

Safe Lifting Best Practices to Reduce Back Injuries

WHAT'S AT STAKE?

Back injuries are some of the most prevalent and hardest-to-prevent injuries on the job. According to the Bureau of Labor Statistics, more than one million workers suffer back injuries each year, and back injuries account for one of every five workplace injuries or illnesses. These types of injuries account for a large majority of worker's compensation claims every year.

WHAT'S THE DANGER?

Most of us know when we've hurt our backs. Pain in the lower back is usually the first signal that an injury has occurred. Another signal is feeling fine while in a resting state but suffering lower back pain when sitting down or getting up. Getting around might also be more difficult, either from pain or stiffness.

Back injuries often occur when:

- An individual is lifting up an object
- Using improper lifting techniques such as lifting with the back and not the legs
- Lifting an object that is too heavy for the individual
- Twisting while lifting or carrying objects
- Repetitive lifting during a work task
- Poorly designed workstations and repetitive motions can also cause serious back problems.

HOW TO PROTECT YOURSELF

Ways to Prevent Back Injuries

Eliminate— The best way to protect individuals against back injuries is to [eliminate](#) as many lifts as possible during the work

day. Using equipment such as forklifts, heavy equipment, dollies, etc are the best way to achieve eliminating, handling and lifting objects by hand. Break down large or heavy objects that pose a hazard when lifting into smaller safer loads when possible.

Engineering Controls– Setup work areas that are ergonomically friendly to all employees. Install mechanical lifting devices and conveyor belts where feasible to limit handling objects. Install proper shelving and setup storage areas that keep objects and lifts within an optimal range. Keeping objects within the proper range helps keep employees from making awkward or dangerous lifts that can result in a sprain.

Administrative Controls– Use the buddy system when lifting any awkward or heavy objects. Agree on weight limits for lifting. For example, having a policy to not lift anything over 100lbs as a team without first involving a supervisor to see if there is a safer way to complete the lift is an administrative control. Also, always select employees who are physically capable of making the lifts of a task before the work begins.

Personal protective equipment such as back supports or back belts have not shown to be overly effective in preventing back injuries. These devices often create a false sense of security when completing lifts. Individuals should focus on stretching and using proper lifting techniques over using a back belt to keep them safe.

The following must be done to prevent or reduce back injuries:

Plan your lift: Look at what you're going to pick up to determine if it's too heavy or awkward to move alone. You may need to get help or use a hand cart.

Position yourself: stand close to the object and place your feet shoulder width apart. Balance yourself by placing one foot slightly of the other.

Bend down: Squat down, bending at the knees and not the waist. Keep your chin tucked into your chest and back as straight as possible.

And lift: Use your thigh muscles to slowly lift your body. Don't twist if you need to turn. Move your feet instead of your trunk.

FINAL WORD

Back injuries are all too common in the workplace. Paying attention to proper lifting technique, asking your supervisor to consider re-designing how a job is performed, and asking for safety training are all ways you can prevent future back injuries.

Substations – NFPA 70E

WHAT'S AT STAKE?

To reduce risk of injury and protect employees from accident, injury and death is the stated purpose of NFPA 70E electrical training. NFPA 70E is the recognized tool that illustrates how employers comply with OSHA standards and regulations. The relationship between OSHA and NFPA 70E is best characterized as "OSHA" as the "shall" and NFPA 70E as the "how".

WHAT'S THE DANGER?

There is a moral and legal obligation to protect workers who may be exposed to Electrical Hazards.

Meeting OSHA regulations, reducing insurance costs, and minimizing downtime and repair costs are additional benefits of Electrical Safety programs. When electrical faults occur, the electrical system is subjected to both thermal and magnetic forces. These forces can severely damage equipment and are accompanied by fires, explosions and severe arcing. Such violent damage often causes death or severe injury to personnel. Costs of repairs, equipment

replacements, and medical treatment can run into millions of dollars. Loss of production and damaged goods are also important considerations. Other major factors include the cost of OSHA fines and litigation. Severe electrical faults may shut down a complete process or assembly plant, sending hundreds or thousands of workers home for weeks while repairs are being made. It is also possible that one tragic event could close a plant permanently.

Organizations like the US Department of Labor and the National Safety Council compile statistics and facts on a regular basis. The following demonstrates the importance of electrical safety.

- 97% of all electricians have been shocked or injured on the job.
- Approximately 30,000 workers receive electrical shocks yearly.
- Over 3600 disabling electrical contact injuries occur annually.
- Electrocutions are the 4th leading cause of traumatic occupational fatalities.
- Over 2000 workers are sent to burn centers each year with severe Arc-Flash burns.
- Estimates show that the 10 Arc-Flash incidents occur every day in the US.
- 60% of workplace accident deaths are caused by burn injuries.
- Over 1000 electrical workers die each year from workplaces accidents.
- Medical costs per person can exceed \$4 million for severe electrical burns.
- Total costs per electrical incident can exceed \$15million.
- In the year 2002, work injuries cost Americans \$14.6 billion.
- Hundreds of deaths and thousands of burns injuries occur each year due to shock, electrocution, arc flash and arc blast.
- On average approximately 2000 workers each year are admitted to hospital treatment due to electrical burns.

HOW TO PROTECT YOURSELF

OSHA bases its electrical safety mandates on the comprehensive information in the NFPA 70E STANDARD. This standard covers the full range, of electrical safety issues from workplace practices to maintenance, special equipment requirements and installation.

The dangers of shock, electrocution fires, explosions and arc blast will always be present on the job. But proper NFPA 70E training and strategy can minimize the likelihood of injuries and fatalities.

Specifically, the NFPA 70E Standard covers the following:

- Electrical Hazards
- Existing and Proposed Standards
- Preparing to Work Safely
- Determining Safe Approach Distance
- Determining Arc Hazard Category
- Fault Current Calculations
- Determination of Arcing Fault Clearing Time
- Boundary Calculations
- Determining Arc Flash Hazard Risk Category
- Incident Energy Exposure Calculations
- Hazard Analysis

An overview:

To protect workers from electric arc threats and, identify potential arc hazards in the workplace, one should confirm the potential and assess the severity of arc hazards by performing an arc hazard analysis, apply engineering solutions to reduce frequency and severity of exposure, train workers on the safe work practices and provide PPE as required in NFPA70E.

Basic preventive safety concepts

The following are basic electrical safety concepts that are encapsulated in NFPA 70E standard.

- Unless there is a compelling safety issue such as life-

support equipment, alarm systems, hazardous location ventilation, or lighting required for safety, OSHA requires that circuits be deenergized and the system be placed in an Electrically Safe Work Condition before any work is performed.

- When placing equipment in an Electrically Safe Work Condition, always follow proper Lockout/tagout procedures.
- An Electrical Hazard Analysis must be performed on all circuits 50 volts and higher that may be worked on while energized.
- The Hazards must be identified and warning labels must be applied to all equipment that may be worked on while energized.
- Workers must be trained on the equipment, hazards and safety precautions, and be certified as “qualified” to work on energized equipment. Training and certification must be documented.
- All work performed on energized equipment must be preceded by a job briefing and a signed Energized Electrical Work Permit.
- When working on or approaching energized circuits, proper protective clothing must be worn. The minimum flame-retardant clothing, safety glasses, and protective gloves and equipment must meet OSHA and NFPA 70E guidelines. Protective insulating blankets and mats are also used to minimize exposure.
- Be certain there is adequate lighting for the tasks to be performed. Portable lighting must be fully insulated so that it will not accidentally cause short circuits when used near energized components.
- Use barricades or barriers to warn unqualified individuals from entering the area.
- Be prepared for the unexpected. Make sure emergency communications and trained medical personnel are available if something goes wrong.
- Use current-limiting overcurrent protective devices wherever possible to reduce the potential electrical hazards.

FINAL WORD

Compliance with NFPA 70E STANDARD for Electrical Safety in the workplace is the only way for companies to protect their employees from accident, injury and death.

Working Alone Utilities / Municipalities

WHAT'S AT STAKE?

600,000 Americans work in the utilities sector as of March 2015.

Many of these utility workers work at water treatment plants. These facilities are often in remote locations away from the base of operations. Often these utility workers at these remote locations have shifts where they are alone.

WHAT'S THE DANGER?

A lone worker can be anyone who works alone in a fixed facility or away from his or her typical base. At times, the definition applies to those who work alone in factories or warehouses on nights or weekends. It also applies to traveling workers in construction, utilities, maintenance and repair, agriculture, and other fields.

Lone Worker Safety

Organizations need to take steps to ensure safety for people who work alone.

A key component of worker safety is to watch out for one another,

but lone work presents a fundamental challenge to watchfulness. How can someone watch a co-worker's back if that co-worker is working alone and out of sight??

Example:

An employee was injured while working alone in a far corner of the warehouse cleaning up the area for about four hours. He was exposed to moving machinery, electrical equipment, harsh chemicals, excessive noise, heat, and vermin such as spiders. In addition, we learned that this employee has hearing loss and could not hear the emergency alarm if it had sounded.

Example:

A park ranger in a national park in the western U.S. was hurt while repairing the walkway through an area of the park. He was exposed to electrical tools, running water, excessive heat (about 95 degrees that day), and heavy lifting. He was a mile or so from the ranger station without a working partner. Occasionally, a hiker would walk by, but on this hot day, that seldom happened.

Example:

A forester who did not return to the camp one day after being in the forest by himself. No one missed him until the next day when he did not show up for work because he lived alone. After checking with relatives and his favorite watering holes, a search team was sent out. Several days later the search team found the worker's body; he had suffered a stroke while in the woods. Perhaps nothing could have been done for him, but if he had carried a communication device or other provisions had been made to account for him, the outcome may have been different.

These examples show the need for communication devices another worker co-worker, or having someone check on employees periodically.

HOW TO PROTECT YOURSELF

By law, employers have a responsibility to protect their workers regardless of whether they're surrounded by colleagues or alone on an assignment. Organizations of all sizes can promote lone worker safety by developing policies, communicating with workers, and using available technology to track worker location and movement.

Identifying hazards, assessing risks and establishing preventive control measures comprise the essence of procedures and policies dealing with lone worker safety.

The bottom line is that employers must develop procedures protecting the welfare of their employees during working hours, especially if they're working alone in isolated areas or they're not within calling distance of somebody. The burden falls on employers to keep their work safe.

Unless OSHA prohibits working alone, it is acceptable for employees to work alone.

Police officers and letter carriers have communication devices which are reasonable prevention should something go wrong.

But most fixed site jobs in factories, warehouses, and buildings expose employees to hazards when there may not be other people around. When this is the case, a Work Alone policy should be developed.

Work Alone Policy incorporates recommended procedures:

- Specify that employees must carry a radio, cell phone, walkie-talkie, man-down indicator, global positioning device, satellite telephone, etc.
- Specify how often and to whom the employee must call in to say that all is well. Many employers who have such a policy require communications every hour, and in some cases, every 15 minutes. This should be based on the severity of the hazard.
- Conduct risk assessments to determine if work may be done

safely by lone workers.

- Train lone workers on emergency response.
- Establish a clear action plan in the event of an emergency.
- Set limits for what is permissible during lone work.
- Require supervisors to make periodic visits to observe lone workers.
- Ensure regular contact between lone workers and supervisors via phone or radio.
- Use automatic warning devices that alert others if signals are not received periodically from a lone worker.
- Verify that lone workers have returned to fixed base or home after completing a task.
- Specifying when an employee must sign in and out on a work log so that someone will know that the employee is out working alone.
- Planning a response to an emergency.

The organization or work entity is not finished after a Work Alone procedure is developed for monitoring lone workers. There must be constant evaluation.

For example:

What has changed in the work environment? New people, new processes, new equipment, need to be reevaluated and taken into consideration. What hazards may be present now that were not before?

FINAL WORD

Development of a Work Alone Policy and Program must be continually updated and monitored with respect to new people, new processes, new equipment and new hazards.

Workplace Inspection

WHAT'S AT STAKE?

Workplace inspections help prevent accidents, injuries and illness. Workplace inspections are a basic necessity of any safety program. A critical examination of the workplace will identify and record hazards for corrective action. Safe to say, workplace inspections serve the purpose of identifying hazards in the workplace.

WHAT'S THE DANGER?

Objects, equipment, people and even animals find their way into work areas – Hazards

Types of workplace Hazards

- Safety hazards such as those caused by inadequate machine guards, unsafe workplace conditions, unsafe work practices.
- Biological hazards caused by organisms such as viruses, bacteria, fungi and parasites.
- Chemical hazards caused by a solid, liquid, vapour, gas, dust, fume or mist.
- Ergonomic hazards caused by physiological and psychological demands on the worker, such as repetitive and forceful movements, awkward postures arising from improper work methods, and improperly designed workstations, tools, and equipment.
- Physical hazards caused by noise, vibration, energy, weather, heat, cold, electricity, radiation and pressure.
- Psychosocial hazards that can affect mental health or well-being such as overwork, stress, bullying, or violence.

HOW TO PROTECT YOURSELF

Planning is essential for effective inspection

- Every inspection must examine who, what, where, when and how. Pay particular attention to items that are or are most likely to develop into unsafe or unhealthy conditions because of stress, wear, impact, vibration, heat, corrosion, chemical reaction or misuse. Include areas where no work is done regularly, such as parking lots, rest areas, office, storage areas and locker rooms.
- Look at all workplace elements – the people, the environment, the equipment and the process. The environment includes such hazards as noise, vibration, lighting, temperature, and ventilation. Equipment includes materials, tools and apparatus for producing a product or a service. The process involves how the worker interacts with the other elements in a series of tasks or operations.

Three types of inspection reports

Ongoing

Pre-operation

Periodic

Supervisors and workers continually conduct ongoing inspections as part of their job responsibilities. Such inspections identify hazardous conditions and either correct them immediately or report them for corrective action. The frequency of these inspections varies with the amount and conditions of equipment use. Daily checks by users assure that the equipment meets minimum acceptable safety requirements.

Pre-operation checks involve inspections of new or modified equipment or processes. Often these are done after workplace shutdowns.

Periodic inspections are regular, planned inspections of the critical components of equipment or systems that have a high potential for causing serious injury or illness. The inspections are often part of preventive maintenance procedures or hazard control programs. Laws and regulations may specify that qualified or competent persons must inspect certain types of equipment, such

as elevators, boilers, pressure vessels, scaffolding, and fire extinguishers at determined points in the work process and at regular intervals.

FINAL WORD

There can be a variety of issues in any single work area. It is important to take the time to thoroughly check your work area for hazards and take the steps to mitigate them. Eliminate as many hazards as you can before relying on a less efficient control to protect yourself such as PPE.

Lockout, Tagout, Tryout

WHAT'S AT STAKE?

Lockout / Tagout / Tryout is a simple procedure designed to prevent accidents when working on equipment.

WHAT'S THE DANGER?

Harm will flow in the form of injuries, sometimes fatalities if procedures of lockout / tagout / tryout are not followed.

Example:

John was a member of the maintenance department. He was called to perform a repair on a machine in unit 3. John simply turned the machine off, got his tools, removed the necessary guards, and started to work. The job was on the back side of the machinery away from the control panel. John was doing an outstanding job of repairing the machine, but he forgot the most important component of this job – Lockout / Tagout / Tryout.

Meanwhile, – Bill, the operator – returned from his break. He did not see John and there was no indication that the machine was under repair. Assuming his machine was ready to run, Bill started it. He had no idea that John was inside!

In an instant John was seriously injured and his painful screams have been forever etched into Bill's mind.

HOW TO PROTECT YOURSELF

Could the accident with John and Bill been avoided?

Yes. Here's how.

Lockout / tagout / tryout is a three-part procedure that is designed to protect you from accidental or unexpected start-up of equipment. This procedure serves four important purposes:

1. To protect the person working on the equipment.
2. To protect other workers in the area.
3. To protect the equipment.
4. To serve as a communication device for the above three. This is usually done in conjunction with a safe work permit.

The "Lockout" involves the use of a specific lock or locks to insolate equipment from all energy sources. These sources may include air, water, electricity or hydraulic power. Once the shut-off devices have been identified, personal locks are attached to each device.

The "Tagout" requires a specific lockout tag to be completed and attached with each lock that is placed on an insulation device. The complete tag will usually have your lock number, name, department, equipment identification, and reasons why the equipment is down.

The "Tryout" requires that you physically attempt to turn on all power switches and devices once the equipment has been locked out. This is your final check and assurance that the equipment has been insulated from all power sources.

Once the equipment has been insulated and locked out by following the proper steps, no one should be able to start the equipment. They would not be able to do so until you have completed the necessary work and remove your personal locks from each power switch or device.

Lockout / Tagout / Tryout is a simple procedure that is designed to prevent an accident such John's.

This procedure is the Key to Your Safety when working on equipment.

FINAL WORD

Lockout / Tagout / Tryout requirements will always vary from one facility to the next. If you are unsure about any specific requirements, you should always ask for more information.

Signaling

WHAT'S AT STAKE?

Signaling is an important part of hoisting and rigging. You should be familiar with the internationally recognized system of standard hand signals. If you're going to rig a load, you also need to know the signals for lifting, moving and landing it. The operation may be a simple LIFT and LOWER, or it may require more complicated signals. In many cases, hand signals are the most efficient form of communication between riggers and crane operators.

WHAT'S THE DANGER?

Busy construction zones are incredibly noisy and busy. In the mix of this, the work of a crane operator and signal person have a lot

to do with job site safety. For example, hand signals should never be used when distance and visibility prevent accurate communication to the crane operator.

There are ground rules for signaling that determine the safety of these important operations involving the operator and signal person.

They include:

- While only one person should signal the operator, anyone can give the STOP signal and it must be obeyed immediately.
- Signals should be clear and, wherever possible, barehanded.
- The load must be directed so that it never passes over anyone.
- Operators should not make a move until they receive and understand your signal. If contact between you and the operator is broken for any reason, the operation must stop.
- Some situations call for two signalers.
- For instance, during a concrete pour, one signaler may be needed to direct the lift while the other directs the drop.
- Where a difficult lift demands voice communication, use two-way radios instead of hand signals.

The importance of the signal person

As the eyes and the ears of a dedicated area or crane, a signal person carries many responsibilities. Before a person can direct the operation of a crane, they must first undergo formal training and complete a qualification in crane signaling. In training, a person will not only develop an understanding of standard hand signals, but they will also be required to become familiar with many different types of cranes, how each crane functions and any hand signals specific to particular equipment. The trainee signal person is required to grasp an understanding of the large library of signals without any memory prompts and show competence in recalling these during an examination by a third-party provider.

The signal person is also responsible for preventing injury and accidents to the best of their ability. This is done by following

strict procedure during crane operation, for instance standing in clear view of the crane operator, ensuring the operating area is clear of people or hazardous objects and performing one signal at a time to avoid confusion.

Overview of signal person role

- Signal person is required, according to OSHA regulations, in the following situations:
- The operator does not have a full view of the point of operation.
- The operator's view is obstructed in the direction that the equipment is moving.
- The operator or the person handling the load feels that a signal person is needed.
- Anytime there are site-specific safety concerns.

HOW TO PROTECT YOURSELF

1. Construction sites are loud. They produce a high level of noise from activities such as digging, piling, and drilling, therefore it can be difficult to convey instruction in an accurate and time efficient way. There are also times when an operator's directional visibility is obstructed or the visibility of a load area is partially blocked. Conducting a lift within these types of conditions can put the operator and the workers around them at serious risk of injury.
2. How does an operator, with a load suspended in air, follow instructions from their team? **Using the simple but effective method of hand signals.** This age-old technique is used by crane operators across the world, aiding them to accurately receive unmistakable directions without the need for fancy equipment or even words!
3. Hand signals provide a simple solution for the communication issues faced by crane operators. Although radios can be used to relay messages across the site, there are some situations when an operator will need extra assistance.

4. Although it recommended to use hand signals during all lifts, it is in these situations when a signal person will definitely be called upon. Easy to understand, hand signals help the operator avoid any potential hazards, completing actions in a safe and timely manner.
5. Working in-sync with your team on the ground is not only crucial for safety but can help your project run smoothly and on schedule. Absolute precision and accuracy is needed and being able to clearly communicate direction is critical.

Safety First

Safety is the number one concern. A signal person performing the hand signals stands at a vantage point which allows one to view the load area from a perspective that is not visible to the crane operator. From this point, the signal person is able to confirm whether a maneuver is safe to perform and halt all activity if they observe a potential risk.

1. Stop signals are one the most important hand signals used on a construction site. When stop signals are used, operation of the equipment must be halted.

- Emergency stop – A signal person will communicate an emergency stop by extending both arms horizontal of the body with palms faced down, from this position they will swing their arms back and forth.
- Stop – In order to pause or stop an action, the signal person will extend a single arm and face their palm down; they will then begin to swing the extended arm back and forth.
- Dog everything – This signal will stop all activity and is performed by clasping hands together and placing them at waist level.

2. Boom signals

Boom signals will inform the crane operator of which maneuver they should perform with the boom.

- Raise boom – To raise the boom, a signal person will extend an arm horizontally to the side of their body and signal thumbs up, with a closed fist.
- Lower boom – In order to lower the boom, the signal person will extend an arm horizontally and signal thumbs down, with a closed fist.
- Swing boom – To swing the boom, the signal person will extend an arm out horizontally, using their index finger to point in the direction the boom is to swing.
- Extend boom – To lengthen the boom, the signal person will place their hands at the front of their waist and point thumbs outwards with remaining fingers in a fist.

3. Load signals

Load signals will dictate what the operator should do with a load once it has been lifted by the crane.

- Hoist load – In order to lift the load upwards the signal person will extend their arm vertically towards the ceiling/sky, point with their index finger and make small circles with their hand and index finger.
- Lower load – To lower the load downward, the signal person will extend their arm horizontally, pointing their index finger towards the ground, once in this position they will make a circle motion with their finger.

4. Speed signals

The signal person can also control the pace of any movement using speed signals.

- Move slowly – In order to slow the rate of an action, the signal person will place their hand above the hand which is giving the action signal.

FINAL WORD

The safety of the workplace particularly in construction zones is largely dependent on the seamless cooperation, understanding and

training of both the crane operator and the signal person.

Aerial-Lift

WHAT'S AT STAKE?

Aerial lifts have replaced ladders and scaffolding on many job sites due to their mobility and flexibility. But what are aerial lifts? They are vehicle – mounted devices telescoping or articulating, or both, which are used to position personnel.

1. Aerial Equipment may be made of metal, wood, fiberglass, reinforced plastic (FRP), or other material.
2. Aerial equipment may be powered or manually operated.
3. Aerial equipment is deemed to be aerial lifts whether or not they are capable of rotating about a substantially vertical axis.
 - This includes aerial ladders, extensible boom platforms, articulating boom platforms, vertical towers, or any combination of these.
4. It is also important to note that aerial lifts do not include manlifts, scissor lifts, forklifts, or firefighting equipment.

WHAT'S THE DANGER?

But there are deadly consequences that have occurred in aerial lifts operations.

- Falls from elevated level,
- Objects falling from lifts,
- Tip-overs,

- Ejections from the lift platform,
- Structural failures (collapses),
- Electric shock (electrocutions),
- Entanglement hazards,
- Contact with objects, and
- Contact with ceilings and other overhead objects.

HOW TO PROTECT YOURSELF

There are procedures to observe and follow in aerial use.

A. Inspections – Pre start

Vehicle components

- Proper fluid levels (oil, hydraulic, fuel and coolant).
- Leaks of fluids.
- Wheels and tires.
- Battery and charger.
- Lower-level controls.
- Horn, gauges, lights and backup alarms.
- Steering and brakes.

Lift components

Do not operate any aerial lift if any of these components are defective or not repaired by a qualified person.

- Operating and emergency controls.
- Personal protective devices.
- Hydraulic, air, pneumatic, fuel and electrical systems.
- Fiberglass and other insulating components.
- Missing or unreadable placards, warnings, or operational,

instructional and control markings.

- Mechanical fasteners and locking pins.
- Cable and wiring harnesses.
- Outriggers, stabilizers and other structures.
- Loose or missing parts.
- Guardrail systems.

Work Zone Inspections

Employers must ensure that work zones are inspected for hazards and take corrective actions to eliminate such hazards before and during operation of an aerial lift.

HAZARDS:

- Drop-offs, holes, or unstable surfaces such as loose dirt.
- Inadequate ceiling heights.
- Slopes, ditches, or bumps.
- Debris and floor obstructions.
- Overhead electric power lines and communication cables.
- Other overhead obstructions.
- Other hazardous locations and atmospheres.
- High wind and other severe weather conditions, such as ice.
- The presence of others in close proximity to the work.

B. Operation Imperatives

Fall Protection:

- Ensure that access gates or openings are closed.
- Stand firmly on the floor of the bucket or lift platform.
- Do not climb on or lean over guardrails or handrails.

- Do not use planks, ladders, or other devices as a working position.
- Use a body harness or a restraining belt with a lanyard attached to the boom or bucket.
- Do not belt-off to adjacent structures or poles while in the bucket.

Operation/Traveling/Loading:

- Do not exceed the load-capacity limits. Take the combined weight of the worker(s), tools and materials into account when calculating the load.
- Do not use the aerial lift as a crane.
- Do not carry objects larger than the platform.
- Do not drive with the lift platform raised (unless the manufacturer's instructions allow this).
- Do not operate lower level controls unless permission is obtained from the worker(s) in the lift (except in emergencies).
- Do not exceed vertical or horizontal reach limits.
- Do not operate an aerial lift in high winds above those recommended by the manufacturer.
- Do not override hydraulic, mechanical, or electrical safety devices.

Overhead Protection:

- Be aware of overhead clearance and overhead objects, including ceilings.
- Do not position aerial lifts between overhead hazards if possible.
- Treat all overhead power lines and communication cables as energized, and stay at least 10 feet (3 meters) away.

- Ensure that the power utility or power line workers de-energize power lines in the vicinity of the work.

Stability in the Work Zone:

- Set outriggers on pads or on a level, solid surface.
- Set brakes when outriggers are used.
- Use wheel chocks on sloped surfaces when it is safe to do so.
- Set up work zone warnings, such as cones and signs, when necessary to warn others.

Insulated aerial lifts offer protection from electric shock and electrocution by isolating you from electrical ground. However, an insulated aerial lift does not protect you if there is another path to ground (for instance, if you touch another wire). To maintain the effectiveness of the insulating device, do not drill holes in the bucket.

C. Training

Only trained and authorized persons are allowed to operate an aerial lift. Training should include:

- Explanations of electrical, fall, and falling object hazards.
- Procedures for dealing with hazards.
- Recognizing and avoiding unsafe conditions in the work setting.
- Instructions for correct operation of the lift (including maximum intended load and load capacity).
- Demonstrations of the skills and knowledge needed to operate an aerial lift before operating it on the job.
- When and how to perform inspections.
- Manufacturer's requirements.

Retraining

Workers should be retrained if any of the following conditions occur:

- An accident occurs during aerial lift use.
- Workplace hazards involving an aerial lift are discovered.
- A different type of aerial lift is used.

Employers are also required to retrain workers who they observe operating an aerial lift improperly.

D. Safety Tips – The Finale

Inspect the lift prior to utilizing it. Walk around and ensure there are no leaks and check all the controls.

- Never walk under the boom to gain access to the platform.
- Only utilize the lift on level ground.
- Only stand on the platform floor. Never stand or sit on the railing.
- Always look in the direction the machine is moving.
- Do not rest the boom or basket on a steel structure of any kind.
- Wear safety harnesses and tie-off to the manufacture provided anchorage point within the platform at all times when you're in the basket. This includes when you are lowered and moving the equipment to another location.
- Keep your hands the external portion of the basket when raising or lowering the basket.
- This includes when you are lowered and moving the equipment to another location.
- Ensure that a fire extinguisher is mounted in the basket when performing activities that present a fire hazard such as welding or grinding. Ensure you have a fire watch person

below.

- Except in a case of an emergency, ground controls shall not be operated on an occupied lift (lift occupant shall be in full control of the lift at all times).

FINAL WORD

Like the forklift, aerial lifts have made work easier in the industrial plant matrix. But deadly consequences flow if proper training and understanding of aerial applications is not followed.

Food Safety Best Before Lunchtime

WHAT'S AT STAKE?

What did you bring for lunch today? And where have you stored your lunch until it's time to eat it?

If it's a salmon sandwich with a creamy homemade dressing, let's hope it's freshly made and kept cold. If it's a container of leftover meat and pasta, it had better not be sitting in your warm truck cab until your lunch break.

WHAT'S THE DANGER?

There are a number of good reasons for following food safety guidelines. They include hepatitis A, campylobacter, salmonellosis, botulism, Norwalk, E. coli, Yersiniosis and Listeria. These foodborne illnesses are caused variously by bacteria, viruses, molds or parasites.

Another list of good reasons for safe food handling is as follows:

discomfort, pain, nausea, vomiting, diarrhea, cramps, dehydration, weight loss, fever and death.

HOW TO PROTECT YOURSELF

To prevent food-related illnesses, you have to keep hot foods hot and cold foods cold. This advice is even more important in warm summer weather, when foods at room temperature can spoil even more rapidly.

Cleanliness is also vital to food safety. Washing your hands and cleaning food preparation surfaces, containers and utensils can also stop the spread of foodborne diseases.

Temperature determines how quickly foodborne pathogens will grow. The danger zone is between 40 degrees Fahrenheit (4 degrees Celsius) and 140 degrees Fahrenheit (60 degrees Celsius). In this temperature range, bacteria grow rapidly. Do not eat food that has been left at room temperature for more than two hours. With warmer summer temperatures, the limit is one hour.

You can keep lunch foods cold in an insulated kit containing a gel freezer pack. Packing a frozen gel pack or a container of juice in your lunch kit also can keep the temperature down to a safe level until you are ready to eat. Hot food such as soup can be kept hot in a preheated thermal container. If you have access to a breakroom equipped with appliances, keep your food safely cold in the refrigerator, and heat foods thoroughly in the microwave.

Do your part to keep your company's lunchroom sanitary and prevent the spread of foodborne illness. Label and date food, you leave in the refrigerator. Get rid of outdated leftovers. Put trash in a covered container. Help keep tables, counters and other surfaces clean and dry. Don't handle your lunch or utensils until you have washed your hands.

A safe work lunch starts when you shop for ingredients and prepare and pack them. Consider these food safety reminders:

- Shop for meats, poultry, fish and seafood last, and put them

away in the refrigerator or freezer promptly when you get home. If you can't get them home right away, keep them in a cooler in your car.

- Keep raw meats separate from other food in the grocery cart, grocery bags and refrigerators. Make sure meat does not drip onto other food.
- Wash fruits and vegetables under running water.

FINAL WORD

Keep an eye on expiration dates for all your processed food products.

Cold Water Shock

WHAT'S AT STAKE?

Cold water shock will rob even the strongest swimmer of the ability to hold his head above water or reach for an extended hand. It's a phenomenon many workers underestimate and one responsible for countless drowning deaths each year.

WHAT'S THE DANGER?

A sudden fall into icy water will send the body into cold water shock and leave a person unable to control his reactions. The initial shock (similar to how a person might react if ice is poured down his back) often takes a person's breath away and causes him to swallow water. Within minutes, his hands and body are so numb he is unable to reach for help or pull himself out of the water. As panic sets in, his heart races, his blood pressure increases and he is unable to swim. Death comes in as little as three to five minutes in water as warm as 77°F (25°C) but usually

closer to 59°F (15°C).

EXAMPLE

A forklift driver swerves to miss another worker and drives off the pier and into the ocean. Witnesses see the man surface after the crash and wave his arms frantically as he bobs up and down. Suddenly, as a rescue boat approaches, the man tilts face first into the water. Rescuers pull him from the water but are unable to revive him.

HOW TO PROTECT YOURSELF

Wear a lifejacket or personal flotation device (PFD) when working on or around the water, regardless of how well you swim. These devices will keep your head above water when your body is no longer able to.

- Wear a wetsuit or immersion suit that protects your extremities and will reduce the effect of cold water on your heart rate, blood pressure and breathing.
- Develop and practice recovery drills.
- Know what to do in an emergency and practice rescuing workers from the water on the first attempt.
- Use guardrails and safety harnesses intended to keep you out of the water.
- Stay out of the water. If a colleague falls in, do not go in after him.
- Never abandon a capsized boat and attempt to swim to shore

FINAL WORD

Understand the effect cold water has on the body and the importance of conserving your energy and keeping your head above water until rescuers come. This is important advice for all workers, especially those working on or near water (including longshoremen, highway crews and bridge workers).

Cold Weather Hazards

WHAT'S AT STAKE?

Dealing with snow and ice removal are the prime hazards for custodian or maintenance workers in winter weather. Also, for those people who get caught up in snow removal on an hoc basis. Staying safe by using sound work practices in winter conditions, has its challenges.

WHAT'S THE DANGER?

Workers and all custodian workers working outside have to reminded of the risk and dangers inherent in their work. Hypothermia a dangerous lowering of the body's core temperature can occur if proper dress procedures are not observed. One has heard of stories of people suffering heart attacks and dying when shoveling snow. There are the usual back injuries because of ill-advised shoveling techniques.

HOW TO PROTECT YOURSELF

What all winters custodians and maintenance workers need to know:

- Staying warm and dry are important for preventing hypothermia. Dress in layers of clothing, so you can remove outerwear if you get too warm. Keep dry by using waterproof footwear and clothing, and keep a change of socks and gloves handy in case yours get wet. In severely cold weather, protect your hands, toes and cheeks from freezing which will cause the tissue damage known as frostbite.
- Take it easy when you shovel snow by hand because of the possibilities of back injury and heart attack. Push, rather than lift, snow when possible. If the snow is wet and heavy,

take smaller loads. Take frequent breaks, keep from getting too warm and drink water often to replace fluid and minerals lost by sweating.

Another important aspect of winter work is dealing with snow removal equipment.

- Check over equipment such as a snowblower before use to make sure it is functioning properly and safety guards are in place. Don't run gasoline-powered equipment indoors because of the danger of carbon monoxide exposure. Do a circle check of plows and other mobile equipment to look for problems and obstructions?
- Keep people away from the area where you start or operate the machine. Shift into neutral and make sure all clutches are disengaged before starting the motor.
- Walk slowly and carefully so you don't slip, and keep a firm hold on the machine. If you try to remove snow too quickly, you'll overload the machine. Stay away from the discharge opening to prevent entanglement or being struck by objects propelled by the blades. Do not use a snow thrower on steep slopes. Make sure you don't hit obstructions such as curbs or tree roots.
- Never put your hand in any part of the equipment while the machine is running. First turn off the engine, wait for all moving parts to stop and disconnect the spark plug wire so the machine can't accidentally start up. Use a tool, never your fingers, to remove any snow or ice buildup.

FINAL WORD

Before using heating devices such as torches for thawing frozen utilities make sure you understand and observe all safety precautions. Learn your employer's procedures for winter emergencies such as storms and power outages. You might have to assume extra duties in these situations but protect your own safety and health while helping others.

Communication Facilities

WHAT'S AT STAKE?

Proper communication is crucial for a job to run smoothly and efficiently. Recognizing the communication tools for work tasks and the work environment is important to ensure the proper messages are being received.

There are just two ways to communicate (i.e.) speaking and sending an email but there many more ways at work to communicate such as posters, labels, warnings, bulletins, JSA's, SOP's, body language.

WHAT'S THE DANGER?

Proper communication and safety go hand in hand. If there is no communication for given work tasks then safety is missing.

There are many other ways that safety is communicated in the workplace. Verbal communication is very important. When you see a situation where someone could be hurt or there could be property loss you should always speak up. Have a conversation with the individuals involved in the task to voice your concerns. [Involve the right personnel](#) to correct a situation before an injury occurs.

Why it matters to communicate effectively

Failure to communicate safety information effectively can have serious negative consequences, including:

- *Accidents, injuries, and illness.*
- *Lost workdays.*
- *Reduced productivity and delays.*

- *Risk-taking by employees.*
- *Inability to comply with regulations.*
- *Higher workers' compensation and health insurance costs.*
- *Damage to materials, equipment, or your facility (for example, in a workplace fire caused by carelessness or lack of knowledge).*
- *Risks to community and environment (for example, in a release or improper disposal of hazardous chemicals).*

Communication Barriers

Unfortunately, numerous obstacles can cause communication to break down.

For example:

- If too much information is being communicated all at once, it can be hard for employees to absorb all those different messages at one time.
- If your message lacks clarity, is confusing or ambiguous, what a worker actually hears might be quite different from what you intended to say.
- If expectations are not clearly defined, you may be unpleasantly surprised by the results.
- It is important to know and express what you expect to happen as a result of your communication.
- If you communicate a safety message without taking the time to listen carefully to the response of employees, the communication is incomplete. Remember, you have to speak and listen for communication to be successful.
- If you don't take employees' concerns and priorities into account, they might not listen to what you have to say.

HOW TO PROTECT YOURSELF

KEYS FOR EFFECTIVE COMMUNICATION

Communicating occupational safety and health information effectively is crucial to preventing employee injuries and illness.

Effective safety communication is:

1. It flows both ways. You speak about safety and you listen to employees' concerns and suggestions.
2. It tells employees what they need to know to work safely under all conditions.
3. It focuses on the exchange of ideas and information to improve workplace safety and prevent accidents and illness.
4. It allows you to interact successfully with employees and spread your safety message to all who need to hear it.

HOW TO IMPROVE COMMUNICATION

Everything we do is communication. Research studies point to 70% of workplace mistakes being caused by poor communication.

How we start our message often determines the result.

People quickly determine the meaning of our message and whether they will be receptive at the beginning. We only have a short time to get our messages across:

- 2 minutes when we are face to face
- 30 seconds on the telephone
- 10 – 15 seconds by voice mail.

The message is the safety information you want to transfer from your head into the minds and hearts of your employees.

- Before you speak, think carefully about what you want to say. Be as clear as possible about each of the points you want to make.
- Organize your thoughts into a logical sequence for communication.
- Consider your expectations. Do you expect employees to take some action as a result of what you tell them? If so, be sure to be clear about what that action is.
- Keep your communications simple. One safety message at a time, simply and directly stated, is more likely to be heard and understood.

- Be as precise as possible. Use concrete language and examples to explain what you mean so that you leave no room for misinterpretation.
- Be concise. Say only what needs to be said to get your point across. A lot of extra words will only confuse the issue.
- Demonstrate when appropriate. Employees generally learn better and retain more of the safety information they see and hear.
- Repeat your message as needed. Studies show that a safety message often needs to be repeated on several different occasions to get through to employees.

FINAL WORD

Recognize all the different tools used in the workplace to communicate a safety message. When communication is not used to its fullest potential there can be an increased chance for injury. Never be afraid to speak up when it comes to safety on the job.

Don't Mess with an Incident Scene

WHAT'S AT STAKE?

When an error is committed in the workplace and it leads to a worker's injury or death, people who believe they could face blame may panic and be tempted to tamper with the accident scene before a safety investigator arrives.

Tampering can include removing evidence such as objects or documents from an accident scene or adding safety-related items that were not there when the worker was killed or injured.

WHAT'S THE DANGER?

Not only is tampering with the scene of an accident or incident morally wrong, it can land workers in serious legal trouble if the fraud is discovered. And the likelihood of a cover-up being sniffed out by someone who has years of experience investigating workplace injuries and fatalities is high.

EXAMPLE

A construction superintendent was sentenced to six months of house arrest and three years' probation after being convicted of trying to cover up the circumstances surrounding a worker's fatal fall from a steep roof. He was found to have directed another person to put fall arrest equipment on the roof to make it appear as though equipment was in place at the time of the fall.

HOW TO PROTECT YOURSELF

There are obviously situations in which workers must disturb an injury or fatality scene, including these:

- You are trying to save a worker's life or relieve someone's suffering following an incident.
- You are trying to prevent serious damage or loss of property following an incident.
- You are attempting to maintain access to essential services such as water, gas or electricity.

Otherwise, you should not be entering the scene unless you have authority to do so or the investigator has concluded his or her examination of the area and given permission for workers to regain access.

Tampering with an accident/incident scene to make it look as though conditions were compliant with safety regulations is extremely risky, not to mention foolish. Safety investigators can interview witnesses, including victims who survive their injuries and quickly determine that you aren't telling the truth.

A lie can snowball and if you continue the deception you can be caught under a legal avalanche. Don't become part of any cover-up if a co-worker asks you to lie for him or her. You've got nothing to gain and everything to lose, including your job and possibly, your freedom.

If you are first on the scene of a workplace accident, help the injured person and call for emergency medical help if required.

As soon as possible, contact your supervisor and report the incident. If you witnessed what happened, write down details of what you saw and heard. Your observations will help investigators determine what happened and how to prevent a similar incident in future.

FINAL WORD

When people have committed errors that could land them in trouble with their employer or legal authorities, they may be tempted to cover up details of what happened. But coming clean on what occurred can save workers months or years of anxiety and worry and ensure that other employees won't face similar hazards in the future.

Emergency Planning Saves Lives

Download Instructor-Led Material



Meeting Kit



PowerPoint

WHAT'S AT STAKE?

Unexpected emergencies happen every year in this country. When you add fire, floods, airplane crashes and ice storms to the list, you can see why your company needs an Emergency Response Plan to cover all expected and unexpected disasters. For this plan to be effective, all employees must be trained in the roles they will play in an emergency.

WHAT'S THE DANGER?

You are on a construction site when someone shouts a warning. You look around and see a tornado bearing down on your work site. Do you know where to find shelter?

A freight train carrying hazardous chemicals derails behind your plant. It splits apart and bursts into flame. How do you raise the alarm?

HOW TO PROTECT YOURSELF

An Emergency Response Plan is basically a "How Do We Get Out of Here Safely" plan, which usually contains provisions for chemical cleanup or applying first aid. A good plan should anticipate all possible emergencies as well as all natural and manmade disasters that could occur.

All employees should regularly practice and review emergency response. Many workers have died because they didn't remember the emergency procedures they read when they were hired. Only practice will expose errors in the plan which could result in lost lives.

Here are some suggestions for preparing for workplace emergencies:

Know where your emergency telephone numbers are located and which agency to contact first.

Know where the two nearest escape routes are located.

Learn to use a fire extinguisher. You should use it on a small

fire only. If the fire gets out of hand, leave the area. Unnecessary heroics have killed many employees.

Learn how and when to operate internal alarm systems.

Know how to find and operate eye wash units and safety showers. These should be clearly marked and easily accessed. A worker covered with burning acid will be in no condition to search for them.

Everyone should be aware of the location of first aid supplies, and several on your crew should have the proper training to use them.

In a natural disaster such as an earthquake, flood or tornado, knowing where to go and what not to do are vital. Panic and death come from being unprepared.

FINAL WORD

Unexpected emergencies occur every day in factories, plants, offices and warehouses, as well as construction sites, airports and train/vehicle intersections. Ignoring the possibility will not prevent one from occurring. Knowing your part in the Emergency Response Plan could make all the difference.

Incident Reporting

WHAT'S AT STAKE?

Is there a difference between the term “accident” and “incident” in the context of the workplace? The term “accident” has been used often in the past referring to an unplanned, unwanted event. Some people suggest that “accident” was a random event that could not

have been prevented!!! But OSHA suggest that nearly all worksite fatalities, injuries, illness are preventable.

Therefore, the term “incident” is the appropriate term when referring to these events.

WHAT’S THE DANGER?

Incident reporting of all injuries including close calls is critical to the integrity of the workplace. The following points hi – lite inherent dangers for failure to report.

- It is impossible to create improved processes that protect workers if management is not aware of what kinds of problems are occurring in the workplace that may cause injury or property damage.
- The workplace is even at greater risk for a more serious incident to occur in the future if a minor incident or near miss is ignored or not reported.
- Failure for incident reporting will negate a process in which situations can be corrected to prevent similar incidents from occurring in the future.
- Without completed incident reports, companies cannot protect themselves from lawsuits.
- Employee participation in workplace safety improvement strategies will not be encouraged if incidents are not reported.
- A strong safety culture will not be fostered if incident reporting is relegated to the trash bin.

HOW TO PROTECT YOURSELF

It is clear that incident reporting is critical to a successful workplace safety and health program.

INCIDENT REPORTING

- All incidents, near-misses and injuries should be reported immediately. The employee should not have to make a guess as

to whether “their issue or incident” is worthy of an incident report. When in doubt, file an incident report.

INCIDENT REPORTING TRAINING

- All employees should be trained on the incident reporting process for their company. Ideally, this training is included as part of the on-boarding process for every employee. Another approach is to have the safety manual, with incident reporting included, be required reading for all employees the first week on the job. Throughout the year, holding periodic safety meetings on the hazard, near-miss, and incident reporting processes is essential.

INCIDENT REPORTING PROCESS

- Every company’s incident reporting process is different. Some companies may require employees to report directly to HR or their immediate supervisor to file a report. Others may have a very convenient online reporting system that employees can access through their company’s internet. Typically, and at minimum, a company should provide a standard incident report form that every employee knows how to locate and any employee can complete and submit.

PAST INCIDENT REPORTING

- There should never be any punitive damages associated with any employee filing an incident report. Following the company’s incident reporting process, there should be an interview with the employee to ensure all the facts have been collected, the form is complete, and the nature of the incident is fully understood. The incident reporting follow-up process should include an investigation into the incident, medical care provided to the employee (if needed), corrective actions implemented immediately and preventive actions implemented as deemed necessary to prevent future incidents of the same nature. Only then should the incident report be closed and filed. All incident reports should be saved in a secure location.

FINAL WORD

Incident reporting is critical to a successful workplace safety and health program. Do your employees know how and when to submit an incident report?

Injury, Illness and Incident Reporting

WHAT'S AT STAKE?

Whenever, there is a workplace accident or illness, or a close call / near miss is experienced, the situation must be reported. Often times many of these incidents, especially first aid type of injuries are not reported. Injuries / illnesses / close calls are not reported for a variety of reasons.

WHAT'S THE DANGER?

There is a myriad of reasons why incidents involving property damage, near misses, spills, illnesses and injuries go unreported.

- Pride – people do not want to admit their mistakes to others.
- Fear the outcome from sharing what occurred with a supervisor.
- Fear from being afraid of being disciplined.
- What others may think or fear the repercussions from the incident.
- The energy it takes to do the paperwork.

With injuries, even minor ones it is important to get them looked at by a supervisor or safety representative. While many injuries

such as a small cut, or insect sting, may not seem like a big deal, can turn into a big one.

Example:

You are bit by some type of insect on a Friday afternoon at work but decide not to tell anyone. You go home and within a few hours you can see the bite area is swelling up. You also notice you have hives. You have trouble breathing.

You realize you need medical attention because you can see you are having an allergic reaction.

You tell the doctor what happened at work beyond first aid. It is an OSHA recordable injury. Since the injury was not immediately reported at work, there are problems.

1. There is no record or witness to it happening at work which could raise concern by the employer whether or not the injury occurred at work. This may end up in a drawn out dispute since there have been many people in the past who have faked or had injuries off the job, but stated it occurred at work in an attempt for it to be paid through worker's compensation.
2. If the injury was reported immediately someone may have been able to recognize that it may develop into an allergic reaction. There could have been [options for first aid instead of medical treatment](#) to treat the issue before it worsened which would have saved you a trip to the hospital and the company an OSHA recordable.

HOW TO PROTECT YOURSELF

Most workplace injuries and illnesses are **PREVENTABLE**. So, when a work-related injury or illness occurs, it is critical to investigate immediately why it happened. By investigating changes, corrective action can be taken to prevent it from happening again.

Purpose of investigation:

- Not to play the "blame game" but to identify factors which

can then be controlled.

Similar incidents can be avoided in the future by identifying the factors that led to the incident and then changing the conditions or actions.

Investigatory protocol:

- Basic facts (who, what, when and where) of the incident that resulted in injury are reviewed to determine the “Why” and “How” to prevent the incident from happening again.
- The information desired from the investigation is shared only with those on a need – to – know basis while maintaining worker confidentiality.

TRENDS / TRACKING OF WORKPLACE INJURY AND ILLNESS

Summaries of work – related injuries and illnesses help identify trends and stabilize processes to prevent recurrence.

The trends identify unhealthy behavior or hazardous conditions by TRACKING work – related injuries and illnesses. Information so gained targets occupational health and safety education activities to prevent future worker work – related injuries and illnesses.

The trending analysis includes:

- Tracking and monitoring workplace injuries and illnesses on an on-going basis.
- Determining if any trends in workplace injuries or illnesses exist and graphing those trends if possible.
- Identifying any equipment, materials, or environmental factors that may be commonly involved in workplace injury or illness incidents.
- Identifying possible solutions and suggesting improvements to reduce or prevent the likelihood of future workplace injuries or illnesses.
- Reviewing data for quality assurance.
- Monitoring safety program leading and lagging indicators

(i.e. training, workers compensation cost.

FINAL WORD

All injuries need to be reported, no matter how small. Not only does it protect you, but it also protects the company as a whole by possibly preventing a first aid injury developing into an OSHA recordable. Something minor in nature can develop into something more serious. Lessons can be learned from minor injuries, to prevent other injuries occurring in the future.

Injury and Illness Prevention Program

WHAT'S AT STAKE?

Employers are mandated by Federal Law to provide a safe and healthy workplace for employees. This is further augmented by state law. California is a state that requires employees in accord with California Code of Regulation, to have an Effective Injury and Illness Prevention Program in writing. The goal of the IIPP is to ensure that worker safety and health are not compromised.

WHAT'S THE DANGER?

Without an effective IIPP, there are potential workplace hazards and hazardous conditions or practices that go unnoticed or ignored. There is always the possibility that employees will be reluctant to inform employers of hazards for fear of reprisal or retaliation.

HOW TO PROTECT YOURSELF

Just what is an IIPP!!

It is a written plan that has the following conditions:

- Management commitment/assignment of responsibilities
- Safety communications system with employees
- System for assuring employee compliance with safe work practices
- Scheduled inspections/evaluation system
- Accident investigation
- Procedures for correcting unsafe/unhealthy conditions
- Safety and health training and instruction
- Recordkeeping and documentation

The IIPP includes procedures that your employer puts into practice. The program includes a system for your employer to communicate with you on matters relating to occupational safety and health.

The safety communications system, one of the elements of the IIPP, should be in a form readily understandable by all affected employees. The safety communication system may include:

- meetings
- training programs
- postings
- written communications
- a system for anonymous notification by employees about hazards
- labor/management safety and health committees
- other means of ensuring communication with employees.

Additional Support

- Construction IIPP requires that supervisors conduct “toolbox” or “tailgate” safety meetings with their crews at least every ten working days to emphasize safety.
- Supervisors also need to hold periodic meetings to discuss safety problems and accidents that have occurred.

- Finally, Employees should never undertake a job that appears to be unsafe. You should not perform a job until you have received instructions on how to do it properly and safely.

FINAL WORD

The goal of the IIPP is to ensure that worker safety and health are not compromised.

Lead Safety Talk

WHAT'S AT STAKE?

Lead exposure is a serious issue that many workers face every day. Lead is common in a wide range of materials including paints and other coatings, lead mortars, and base metals, which may be welded on or abrasive blasted.

Lead occurs naturally, but much of its presence in the environment stems from its historic use in paint and gasoline and from ongoing or historic mining and commercial operations. Lead is found in abundance in our environment and because of this it is traceable in most people's bodies today.

WHAT'S THE DANGER?

You can be exposed to lead in a variety of ways:

- Breathing workplace air (lead smelting, refining and manufacturing industries)
- Eating lead-based paint chips
- Drinking water that comes from lead pipes or soldered fittings
- Breathing or ingesting contaminated soil, dust, air, or

water near waste sites

- Breathing tobacco smoke
- Eating contaminated food grown on soil containing lead or eating food covered with lead containing dust
- Lead can be inhaled or swallowed and once inside the body tends to remain in tissue and organs.

Construction Industry

According to OSHA, overexposure to lead is most common in the construction industry among trades such as plumbing, iron work, welding, lead-based paint removal, electrical work and others. These trades often are involved in activities that generate lead dust and fumes.

Specific hazardous worksite practices in construction trades

- Renovating or demolishing structures that have lead – painted surfaces.
- Removing lead-based paint or spray painting with lead-based paint.
- Sandblasting steel structures that are painted with lead.
- Grinding, cutting, or torching metal surfaces that are painted with lead.
- Welding, cutting, or removing pipes, joints, or ductwork that contain lead or are painted with lead.
- Lead soldering.
- Cutting or stripping lead-sheathed cable.
- Cleaning up sites where there is lead dust

Exposure Hazards

You may get lead poisoning if you ingest or inhale lead dust or fumes. In adults, common symptoms of acute lead poisoning include nausea, vomiting, loss of appetite, stomach cramps, headache, fatigue, joint or muscle pain, constipation, anemia and decreased sexual drive. Lead poisoning also can cause damage to the nervous system and even lead to death.

Workers who experience repeated exposure to lead over time can develop chronic lead poisoning, an accumulation of lead in the

body. Lead accumulates in bones and is gradually released into the bloodstream. Long after the exposure has ended, the effects of chronic lead poisoning can harm the nervous system, kidneys, bones, heart and reproductive system.

HOW TO PROTECT YOURSELF

A. Employers

AIR Sampling

Employers of job sites that might contain lead are required by Cal/OSHA to recognize the potential hazard. For example, painted surfaces must be presumed to contain lead until all layers of the paint are sampled and analyzed. The detection of any amount of lead in the paint will trigger numerous requirements, even for common tasks such as drywall demolition, manual paint scraping, and manual paint sanding. The employer is required to conduct air sampling to determine the exposure to lead during these tasks and during other tasks that could result in lead exposure. Until actual exposures are determined, workers are required to wear respirators that are appropriate to the task.

Blood – Lead Levels

Employers should monitor the blood-lead levels of exposed workers to ensure that they are receiving adequate protection and to help identify problems. Some companies hold training sessions and weekly safety meetings to inform employees about lead and explain the monitoring devices. Industrial hygienists can help supervisors understand lab results so they can be explained to employees in easily understand- able terms.

Decontamination Techniques

Some companies that work with lead have their workers and supervisors trained (and retrained) on lead hazards. On some jobsites, companies that work with lead have a decontamination station or trailer with washing and shower facilities.

Some companies require workers to change into special clothes that are kept in a decontamination trailer, and the employees are given Tyvek suits to wear over their clothes. If workers go off the job

for any reason, they have to shower first and leave their work clothes and shoes in the decontamination trailer. This helps to prevent workers from tracking lead dust into their vehicles and taking it home. On break time, employees are vacuumed off with a vacuum that uses a HEPA filter before they go into the decontamination trailer. Workers must also wash their hands thoroughly.

B. THREE – Pronged Protocol

OSHA recommends a three-pronged attack on lead hazards which includes **Safe Work Practices** like decontamination procedures, **Engineering Controls** (mechanical and local exhaust ventilation, shrouded tools, and wetting agents to keep lead-contaminated debris from becoming airborne); and **Personal Protective Equipment**, including supplemental respirator use.

Workers and supervisors need to know the health effects of lead and the safe work practices and procedures that need to be followed. Otherwise, lead can be a silent killer.

C. Worker Prevention / Precautions

Training

All workers who may be exposed to lead must be trained in the hazards of lead. The results of air sampling are used to determine if workers are exposed to lead above the action level (AL) of 30 micrograms per cubic meter of air or above the permissible exposure limit (PEL) of 50 micrograms of lead per cubic meter of air, averaged over an 8-hour shift. Exposures above the AL or PEL will trigger additional requirements including engineering controls, proper housekeeping, washing facilities for hand and face washing, additional worker training, respiratory protection, medical monitoring, and additional air sampling. The employer must have a written compliance plan.

Protective Clothing / Hygiene

Workers should wear protective clothing and dispose of it properly. The type of protective clothing and respiratory protection needed for workers can be determined by special

monitoring equipment that measures the amount of lead in the air. Workers should also take showers and change into street clothes before leaving the worksite. Lead is absorbed through skin pores, as well as through inhalation, which makes it important for workers to remember to wash their hands before they eat or smoke.

Education / Knowledge

Workers should be able to perform the job safely if companies follow OSHA regulations. The OSHA standard requires workers to receive training on the hazard of lead exposure, know how to perform their work safely, and have adequate protective clothing and equipment for abatement, disposal and cleanup.

FINAL WORD

It is important to understand where lead is found in our environment and the health effects related to overexposure. Often times many people develop an illness, but it is misdiagnosed by a doctor or disregarded by the individual altogether. If you suspect you or a loved one is suffering from lead poisoning talk with your doctor. Blood tests are available that can determine the amount of lead in a person's blood.

Lockout Tagout for Affected and Authorized Employees

WHAT'S AT STAKE?

Lockout / Tagout / is series of safety procedures designed to prevent accidents causing serious injuries including fatalities to employees on the unexpected startup of the equipment or energy while servicing.

WHAT'S THE DANGER?

Energy sources including electrical, mechanical, hydraulic, pneumatic, chemical, thermal or other sources in machines and equipment can be hazardous to workers. During the servicing of machines and equipment, the unexpected start up or release of stored energy could cause injury to employees.

Anyone who operates, cleans, services, adjusts, and repairs machinery or equipment should be aware of the hazards associated with that machinery. Failure to lock out or tag power sources on equipment can result in electrocutions, amputations, and other serious-sometimes fatal-accidents.

Some of the causes of accidents:

- The machine or piece of equipment was not completely shut off before a maintenance or repair operation. Not only must the machine be turned off but also the power source that goes to it.
- The machine was turned on accidentally, either out of carelessness or because the person who turned it on did not realize that another worker was there and could get hurt.
- The machine was not working correctly but was not fixed, turned off, locked or tagged, and someone who did not know about the problem used it.
- Moving equipment was not blocked.
- Safety procedures were inadequate or had not been properly explained.

HOW TO PROTECT YOURSELF

The Lockout/Tagout standard establishes the employer's responsibility to protect employees from hazardous energy in machines and equipment during service and maintenance. An initial review should be made to determine which switches, valves, or other energy isolating devices apply to the equipment being locked out since more than one energy source may be involved.

The standards establish requirements that employers must follow when employees are exposed to hazardous energy while servicing and maintaining machinery and equipment. The most critical requirements from these standards are outlined below and also prevent injuries:

- Develop, implement and enforce an energy-control plan.
- Use lockout/tagout devices for equipment that can be locked out. Tagout devices may be used in place of a lockout device only if the tagout program provides employee protection equivalent to that provided through a lockout program.
- Ensure that the new or overhauled equipment is capable of being locked out.
- Develop, implement and ensure an effective tagout program if machinery or equipment are not capable of being locked out.
- Use only lockout/tagout devices authorized for the particular equipment or machinery and ensure that they are durable, standardized and substantial.
- Ensure that the lockout/tagout devices identify the individual users.
- Establish a policy that permits only the employee who applied a lockout/tagout device to remove it.
- Provide effective training for all employees covered by the standard and offer periodic refresher training.
- Comply with the additional energy control provisions under OSHA standards when machines or equipment must be tested or repositioned when outside contractors work at the site, in group lockout situations, and during shift or personnel changes.
- Develop written procedures explaining how a lockout is done.
- Use engineering and administrative controls as much as possible to eliminate the need for lockout.
- Perform regular maintenance to prevent malfunctioning equipment.

Those employees affected by safety procedures of lockout / tagout are:

- Authorized Employee – An employee who manually locks/tags

machines or equipment in order to perform servicing or maintenance.

- Affected Employee – An affected employee is one, who is not qualified to lock/tag a piece of equipment which may need maintenance or servicing. An affected employee can also be a person who works in/around an area where the equipment may be locked/tagged out.

FINAL WORD

Be aware of your personal safety and the safety of others when working with or around moving equipment and machinery. Always follow proper lockout and tagout procedures, even for a quick or minor repair!

Radiation (Ionizing)

WHAT'S AT STAKE?

Radiation or Electromagnetic Radiation (EMR), is energy in a wave form. An Electromagnetic Field (EMF) is made up of an electric field and a magnetic field. EMFs occur naturally and also come from sources created by human activity. Natural EMFs comes from sources such as the earth's own magnetic field, electrical storms, the sun and even the body's own essential electric activity. Manufactured EMFs, come from overhead power lines, electric wiring in buildings, radio towers, and laser tools. It is these that are of more concern. EMR can be either ionizing or non-ionizing.

WHAT'S THE DANGER?

Ionizing radiation is high frequency and high-energy and can penetrate the body – it has enough energy to break up atoms and

molecules as it passes through the body (ie, it can cause ionization).

Ionizing radiation occurs as either electromagnetic rays (X-rays and gamma rays) or particles (such alpha and beta particles).

- Alpha particles can be easily stopped (energy absorbed) by a piece of paper.
- Beta particles can penetrate one or two centimeters of human tissue – but can be stopped by glass or metal.
- Gamma rays and X-rays are waves of energy similar to visible light; except they have more energy and are invisible. They travel at the speed of light and penetrate matter more easily. They can be screened by lead, concrete or water.

Where do you find ionizing radiation?

Most ionizing radiation in industry is due to X-rays. Equipment which emits X-rays can be found in:

- Medical and dental diagnostic and therapeutic radiography;
- Industrial radiography for detection of faults in welding or metal castings;
- Testing instruments such as thickness gauges in sheet metal, plastic and paper production.

Gamma radiation is used in the sterilization of medical and surgical equipment. Radioactive isotopes are used in the mineral industry, in analytical laboratories, in diagnostic pathology and in research.

Health Effects of Exposure to IONIZING

When radiation is absorbed in the body it causes chemical reactions to occur which can alter the normal functions of the body. At high doses this can result in massive cell death, organ damage and even death. At low doses the situation is more complex.

It is well documented in the public domain that the human body is composed of brain cells, muscle cells, blood cells etc. Ionizing

radiation affects the tissues of the body.

Low doses of radiation can damage the genes. The following are harmful effects:

- **RADIATION SICKNESS**

When the body is exposed to large doses of ionizing radiation over a short period, for example as a result of a radiation accident – can lead to severe massive cell destruction and death of the person. This can occur very quickly, or over a longer period of time if the dose was smaller. Symptoms include nausea and vomiting, loss of hair, inflammation of the mouth and throat.

- **CANCER**

A cell damaged by ionizing radiation can lose its ability to control the rate at which it reproduces – this is cancer. Radiation at low doses can have this effect. The most common radiation induced cancers are leukemia, skin tumors and thyroid cancer, though tumors in various other organs can also occur.

- **GENETIC DEFECTS & REPRODUCTIVE TOXICITY:**

If an unborn child is exposed to ionizing radiation, then the chances that of the child then developing childhood cancer (especially leukemia) are greater. Changes to basic cell structures (mutations) of reproductive cells (ova or sperm) can lead to miscarriages and birth defects.

- **CATARACTS**

Clouding of the lens of the eye, eventually leading to blindness.

- **BLOOD CHANGES**

Effects on the production of bone marrow resulting in a reduction of white blood cells and a less effective immunity system to fight infections

- **NERVOUS SYSTEM EFFECTS**

Alteration of the electrical activity of the brain resulting in

headache, fatigue, dizziness, changes in behavior.

- **CARDIO-VASCULAR EFFECTS**

Altered blood pressure; altered electrical activity of the heart.

HOW TO PROTECT YOURSELF

If not properly controlled and monitored Ionizing radiation can prove to be deadly. This workplace hazard should be handled in the following manner.

HAZARD IDENTIFICATION

- Ensure your employer identifies any sources of ionizing radiation and undertakes monitoring.
- Ensure your employer monitors all workers who may be exposed to ionizing radiation using a dosimeter, which is worn as a badge attached to clothing. At monthly intervals the dosimeter should be sent to a laboratory where the radiation exposure can be read.
- Note it is likely that your employer will need to employ someone with the relevant expertise to do this. The employer has a duty to employ or engage someone who is 'suitably qualified'.

Talk to members of your work group about the hazards of radiation and their control, and any effects they may be experiencing on a regular basis.

Investigate any past incidents.

RISK ASSESSMENT

- Ensure the employer assesses results of monitoring – keep a check on results.
- Ensure your employer has an effective incident reporting procedure in place to record actual and potential exposure to radiation, unsafe conditions, and workers.

RISK ELIMINATION / REDUCTION

Ensure your employer controls the risks of radiation following the preferred order of control methods:

- Takes all measures possible to avoid exposure.
- Isolates all sources of radiation by shielding, containment or remote handling.
- Maintains all radiation generating equipment in order to minimize radiation emitted and prevent any 'leakages'.
- Implements engineering controls to reduce radiation levels.
- Develops safe practices work practices and procedures, and ensures they are followed.
- Provides suitable protective clothing and administrative controls, including job rotation and rest breaks, to limit the amount of time employees are exposed, where engineering controls are unavailable or ineffective to reduce exposure levels.
- Provides adequate information and training on any radiation hazards in the workplace. Training should include information on the sources of the radiation, the health effects, the control procedures in place and how they are monitored, safe work practices, personal protective equipment (PPE), emergency procedures and radiation monitoring programs where appropriate.
- Maintain all controls implemented.
- Develops back up option emergency procedures in the case of control measures failure.

FINAL WORD

Prevent damages and possible disaster with the three steps prevention protocol. Hazard Identification, Risk Assessment and Risk Elimination / Reduction.

Safety Talk Cranes and Derricks Operator Qualification and Certification Construction

WHAT'S AT STAKE?

The massive cranes that transcend our skylines are imposing devices. Questions range... are the operators competent and qualified to operate?... how are operators trained?... who evaluates them? ... is there re-training and refresher courses?... How is the safety of operators and workers in proximity ensured and monitored?

WHAT'S THE DANGER?

Today, manufacturing and construction industries move large, heavy loads. Careful training and extensive workplace precautions and improving technologies have been developed for those operations. There are significant safety issues to be considered for both operators of cranes including workers in close proximity.

Construction sites are among the most dangerous sites in all industry. Records are replete with injuries and fatalities. Osha itself says that approximately 75% of struck – by fatalities involve heavy equipment such as cranes and trucks.

HOW TO PROTECT YOURSELF

Issues of crane safety for operators and workers have dominated the construction safety dialogue at least since 2010. In 2010, OSHA formulated 4 options for employers to ensure their operators were qualified to operate cranes.

- If the employers operated in a state or locality that had specific crane operator licensing laws, then they were

required to follow those laws (assuming the laws met certain criteria).

- Operators could be certified by passing an examination administered by an accredited testing organization.
- Operators could be qualified through the employer's in-house, but independently audited, testing program.
- Operators could be qualified by the United States military.

In May 2018, OSHA issued a new proposed rule related to the operator qualification and certification requirements. OSHA proposed to (1) permanently extend and clarify each employer's duty to ensure the competency of crane operators through required training, certification or licensing, and evaluation; (2) establish minimum requirements for operator competency; and (3) revise the previous requirement that certification must be based on type and rated capacity, instead just requiring that certification be based on type of crane.

New Rule

On November 9, 2018, OSHA retained the operator qualification and certification initially established in 2010 that requires crane operators to be certified through one of the four options allowed in the original rule. However, **OSHA revised the rule to require certification by "type" of crane only, not "type" and "capacity."**

- The new, final operator qualification and certification provisions require the employer to provide each operator-in-training (i.e., an operator that has not been certified and evaluated) with sufficient training, through a combination of formal and practical instruction, to ensure that the operator-in-training develops the skills, knowledge, and ability to recognize and avert risk necessary to operate equipment safely.
- The operator's trainer must be someone who has the knowledge, training, and experience necessary to direct the operator-in-training on the equipment in use.
- Finally, employers must also ensure and evaluate that each operator is "qualified" by a demonstration of the skills and

knowledge, as well as the ability to recognize and avert risk, necessary to operate the equipment safely.

- This evaluation must be conducted by an individual “who has the knowledge, training, and experience necessary to assess equipment operators.”

FINAL WORD

The goal is to ensure that all operators of cranes develop and utilize all the skills, knowledge and ability to recognize and avert risk necessary to operate equipment safely.

Cranes and Derricks Signalling Construction

WHAT'S AT STAKE?

Signal persons are a crane operator's eyes and ears on the ground and have a major responsibility in guiding operations. Signaling and communicating correctly with [crane operators](#) is vital to prevent crane accidents.

WHAT'S THE DANGER?

It has been well documented that the construction work site can be very perilous for worker safety.

Here are some stark statistics:

- Between 1992 and 2010 there were 5,096 fatalities in the United States due to fatal contact with electricity on construction sites. There was a total of 66,748 injuries that required days away from work in the same time period

due to electricity. **The construction industry experience the majority of injuries and fatalities due to electricity.** These statistics do not include injuries caused by secondary events. For example, an individual falling from a ladder due to getting shocked. If these types of injuries were included, the statistics would be higher.

- One of the biggest exposures for a fatality on a construction site is ground personnel being struck by moving equipment. OSHA states approximately 75% of struck – by fatalities involve heavy equipment such as cranes or trucks.

HOW TO PROTECT YOURSELF

The construction site is fraught with dangerous equipment and, therefore potentially dangerous circumstances. Coupled with human error, workers can be endangered in this environment. Signaling is an important element to reduce / eliminate injuries and fatalities in construction crane work.

Signaling is an important part of hoisting and rigging and one should be familiar with the internationally recognized system of standard hand signals.

In many cases, hand signals are the most efficient form of communication between riggers and crane operators.

When is a signal person required?

On construction sites, signaling is required in five situations.

1. When the operator cannot see the load.
2. When the operator cannot see the load landing area.
3. When the operator cannot see the path of travel of either the load or the crane.
4. When the operator is too far from the load to judge distance accurately.
5. When the crane or other hoisting device is working close to live power lines or equipment.

Hand signals have their limitations. For example, they should

never be used when distance or visibility prevents accurate communication with the operator.

There is a signal for each action of the crane. By using the correct hand signals, you can get a crane to do almost anything you want. The operator only needs to clearly see and understand your signals.

These are the ground rules for signaling:

- While only one person should signal the operator, anyone can give the STOP signal and it must be obeyed immediately.
- Signals should be clear and, wherever possible, barehanded.
- The load must be directed so that it never passes over anyone.
- Operators should not make a move until they receive and understand your signal. If contact between you and the operator is broken for any reason, the operation must stop.
- Some situations call for two signalers. For instance, during a concrete pour, one signaler may be needed to direct the lift while the other directs the drop.
- Where a difficult lift demands voice communication, use two-way radios instead of hand signals.

What does a signal person need to know?

- Know and understand the type of signals used. If hand signals are used, the signal person must know and understand the Standard Method for hand signals.
- Be competent in the application of the type of signals used.
- Have a basic understanding of equipment operation and limitations, including the crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads.
- Demonstrate that he/she meets all the requirements through an oral or written test, and through a practical test.

How does a signal person become qualified?

- The employer of the signal person must ensure that each signal person meets the Qualification Requirements prior to

giving any signals. This requirement must be met by using either Option (1) or Option (2).

- (1) Option – Third Party Qualified Evaluator. The signal person has documentation from a Third-Party Qualified Evaluator showing that the signal person meets the Qualification Requirements.
- (2) Option –
- The Employer's Qualified Evaluator assesses the individual and determines that the individual meets the Qualification Requirements and provides documentation of that determination. An assessment by an Employer's Qualified Evaluator under this option is not portable—other employers are not permitted to use it to meet the requirements of this section

Voice Communication

There are situations where hand signals are not appropriate or impossible to implement. Voice signal communication can be instituted in place of hand signals.

Prior to Lifting Operations

Prior to beginning lifting operations using voice signals, the signals shall be discussed and agreed upon by the person directing lifting operations, the crane operator, and the appointed signalperson.

Telephones, radios, or equivalent, if used, shall be tested before lifting operations begin.

Prior to commencing a lift, the operator and signalperson shall contact and identify each other.

- Begin by calling for the operator by name
- Operator will acknowledge with the signalperson's name

Voice Command Basics

The devices used to transmit signals shall be tested on site before beginning operations to ensure that the signal transmission is clear and reliable.

Signal transmission must be through a dedicated channel.

The operator's reception of signals must be by a hands-free system.

Cautions regarding radio use may include the following:

- Awareness of any explosive devices in general area (radio transmissions have been known to cause premature detonation of explosives that use electric detonators)
- Other electronics (potential for interference)
- Other radios nearby operating on the same frequency

Elements of Voice Signals

Each series of voice signals shall contain three elements stated in the following order:

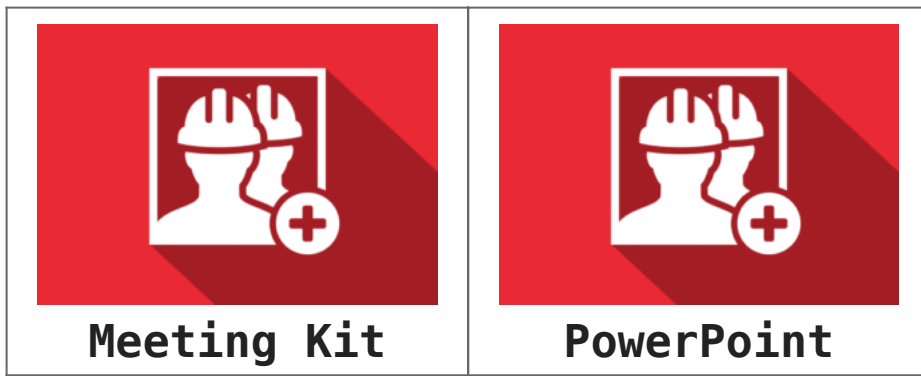
1. Function and direction
2. Distance and/or speed
3. Function stop

FINAL WORD

The modern-day construction site safety norm relies heavily on the seamless interaction between the crane operator and the signal person on the ground.

Dangers for Divers

Download Instructor-Led Material



WHAT'S AT STAKE?

Each year hundreds of divers become entangled in vegetation, run out of air, get caught in small spaces or get the “bends”. These divers are at risk every time whether harvesting seafood, repairing ships or retrieving golf balls from ponds.

WHAT'S THE DANGER?

There is the undeniable importance of careful planning, preparation and strict adherence to safety procedures.

Only those properly trained and qualified should undertake diving. As usual and predictable, human error is responsible for virtually every dive emergency. Many divers have died trying to rescue others or because there was no one to rescue them.

Example

A worker drowned while completing routine underwater maintenance on a small boat. The man had been working below the surface for more than an hour when his co-workers became concerned and pulled his rescue line. The diver failed to surface, and by the time a second diver arrived the worker had died; his rescue line caught on a propeller and he was unable to see in the murky water.

HOW TO PROTECT YOURSELF

The minimum requirements for divers to maintain safety are as follows:

- Dive only if a supervisor and standby diver (ready to enter the water within one minute) are present. One of these people must know CPR.
- Dive only if properly trained to do so. A recreational scuba certificate is not adequate for occupational diving.
- Evaluate potential hazards before each dive, including weather conditions, water conditions and entanglement hazards such as weeds, netting and fishing lines.
- Maintain continuous contact with someone on the surface and with your diving partner (if applicable).
- Leave the water when other divers do and never re-enter with a depleted air supply.
- Watch for signs of decompression sickness (the bends) including skin rash, extreme fatigue, painful joints and paralysis. Decompress under a supervisor's guidance.
- Check your equipment carefully before each dive and have it verified by the dive coordinator.
- Carry a knife and alternate air source such as a pony bottle; a small cylinder strapped to a diver's main tank for emergency use.
- Wear a rescue line connecting you to the surface. Use a buoy to mark your location while in open water.
- Ensure all machines you are diving near are locked out and secure, including intakes, pipes and tunnels. Have additional rescue divers available if the risk of entrapment is high.

FINAL WORD

Occupational diving is exacting work with absolutely no room for error. Careful planning and strict adherence to safety guidelines are essential for keeping dives from turning disastrous.

Electrical Safety Oil and Gas

WHAT'S AT STAKE?

The issue of safety in the oil and gas industry will not likely subside soon. With energy demand in countries in the Middle East, China and Brazil expected to continue growing oil and gas activity worldwide is expected to increase to meet demand. Add to this, the U.S. oil and gas industry ramps up exploration and production of shale resources in the Gulf of Mexico and Alaska.

Arc flashes, fires, explosions occur on shore and off shore operations in the volatile oil and gas industry.

WHAT'S THE DANGER?

What's Arc Flash?

Arc flash, a release of heat energy that includes molten metals, hot metallic oxides and toxic burning smoke, is often violent, and deadly. Arc flash temperatures exceed 35,000 degrees Fahrenheit, hotter than the sun's surface, with 700 miles per hour projectile-producing pressure, which can throw a person across a room.

An estimated five to 10 arc flashes occur each day in the United States, according to a report from the National Institute for Occupational Safety and Health.

Arc flashes pose a particular risk **offshore**, where lower voltage machinery with between 480 and 600 voltages while not recommended is frequently worked on without the machinery being shut down. While no work is or should be done live on medium voltage machinery in general, work done on low voltage motor control centers and distribution boards cannot typically be shut down in a critical operation. Never work on live equipment but the reality is that people sometimes do.

A stumble by a worker or a dropped tool may cause conductors to be

crossed, creating a blast. Damaged or overheated equipment, particularly **offshore**, are other factors that can lead to an arc flash.

One arc flash incident can cost up to \$15 million, including healthcare costs, workers compensation, replacing equipment, increased insurance premium, and lost production time.

A 2010 report from the International Oil & Gas Producers Association found that 16.1 percent of all fatalities at oil fields were caused by an **electrical accident, explosion or burn**.

Fires and explosions are the third most common cause of worker death in the **oil and gas industry**. One out of seven occupational fatalities in the **oil and gas industry** results from a fire or explosion. From 2004 to 2008, fires and explosions caused 18.7 percent of worker deaths in the **oil and gas industry**, according to the U.S. Bureau of Labor Statistics.

HOW TO PROTECT YOURSELF

1. Awareness of the risk of arc flashes began to grow significantly as videos of incidents began to be posted online, and studies of security camera footage on offshore and other facilities showed arc flash incidents. The public videos really accelerated the market demand for arc flash safety information. Administration and industry standards groups began seeking to quantify the risk and drive change.

Government-backed research efforts, particularly in the United States (IEEE standards) and Europe (IEC standards) to investigate arc flashes, also led to the release of technical information and specific videos showing the damage that arc flashes pose. Once the manufacturing community and industry standards bodies and customers became more aware of equipment dangers, they recognized the need to quantify the risks.

To quantify the risk, manufacturers have begun labeling equipment showing the arc flash energy that could be released at a particular distance. Customers have also begun training employees

to understand the labels. If a piece of equipment could emit a certain level of calories per centimeter squared, they have to wear a certain level of protection equipment or deem the equipment non-approachable.

While workers wearing the right protective equipment can still sustain injury, the risk of arc flash associated with new equipment manufactured has been lowered thanks to information now available. **The lowered risk has been made possible by arc-resistant Personal Protective Equipment.**

2. **Prevention of arc flashes really comes down to education,** and helping workers better understand the risks, as well as identifying risk areas for arc flashes and identifying tools that can mitigate this risk. Operators should have an **arc flash mitigation plan** in place both for existing equipment and new projects.

To prevent arc flashes, companies should evaluate their systems for hazards, determine incident energy exposure and arc flash boundaries, and use warning labels to indicate arc flash hazards.

Other steps companies can take:

- Minimize or preferably eliminate the amount of work done around live equipment.
 - Use remote diagnostic and maintenance tools.
 - Install devices to reduce energy rather or in addition to containing energy.
 - Utilize properly designed and installed equipment for new and existing installations are also critical in mitigating arc flash hazards.
3. As the awareness of arc flash dangers has grown, customers and contractors are standing up and demand change. **North American oil and gas companies** are leading to focus on more awareness of arc flash safety, implementing efforts to address arc flash throughout their operations from workplace safety to the types of equipment they purchase.

Offshore operations get safer as awareness of safety grows in

electrical and other aspects of offshore oil and gas operations.

The combination of efforts **by standards bodies, workplace safety initiatives, and equipment design for offshore and onshore rigs, infrastructure, pipelines and refineries** make the oil and gas industry safer for all its workers.

FINAL WORD

The oil and gas is a safer industry efforts of by the combination of STANDARDS Bodies, Workplace Safety Initiatives and Equipment design for off – shore and on shore rigs, infrastructure, pipelines and refineries.

Fall Hazards and Fall Protection Oil and Gas

WHAT'S AT STAKE?

The oil and gas industry continue to advance as engineers and safety professionals are able to produce creative and ergonomic ways to access oil and gas reserves. As the oil and gas industry continues to expand, keeping oil and gas workers safe is the top priority.

WHAT'S THE DANGER?

Oil and gas Workers are mentally touch but the **oil and gas industry** is very dangerous because workers are often exposed to chemical, physical, and biological hazards, such as toxics, extreme temperatures, and bacteria. Workers are also exposed to contact injuries, fires and explosions, falls, and confined space

issues.

Few industries require more fall protection equipment than the [oil and gas industry](#). In North America, between 2003 and 2013, more than 1,100 workers in the **oil and gas sector** were killed in workplace accidents, which is an average of more than a hundred deaths a year.

Specific Dangerous Work

The work accomplished on an **oil rig** is considered one of the most at risk in the industry. The workers put in long hours and perform dangerous tasks in harsh environments. Regularly, the workers must climb a derrick ladder to access different areas of the rig. Consequently, many workers climb up to altitudes that are often 100 feet high, numerous times a day. The ladder may be greasy, icy or extremely narrow, which can lead to a fall. Ladders are often offset, forcing workers to switch from one fixed ladder to another. This transition may pose challenges to fall protection systems as workers must be protected the entire time.

More Risk to Fall Protection System

Prolonged exposure to materials found in petrochemical plants may cause important health and safety risks to maintenance personnel.

Due to the corrosive effects of salt, and the constant motion of an oil rig at sea, the fall protection systems are subject to corrosive and caustic substances. The durability of materials is a crucial consideration during system design. The anti-spark synthetic cable systems are often required in petrochemical applications to minimize the risks of sparks and accidental explosions.

Specific Fall Hazards in the Oil and Gas Industry

- Climbing the [derrick ladder](#).
- Transitioning from the derrick ladder to the derrick.
- [Swing fall](#)
- Inclement weather.
- Entanglement of the SRL in moving machinery parts.

- Adequate fall clearance for low applications, such as pipe racks.
- Specialized fall arrest equipment, such as for welding.
- Environmental challenges, such as poor lighting and greasy pipes.
- Hindered movement due to tight spaces.
- Often entering dangerous, complicated areas not accessed frequently.
- Entrapment hazards.

HOW TO PROTECT YOURSELF

OSHA takes the lead in requiring employers to provide the following in the workplace.

- Provide working conditions that are free of known dangers.
- Keep floors in work areas in a clean and sanitary condition.
- Select and provide required personal protective equipment at no cost to workers.
- Train workers about job hazards in a language that they can understand.

The standard fall protection system in the oil and gas industry should consist of:

- a self-retracting lanyard (SRL).
- secondary protection with another SRL attached to a different anchor point.
- an oil and gas specific full-body harness.
- descent devices to provide a quick, safe escape for emergencies.
- trauma relief straps for post-fall arrest.

Fall Protection Training – Three Levels

Because of the dangerous nature of the oil and gas industry, proper fall protection training is very important. There are three basic levels of training: **competent person, qualified person, and authorized person**. OSHA defines a **competent person** as “one who is capable of identifying existing and predictable hazards in the

surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.” Every team leader, rescue team leader, and day-to-day supervisor should be certified as a competent person because they must ensure that workers are following the proper fall protection procedures.

OSHA defines a **qualified person** as “one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.” The qualified person should understand all fall protection standards, equipment, and systems used at the workplace. The qualified person’s main responsibilities include supervising the design, selection, installation, and inspection of certified anchorages and lifelines and participating in accident investigations.

OSHA defines an **authorized person** as “a person approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location or locations at the jobsite.” Authorized person certification is the basic level of fall protection training that every oil and gas worker must have if they work at height. Certified authorized persons should be taught how to recognize and eliminate or control fall hazards, how to use written fall protection procedures, and how to understand and follow fall protection regulations, employee roles and responsibilities under these regulations, and post-fall rescue procedures. Through proper training and proper use of equipment, oil and gas hazards can be avoided and conquered, and more importantly, oil and gas workers can be kept safe.

FINAL WORD

When employees are working on derricks, make sure they are tied off properly. Train them on the hazards of the job. Train them how to use the fall protection equipment. Train them never to take risks when it comes to fall protection safety.

Finding the Real Cause of Injuries

WHAT'S AT STAKE?

Injuries of employees cause economic-down time, replacement costs and generally lower productivity. It also impacts the life of the injured employee as he or she cannot enjoy the fruits of life like recreation or sport time with their friends or family.

WHAT'S THE DANGER?

What are the dangerous conditions under which employees find themselves? There are many but here are a few examples.

- Stacking meat crates and one of them fell, striking a man in the face.
- Man was using piece of wood to follow up work on a joiner. This piece was too small and was grabbed by the joiner blades, causing part of his right middle finger to be amputated, and wounds to other fingers.
- Injured was painting the ceiling and the ladder fell with injured on it.
- Man was assisting a crane lifting pallets. While helping to free the pallet from under a pipe, it swung free and pinned the man against another stationary pallet.
- Woman was holding a locker next to the wall so it could be bolted in place. A man setting a second locker down next to the first. The second locker slipped and fell on the woman's left foot.

HOW TO PROTECT YOURSELF

There are three areas to delve into the examination of injury reports due to accidents.

1. Patterns
2. Attitudes
3. personal responsibility

Safety specialists look for patterns they might see a certain type of equipment is involved in a number of injuries, such as impact tools, electrical power tools or metal working machines. They might see patterns involving chemical exposures or slippery decks. They might even see attitudes expressed in the injury reports. Sometimes the reports reflect:

- Apathy toward safety
- Resentment at being told how to do a task
- Risk-taking
- Impatience

Look at the explanations of injuries at the beginning of this safety talk. What pattern do you see? They all seem to ascribe some sort of life to inanimate objects.

In each case, the injured person seems to be an innocent victim of an object just waiting for an opportunity to hurt someone. Sounds silly, doesn't it?

Of course, we know better. Or do we? Looking at them again, we are sure the crate didn't fall of its own accord, the jointer blades didn't deliberately grab the piece of wood and chop the man's finger off, and the ladder didn't maliciously slide out and carry the man with it. No, in every case somebody did something wrong and the objects either followed the natural laws of motion or the unintentional directions of the worker. We have to ask ourselves why the object behaved as it did, and in each case we will discover a human-made cause.

Let's take a realistic look at injury incidents. Most of them are the result of things people

did wrong, or the omission of things they should have done. Some are caused by unsafe conditions or environment, but in most of these cases, the situation came about the result of unsafe personal actions or omissions.

FINAL WORD

Instead of blaming injuries on conditions or things, let's look at what people did to cause them. When we are **personally responsible**, we can determine what to do to prevent injuries. Get the real facts on the underlying causes into the injury reports, and the right answers can be found. And, perhaps most important of all, take a look at attitudes. They make the difference between injuries and safety.