

One of the most important ways to protect against fatigue is to get enough rest. For most people that means seven to eight hours of sleep per night.

Tips for getting a good night's sleep:

1. Go to bed and get up at the same time every day, even on weekends.
2. Don't eat too close to bedtime, as doing so can cause heartburn and just generally make it hard to fall asleep. Do eat a balanced diet of fruits, veggies, healthy fats, proteins and whole grains.
3. Turn off your cell phone or tablet at least one hour before you go to sleep and don't watch TV in bed.
4. Exercise regularly, but not too close to bed time. Exercising an hour or so before bed can make it hard to fall asleep.
5. Avoid caffeine, tobacco and alcohol before bed as well. Stay away from foods and drinks that contain caffeine for at least five hours before bedtime.
6. Keep your room dark and cool. Most of us sleep better in a cooler room.
7. If you can't sleep, get up and go into another room and read or perform some other quiet activity that doesn't involve staring at a screen until you feel sleepy.

At work, remember these fatigue-triggering factors and try to avoid them:

1. Dim lighting.
2. High temperatures, high noise, and high comfort, such as sitting for long periods in a very comfortable chair.
3. Repetitive, long, boring and monotonous tasks.

Tips for staying alert:

1. If you can, take breaks or break up tasks and keep the lights bright.
2. On longer breaks or lunch time go for a run, bicycle ride or brisk walk in every kind of weather.
3. Perform the most boring tasks at the start of your shift if permitted.
4. Eat light, healthy snacks throughout your shift instead of heavy, fatty snacks.
5. If you're driving, be sure to take breaks at least every few hours and change drivers if you can.

GHS

INCIDENT

No industry or business is automatically exempt from chemical exposure, and some of the most frightening incidents take place where we least expect them – in no small part because it's where we least expect them.

For instance, every year there are a slew of chemical [incidents in schools and at colleges](#) that force the evacuation of student and faculty, often after a life threatening exposure has occurred.

This month, ABC News reported on two stories of customers at restaurants ingesting hazardous chemicals after employees unknowingly served contaminated beverages. The [most recent incident](#) took place at a fast food restaurant, where an employee served vanilla shakes tainted with a cleaning chemical to several customers.

According to the ABC report, “the mistake occurred when one employee left a container with chemical cleaner in the sink and then another employee later filled that container with vanilla syrup, thinking the container was clean.” [The New York Daily News](#) clarifies that a vanilla bottle had been in the sink when degreaser was poured into the sink, contaminating the bottle. Another employee took the bottle, thinking it was clean, refilled it with syrup and put it out for use.

Without knowing the specifics, it appears as though this accident was caused by a breakdown on many fronts, particularly on the employee training side. The business basically said as much by responding to the incident with news that employees would be undergoing additional training. Even if a company only has one hazardous chemical in the workplace, it should command the appropriate respect, as this case illustrates, because the consequences are too deplorable – and are downright bad for

business.

The second incident in the news took place at a restaurant in Utah where a woman was [served tea tainted with lye](#). According to the report, “An employee mistook degreaser – made up of sodium hydroxide, or lye – for sugar, mixing it into the tea and causing extreme burns to [the customer’s] throat and mouth.”

Making the matter worse, it was the second time this summer that lye was mistaken for sugar at the restaurant. An employee burned her tongue after testing the substance which was apparently stored in a sugar container. The lawyer for the injured customers stated, “To me it means that the company was on notice that there was a hazardous substance that wasn’t properly labeled, that wasn’t properly controlled...And that things should have and could have been done to prevent my client...from being injured.”

NEED TO KNOW

What is the Globally Harmonized System (GHS)?

GHS stands for the Globally Harmonized System of Classification and Labelling of Chemicals. GHS defines and classifies the hazards of chemical products, and communicates health and safety information on labels and safety data sheets). The goal is that the same set of rules for classifying hazards, and the same format and content for labels and safety data sheets (SDS) will be adopted and used around the world. An international team of hazard communication experts developed GHS.

The global GHS, as developed by the United Nations. GHS is a ‘non-binding’ system of hazard communication. Only the elements of GHS that have been explicitly adopted by Canadian legislation are enforceable.

Why is global harmonization necessary?

Currently many different countries have different systems for classification and labelling of chemical products. In addition, several different systems can exist even within the same country. This situation has been expensive for governments to regulate and

enforce, costly for companies who have to comply with many different systems, and confusing for workers who need to understand the hazards of a chemical in order to work safely.

GHS promises to deliver several distinct benefits. Among them are:

- Promoting regulatory efficiency.
- Facilitating trade.
- Easing compliance.
- Reducing costs.
- Providing improved, consistent hazard information.
- Encouraging the safe transport, handling and use of chemicals.
- Promoting better emergency response to chemical incidents.
- Reducing the need for animal testing.

What is the scope of GHS?

GHS covers all hazardous chemicals and may be adopted to cover chemicals in the workplace, transport, consumer products, pesticides and pharmaceuticals. The target audiences for GHS include workers, transport workers, emergency responders and consumers.

What are the two major elements in GHS?

The two major elements of GHS are:

1. Classification of the hazards of chemicals according to the GHS rules.

GHS provides guidance on classifying pure chemicals and mixtures according to its criteria or rules.

2. Communication of the hazards and precautionary information using Safety Data Sheets and labels:

Labels – With the GHS, certain information will appear on the label. For example, the chemical identity may be required. Standardized hazard statements, signal words and symbols will appear on the label according to the classification of that

chemical or mixture. Precautionary statements may also be required, if adopted by your regulatory authority.

Safety Data Sheets (SDS) – The GHS SDS has 16 sections in a set order, and minimum information is prescribed.

What are some key terms in the GHS Vocabulary?

- **SDS**– Safety Data Sheet. SDS is the term used by GHS for Material Safety Data Sheet (MSDS).
- **Hazard group**– While not given a formal definition, GHS divides hazards into three major groups – health, physical and environmental.
- **Class**– Class is the term used to describe the different types of hazards. For example, Gases under Pressure is an example of a class in the physical hazards group.
- **Category**– Category is the name used to describe the sub-sections of classes. For example, Self-Reactive Chemicals have 7 categories. Each category has rules or criteria to determine what chemicals are assigned to that category. Categories are assigned numbers (or letters) with category 1 (or A) being the most hazardous.
- **Hazard Statement**– For each category of a class, a standardized statement is used to describe the hazard. For example, the hazard statement for chemicals which meet the criteria for the class Self-heating substances and mixtures, Category 1 is Self-heating; may catch fire. This hazard statement would appear both on the label and on the SDS.
- **Precautionary Statement**– These statements are standardized phrases that describe the recommended steps to be taken to minimize or prevent adverse effects from exposure to or resulting from improper handling or storage of a hazardous product.
- **Signal word** – There are two signal words used by the GHS – Danger and Warning. These signal words are used to communicate the level of hazard on both the label and the SDS. The appropriate signal word to use is set out by the classification system. For example, the signal word for

Self-heating substances and mixtures, Category 1 is Danger while Warning is used for the less serious Category 2. There are categories where no signal word is used.

- **Pictogram**– Pictogram refers to the GHS symbol on the label and SDS. Not all categories have a symbol associated with them.

What is meant by the GHS hazard groupings and building block concept?

There are three major hazard groups:

- Physical hazards.
- Health hazards.
- Environmental hazards.

Within each of these hazard groups there are classes and categories. Each of these parts is called a building block. Each country can determine which building blocks of the GHS it will use in their different sectors (workplace, transportation, consumers). Once the building blocks are chosen, the corresponding GHS rules for classification and labels must be used.

What are the classes within the Health hazard group?

Criteria for classifying chemicals have been developed for the following health hazard classes:

- Acute toxicity.
- Skin corrosion/irritation.
- Serious eye damage/eye irritation.
- Respiratory or skin sensitization.
- Germ cell mutagenicity.
- Reproductive toxicity.
- Specific target organ toxicity – single exposure.
- Specific target organ toxicity – repeated exposure.
- Aspiration hazard.

What are the classes within the Physical hazard group?

Criteria for classifying chemicals have been developed for the following physical hazard classes:

- Flammable gases.
- Oxidizing gases.
- Gases under pressure.
- Flammable liquids.
- Flammable solids.
- Self-reactive substances and mixtures.
- Pyrophoric liquids.
- Pyrophoric solids.
- Self-heating substances and mixtures.
- Substances and mixtures which, in contact with water, emit flammable gases.
- Oxidizing liquids.
- Oxidizing solids.
- Organic peroxides.
- Corrosive to metals.

What are the classes within the Environmental hazard group?

Criteria for classifying chemicals have been developed for the following environmental hazard classes:

- Hazardous to the aquatic environment (acute and chronic).
- Hazardous to the ozone layer.

Where can I get information on the GHS criteria for the different hazard classes?

The most current information on GHS classification, labels and SDS as well as other criteria is available in the **5th revised edition** of the [Globally Harmonized System of Classification and Labelling of Chemicals \(GHS\)](#) from the United Nations Economic Commission for Europe (UNECE).

GHS is a dynamic system. The international GHS committee meets twice a year to work on developing potential new hazard classes as well as resolving specific issues, and updating the latest GHS publication. Check the above link for more information.

What is the target date for implementation of GHS?

Countries and sectors (consumer, environmental, workplace, transportation) within a country will implement GHS at varying times depending on their local circumstances.

BUSINESS/REGULATION

Overall, the current roles and responsibilities for suppliers, employers and workers have not changed in WHMIS 2015.

Suppliers, Importers and Producers duties continue to include:

- Classifying hazardous products.
- Preparing labels and SDSs.
- Providing these elements to customers.

Employers must continue to:

1. Educate and train workers on the hazards and safe use of products.
2. Ensure that hazardous materials are properly labelled.
3. Prepare workplace labels and SDSs as necessary.
4. Provide access for workers to up-to-date SDSs.
5. Ensure appropriate control measures are in place to protect the health and safety of workers.

Workers still must:

- Participate in WHMIS and chemical safety training programs.
- Take necessary steps to protect themselves and their coworkers.
- Participate in identifying and controlling hazards.

Canada

The *Hazardous Products Regulations* were published in *Canada*

Gazette, Part II on February 11, 2015. Both the amended *Hazardous Products Act* and new regulations are currently in force. “In force” means that suppliers may begin to use and follow the new requirements for labels and SDSs for hazardous products sold, distributed, or imported into Canada.

Note that the provincial, federal, and territorial occupational health and safety WHMIS regulations will also require updating.

A multi-year transition plan has been announced. From now until May 31, 2017 suppliers (manufacturers and importers) can use WHMIS 1988 **or** WHMIS 2015 to classify and communicate the hazards of their products (suppliers must use one system **or** the other). Beginning June 1, 2017 to May 31, 2018, distributors and suppliers importing for their own use can continue to use WHMIS 1988 or WHMIS 2015.

United States

Final Rule became effective May 26, 2012. Key dates in the US implementation include:

- December 1, 2013 – Train employees on the new label elements and SDS format.
- June 1, 2015 – Comply with all modified provisions of the final rule, except December 1, 2015 – Distributors may ship products labelled by manufacturers under the old system until December 1, 2015.
- June 1, 2016 – Update alternative workplace labelling and hazard communication program as necessary, and provide additional employee training for newly identified physical or health hazards.
- Transition Period – Comply with either 29 CFR 1910.1200, or the current standard, or both.

STATISTICS

- Chemical exposure is a serious risk that many workers face on a daily basis. According to the [S. Bureau of Labor Statistics](#), exposure to harmful substances or environments is among the five most common causes of workplace

fatalities. Nearly 10 percent of all workers who lose their lives due to occupational illnesses or injuries die as a result of chemical exposure. [This amounts to an estimated 60,000 deaths](#)– which is on top of the roughly 860,000 illnesses resulting from chemical exposure in the workplace every year.

- While some exposures can result in immediate injuries (such as chemical burns), in many cases, exposure takes its toll over time. In fact, even relatively modest chemical exposures, if repeated over the course of years and years of employment, can lead to life-changing medical conditions.

PREVENTION

Read the MSDS for each chemical before you use it for the first time. Review it as needed. Your company will have written material safety data sheets on file. These MSDSs can also be accessed on the internet. Follow the directions for use, handling and disposal of the chemicals. Make sure you are aware of what to do in case of a spill or other emergency.

1. THE HAZCOM PROGRAM

Your company should have a complete and comprehensive HAZCOM program. The program should be in writing and should include: a determination of the hazards presented in your company, labeling of all chemical containers, training about the hazardous chemicals, an inventory of all of the hazardous chemicals, and material safety data sheets. The program should also cover tasks that involve chemicals, but that are not routine.

2. INFORMING EMPLOYEES

The employer must inform its employees of the hazards of the chemicals they use. This is done by training new employees or whenever new chemicals are brought in for use. Training should be

repeated periodically. Other ways of informing employees about hazards include material safety data sheets and labeling of containers that hold chemicals.

3. IF MEDICAL ADVICE IS NEEDED, HAVE PRODUCT CONTAINER OR LABEL AT HAND.

P102: Keep out of reach of children.

P103: Read label before use.

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

P211: Do not spray on an open flame or other ignition source.

P220: Keep/Store away from clothing/.../combustible materials.

P221: Take any precaution to avoid mixing with combustibles...

P222: Do not allow contact with air.

P223: Keep away from any possible contact with water, because of violent reaction and possible flash fire.

P230: Keep wetted with...

P231: Handle under inert gas.

P232: Protect from moisture.

P233: Keep container tightly closed.

P234: Keep only in original container.

P235: Keep cool.

P240: Ground/bond container and receiving equipment.

P241: Use explosion-proof electrical/ventilating/lighting/.../equipment.

P242: Use only non-sparking tools.

P243: Take precautionary measures against static discharge.

P244: Keep reduction valves free from grease and oil.

P250: Do not subject to grinding/shock/.../friction.

P251: Pressurized container: Do not pierce or burn, even after use.

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

P261: Avoid breathing dust/fume/gas/mist/vapours/spray.

P262: Do not get in eyes, on skin, or on clothing.

P263: Avoid contact during pregnancy/while nursing.

P264: Wash thoroughly after handling.

P270: Do not eat, drink or smoke when using this product.

P271: Use only outdoors or in a well-ventilated area.

P272: Contaminated work clothing should not be allowed out of the workplace.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P281: Use personal protective equipment as required.

P282: Wear cold insulating gloves/face shield/eye protection.

P283: Wear fire/flame resistant/retardant clothing.

P284: Wear respiratory protection.

P285: In case of inadequate ventilation wear respiratory

protection.

P231 + P232: Handle under inert gas. Protect from moisture.

P235 + P410: Keep cool. Protect from sunlight.

P301: IF SWALLOWED:

P302: IF ON SKIN:

P303: IF ON SKIN (or hair):

P304: IF INHALED:

P305: IF IN EYES:

P306: IF ON CLOTHING:

P307: IF exposed:

P308: IF exposed or concerned:

P309: IF exposed or if you feel unwell:

P310: Immediately call a POISON CENTER or doctor/physician.

P311: Call a POISON CENTER or doctor/physician.

P312: Call a POISON CENTER or doctor/physician if you feel unwell.

P313: Get medical advice/attention.

P314: Get medical advice/attention if you feel unwell.

P315: Get immediate medical advice/attention.

P320: Specific treatment is urgent (see ... on this label).

P321: Specific treatment (see ... on this label).

P322: Specific measures (see ... on this label).

P330: Rinse mouth.

P331: Do NOT induce vomiting.

P332: If skin irritation occurs:

P333: If skin irritation or rash occurs:

P334: Immerse in cool water/wrap in wet bandages.

P335: Brush off loose particles from skin.

P336: Thaw frosted parts with lukewarm water. Do not rub affected area.

P337: If eye irritation persists:

P338: Remove contact lenses, if present and easy to do. Continue rinsing.

P340: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P341: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

P342: If experiencing respiratory symptoms:

P350: Gently wash with plenty of soap and water.

P351: Rinse cautiously with water for several minutes.

P352: Wash with plenty of soap and water.

P353: Rinse skin with water/shower.

P360: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.

P361: Remove/Take off immediately all contaminated clothing.

P362: Take off contaminated clothing and wash before reuse.

P363: Wash contaminated clothing before reuse.

P370: In case of fire:

P371: In case of major fire and large quantities:

P372: Explosion risk in case of fire.

P373: DO NOT fight fire when fire reaches explosives.

P374: Fight fire with normal precautions from a reasonable distance.

P375: Fight fire remotely due to the risk of explosion.

P376: Stop leak if safe to do so.

P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P378: Use ... for extinction.

P380: Evacuate area.

P381: Eliminate all ignition sources if safe to do so.

P390: Absorb spillage to prevent material damage.

P391: Collect spillage.

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

P301 + P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

P301 + P330 + P331: IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

P302 + P334: IF ON SKIN: Immerse in cool water/wrap in wet bandages.

P302 + P350: IF ON SKIN: Gently wash with plenty of soap and water.

P302 + P352: IF ON SKIN: Wash with plenty of soap and water.

P303 + P361 + P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P304 + P341: IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P306 + P360: IF ON CLOTHING: rinse immediately contaminated clothing and skin with plenty of water before removing clothes.

P307 + P311: IF exposed: Call a POISON CENTER or doctor/physician.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

P309 + P311: IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.

P332 + P313: If skin irritation occurs: Get medical advice/attention.

P333 + P313: If skin irritation or rash occurs: Get medical advice/attention.

P335 + P334: Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.

P337 + P313: If eye irritation persists: Get medical advice/attention.

P342 + P311: If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.

P370 + P376: In case of fire: Stop leak if safe to do so.

P370 + P378: In case of fire: Use ... for extinction.

P370 + P380: In case of fire: Evacuate area.

P370 + P380 + P375: In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.

P371 + P380 + P375: In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

P401: Store ...

P402: Store in a dry place.

P403: Store in a well-ventilated place.

P404: Store in a closed container.

P405: Store locked up.

P406: Store in corrosive resistant/... container with a resistant inner liner.

P407: Maintain air gap between stacks/pallets.

P410: Protect from sunlight.

P411: Store at temperatures not exceeding ... °C/...°F.

P412: Do not expose to temperatures exceeding 50 °C/122°F.

P413: Store bulk masses greater than ... kg/... lbs at temperatures not exceeding ... °C/...°F.

P420: Store away from other materials.

P422: Store contents under...

P402 + P404: Store in a dry place. Store in a closed container.

P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

P403 + P235: Store in a well-ventilated place. Keep cool.

P410 + P403: Protect from sunlight. Store in a well-ventilated place.

P410 + P412: Protect from sunlight. Do not expose to temperatures

exceeding 50 celcius degress.

P411 + P235: Store at temperatures not exceeding ...Keep cool.

Housekeeping

INCIDENT

On Jan. 5, the U.S. Chemical Safety Board (CSB) released a report on the three deadly fires and explosions that occurred at a Hoeganaes Corp. plant in Gallatin, Tenn., in 2011. The report asserts that the accumulation of fine iron powder in the facility led to the explosions, and that Hoeganaes did not take necessary action to prevent these fatal events. CSB also used its report to highlight the need for an OSHA standard on **Combustible Dust**.

Five workers died and three were injured in three separate incidents at Hoeganaes Corp.'s Gallatin powdered metals plant in 2011. When fine particles of iron dust ignited on Jan. 31, two workers were burned and later died from their injuries. On March 29, a similar flash fire burned another employee. Finally, on May 27, a hydrogen explosion at the plant shook loose iron dust accumulations, which ignited and rained down on workers. The explosion and ensuing fire killed three employees and injured two others.

"The three accidents at the Hoeganaes facility were entirely preventable. Despite evidence released by the CSB and information that Hoeganaes had in its possession even before the first accident in January 2011, the company did not institute adequate dust control or housekeeping measures," said CSB Chairperson Rafael Moure Eraso.

According to CSB, significant amounts of the fine iron powder had accumulated over time in the facility and the company did not reduce the hazards through engineering controls and basic

housekeeping. Furthermore, the investigation found that Hoeganaes did not institute procedures such as combustible gas monitoring or provide training for employees on avoiding flammable gas fires and explosions. CSB also found that the company did not require atmospheric testing for hydrogen or other explosive gases.

NEED TO KNOW

Housekeeping at work is as important as it is at home, especially if you want a safe workplace. People who must function every day in a messy, disorderly work environment have lower morale, although they may not be aware of the cause. But the safety ramifications of poor housekeeping in the workplace are even more important.

Poor housekeeping may result in employee injuries or even death, citations by the Occupational Safety and Health Administration (OSHA) (or another regulatory agency) and even difficulty in securing future work. How can such a seemingly “minor” issue such as housekeeping have such serious consequences?

Poor housekeeping practices can result in:

- Injuries when employees trip over, strike or are struck by out-of-place objects.
- Injuries from using improper tools because the correct tool can't be found.
- Lowered production because of the time spent maneuvering over and around someone else's mess and time spent looking for proper tools and materials.
- Lack of future work due to a reputation for poor quality.

General housekeeping rules to remember:

- Housekeeping is everyone's responsibility!
- Clean up after yourself. Pick up trash and debris and dispose of it properly. Keep your work area clean throughout the day, minimizing the time needed to clean a larger mess at the end of the day.
- Dispose of combustibles and flammables properly. If improperly discarded, they will increase the potential for a

fire.

- Remove protruding nails and other sharp objects or hammer them flat to prevent someone from being injured by them.
- Stack materials and supplies in an orderly manner and secure them so they won't topple.
- Report all slips, trips and falls, with or without injury, so the hazard can be corrected.
- Remove any cords or cables in walking areas.
- Organize cables under desks.

MORE CONSEQUENCES OF POOR HOUSEKEEPING

- A trip or fall over lines and leads in walkways and work areas
- A slip or fall on an oily or slippery facility floor, vessel deck or another working surface
- A trip or fall from a dock or vessel
- An allergic reaction to a spilled chemical
- An eye injury from falling grit left in the overhead of a work site
- A fire as a result of oily rags left in an area where hot work is performed, or due to the accumulation of combustible dust
- Illness due to the unsanitary conditions of restrooms
- Electrical shock as a result of poorly maintained equipment or energy sources, such as broken, cracked or damaged insulation and connections of wiring
- Lacerations and amputations when poor maintenance results in inadequate lighting
- Exposure to hazardous substances from poor storage and ineffective labeling of hazardous chemicals
- Slip hazards where snow, ice, or standing-water is left on walkways

MANAGEMENT TRAINING

Here are some results of poor housekeeping practices at work:

- Time spent investigating and reporting accidents that could have been avoided.

- Fires due to improper storage and disposal of flammable or combustible materials and wastes.
- Substandard quality of finished products because of production schedule delays, damaged or defective finishes, ill-equipped employees, etc.
- “Wall-to-wall” OSHA inspections due to the “first impression” of the compliance officer.

BUSINESS / REGULATION

Good housekeeping not only results in a cleaner workplace, but makes it safer as well. Good housekeeping reduces illnesses and injuries and promotes positive behaviors, habits, and attitudes. Employers are responsible for assessing each workplace before work begins to identify the potential hazards present, and determine ways to eliminate the hazards. An effective housekeeping program is an important element in workplace safety and health management systems.

Uncluttered working conditions are essential to the safety of all workers and should be maintained at all times in both work and office areas. Proper housekeeping management provides for an orderly arrangement of operations, tools, equipment, storage facilities, supplies, and waste material. Good housekeeping is evidenced by floors free from grease and oil spillage; properly identified passageways; unobstructed accesses and exits; neat and orderly machinery and equipment; well-nested hoses and cords; properly stored materials; removal of excess waste material or debris from the working area; walkways free from ice and snow; surfaces, including elevated locations, free from accumulated dust; and adequate lighting. Maintaining these conditions contributes significantly to lower incident rates.

While **OSHA Regulations** require that each working surface be cleared of debris, including solid and liquid waste, at the end of each work shift or job, whichever occurs first, to fully realize the benefit of a clean workplace, it is recommended that good housekeeping be maintained throughout the course of the job and workday.

PROVISIONS CONTAINED IN [29 CFR 1915.81](#) OUTLINE OSHA'S MINIMUM HOUSEKEEPING REQUIREMENTS TO PROTECT WORKERS. EMPLOYERS MUST:

1. Establish and maintain good housekeeping practices.
2. Eliminate slippery conditions, such as snow, ice, and grease, from walkways and working surfaces as necessary. Where removal is not possible, access to such areas must be restricted and an alternate route established, or slip-resistant footwear provided.
3. Store materials in a way that does not create hazards for workers.
4. Ensure easy and open access to all exits (including ladders, staircases, scaffolds, and gangways), fire-alarm boxes, fire extinguishing equipment and fire call stations.
5. Dispose of oils, paint thinners, solvents, rags, scraps, waste, or other flammable and combustible substances, or store them in covered fire-resistant containers, at the end of each work shift or when the job is complete, whichever occurs first.
6. Maintain walkways so that they provide adequate passage and are:
 - Free from debris, including solid and liquid waste;
 - Clear of tools, materials, equipment, and other objects; and
 - Free from trip hazards as a result of the improper storage or placement of hoses and electrical service cords. Hoses and cords must be placed above or underneath walkways or covered.
7. Cordon off any portion of a walkway that is being used as a working surface.
8. Make sure working surfaces are free from all tools, materials, and equipment not necessary to perform the job in progress. All debris, including liquid and solid waste, must be cleared at the end of the job or work shift, whichever occurs first.
9. Keep working surfaces dry, when possible. If a wet process is used, drainage must be maintained and dry standing places made available, or workers provided with protective footwear when such means are not practicable.

STATISTICS

The Bureau of Labor Statistics (2015) revealed that out of 120 workplace deaths in the **mining, oil and gas extraction industry**, 74 of them occurred within the support activities for **oil and gas operations**.

The constant pressure of efficient productivity due to the high cost of drilling projects, time away from home, long work days, and high physical demands takes a hefty toll on workers. These factors can ultimately affect worker safety.

Workers are susceptible to motor vehicle accidents, contact injuries, slips, trips, and falls and encounter fires, explosions, chemical exposure, and confined space issues.

One study puts office accidents at 40,000 accidents a year!!! An office: One wouldn't think that an office is a dangerous place to work. Good housekeeping at work can perform magic to keep you safe from slips, trips, falls and fires.

Dust explosions, like the tragedy at the Hoeganaes Plant in Tennessee, have been linked to poor housekeeping. **More than 100 workers lives were claimed and injured more than 600 according to the U.S. Chemical Safety and Hazard Investigation Board.**

RECOMMENDATIONS

Policies to consider:

- Institute a routine cleaning schedule.
- Hold everyone in the workplace accountable for housekeeping.
- Keep walkways free of debris, cords, cables and storage items.
- Clean up oil, water and grease on floors immediately.
- Train all employees on the proper disposal of combustible and flammable materials.
- Provide nonskid strips or floor mats in slippery or wet areas and ensure they are kept in good condition (no curls

or frayed edges).

- Ensure that workers wear proper footwear for their work environment.
- Encourage employees to inform you immediately of any potential safety hazards and accidents, with or without injuries. Implement corrective measures immediately.

PREVENTION

Careful consideration must be given to the volume of materials to be handled, the space needed for these materials and the methods of handling and transportation.

Piling materials

When piling materials, keep these points in mind:

- Height of pile – hazards include toppling, nearby traffic and interference with sprinkler systems.
- Strength of support – allowable floor loads should be posted.
- Continued stability – related to yard piling where uneven or moist ground may cause toppling.
- Location – aisle traffic or machinery may make it necessary to limit the height or type of materials.
- Pipe or long stock – racks aid handling, but projecting ends should be protected by railings or barriers.
- Mechanical aids – employing manual methods instead of utilizing stackers or hoists is a common fault.

Tool housekeeping

Racks and holders should be provided for all hand tools, jigs, cutters, blades and other parts. Tools frequently used at a bench or machine should be placed on racks. Wheeled racks are often very helpful.

Scrap and waste disposal

The old way of letting it fall to the floor and cleaning it up

periodically is not conducive to safety. A suitable means of collecting and disposing of waste in a timely manner is recommended.

Marking storage space

Clearly marking aisles and spaces reserved for storage will solve a lot of problems in the workplace.

Leaks, drips and spillage

Use oil pans, splash guards and drip pans to keep oil off the floor. Proper means of oiling and good maintenance reduce dripping, and good construction reduces leaks.

Aisle layout

Aisles too narrow for safety are also too narrow for efficiency. Aisles accommodating powered truck traffic should be three feet wider than twice the width of the trucks used.

Machinery and equipment layout

The provision of adequate space and the proper arrangement of various production units are vital to housekeeping.

A common mistake is to add machines to well-filled floor space. This not only increases the accident hazard but often decreases efficiency because of overcrowding.

Important housekeeping tips

1. When you are finished using tools or material, return them to their proper place and clean up anything that is left sitting on work surfaces or floors.
2. If you observe materials protruding from shelving that could either fall onto workers or injure anyone walking by, push them back or if they are too large to handle or cannot be repositioned so they fit on the shelf, report them to your supervisor.

3. Ensure that all walkways are free of obstructions such as materials, tools, or wires that could cause someone to trip or fall.
4. Never stack material to a height where it becomes unstable and might fall.
5. If emergency exit routes are blocked by material, inform your supervisor.
6. Don't leave garbage hanging around. Trash should be taken to a dumpster at the end of the shift.
7. Dispose of oily rags in covered metal containers. These containers need to be emptied on a regular basis.
8. Ensure that fire extinguishers and sprinkler systems are not blocked by equipment or materials.

"Good Housekeeping" must be practiced day-by-day.

Good Housekeeping Benefits

9. Reduce drilling costs.
10. Increase hole drilled.
11. Improve control of drilling.
12. Conserve materials and parts.
13. Decrease rig down time.
14. Use space more efficiently.
15. Open access routes and enable better movement.
16. Lower incident rates on the rig.
17. Build higher crew morale.
18. Reduce rig fire hazards

Housekeeping Practices:

- Put a tool back in the rack when you are finished using it.
- Sweep up or wash off any dirt or mud as soon as you can.
- Repair those loose steps, rickety handrails (check the base sockets and welds) and loose walkways.
- Keep cables, slings, chains, rope (catline), etc. coiled up and off the floor when not in use.
- Do not allow oil to collect on the rig floor or in the cellar.
- Do not block fire extinguishers.

- Do not block emergency exit routes.
- Keep the BOPs and cellar washed down and keep cellars jettied down.
- Keep all trash and miscellaneous parts from under sub-structure.
- Keep all excess pipe, connections etc., in a rack, not under or spread around the rig.
- Keep the water hose clean and coiled up, when not in use.
- Keep the water hose such that it cannot reach the kelly (kelly bushings).
- See that all fire extinguishing equipment is in the clear and ready for use.
- See that first aid kits and supplies are clean, filled and ready for use.
- Check all safety equipment (hard hats, shoes, goggles, gloves, gas masks, etc.) and ensure that they are clean and in good repair.

Safety Check List

Slips / Falls:

Slips can be caused by spilled liquids or improper maintenance. Are the floors clean and free of ice, mud, water or coffee spills? Do you wipe up small messes immediately and report larger ones to the maintenance department?

Trash:

Trash can also be a source of slips and falls as well as fires. Do you place all of your trash in your waste-paper basket or recycling container?

Fire hazards:

Speaking of fire hazards, if you smoke do so only in the assigned areas. Do you use a

designated covered metal can for emptying ashtrays? This is one type of trash which should never be placed in a waste-paper basket.

Electric cords:

Abused electrical cords can be another source of fire. Are the electrical cords for your printers, computers, monitors, fax machines and photocopiers in good condition? Inspect yours regularly and report any cords which appear to be worn, broken or lacking pieces of insulation.

While you are looking at the condition of your electrical cords, consider whether they are a tripping hazard as well. Are they routed away from traffic areas? Perhaps you may have to consider changing the office equipment layout to prevent people from walking on or over the electrical cords.

Tripping Hazards:

Do you keep your work and traffic areas free of tripping hazards for co-workers? Old files, such as the month and year-end reports, should be stored in proper boxes and moved to a central storage area.

Other tripping hazards are loose, worn or frayed carpets and unsecure small rugs or mats. Do you regularly report any problems to your supervisor or the maintenance staff?

Office furniture:

Is the office furniture kept in good repair to maintain safety? Defective furniture such as chairs should be removed from service immediately.

Flammable materials:

Flammable liquids such as solvents and art supplies should be stored in approved containers which are kept closed. They should be kept in areas with adequate ventilation and away from any possible sources of ignition.

Combustible materials:

Do you keep combustible substances, such as paper and cardboard, away from heat sources such as electrical heaters? Paper being saved for recycling should be picked up regularly so that it does not accumulate and present a fire hazard.

Exits:

Make sure that fire exits remain clear. Never place furniture or supplies in front of a fire exit – even just temporarily.

Fire doors:

Fire doors, which are designed to slow the spread of fire, should be kept closed as directed. Never prop open a fire door just to facilitate traffic or to let in a breeze.

The possibilities for injury or death in a cluttered workplace are many. Workers can slip on spilled material that hasn't been cleaned up, trip over debris on a floor, hurt themselves while walking past heavy or sharp objects that are protruding from shelves or be struck by unsecured items that shift and fall from racking.

If sawdust, sugar or other material is left to accumulate on surfaces and it comes in contact with an ignition source, it can cause a deadly explosion and fire.

It is neither safe nor practical for you to sweep dust off a beam high in the air in your workplace. If you are concerned about a buildup of combustible dust and the potential for an explosion, talk to your supervisor.

As a worker, there's plenty you can do on the ground to keep yourself and your co-workers safe. While it can be annoying to see someone create a mess such as a spill and walk away from it, ignoring that mess yourself is wrong because it puts everyone in danger.

The few seconds it takes to mop up a coffee spill on the floor or sweep up some wood chips and sawdust can make a huge difference to the safety of your workplace. But if you don't know what the

spilled material is, talk to your supervisor before attempting to clean it up.

Machine Guarding Fatality File

PREAMBLE

Machine guarding is a safety feature on or around [manufacturing](#) or other engineering equipment consisting of a shield or device covering hazardous areas of a machine to prevent contact with body parts or to control [hazards](#) like chips or sparks from exiting the machine. Machine guarding provides a means to protect humans from [injury](#) while working nearby or while operating equipment. It is often the first line of defense to protect operators from injury while working on or around [industrial machinery](#) during normal operations.

Manufacturers design their machines to protect operators from coming into contact with hazardous parts causing [amputations](#), lacerations, and crushing injuries. Many of these injuries were caused by unsafe operation or improper maintenance. **Machine guards**, or barriers between the operator and dangerous parts, are one of the most common strategies to prevent these injuries.

Types of Machine Guards

There are several different types of **machine guards**. The most common types of machine guards are:

- Fixed guards
- Interlocking guards
- Adjustable guards
- Self-adjusting guards

INCIDENT

On Nov. 16, 2016, Nissan North America sent 46-year-old maintenance technician Dennis Pinkston to investigate an equipment breakdown.

Pinkston, along with the rest of the maintenance crew at the company's Smyrna, Tenn. plant, discovered the roller drive motor for an elevator, which is designed to move car seat pallets from one conveyor system to another, was not working.

They removed some machine guarding and set to work. However, when checking whether the elevator correctly was functioning, the crew neglected to place the machine guarding back where it had been, according to Tennessee OSHA.

OSHA described the following actions that led to Dennis Pinkston's death:

"After replacing the drive motor, the employee was testing the lift table. He leaned into an opening to look under the lift table as the table was being raised. He was struck by a counterbalance weight that was descending as the lift table was elevated. A guard for the opening had been removed for the repair and not replaced to cover the opening before the lift table was activated."

Pinkston was struck in the back of the head. The counterweight, which weighed 1,275 lbs. pushed his head downward, where his head was caught between the weight and the top of the metal guarding system.

Emergency services were called, and he was transported to a nearby hospital but did not survive.

Pinkston had been a maintenance technician at Nissan North America since 2004 and was authorized to perform service on machines and equipment. He had received training on lockout/tagout procedures.

However, Tennessee OSHA's subsequent investigation revealed that while lockout/tagout steps were taken, the mesh machine guard was not replaced and Pinkston was not positioned far enough away from the machinery while performing a final test.

The agency discovered that Nissan North America had failed to perform routine equipment inspections or check whether it complied with the 29 CFR 1910.147 standard which details periodic inspections. In addition, Nissan received a **Repeat -Serious violation** because lockout/tagout devices were not replaced once maintenance was completed. The company previously had been cited for this in 2014.

Nissan North America has 30 days to pay a total of \$29,000 as a result of the incident.

Despite Pinkston's death, the company received an overall "effective" rate for its safety and health program.

"The safety and well-being of our employees is always our top priority," the company said in a media statement. "We dedicate extensive time and resources to safety programs and training at the plant. Nissan is working through TOSHA's established process to contest these citations and bring this matter to a close. We also continue to work on determining what can be done to prevent future occurrences."

"I was mad at first, but once I read the report – I mean the way the reports wrote and all that, it's obviously just an accident," Pinkston's brother [told local TV outlet WSMV 4 in an interview](#). "It's an accident that could've been avoided if the guard had been put back in place. After reading that, that's going to bother me for a long time. It could've very well been avoided."

BUSINESS / REGULATION

Moving machine parts create workplace hazards and potential machinery-related injuries, making machine guards vitally important. [Machine safeguarding](#) can help you protect workers from preventable injuries.

OSHA's requirements for machine guarding are found in **29 CFR 1910 Subpart O, Machinery and Machine Guarding**. The regulation is broken down into these components:

1910.211 – Definitions 1910.212 – General requirements for all

machines 1910.213 – Woodworking machinery 1910.214 – Cooperage machinery [Reserved] 1910.215 – Abrasive wheel machinery 1910.216 – Mills and calendars in the rubber/plastics industries 1910.217 – Mechanical power presses 1910.218 – Forging machines 1910.219 – Mechanical power-transmission apparatus

General requirement 1910.212(a)(1) states that one or more methods of machine guarding must be used to protect operators and other employees from hazards, including those created by point of operation, in-running nip points, rotating parts, flying chips and sparks.

Hazardous Mechanical Motions and Actions

Identifying hazards is the first step toward protecting workers and promoting safety in the workplace.

Federal Law Mandates

Under federal law, you are entitled to a safe workplace. Your employer must provide a workplace free of known health and safety hazards. If you have concerns, you have the right to speak up about them **without fear of retaliation**. You also have the right to:

- Be trained in a language you understand
- Work on machines that are safe
- Be provided required safety gear, such as gloves or a harness and lifeline for falls
- Be protected from toxic chemicals
- Request an OSHA inspection, and speak to the inspector
- Report an injury or illness, and get copies of your medical records
- See copies of the workplace injury and illness log
- Review records of work-related injuries and illnesses
- Get copies of test results done to find hazards in the workplace

STATISTICS

Employee exposure to unguarded or inadequately guarded machines is

prevalent in many workplaces. Consequently, workers who operate and maintain machinery suffer approximately 18,000 amputations, lacerations, crushing injuries, abrasions, and over 800 deaths per year. Amputation is one of the most severe and crippling types of injuries in the occupational workplace, and often results in permanent disability.

PREVENTION

General Safety Precautions

To avoid potentially life-threatening injury, employees should receive proper training before operating any machines or [power tools](#). Employees must never operate machinery without prior training. **Employees must:**

- Inspect all tools and guards before each use
- Follow all proper [lockout/tag out](#) procedures when necessary
- Use proper procedures when setting up a machine, adjusting a machine, clearing jams, and cleaning or lubricating parts
- Never remove guards while operating a machine
- Tag all damaged guards and machinery “Do Not Use” and report them immediately

METHODS OF SAFEGUARDING

There are five (5) general types of machine safeguards that can be used to protect workers and personnel in the immediate vicinity of machinery.

- **Guards**— these are physical barriers that prevent contact. They can be fixed, interlocked, adjustable, or self-adjusting.
- **Devices**— these limits or prevent access to the hazardous area. These can be presence-sensing devices, pullback or restraint straps, safety trip controls, two-hand controls, or gates.
- **Automated Feeding and Ejection Mechanisms**— These eliminate

the operator's exposure to the point of operation while handling stock (materials).

- **Machine Location or Distance**— this method removes the hazard from the operator's work area.
 - **Miscellaneous Aids**— these methods can be used to protect both operators and people in the immediate vicinity of operating machinery. Examples include shields to contain chips, sparks, sprays or other forms of flying debris; holding tools that an operator can use to handle materials going into the point of operation; and awareness barriers to warn people about hazards in the area.
-

Methane Gas

INCIDENT

In 2016, a 58-year-old coal miner died from injuries he sustained during an explosion of methane gas. He was working above ground at the time of the incident. The explosion took place underground, in a 753-foot-deep shaft.

The victim was standing on expanded metal grating which covered the opening of the shaft. He and another employee were working to repair loose guarding on a pump that feeds down into the shaft. The second worker had just stepped off the grating to grab a tool when the incident occurred.

The second worker remembers hearing a noise, loud like a jet engine, coming from inside the shaft. He yelled for his co-worker, the victim, to run. But the victims were standing in the direct line of fire. He was still on the grating of the shaft cover.

The noise that the witness heard was a methane explosion, traveling upward and out of the shaft. After an investigation, it was determined that the explosion took place because sparks and slag from their welding work had fallen into the shaft. The sparks

and slag made contact with excessive levels of methane.

The methane ignited, and created an intense fire and explosion. The victim received first aid on site, was evacuated via helicopter, and died at the hospital several days later.

NEED TO KNOW

Methane (a gas composed of carbon and hydrogen) is produced two ways. The first is through biologic decomposition of organic matter at shallow depths. Swamps, landfills, and even shallow bedrock are some settings where this occurs. Methane can also be derived over millions of years by high pressure and high temperature processes that produce fossil fuels deep underground. Examples include coal deposits and oil and natural gas accumulations.

Under the right conditions, methane gas can migrate into water wells along with the groundwater. High concentrations of methane in water wells can accumulate in confined spaces and act as an asphyxiant or become flammable. These dangers can be mitigated through enhanced venting of the well casing or venting confined spaces (like basements) and removing any ignition sources.

What are the potential health effects of methane?

Main Routes of Exposure: Inhalation.

- **Inhalation:** Low concentrations are not harmful. A high concentration can displace oxygen in the air. If less oxygen is available to breathe, symptoms such as rapid breathing, rapid heart rate, clumsiness, emotional upsets and fatigue can result. As less oxygen becomes available, nausea and vomiting, collapse, convulsions, coma and death can occur. Symptoms occur more quickly with physical effort. Lack of oxygen can cause permanent damage to organs including the brain and heart.
- **Skin Contact:** Not irritating. Direct contact with the liquefied gas can chill or freeze the skin (frostbite). Symptoms of mild frostbite include numbness, prickling and itching. Symptoms of more severe frostbite include a burning

sensation and stiffness. The skin may become waxy white or yellow. Blistering, tissue death and infection may develop in severe cases.

- **Eye Contact:** Not irritating. Direct contact with the liquefied gas can freeze the eye. Permanent eye damage or blindness can result.
- **Ingestion:** Not a relevant route of exposure (gas).
- **Effects of Long-Term (Chronic) Exposure:** Not harmful.
- **Carcinogenicity:** Not a carcinogen.

First aid measures for methane

Inhalation: Take precautions to prevent a fire (e.g. remove sources of ignition). In case of oxygen deficiency: take precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). Move victim to fresh air. Keep at rest in a position comfortable for breathing. If breathing is difficult, trained personnel should administer emergency oxygen. If the heart has stopped, trained personnel should start cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED). Immediately call a Poison Centre or doctor. Treatment is urgently required. Transport to a hospital.

Skin Contact: Not applicable (gas). Liquefied gas: quickly remove victim from source of contamination. DO NOT attempt to rewarm the affected area on site. DO NOT rub area or apply direct heat. Gently remove clothing or jewelry that may restrict circulation. Carefully cut around clothing that sticks to the skin and remove the rest of the garment. Loosely cover the affected area with a sterile dressing. DO NOT allow victim to drink alcohol or smoke. Immediately call a Poison Centre or doctor. Treatment is urgently required. Transport to a hospital.

Eye Contact: Not applicable (gas). Liquefied gas: immediately and briefly flush with lukewarm, gently flowing water. DO NOT attempt to rewarm. Cover both eyes with a sterile dressing. DO NOT allow victim to drink alcohol or smoke. Immediately call a Poison Centre or doctor. Treatment is urgently required. Transport to a hospital.

Ingestion: Not applicable (gas).

First Aid Comments: Some of the first aid procedures recommended here require advanced first aid training. All first aid procedures should be periodically reviewed by a doctor familiar with the chemical and its conditions of use in the workplace.

Fire hazards and extinguishing media for methane

Flammable Properties: FLAMMABLE GAS. Can easily ignite. Can readily form explosive mixture with air at room temperature. Can be ignited by static discharge.

Suitable Extinguishing Media: Dry chemical powder and high-expansion foam. Foam manufacturers should be consulted for recommendations regarding types of foams and application rates.

Unsuitable Extinguishing Media: DO NOT use carbon dioxide, low expansion foams, and direct application of water on liquefied gas.

Specific Hazards Arising from the Chemical: Gas or vapour may travel a considerable distance to a source of ignition and flash back to a leak or open container. Gas or vapour may accumulate in hazardous amounts in low-lying areas especially inside confined spaces, resulting in a health hazard. Can displace oxygen in the air, causing suffocation. Direct addition of water to liquefied gas will cause flash vaporization resulting in an explosion (either immediately or delayed) known as a “boiling liquid, expanding vapour explosion (BLEVE)”. Heat from fire can cause a rapid build-up of pressure inside cylinders. Explosive rupture and a sudden release of large amounts of gas may result. Cylinder may rocket. In a fire, the following hazardous materials may be generated: very toxic carbon monoxide, carbon dioxide.

Know the stability and reactivity hazards of methane

- **Chemical Stability:** Normally stable.
- **Conditions to Avoid:** Open flames, sparks, static discharge, heat and other ignition sources.
- **Incompatible Materials:** Increased risk of fire and explosion on contact with: strong oxidizing agents (e.g. perchloric

acid), halogens (e.g. chlorine). Not corrosive to: aluminum alloys, carbon steel.

- **Hazardous Decomposition Products:** None known.
- **Possibility of Hazardous Reactions:** None known.

Accidental release measures for methane are:

Personal Precautions: Evacuate the area immediately. Isolate the hazard area. Keep out unnecessary and unprotected personnel. Eliminate all ignition sources. Use grounded, explosion-proof equipment.

Methods for Containment and Clean-up: Stop or reduce leak if safe to do so. Knock down vapour with fog or fine water spray. Ventilate the area to prevent the gas from accumulating, especially in confined spaces.

Handling and storage practices used when working with methane

Handling: Eliminate heat and ignition sources such as sparks, open flames, hot surfaces and static discharge. Post “No Smoking” signs. If used in a confined space, check for oxygen deficiency before worker entry and during work. Secure cylinder in an upright position. Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Prevent accidental contact with incompatible chemicals. Additional information for handling refrigerated liquefied methane: ensure that cryogen dewar can withstand extremely low temperature. Cool the receiving container prior to transfer. Slowly fill containers or put objects into liquefied gas to minimize boiling and splashing. Do not overfill portable dewars.

Storage: Store in an area that is: cool, well-ventilated, temperature-controlled, out of direct sunlight and away from heat and ignition sources, clear of combustible and flammable materials (e.g. old rags, cardboard), separate from incompatible materials. Always secure (e.g. chain) cylinders in an upright position to a wall, rack or other solid structure.

The engineering controls for methane

Engineering Controls: Use local exhaust ventilation, if general ventilation is not adequate to control amount in the air. Use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas where this product is used and stored. Do not allow product to accumulate in the air in work or storage areas, or in confined spaces. For large scale use of this product: use stringent control measures such as process enclosure to prevent product release into the workplace.

Personal Protective Equipment (PPE) is needed when working with methane

Eye/Face Protection: Wear chemical safety goggles and face shield when contact is possible.

Skin Protection: Always wear insulated protective clothing, if contact with refrigerated gas is possible.

Respiratory Protection: Not normally required.

In areas of potential oxygen deficiency or where equipment failure may cause an immediate high concentration of methane, approved respiratory protection should be readily available.

Emergency or planned entry into unknown concentrations or into an area where there is less than 18% oxygen.

BUSINESS / REGULATIONS

The control of chemical hazards and toxic substances

It is OSHA's long-standing policy that engineering and work practice controls must be the primary means to reduce employee exposure to toxic chemicals, where feasible. Respiratory protection is required to be used if engineering or work practice controls are infeasible or while engineering controls are being implemented.

Requirements for respirator use

When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used.

Employers must provide appropriate respiratory protection at no cost to workers, provide appropriate training and education regarding its use, and ensure that workers use it properly. (See [29 CFR 1910.134](#) or OSHA's [Respiratory Protection Safety and Health Topics Page](#))

Information relating to specific chemicals

First, explore this **Safety and Health Topic webpage** that includes links to much of the related information available from **OSHA**, in addition, near the top of this page is a list of other Safety and Health Topic pages which address specific chemicals. Other sections contain information or links on subjects such as laboratory safety, and Hazard Communication or Process Safety. The [OSHA Occupational Chemical Database](#) compiles information from several government agencies and organizations. Information available on the pages includes chemical identification and physical properties, exposure limits, sampling information, and additional resources.

STATISTICS

In 2017, 41 U.S. workers died on the job after a single episode of inhaling chemicals and chemical products—7 more fatal injuries than in 2016. This number ranged between 33 and 55 fatal injuries each year from 2011 to 2017, with a total of 297 fatalities across the 7-year span.

Inhaling carbon monoxide led to the most fatalities during this time period (116 fatal injuries) followed by inhaling hydrogen sulfide (46 fatal injuries).

Of the fatal single episode inhalations of chemicals and chemical products from 2011 through 2017, 37 percent occurred in a confined space (110 fatal injuries). All fatal single inhalations of methane gas involved a confined space (9 fatal injuries).

Other chemicals and chemical products that led to fatal injury after a single inhalation in spaces that were confined and not confined were toluene (5 fatalities), solvents and degreasers (7 fatalities), dichloromethane (8 fatalities), and coal, natural

gas, petroleum fuels and products (11 fatalities).

These data are from the [Injuries, Illnesses, and Fatalities](#) program and include workers in the private sector and government. To learn more, see “[National Census of Fatal Occupational Injuries in 2017](#).” We also have [more charts](#) on fatal work injuries. For more on related Occupational Safety and Health Administration regulations, visit “[Chemical Hazards and Toxic Substances](#)” and “[Confined Spaces](#).”

In 2009, 784 people died of unintentional injuries due to non-fire exposure to gases. Anoxia, which is injury involving oxygen deprivation, accounted for 33,600 injuries reported to hospital emergency rooms in 2012, including 16,800 with no fire involvement.

During 1999–2010, a total of 5,149 deaths from unintentional carbon monoxide poisoning occurred in the United States, an average of 430 deaths per year. The average annual death rate from carbon monoxide poisoning for males (0.22 per 100,000 population) was more than three times higher than that for females (0.07). The death rates were highest among those aged ≥ 65 years for males (0.42) and females (0.18). The rates were the lowest for males (0.08) and females (0.04) aged < 25 years

PREVENTION

The incident report does not specify what type of clothing the victim was wearing. Flame-resistant materials may have protected him some. But his death was attributed to “internal burns.” It’s also reported that he received burns and lacerations to his face.

There are, however, different kinds of PPE and safety equipment that could have prevented this incident. In this particular case, the presence of methane was a known potential. And even though the area was abundant with “no smoke or open flame” signs, nothing was done to prevent sparks from falling down into the shaft. Welding blankets would have prevented that. A gas monitor could have been used as well, to detect the presence of methane.

7 Methane Gas Safety Tips

Methane gas is one of the worst greenhouse gases. Methane can also be dangerous, just like any other gas. That means you need to take precautions when around methane for your own safety.

1 – Ventilation

You're likely to find most methane when you're around a livestock manure pile. Any area like this needs to be well ventilated, even if it means the odor will be spread on the air. If you have to close the area off, be sure to wear safety goggles when you enter, as the gas will have accumulated. If it's a large area, wear a breathing mask when you first enter.

2 – Personal Safety

Personal protection is important when you're around methane gas. Always wear safety goggles and a breathing mask. You don't want to breathe in the methane gas so it enters your lungs, where it can burn.

3 – Dangers

Be aware that methane gas can asphyxiate. This is why it's so important to have the area well-ventilated or have breathing equipment. It's easy for the methane gas to displace the oxygen in the bloodstream. It can happen before you know you, and the result will be serious injury or even death.

4 – Explosions

Be aware that methane gas can be very explosive when it's concentrated. When you're around methane you should never smoke or have a naked flame-that's just asking for trouble. The flash point for methane gas is very low. You should keep it away from oxygen, halogens and interhalogens to keep it safer. It's vital that you not only treat methane with respect but also remain aware of just how volatile it can be.

5 – Manure Pits

If there's a manure pit it should be well signposted and fenced off. No one should smoke in the vicinity of a manure pit because of the danger of an explosion and fire. Methane gas is lighter than air so it can spread very easily. When methane gas burns it produces both carbon dioxide and carbon monoxide, both of which can kill.

6 – Storage

It's important to have the safe storage of methane gas. Containers of methane gas have to be in well-ventilated areas and away from all heat sources, including direct sunlight. If a fire does occur it's vital to cut off the methane gas supply and keep other containers cool by soaking them in water.

7 – Frostbite

When working with methane gas containers that are under pressure, always wear heavy gloves. This is because methane can cause frostbite on exposed skin, with all the pain. It will turn exposed skin white or pale yellow. The pain will soon decrease, but with care it can be avoided altogether.

When working with methane gas containers, cover all exposed skin, and have safety goggles and breathing equipment. This will give you ample protection in the event of an accident. Work slowly and methodically and keep the methane containers in ventilated areas for safety.

What are the Critical Elements of an Emergency Action Plan

1. Preparedness; save lives; confusion
2. Prevent injuries; uncertainty; emergencies;
3. Prevent injuries; save lives; limit property damage.

4. Confusion; emergencies; preparedness

ANSWER

Prevent injuries; save lives; limit property damage.

WHY IS IT RIGHT

Fire, natural disaster, and other emergencies can strike your workplace without warning. While you can't predict them, you can prepare for them and preparedness **save lives, prevent injuries, and limits property damage.**

CONDUCT HAZARD ASSESSMENT

The primary hazards in an emergency such as a fire, chemical release, serious machine malfunction, workplace violence, or natural disaster are often only the beginning of the damage and destruction. A hazard assessment will shed light on all these possible hazards.

IDENTIFICATION OF EMERGENCY CONTROL PROCEDURES AND WRITTEN EAP

The next step is to use the findings of your hazard assessment to develop a written Emergency Action Plan (EAP). The plan must include:

1. All possible emergencies, consequences, required actions, written procedures, and available resources.
2. A detailed list of personnel to contact in an emergency and their role in an emergency.
3. A list of external organizations to contact such as fire, rescue, and ambulance services; hospitals, police department and any government agencies; utility companies; and any industries in nearby that should be informed because of a potential safety risk to their workers and their operations.
4. Floor plans and large-scale maps showing excavation routes, emergency equipment, hazardous areas (i.e. chemical storage), as well as gas and water lines and other information as required by applicable safety regulations.

An EAP should include the following:

1. Personnel Assignments: The EAP should establish a clear chain of command in which all personnel have clearly assigned roles in the event of an evacuation. The EAP should designate:
 - A leader with authority to order an evacuation or shutdown.
 - An appropriate number of evacuation wardens to help with the evacuation and ensure that everybody is accounted for before evacuating themselves.
 - Individuals to remain behind to carry out or close-down vital plant operations before evacuating themselves.
 - Individuals authorized to perform rescue or medical duties in the event of an evacuation.
2. At a minimum, the EAP must incorporate the following procedures:
 - Procedures for reporting fires and other emergencies.
 - Emergency evacuation procedures, including evacuation type and identification of exit routes.
 - Procedures to help disabled employees that require assistance to evacuate.
 - Procedures for the employees who remain behind to operate critical plant operations before evacuating themselves.
 - Procedures to account for all employees after evacuation.
 - Procedures for the employees performing rescue or medical duties.
3. Alarm & Notification Systems including:
 - An alarm system that uses a distinctive signal that all employees recognize to communicate orders to evacuate or perform other actions under the EAP.
 - A public address or other emergency communications system that's available to use to notify employees of the emergency and contact local fire, police and other emergency respondents.
 - An auxiliary power supply in case electricity is shut off.
4. PPE & Protective Clothing: Workers counted on to extinguish fires or who are otherwise exposed to risk of fire and

explosion must be equipped with and use appropriate PPE and protective clothing.

- Foot and leg protection;
- Protective footwear;
- Body protection;
- Gloves or glove systems;
- Head, eye and face protection; and
- Respiratory protective equipment.

TRAINING AND EDUCATION

Workers must receive training and education needed to carry out their roles under the EAP.

Other items to educate workers on include:

- Threats, hazards and protective actions.
- Notification, communication and warning procedures.
- Means of locating family members in an emergency.
- Emergency response procedures.
- Evacuation, shelter and accountability procedures.
- Location and use of emergency equipment.
- Procedures for emergency shutdown.

Ensure workers understand and can apply their training on the job by:

- Quizzing workers on the lesson after you deliver it.
- Making workers demonstrate the procedures covered during the training.
- Making workers demonstrate proper use of the PPE covered during the training.
- Staging evacuation drills to verify that workers can carry out the EAP and evacuate safely in the event of a fire or other emergency.

INSPECT, MONITOR, REINFORCE, AND IMPROVE

- You must review the EAP with each worker the plan covers when:
- The EAP is first developed or the worker is first assigned

- to carry out a responsibility under the plan;
- The worker's responsibilities under the EAP change; and
- Changes are made to the EAP itself.

Monitoring must be carried out on an ongoing and continuous basis. The monitoring process never ends.

WHY IS EVERYTHING ELSE WRONG

Anything less than devising and implementing an EAP, will fall short of protecting the workplace in an emergency. Confusion and uncertainty are typical in an emergency. They happen from not knowing or recalling how to react or not recognizing the potential for danger.

Knowing and practicing what to do before an emergency occurs is a key step in protecting yourself and your co-workers.

If you do not feel you are ready for an emergency, contact your supervisor or safety contact in your organization. If you wait for an emergency to learn how to protect yourself, it's likely already too late!!!

What is the Current Dose Limits for Exposure to Licensed Sources of Radiation?

1. 100mSv over 5 years or 50mSv annually
2. 50mSv over 5 years or 10mSv annually
3. 500mSv over 5 years or 100mSv annually
4. 1000mSv over 5 years or 100mSv annually

ANSWER

1. 100mSv over 5 years or 50mSv annually

WHY IS IT RIGHT

All exposures to ionizing radiation carry a risk of biological damage, although this risk decreases as the exposure decreases. For example, the risk associated with natural background radiation is very small, although elevated levels of naturally occurring radon increase the risk of lung cancer. For workers in certain industries, such as miners and medical radiographers, the risk is slightly higher. Exposure levels as a result of a nuclear or radiological emergency can vary widely, depending on the nature of the incident, the type of radiation involved, and even weather patterns.

Dose assessment

There are a number of factors that must be taken into consideration in calculating the quantity, or dose, of radiation a person has received, including:

- the nature of the ionizing radiation,
- the strength of the source,
- the biological sensitivity of the area exposed, and
- exposure factors such as time, distance, and shielding from the source.
- This calculation is referred to as a dose assessment.

Radiation dose terminology

The terminology used for specifying radiation dose and its effects on the human body has been developed to account for all the factors that are important in determining its biological impact. The most frequently used dose measurements are absorbed dose, equivalent dose, effective dose, and collective dose, which are all briefly described below.

- **Absorbed dose:** As radiation passes through matter, some of its energy is left behind; that is, it is “absorbed” by the matter. This is referred to as the absorbed dose, and the measurement of this dose is given in grays (Gy).
- **Equivalent dose:** Different types of radiation have different effects on tissue. In order to account for these

differences, the absorbed dose is multiplied by a radiation weighting factor. This factor is dependent upon the type and amount of radiation involved. The result is referred to as the equivalent dose, and it is expressed in sieverts (Sv).

- **Effective dose:** Different tissues and organs are affected differently by radiation. For example, lung tissue is more likely to be affected by radiation than is the skin. In order to account for the differing sensitivities, the equivalent dose is multiplied by a tissue weighting factor: the resulting unit is referred to as the effective dose. The effective dose is also given in sieverts.
- **Collective dose:** The collective dose refers to the amount of radiation received by a group of people. It is calculated by multiplying the average effective dose received by the number of persons exposed. The collective dose is expressed in person-sieverts (person-Sv).

WHY IS EVERYTHING ELSE WRONG

You are exposed to radiation on a daily basis, most of it in very small doses; however, if you are working in a job where exposure is a risk (dental office, x-ray clinic, airport, etc.) you should have a meter and be measuring your exposure over time. Radiation poisoning does not make you a superhero, it can lead to very serious effects like cancer, organ failure, or death.

Here is a list of some common everyday things that emit radiation.

1. **Hand-held lasers and laser pointers**
2. **Airport full-body scanners**
3. **Tanning beds and lamps**
4. **Smart meters**
5. **Power lines and electrical appliances**
6. **Wi-Fi**
7. **Compact fluorescent lamps**
8. **Wind turbines**
9. **Cell phones and cell phone towers**
10. **Personal stereo systems**
11. **Airplanes**
12. **Microwave ovens**

Acute Radiation Syndrome (ARS) (sometimes known as radiation toxicity or radiation sickness) is an acute illness caused by irradiation of the entire body (or most of the body) by a high dose of penetrating radiation in a very short period of time (usually a matter of minutes). The major cause of this syndrome is depletion of immature parenchymal stem cells in specific tissues. Examples of people who suffered from ARS are the survivors of the Hiroshima and Nagasaki atomic bombs, the firefighters that first responded after the Chernobyl Nuclear Power Plant event in 1986, and some unintentional exposures to sterilization irradiators.

The required conditions for Acute Radiation Syndrome (ARS) are:

- **The radiation dose must be large** (i.e., greater than 0.7 Gray (Gy)^{[1](#), [2](#)} or 70 rads).
 - Mild symptoms may be observed with doses as low as 0.3 Gy or 30 rads.
- **The dose usually must be external** (i.e., the source of radiation is outside of the patient's body).
 - Radioactive materials deposited inside the body have produced some ARS effects only in extremely rare cases.
- **The radiation must be penetrating** (i.e., able to reach the internal organs).
 - High energy X-rays, gamma rays, and neutrons are penetrating radiations.
- **The entire body** (or a significant portion of it) must have received the dose^{[3](#)}.
 - Most radiation injuries are local, frequently involving the hands, and these local injuries seldom cause classical signs of ARS.
- **The dose must have been delivered in a short time** (usually a matter of minutes).
 - Fractionated doses are often used in radiation therapy. These are large total doses delivered in small daily amounts over a period of time. Fractionated doses are less effective at inducing ARS than a single dose of the same magnitude.

The three classic ARS Syndromes are:

- **Bone marrow syndrome** (sometimes referred to as hematopoietic syndrome) the full syndrome will usually occur with a dose between 0.7 and 10 Gy (70 – 1000 rads) though mild symptoms may occur as low as 0.3 Gy or 30 rads⁴.
 - The survival rate of patients with this syndrome decreases with increasing dose. The primary cause of death is the destruction of the bone marrow, resulting in infection and hemorrhage.
- **Gastrointestinal (GI) syndrome:** the full syndrome will usually occur with a dose greater than approximately 10 Gy (1000 rads) although some symptoms may occur as low as 6 Gy or 600 rads.
 - Survival is extremely unlikely with this syndrome. Destructive and irreparable changes in the GI tract and bone marrow usually cause infection, dehydration, and electrolyte imbalance. Death usually occurs within 2 weeks.
- **Cardiovascular (CV)/ Central Nervous System (CNS) syndrome:** the full syndrome will usually occur with a dose greater than approximately 50 Gy (5000 rads) although some symptoms may occur as low as 20 Gy or 2000 rads.
 - Death occurs within 3 days. Death likely is due to collapse of the circulatory system as well as increased pressure in the confining cranial vault as the result of increased fluid content caused by edema, vasculitis, and meningitis.

The four stages of ARS are:

- **Prodromal stage (N-V-D stage):** The classic symptoms for this stage are nausea, vomiting, as well as anorexia and possibly diarrhea (depending on dose), which occur from minutes to days following exposure. The symptoms may last (episodically) for minutes up to several days.
- **Latent stage:** In this stage, the patient looks and feels generally healthy for a few hours or even up to a few weeks.
- **Manifest illness stage:** In this stage the symptoms depend on

the specific syndrome (see Table 1) and last from hours up to several months.

- **Recovery or death:** Most patients who do not recover will die within several months of exposure. The recovery process lasts from several weeks up to two years.
-

What are the Big 3 for Providing a Safe Workplace With Regard to Equipment/Machinery?

1. Personal Protective Equipment; training; hazards.
2. Supervision; maintenance; inspections/ risk assessment.
3. Training; maintenance; guards.
4. Training; maintenance; inspections/risk assessment.

ANSWER

Training; maintenance; inspections/risk assessment.

WHY IS IT RIGHT

Training is required to use machinery

Training must be sufficient to ensure that all people know how to competently use any equipment they use at work, without unnecessary risks to the health and safety of themselves or others. Training therefore depends on the task, and to what extent an employee already has relevant knowledge and experience. Individual training needs are likely to be greatest when a person is first recruited, although further training may also be required in any of the following examples:

- if the work task and its associated risks change
- if new technology or equipment is introduced

- if the system of work changes

In many industrial sectors, there are well-recognized standards for training, whether delivered in-house or by external providers. These are often accompanied by some form of competence assessment to help ensure minimum standards of attainment. However, for many simple tasks, on-the-job training, which is locally assessed and backed up with simple records, will suffice. There will also be a need for refresher training to ensure that skills don't decline. Again, the nature and frequency of refresher training should be sufficient to ensure ongoing health and safety, so far as reasonably practicable.

To be appropriately trained to prepare and check work equipment, doesn't always mean formal, certificated training. Often the work to prepare or check equipment prior to use can be carried out following manufacturer's instructions using basic skills and common sense. However, for certain types of equipment, there are well-recognized industry schemes that cover, for example, the mounting of abrasive wheels. There are also certain equipment-specific legal requirements.

Information Needed in Use of Work Equipment

Any worker who uses or operates work equipment, or any other person who may be affected by the use of the equipment, **must be made aware of the hazards involved.**

Any person using work equipment must be **properly trained** in the safe use of the equipment or machinery. There should also be **proper supervision** and **inspection of the use of work equipment** to ensure that safety procedures are followed correctly.

Risk assessments

Before any work equipment or machinery is used or installed a risk assessment must be carried out. The purpose of the risk assessment is to identify the hazards and risk of injury that may arise when using the work equipment. The risk assessment should also identify ways in which the hazards and risk may be eliminated or reduced.

Hazards

There are many ways in which work equipment and its use can create a risk of injury. The most common hazards are:

- **Entrapment**– for example when fingers are caught in the moving parts of a machine
- **Impact**– when workers are crushed by moving parts of equipment or by other items being processed by a machine
- **Contact**– when the body comes into contact with sharp edges, hot parts or live electrical items
- **Entanglement**–when clothing, hair or jewelry become caught in parts of a machine
- **Ejection**– when workers are hit by parts or objects flying out or off machines

Maintenance

Maintenance work should only be undertaken by those who are competent to do so, who have the necessary knowledge and experience to:

- know what to look at
- know what to look for
- know what to do, and
- be aware of, and able to avoid, unnecessary risks to themselves and others

In some cases, workers undertaking maintenance on certain types of equipment should have specific training which is relevant to that work (eg where they may encounter asbestos).

*Employers have the duty to provide suitable work equipment that is **well designed** and **suitable** for the job.*

When selecting new work equipment employers should:

- obtain full information about the safe use of the equipment
- ensure that the equipment has a CE safety mark to show that it complies with standards
- arrange adequate training for using the equipment

Inspections

Employers, you are legally required to provide safe equipment for use in connection with your work. Where the safe of equipment depends on the installation conditions or is exposed to conditions causing deterioration liable to result in dangerous situations, you must inspect your equipment to identify whether it can be operated, adjusted and maintained safely. Doing this on a regular basis can help you detect any deterioration and take action before it results in any health and safety risk.

Inspection frequencies depend on the type of work equipment, its use and the conditions to which it is exposed. This should be determined through:

- risk assessment, taking full account of any manufacturer's recommendations
- the advice of others, such as trade associations and consultants
- other sources, such as published advice on health and safety

Different types of inspection include:

- quick checks before use (eg the condition of electric cables on hand-held power tools, functional testing of brakes)
- weekly checks (eg tire pressures, presence of guarding, function of safety devices)
- more extensive examinations, undertaken every few months or longer (eg the general condition of a ladder, close examination of a safety harness, portable appliance testing).

Use of personal protective equipment and clothing

This may be necessary when certain hazards from work equipment cannot be avoided. Examples of personal protective equipment and clothing that may be necessary when using work equipment are:

- safety helmets
- gloves
- safety goggles

- ear protectors
- safety footwear
- types of clothing – for instance high visibility garments

Personal protective equipment or clothing must:

- be suitable for the task being undertaken
- give adequate protection against the hazard
- fit properly and comfortably

WHY IS EVERYTHING ELSE WRONG

The scope of work machinery is very wide. Consider work equipment as any machinery appliance, apparatus, tool, or installation like a conveyor belt at work.

The essence of providing a safe workplace is encapsulated in the **Big Three:**

1. **Training**
2. **Maintenance** and
3. **Inspection/Risk assessments**

Everything else takes a second place!!

What are the 4 Key Action Items of Preventative Maintenance?

1. Maintenance; inspection; detection; work environment.
2. Detection; correction; defective equipment; maintenance.
3. Inspection; detection; correction; prevention.
4. Work environment; inspections; equipment performance; prevention.

ANSWER

Inspection; detection; correction; prevention.

WHY IS IT RIGHT

WHAT IS PREVENTIVE MAINTENANCE?

[Preventive maintenance](#) (also called “preventative” maintenance) is a systematic approach to building operations that aims to predict and prevent catastrophic equipment failures before they occur.

it's better to *prevent* issues than *react* to them. Preventive maintenance reduces the likelihood of unexpected issues by promoting optimal equipment performance.

- Schedule and perform regular inspections of equipment
- Conduct regular cleaning of buildings, grounds and assets
- Lubricate moving parts to reduce wear-and-tear
- Adjust controls for optimal performance and energy efficiency
- Repair and replace any defective equipment parts

THE FOUR KEY ACTION ITEMS OF PREVENTIVE MAINTENANCE?

Preventive maintenance takes a proactive approach towards maintenance and involves four key action items:

1. **Inspection:** Inspections are a necessary part of preventive maintenance and aid organizations in two ways. First, [facility inspections](#) ensure that equipment is safe to use. Regular inspections help prevent workplace injuries and provide a business with increased liability protection. Second, regular inspections protect property. Inspections ensure that equipment is functioning as the manufacturer intended.
2. **Detection:** Operating on a run-to-failure approach can end up costing a facility department significant money, which is why many facility managers choose to utilize a preventive approach to maintenance. Preventive maintenance helps facility managers detect problems early, when issues are still relatively easy and inexpensive to fix.
3. **Correction:** Preventive maintenance encourages facility

managers to take a proactive approach towards equipment care and correct issues before they occur.

4. **Prevention:** Facility managers can combine inspection records and maintenance notes to learn from past mistakes and correct repeated issues with equipment. Prevention of asset failure reduces stress and increases productivity for facilities teams.

THE BENEFITS OF PREVENTIVE MAINTENANCE

Facility managers and their teams can use the principles of preventive maintenance to achieve various benefits, including the following:

- Diminish excess [depreciation of equipment](#)
- Prevent untimely breakdowns of critical equipment
- Eliminate unnecessary inspections and maintenance tasks
- Save money by extending the useful life of assets
- Prepare for and prevent future issues from occurring

PREVENTIVE MAINTENANCE REDUCE RISK IN MY FACILITY

Facility managers and their teams are responsible for securing these risks and upholding safety in a facility.

Employers must provide welfare facilities and a working environment that's healthy and safe for everyone in the workplace, including those with disabilities.

You must have:

- **welfare facilities** – the right number of toilets and washbasins, drinking water and having somewhere to rest and eat meals
- **a healthy working environment** – a clean workplace with a reasonable working temperature, good ventilation, suitable lighting and the right amount of space and seating
- **a safe workplace** – well-maintained equipment, with no obstructions in floors and traffic routes, and windows that can be easily opened and cleaned.

WHY IS EVERYTHING ELSE WRONG

The four key action items of preventative maintenance underscore the following: to prevent is to be proactive and not reactive. If you have to react to issues all the time, you are probably losing time, money and putting your workers at risk.

That is why everything else but **Inspections, Detection, Correction**; and **Prevention** is wrong!!

What are the 5 Key Elements of Pre-Job Briefings?

1. Identify hazards; ensure workers safety; protect equipment and public.
2. Plan work; identify hazards; ensure workers safety
3. Protect equipment and public; plan work; security.
4. Environmental controls; security; identify hazards.

ANSWER

Identify hazards, ensure workers safety; protect equipment and public.

WHY IS IT RIGHT

Employee failure to identify and grasp jobsite hazards has led to numerous electrical utility accidents. Before ever stepping foot on a work site, employees need to know what hazards exist and what steps to take to reduce the risk of accident and injury.

Job briefings help you plan your work and ensure employee safety, protect equipment, and protect the public from whatever could go wrong. They are delivered by a senior person on the site such as a supervisor, project manager or site foreman.

WHAT DO EMPLOYEES EXPECT FROM PRE-JOB BRIEFING?

1. Discussion of hazards associated with the job

- Be reminded where hazard management plans are kept on the site.
- Supervisor completes a briefing checklist.
- Be told the Minimum Approach Distances (MAD) for unprotected parts of the body.
- Discuss "Extended Reach".
- The presence of any hazardous substances highlighted, especially in power generation facilities.
- Other dangers, such as:
 - high air pressure;
 - high water pressure;
 - pressurized chemical injection systems;
 - steam pressure;

2. Review of hazard management plans

- What is to be done and in what sequence.
- How it is to be done and by whom.
- Possible hazards and how they are to be addressed.
- The status of energy sources.
- Personal protective equipment requirements.
- All changes in procedure and scope of the work.

3. How to deal with significant changes

- Different kinds of tasks on the same shift.
- New personnel or spectators.
- Changing weather.
- Significant delays (e.g., interrupting work for a trouble call, then resuming).
- Changing scope of work.
- Unexpected complications, hazards, malfunctions, or distractions.

4. To be brief or not to be

- Short briefings are needed for:
 - daily updates;
 - routine work;

- employees' training and experience are adequate to recognize and avoid hazards.
- Extensive briefings are needed for:
- complicated or hazardous work;
- employees who might not have the experience to recognize and avoid hazards.

5. Remember these meetings are for you and your safety

- Get involved in the briefing, don't just listen.
- Make suggestions about how to stay safe.
- Raise health and safety concerns.

WHY IS EVERYTHING ELSE WRONG

In summary, hazards must be identified communicated, controlled and managed

The five key elements covered in the Pre-Job briefings are: hazards associated with the job, work procedures involved, special precautions, energy source controls, and personal protective equipment (PPE) requirements.

Without the aforementioned in place, everything is wrong.

What are the Most Important Excavation and Trenching Safety Factors?

1. Inspection guideline; vibrations; training.
2. Protective systems; pre-planning; soil types
3. Protective systems; pre-planning; inspection guidelines
4. Competent person; regulatory; training.

ANSWER

Protective systems; pre-planning; inspection guidelines

WHY IS IT RIGHT

An excavation is any man-made cut, cavity, hole, trench, or depression made in the earth's surface by the removal of soil. Workers in excavations can be exposed to cave-ins, engulfment, hazardous atmospheres, and falls.

Cave-ins are the greatest risk to workers in an excavation or trench. Other hazards include falling loads, moving equipment, falls, confined space hazards, and hazardous atmospheric conditions.

Prevention

There are procedures and protocols that must be followed by excavation and trench workers. Too often tragedy occurs when these protocols and procedures are not followed. The answer **protective systems**.

Designing a protective system requires consideration of many factors, including: [soil classification](#), depth of cut, water content of soil, weather and climate, and other operations in the vicinity. Choose the most practical design that will provide the necessary protections. The most common protective systems are:

- Sloping – cutting back the trench wall at an angle away from excavation.
- Shoring – supporting the walls of the trench by installing wood or metal cross-braces to prevent the soil from caving in.
- Shielding – using trench boxes placed in the excavation to prevent the sides from collapsing.

Pre-planning

Waiting until after the work starts to correct mistakes in shoring or sloping slows down the operation, adds to the cost of the project, and makes a cave-in or other excavation failure more likely.

Before preparing a bid, you should know as much as possible about the jobsite and materials needed to perform work safely and in compliance with safety standards. Factors to consider:

- Traffic
- Proximity and physical condition of nearby structures
- Soil classification
- Surface and ground water
- Location of the water table
- Overhead and underground utilities
- Weather
- Quantity of shoring or protective systems that may be required
- Fall protection needs
- Number of ladders that may be needed
- Other equipment needs

Inspections

A competent person must inspect excavations, adjacent areas, and protective systems daily for possible cave-ins, indications of failures in protective systems and equipment, hazardous atmosphere, and other hazardous conditions.

Inspections must be done prior to the start of work and as needed throughout the shift and are required after natural events, such as rainstorms, or other hazard-increasing occurrences, such as blasting work.

If unsafe conditions are found during an inspection, workers must be moved away from the hazardous area until the necessary safety precautions have been taken.

WHY IS EVERYTHING ELSE WRONG

There are few activities as risky as excavation and trench work. Though **Protective Systems**, **Pre-Planning** and **Inspections** are the core of excavation and trench work, **training** is also vital.

Any workers who has a part in any excavation work must be trained on the procedures and responsibilities they have for working

safely in excavations and trenches. This includes the competent person, supervisors, equipment operators, and the workers down in the excavations. Training must cover hazards, protective measures and PPE required, how to identify potential and existing hazards and report dangerous conditions.

What are the 3 Most Critical Elements of Emergency Equipment?

1. Emergency situations; readiness; training.
2. Emergency equipment; power supply; maintenance.
3. Emergency equipment; properly located; training and maintenance.
4. Regular inspections; readiness; hazards.

ANSWER

Regular inspections; readiness; hazards.

WHY IS IT RIGHT

1st Question

Where should emergency equipment be located?

A Hazard Identification process should be conducted to identify all locations where emergency equipment may be required.

This should include equipment such as:

- Firefighting equipment
- Drench showers and eye-baths where workers are at risk of being in contact with harmful substances (particularly

corrosive substances such as acids).

- Spill control equipment

Emergency equipment should be located in easily accessible areas and within a reasonable distance from the source of hazard.

2nd Question

Is training required?

It is essential to train all personnel so that they are thoroughly familiar with the locations of all emergency equipment and the correct methods for using them.

It is also beneficial to ensure that all staff members are familiar with the use and locations of emergency equipment during the induction training process.

3rd Question

What maintenance is needed?

To ensure that all emergency equipment is in proper working order, regular inspections and maintenance must be carried out. This will put your equipment in a state of readiness in the event of an emergency.

Enlist qualified personnel to carry out all inspections in accordance with controlled inspection check sheets.

Be sure to keep full records of inspections and testing of emergency equipment.

Minutes and seconds can seem like an eternity in an emergency situation. To prevent injuries and save lives, quick actions are needed. Emergency equipment must be:

1. Properly located;
2. Properly maintained; and
3. Staff properly trained in the use.

WHY IS EVERYTHING ELSE WRONG

The important takeaway in the discussion of Emergency Equipment management is to recognize the importance of the **BIG TREE** nearby, emergency equipment location proper training and proper maintenance schedules for all emergency equipment. All other collateral issues though important in the achieve of safety, are loss important. These include emergency devices and lights and emergency power supply.

Overhead Hazards

INCIDENT

A comparison in real time between a **Near-Miss/Close Call** and a **fatality**.

See a video online in which workers in Rio de Janeiro are repairing the 125-foot-high Christ the Redeemer statue after it was struck by lightning. In the video, the workers are tied off but are using a hammer and chisel that are not tied off and below is a crowd of people. In the middle of the video, one of the workers answers a call from his son on his cell phone, which also is not tied off.

In another example, a man delivering sheet rock to a construction site in Jersey City was killed by a tape measure. The independent contractor for a trucking company was leaning into a car window to speak with someone and when he pulled his head out, he was struck by a one-pound tape measure that had slipped out of a worker's hands 50 stories above.

Needless to say, if that worker on the statue in Rio de Janeiro had dropped his hammer and it had hit a visitor below, it likely would have caused a fatality.

NEED TO KNOW

The focus for all objects at heights should always be on preventing objects from falling rather than a catching object, or on limiting the damage after they fall.

BUSINESS / REGULATIONS

Fewer than 25% of construction workers think that all accidents are preventable. What is more clear that workers often view themselves as victims of accidents and not as the cause of accidents.

We expect workers at height to wear a fall protection harness and be tied off because we're trying to prevent people from falling.

But we need to stop things from falling in the same way we have worked diligently towards preventing people from falling.

To determine what kind of force an object falling from a certain height generates, calculations can be done around the physics of gravity. For example, an eight-pound wrench dropped 200 feet would hit with a force of 2,833 pounds per square inch – the equivalent of a small car hitting a one-square-inch area.

Most organizations have deployed a fall protection program for workers but have not deployed a drop prevention program for tools and equipment. Expanding a fall protection program to include tools and equipment is far easier for companies and employees than creating a new program for drop prevention.

The difference between a fall protection program for humans and fall protection program for tools is only a matter of perspective: The first saves you; the second saves others.

While the most obvious person at risk when objects are dropped is the one underneath, the worker using the tool also can be at risk, as his knee-jerk reaction may be to catch or go after the falling object, which could cause him/her to lose balance and fall.

People are not designed to work at height. That's why they wear a fall protection harness. Tools are not designed for use at height either. That's why we also need to provide a fall protection

harness and connection point for tools – so they easily can be tied off.

A harness for a person acts as the primary component of a personal fall protection system. However, for tools, we typically rely on secondary, passive systems, such as debris nets. We rarely deploy a primary system for tools and equipment.

STATISTICS

The third largest cause of death in the workplace, behind transportation incidents and workplace violence, is contact with objects and equipment, the majority of which are being struck by a falling object.

There are more than 52,260 recorded incidents of people being struck by falling objects in the last recording period, according to OSHA. This number likely is much lower than the actual number, of course, but this would mean that, on average, nearly 143 objects strike people every day – including Saturdays and Sundays – in the United States alone.

PREVENTION

An ounce of prevention, will yield much more than a pound of cure in Overhead Hazards with other objects.

Dropped Objects Prevention – Best Practices and Solutions

1. Expand fall protection programs to include tools and equipment.
2. Provide a competent person to manage the expanded program.
3. Raise awareness of drop hazard identification and mitigation techniques within the workforce.
4. Require risk assessments before performing work with drop hazards.
5. Consider regularly scheduled “hazard hunts” to drive awareness of drop hazards.
6. Consider using tethered tools. These tools either have built-in connection points placed by the manufacturer or can be retrofitted with connection points. Next, the tools are

connected to a lanyard. This solution not only applies to small hand tools, but also can be used for tools and small pieces of equipment that weigh up to 80 pounds, such as rivet busters, portable generators, etc. Tethered tools mostly are used by larger construction companies and are not in wide use yet. But this may change, as younger workers tend to be more concerned with safety than veterans.

7. Consider using energy-absorbing lanyards, which will reduce the force associated with the dropped tool. Tools either can be connected to a worker through a tool belt, harness or wristband, or anchored to a fixed structure.
8. Tools that weigh more than five pounds should never be tied-off to a person. If a heavy object gets loose, the weight and force could dislocate a wrist or shoulder or even pull a worker over a ledge or scaffolding.
9. If a worker has a tool attached to him and needs to pass it off to a colleague, that colleague can connect to the tool before the passing worker disconnects from it, ensuring the tool is 100 percent tied off and never has the opportunity to become a drop hazard.
10. Employees should be properly trained on how to use tethered tools. They must be taught how to attach a connection point to the tools, use the lanyards properly and respect the weight rating of the lanyards.
11. As a best practice, workers at height should only bring up the tools they need to do their job.
12. Hoist up items and then transfer them over with different lanyards to the workers themselves or to static anchor points. This can be done in a bucket, which can then house the extra tools. But many popular plastic buckets present other safety concerns, as they frequently fall over, spilling their contents.
13. There are many buckets, bags and pouches available on the market with closure systems to dramatically reduce the likelihood of items falling out. Some even close automatically when turned upside down.
14. A secondary solution to dropped objects are toe boards. Toe boards should be capable of withstanding a force of at least

50 pounds in any downward or outward motion.

15. Debris nets are another secondary solution and provides a way to catch dropped objects. Green netting that goes over buildings when they are being refaced in areas where there are a lot of pedestrians is the most recognized form, but there also is netting that is put up within the construction project, such as directly under work being done, to help stop objects from falling on workers below. However, nets can't be the only solution, as objects often don't fall straight down or are small enough to go right through the debris netting.

Why is all the Preventive Procedures necessary?

OSHA can use the General Duty clause to cite companies when dropped objects have caused injuries or are a hazard, but OSHA rarely cites a company for dropped objects under the General Duty clause. The clause says there must be a hazard; the hazard must be recognized; the hazard causes or is likely to cause injury or death; and the hazard must be correctable.

Distracted Worker

INCIDENT

A worker at a shipyard was installing hatch covers on the top of deck openings and was applying silicone to rubber gaskets to keep them from drying out. A hatch lowered into position as he was applying the silicone. Since he was talking with a coworker, he wasn't paying attention to where the hatch was.

His hand got stuck and was crushed.

He no longer has feeling in his hand, even after 6 months of therapy. A "disabled" classification made it so he had to look for a new insurance carrier.

NEED TO KNOW

Many people think they can multitask effectively, but studies have shown that people are incapable of doing several things well simultaneously.

1. Three common distractions in the workplace that may not be dangerous, but definitely cause stress and reduce productivity are: loud co-workers, people stopping by for a chat, and too many meetings that take up too much work time.
2. If you find yourself distracted and unable to focus, one thing that can help is to take a quick break outside and get some fresh air.
3. A whopping 80 percent of young drivers polled believe that texting while driving makes no difference to their driving performance. (National Highway Transportation Safety Administration)
4. An interruption of less than five seconds causes a tripling of task-related errors made by workers. (Michigan State University)
5. Reports of distracted walkers being treated at emergency rooms increased by four times over a seven-year period. (Associated Press)
6. One form of workplace distraction that many people might find surprising is poor housekeeping. Something as simple as putting a screwdriver down in a messy area and being unable to find it can cause frustration, waste time and distract workers from the jobs they are performing.
7. Two things supervisors need to do to minimize dangerous distractions are: Train workers to never approach co-workers who are performing safety-sensitive tasks until those tasks have been completed and, train operators to shut down equipment, turn power tools off and stop what they are doing before talking to another worker who approaches them.

Accidents occur for many reasons. In most jobsites people tend to look for “things” or “people” to blame when an accident happens, because it’s easier than looking for “root causes,”

Failure to Pre-Plan the Work:

There is a lot of talk today about Job Hazard Analysis. JHA's are an effective way to figure out the smartest ways to work safely and effectively. Being hasty in starting a task, or not thinking through the process can put you in harm's way. Instead, Plan Your Work and then Work Your Plan.

While some factors in the workplace can play a role in causing distractions, the fact remains that more hazards result from unsafe acts than from unsafe conditions. In truth, much of the safety of employees lies in their hands. So think straight, follow safe procedures and you don't have to worry about hurting yourself before each work day ends!

Mental Distractions:

Mental distractions often lead to inattention. You could miss noticing that another worker is working below you just because you're too engrossed over that argument you had with your wife. Whether you're worrying, daydreaming, or chatting, mental distractions can be likened to hazards or defects in machines that you need to secure with "guards". Always remind yourself of these mental distractions with a DANGER sign, close the "door" and focus on the work at hand.

If that's all too hard to do, then you may consider taking a break and getting some fresh air to blow those distracting thoughts away or finishing that nice chat with a co-worker.

Poor Housekeeping:

Housekeeping is a big player for you to continue focusing on your job, safety is next to the latter as well. Just imagine how distracted you'd be if your workstation is cluttered with all your personal stuff, unsorted files, bolts, screws, wires, food wrappers and other junk. Visual clutter can easily translate itself to mental clutter. It would be easy to miss that obstruction in the equipment operations when dust and all these debris mess up with your focus.

Ignoring Safety Procedures:

Purposely failing to observe safety procedures can endanger you and your co-workers. You are expected to follow the company safety policies-not to make your own rules. Being “casual” about safety can lead to a casualty!

Here are Some of the Most Common Distractions in the Workplace and Measures you can Take to Minimize or Eliminate them.

Pressure to Perform

Companies often demand employees meet deadlines or quotas to ensure profitability. However, getting work done quickly can often overshadow safety. The risk of injury increases substantially when supervisors or managers urge employees to work towards a goal instead of doing all work safely.

Employees may also push themselves to do more than they should to meet or exceed production goals. They may want management to notice their performance in hopes of a raise or promotion, or simply to ensure job security.

Regardless of whether the company or the employee exerts pressure to perform, the result is often the same. Employees take risks to meet goals, injuries impact your production goals and safety record, and insurance premiums increase.

Repetition Breeds Complacency

When employees perform the same tasks repeatedly, they're confident they know their job. The work becomes routine and employees can do the work automatically. Unfortunately, daydreaming in the workplace or becoming over-confident can cause employees to overlook existing or new hazards which can lead to injuries.

Internal Distractions

Socializing with fellow employees is great in the lunchroom or during a coffee break, but it is a major distraction while

working. When employees are busy talking about their weekend plans while they're working, they're not totally focused on their work.

Of course, you can't tell people not to talk to each other, and socialization is an important part of the work environment. However, you can minimize interruptions, which clearly pose a safety threat.

External Distractions

Employees often carry distractions with them when they come to work. They may have financial worries, problems with the kids, or they're thinking about their upcoming vacation.

BUSINESS / REGULATIONS

There are many ways in which safety, operations, and production can gauge how a culture is doing in terms of combating safety complacency, beyond just a review of the Lost Time Injury (LTI) and Experience Modification Rate (EMR) rates in recent years. Do safety leaders—such as the operations manager, superintendent or general manager—take the time to walk with the on-site safety professionals? Or, if an incident occurred, and corporate staff conducted a review and came up with a list of items that could be incorporated into policy to prevent or to curb re-occurrence—were those changes actually implemented?

Another question: have other leaders in the organization listened to, or taken to heart the hazards that field personnel have brought to our attention—or have they just placed their suggestions into the back of their memory bank and gone on with their day?

What Is Safety Complacency?

Complacency is a state of mind where a worker is out of touch with the hazards and risks around them. Often times, complacency happens over time, where workers take the conditions or the context around for granted.

For example, consider a worker who is so caught up in a regular

routine each day, that he/she doesn't notice cues around them that are out of the norm. These signs could be something that's wrong with his/her equipment, or worse yet, it could be a more immediate threat that could put his/her in harm's way. If someone is cutting corners on protocol, or almost in a "trance" on the job, they are potentially putting his/her life, and others' lives, at risk.

Complacency can be one of the most problematic mindsets that can contribute to injuries and incidents on the job.

Additional Liabilities for Distracted Employees

As any employer with industrial machinery knows, preventing accidents starts with making sure employees are aware of their surroundings. The inappropriate use of cell phones imperils employees' ability to recognize and react to hazards, such as passing forklifts, which can hit pedestrian employees. Of recent concern is the use of "augmented reality" games, such as **Pokémon Go**, in which players view the world through cell phone screens, walk around while distracted, and search real world sites for game-related information. These games encourage cell phone use and distraction while walking around, and should be prohibited from the worksite.

OSHA citations and associated penalties are not the only liabilities that employers must be concerned about when it comes to cell phone distractions. For example, thirteen states ban the use of handheld phones while driving for talking. 46 states and the District of Columbia ban text messaging for all drivers, and in many of the remaining states similar bans are in place at the county or city level. These laws make texting while driving illegal and also open employers to liability for accidents that result from their employees' distracted driving and improper use of cell phones.

Employees face both individual civil and criminal liability for damages that result from accidents caused by texting while driving or engaging in other work. Likewise, employers face vicarious liability for the acts of their employees under agency law for personal injury or property damage they cause during the course of

employment. When an accident happens as a consequence of distracted driving or operating machinery while the employee is on company time, the employer is potentially liable. Where the employer has not affirmatively prohibited texting while driving and enforced that policy, the employer faces potential liability as a result of the accident.

Vicarious liability, as it is called, is not a new legal concept. Employers have faced liability in similar situations for decades for the acts of their employees that occur during the course of the employment relationship. Consider the claims made against pizza delivery companies whose drivers were instructed to deliver a pizza in 30 minutes or less. In the context of distracted driving, the price of vicarious liability can be significant. In Florida, a lumber wholesaler settled for over \$16 million after one of its salesmen hit and severely disabled an elderly woman while talking on a cell phone.

Beyond potential OSHA administrative penalties and civil and criminal liability, employers should also consider how their policies and practices can affect their insurance rates. There is no question that with an increase in accidents caused by distracted employees, the cost of worker's compensation and other insurance coverage will rise.

Cell Phone Fires and Explosions

Modern cell phones use lithium-ion batteries, that in some cases, allegedly have caused fires and sparks while in stand-by or charging. Defective batteries allegedly have produced smoke and grounded a flight, ignited a car, and smoldered on a child's pillow. A cell phone manufacturer has reported 35 cases of its devices' batteries burning or exploding while charging, and has issued a recall for millions of devices. The Federal Aviation Administration has issued a warning about a particular model of personal device, telling passengers "not to turn on or charge these devices on board aircraft and not to stow them in any checked baggage."

Consequently, some cell phones may represent a recognized fire

hazard at the workplace. As the Agency's understanding of the hazards develops, OSHA may address this issue under the **General Duty Clause**, citing employers who fail to protect employees from the recognized hazard of cell phone battery fires. Employees who work around flammable vapors or dust may face risks from fires and explosions. It is a common practice at gasoline stations to have warnings that cell phones should not be used while fueling because of the potential for ignition of flammable gasoline vapors. Employers must manage and limit the potential fire hazards posed by recalled cell phones in the workplace.

Conclusion

As OSHA's enforcement relating to inappropriate employee cell phone use gains more notoriety, it can be expected that it will have a significant collateral impact on law enforcement at all levels. Employers may wish to look closely at their policies, procedures, and training systems to determine whether updates are appropriate to reduce potential individual civil and criminal liability of employees, as well as the vicarious liability to the employer.

Prohibit the use of cell phones at work

There are currently no other federal OSHA standard that specifically forbids the use of a cell phone while at work.

OSHA did address the potentially hazardous use of cell phones when they partnered with the Department of Transportation to implement a "[Distracted Driving Initiative](#)" a few years ago. As part of that initiative, OSHA warned employers that they should prohibit any work policy or practice that requires or encourages workers to text while driving. Otherwise they could face a citation for violation of the **General Duty Clause (paragraph (5)(a)(1) of the OSH Act of 1970)** for failure to provide a workplace free from recognized hazards. One can only assume that OSHA compliance officers may try to use the same strategy when it comes to citing an employer when their employee is found to be using a cell phone

while performing complex tasks.

Despite the near absence of federal OSHA standards directly addressing the subject, employers should consider developing and implementing a formal policy regarding the use of cell phones while at work. As with all newly-implemented policies, employee training on this topic is the key to making sure workers are aware of your policy as well as the reasons it is important to protect worker safety.

Of course, a policy addressing this (or any other) topic is worthless unless it is fully and consistently enforced, so make certain not to let it fade away and be ignored. Can you imagine the ramification if you had a long-standing policy against the use of cell phones during a certain task(s) that was not enforced, and then an accident occurred? That could be even worse for the employer than having no policy at all.

STATISTICS

In studies conducted by [Queens School of Business](#) and the [Gallup Organization](#), disengaged workers have 37 percent higher absenteeism, 49 percent more accidents and 60 percent more errors and defects. Organizations with low employee engagement scores experienced lower productivity, profitability, job growth and share price over time.

Engaged workers fully are committed to their work and the success of the company. They put in more effort, have a higher quality work product, go out of their way to assist others, have fewer accidents and are willing to provide feedback and suggestions on ways to increase efficiencies and improve the work environment.

In contrast, companies with highly-engaged employees are sought after by other workers and, as a result, have seen a 100 percent increase in job applications for current and future job openings, according to the studies.

The top workplace distractions involve not just where you work, but who you work with. According to a new poll by [Udemy and Toluna](#), 80 percent of people report being distracted by chatty

coworkers, the number one office place distraction. Office noise is the second most cited workplace disturbance, with seven out of ten respondents citing noise as a top bother in their day-to-day workflow. Lower on the list, but still a problem, was social media. Half of the people surveyed thought that personal social media use was a disturbance to them at work.

The report found that reducing workplace distractions increased workers productivity, motivation, confidence, and overall happiness. As open office plans have come into vogue in the modern workplace, [new studies](#) have brought into question how effective they are at fostering a collaborative environment as many complain of their distractions and misuse.

Injuries caused by being distracted due to using a cellphone while walking has become so common that National Safety Council has actually added “distracted walking” as a category in their statistical report *Injury Facts*. This report tracks data around the leading causes of unintentional injuries and deaths.

Other researchers have been looking at the details of these injuries. [Some of their findings include](#):

- 52% of distracted walking incidents involving cell phones happen at home
- 68% of those injured are women
- 54% are people ages 40 or younger

Recent injury statistics that show the total number of injuries due to distracted walking are hard to come by. [One study conducted by the U.S. Consumer Product Safety Commission](#) shows that in 2011, a total of 1,152 people of all ages were treated in hospital emergency rooms in the U.S. for injuries sustained while walking and using a cell phone or other electronic device. As you can imagine these numbers are probably higher now due to an increased smartphone use.

Overview

What People Find Distracting at Work

- 80% Chatty coworkers
- 70% Office noise
- 61% Feeling overwhelmed by changes at work
- 60% Meetings
- 56% Social Media

RECOMMENDATION

Complacency can be a safety issue and there are no OSHA regulations that apply to it we cannot control the thoughts and make sure they understand how important it is for them to stay focused on the job safety procedures every day. Companies that take the time to focus on getting managers and workers to avoid complacency will prevent accidents.

There are 5 key steps to curb safety complacency:

1. Keep the company's values and safety mission at the forefront all the time. For example, start the day with a safety message and remind managers and workers that their safety and well-being are far more important than getting a job finished.
2. Make sure all workers understand their job, what is expected of them, and how to perform it safely. Make sure workers know and understand the safety rules, how to use the equipment they will be expected to use, and exactly what you wish them to do.
3. Avoid routines that require the worker to do the same thing all the time. Training workers to do different things and giving them the opportunity to diversify their tasks keeps them interested so they don't become complacent.
4. Managers and workers should be instructed to observe their fellow employees because it helps raise their awareness as well as that of the co-worker. Obviously when something is not being done correctly, there must be an emphasis on safety, and the observer should advise his/her co-worker.
5. Formal safety training is where it all starts but it is important to remember that most people will only remember about 10-20% two weeks later. Therefore, it is important to follow up with additional training such as toolbox talks and

other regular reminders about safety.

Many companies implement a team approach, charging all employees with looking out for each other. The purpose is to ensure that the inexperienced workers learn how to perform the work safely and to ensure complacency does not become part of your company's internal culture.

Complacency can be a safety issue and there are no OSHA regulations that apply to it. We cannot control the thoughts within the employee's mind but we can help to change their mindset if we train them regularly and make sure they understand how important it is for them to stay focused on the job safety procedures every day. Companies that take the time to focus on getting managers and workers to avoid complacency will prevent accidents.

Have you formally addressed the use of cell phones within your organization? If so, has it been readily accepted by workers, or are they allowed to eventually revert to their old habits? Have you ever been cited by OSHA because an employee using a cell phone while at work? If you would like to **share your experiences** or other information pertinent to this topic, please do so by **clicking here** and entering your comment in the "Comments" box. And last but not least, I would like to encourage you to **Share this Blog post with others in your Network** who might benefit from reading this information.

PREVENTION

Complacent workers stop recognizing that they are at risk performing certain tasks and are more easily distracted than others who are aware of danger. Any task can be hindered by distraction-related errors, but some errors are more grievous than others—and some distractions are downright deadly.

Three Deadly Distractions

Here are three common distractions that can take workers' minds off their task—and strategies for addressing them:

1. **Electronic devices.** Operating a motor vehicle or a piece of heavy equipment is exactly the sort of safety-critical operation we are most likely to think of. But it's not just cell phones that can cause these problems: laptop and notebook computers and tablets are also potentially deadly distractions—even when their use on the job is required.

Eliminate device-related distractions: Put a policy in place to ensure that workers are not required to use their cell phones, laptops, or tablets at moments when they should be focused on what they're doing—like driving.

2. **Interruptions.** *Eliminate interruptions:* Create your own “sterile cockpit” rule for hazardous tasks. The term comes from the airline industry, where many routine tasks have a high disaster potential. Airlines have gone to great lengths to ensure that pilots will be fully focused during landing procedures. Pilots are trained to work together in teams when landing and are constrained by the sterile cockpit rule during landing, takeoff, taxiing, and while flying below 10,000 ft. The rule strictly limits nonessential communication and activities during those times.
3. **Divided attention.** We like to think we can multitask safely—but the truth, researchers say, is that we're probably not doing any of those multiple tasks well. If any of the tasks you're performing have the potential to cause serious injury, divided attention can trigger disaster.
4. **Eliminate divided attention:** Address the problem at the planning level. When workers are required to perform potentially hazardous tasks, don't give them more than one thing to do at a time. Either give them a stepwise procedure to follow, or give them a single task to do, but assigning multiple, potentially hazardous tasks is an invitation to disaster. Plan tasks with care, and make sure that adequately trained personnel are on hand to do them.

The following are 6 steps employers can take to eliminate and mitigate against employee distraction.

1. MONITOR BEHAVIOR

Since an employer cannot eliminate distractions, they must focus on employee behavioral changes. A strong relationship between managers, supervisors and the people they oversee is the best way to identify warning signs to reduce risk.

Employers should conduct regular walk-throughs to detect potential issues, discuss problems with employees, and seek ways to reduce distractions.

2. VARIETY & PROPER SCHEDULING

Good managers and supervisors schedule work into digestible sections instead of assigning huge projects. This not only allows employees to take short breaks between each section, but it also makes employees feel more accomplished. There's something extremely satisfying about "finishing" a job.

Managers and supervisors should also try to vary employee tasks so they're not performing the same duties for long periods. Working employees until they're fatigued or bored to tears isn't beneficial to a smooth and safe workflow.

When employees tire or fall into a set routine they react slowly, make mistakes, can't concentrate, and quality suffers. Of course, tired or bored employees are also more likely to injure themselves, which stops or impedes production.

3. INCORPORATE BREAKS

Companies need to encourage employees to step away from their work to take a break, even when they're trying to meet a deadline or production quota. Employees may skip breaks even when they're entitled to them if the company does not cultivate a "safety first" environment.

A [recent study](#) shows that "micro-breaks" of just a few minutes can increase job satisfaction, make it more likely an employee will go above-and-beyond their job description, and they reduce emotional

exhaustion. Micro-breaks also increase productivity and lower the risk of injuries due to distractions.

4. LIMIT DEVICES

Limiting MP3 players and cellphones to break time increases employee focus and minimizes risk. Employees can still receive emergency calls through the main office line or listen to music on a coffee or lunch break.

5. ENLIST EMPLOYEE INPUT

Employers should ask employees about problems they see in the workplace and take steps to resolve them. For instance, if a particular machine constantly jams and the employees must unjam it, then there's a higher risk of injury.

An employee safety program provides consistent reinforcement and reliability.

A dedicated safety officer with the power to make changes is the employee go-to for reporting unsafe conditions or to make suggestions for improvement.

6. ENCOURAGE WELLNESS

Employees with a healthy lifestyle have superior stress management skills, improved focus, more energy, and a stronger body and mind. A [Harvard Business School study](#) also found companies that invest in wellness average a \$2.71 return for every dollar spent due to increased productivity, decreased absenteeism, and reduced healthcare cost.

Many U.S. companies now institute wellness programs to reduce workplace distractions and improve health. It also improves employee retention and strengthens your brand.