



Advocacy Communications Conferences Education and Training Science and Technology Sections

The Authoritative Resource on Safe Water®





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About *Let's Talk Safety*

he American Water Works Association is pleased to provide you with this 2011 edition of *Let's Talk Safety*. We've reviewed, updated, and edited the discussion topics to ensure they continue to be current, pertinent, and beneficial to you and your employees. For example, this edition provides updated information about the revised cardiopulmonary resuscitation (CPR) guidelines recently adopted by the American Heart Association. There's also an important overview of the much-anticipated revisions to Occupational Safety and Health Administration (OSHA) regulations on cranes and derricks. New articles provide helpful tips on preventing heat illness and guidelines for ensuring the safety of employees working in remote locations. We've added Web site addresses to every article so you and your staff can conduct deeper research into particular safety topics.

There are also repeat articles from previous editions. Many AWWA members and *Let's Talk Safety* subscribers have asked that specific articles be updated and repeated every year. Certain safety topics remain extremely important and warrant regular discussions.

We have timed the weekly placement of certain topics to coincide with national awareness efforts like National Safety Month by the National Safety Council. We hope you use these opportunities to leverage the importance of a particular safety topic by tying it to a national campaign.

How to Use Let's Talk Safety

We are all seeking an injury-free work environment. Our universal goal is to have every employee, every day, return home to his or her family uninjured. We believe that the first step to not being injured is knowing that you can be injured. *Let's Talk Safety* is designed to help you build awareness of potential work hazards, and provide safety practices that help mitigate those hazards. Talking to your employees about their safety, and listening to their safety concerns and experiences, are the foundation to building an effective safety culture. This book will help you open up important safety dialogues and give you common starting points for discussion. You may also want to consider placing these articles in your employee safety publications. Here's how you can make your safety meetings more interesting, engaging, and effective:

- Cover only one safety topic in a meeting. Employees can easily lose focus when too many topics are discussed.
- Ensure the discussion topic is pertinent to the participants. AWWA *Let's Talk Safety* covers topics in a generic manner, and a particular talk may not apply to every workplace and every work situation. Be creative and use a topic presented here and relate it to your work group's particular safety issue or concern.
- Involve the employees in the meeting. You may want to appoint a different employee each week to lead the discussion. Ask questions and ask for personal examples of near misses and hazardous situations.
- Don't let a safety meeting become a complaint session—especially if it's not about safety! Acknowledge the complaint and let the workers know it will be addressed afterwards. Keep the focus on the safety topic at hand.
- Chalkboards, charts, DVDs, and other interactive materials will all help keep the topics interesting and engaging. Change up the meetings occasionally by bringing in the tools or personal protective equipment being discussed. When talking about large equipment, hold the meeting in the yard and use the specific equipment as the backdrop. Occasionally invite guest speakers who are experts in a particular subject.
- Conduct your meetings early in the week so the employees have a chance to practice what they hear.
- Use the "Additional Notes" space we've included at the end of most topics to add personal observations and to jot down specific incidents or experiences you want to discuss. Avoid embarrassing a particular employee by pointing that person out as an example of what not to do. Speak in generalities if possible.
- Pass out copies of the *Let's Talk Safety* briefing each week.

The safety awareness information presented in this book is designed to help your utility workers develop a greater safety awareness of potential job hazards and help them make informed, mitigating decisions. The information contained in *Let's Talk Safety* provides only general safety awareness guidelines related to the many aspects of working in the water utility industry. This compendium is not comprehensive and does not cover every potential aspect of a safety issue a typical water utility worker may encounter.

The safety articles are not intended, nor should they be considered, as a substitute for more comprehensive and formal safety training courses and certification programs that provide greater detail and explanation.

For employees to do their job effectively and safely, they must be responsible for learning and understanding the safety rules and regulations that apply to their particular occupation. Health and safety regulations and requirements mandated by the federal, state, and provincial governments, as well as your company's established policies and regulations, need to be consulted before any work begins.

Each article provides a reference for Web-based information that can provide additional information as well as possible updates or changes to safety regulations. Also review the extensive AWWA safety DVDs that can be purchased to augment safety awareness training. Refer to the back of this book for a list of DVDs and other products that are available.

Acknowledgments

This 2011 edition of *Let's Talk Safety* has been substantially revised and updated and includes more than a dozen new entries. Contributing editor Charles Basham, a corporate and utility safety professional, is past president of Utility Communicators International and has written extensively about utility safety for more than three decades.

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ABCs of Safety: Awareness, Background, and Caution

Nowing that you can be hurt is the first step toward not getting hurt! Simply put, workplace accidents and injuries are 100 percent preventable. An easy way to remember this is to live and work by three important safeguards: Awareness, Background, and Caution. These make up the "ABCs of Safety."

The ABCs cover most hazards you might typically encounter while at work, at home, or even at play. Applying these terms can help create an atmosphere of safety before you start a task. After an accident, it's too late for anything but second guessing.

Here's a Detailed Breakdown on the ABCs

Awareness: Constant awareness is critical for workplace safety. It's the "Watch out!" part of the ABCs. Awareness can be defined as "having and using knowledge or cognizance." Awareness means applying and using your knowledge and just plain common sense to recognize and avoid safety hazards before an accident occurs.

At a jobsite, you need to be continually aware not only of the hazards you face but also those of your co-workers. If you see a hazardous situation—perhaps it's something as simple as someone is not wearing the proper personal protective equipment (PPE)—stop the work immediately and speak up! Do not start working again until the situation is made safe. Ask yourself, how would you feel if you didn't speak up and someone were injured or killed? It's everybody's job to be fully aware of, and alert to, all of a work site's potential hazards. You have the right to stop the work and express your concerns about an unsafe and hazardous situation.

Background: Your years of on-the-job work experience, your training, and your education are all key ingredients to the formula for working safely. Use that wisdom and knowledge to enhance your company's safe work procedures. Draw from your experiences to prevent accidents. Build on your co-workers' combined experience to prevent future safety problems.

Proper training is critical to a well-rounded background in safety. To be safe, you must learn and understand such things as the potential interactions of chemicals, safe load limits for cables and lift slings, and what a low level of electrical current



through the heart can do to you. Unfortunately, many trade workers with years of experience have learned to take safety shortcuts to save time. Eventually, many of these shortcuts lead to catastrophic injuries or even death. Sometimes the safety shortcuts are passed on to the new workers as the right way to do the work. Eventually, someone will pay the price.

Caution: Caution is defined as "careful forethought to avoid danger or harm." It's an enhanced state of awareness in which an alarm goes off in your head to prevent an action that may cause you or someone else serious harm. Often, after an accident, people will say, "I knew that was going to happen." A tempting response is "If you knew it was going to happen, why didn't you do or say something to prevent it?"

Properly trained and fully aware employees won't be afraid to speak up when confronted with a dangerous situation. They will identify a dangerous situation before it happens and, without reserve, do whatever is necessary to prevent an accident or tragedy from happening. They understand that being cautious is the standard way of performing their job, even if the job takes a little longer to complete.

Safety Is Work

Safety must always be in the forefront of your mind, something that cannot be "put off" until tomorrow or next week. Most of the work—and it is part of your everyday work—associated with safety is really up to you.

-By Edward Butts, adapted from Opflow, May 2003

For additional information go to: http://www.workplacesafetytips.org

Basic CPR Saves Lives

N ot long into an average workday several years ago, two Wisconsin utility workers saw something go very wrong with a 40-year-old co-worker. During a mid-morning break, the co-worker was warming a snack in a microwave oven when he collapsed and stopped breathing. One of his colleagues immediately ran to a phone and called 911. He then returned to the fallen man and began mouth-to-mouth resuscitation. Another colleague simultaneously performed chest compressions on the victim.

The fallen worker had suffered ventricular fibrillation, a serious and frequently fatal condition. Without immediate medical attention, ventricular fibrillation can lead to cardiac arrest and death.

The victim, a laborer who occasionally works alone on hydrants, was lucky to be with other employees when his attack occurred. Today, he is feeling fine. And his coworkers received AWWA Heroism Awards for their quick, lifesaving efforts.

What did the two heroes do? They took two key actions:

- 1. Called 911
- 2. Performed cardiopulmonary resuscitation (CPR)

The first action in a medical emergency is to call 911. Ideally, one person can attend to the victim while another calls 911. But if you are the only one around, it's critical that you call for emergency help before you begin CPR. The sooner the emergency response personnel arrive, the sooner they can administer the lifesaving equipment.

Basic CPR can be learned in less than a day of training, and many businesses will either sponsor their staff to attend CPR classes or bring a professional in for the staff training. A person trained in CPR can assess if a victim needs to be treated with mouth-to-mouth resuscitation and chest compressions, and then appropriately conduct these procedures.

New CPR Guidelines

New CPR guidelines were released in October 2010 by the American Heart Association (AHA). The revised protocol recommends that the three steps of cardiopulmonary resuscitation be rearranged.

The new first step is doing chest compressions instead of first establishing the airway and then doing mouth to mouth. The new guidelines apply to adults, children, and infants (except newborns).

The old method was A-B-C—for airway, breathing, and compressions.

The new method is C-A-B—for compressions, airway, and breathing.

By starting with chest compressions, many victims can be saved without additional action. The former approach was causing delays in chest compressions, which are crucial for keeping the blood circulating.

The AHA believes the new guidelines will inspire more people to perform CPR. Many would-be rescuers found mouth-to-mouth resuscitation intimidating and considered it difficult to perform without the proper training. The general feeling now is that most anybody can do chest compressions even without a CPR class. Properly executed chest compressions will help save lives, because in many cases there is a reserve of oxygen left in the victim's blood and lungs. Chest compressions can take advantage of that oxygen reserve.

Here's a step-by-step guide for the new CPR:

- Call 911 or ask someone else to do so.
- Try to get the victim to respond; if he does not, gently roll him on his back.
- Start chest compressions. Place the heel of your hand on the center of the victim's chest. Put the other hand on top and interlace the fingers.
- Press down so you compress the chest at least 2 inches in adults and children and 1.5 inches in infants. One hundred compressions a minute or even a little faster are optimal. (That's approximately the beat of the Bee Gee's song "Stayin' Alive").
- If you've been trained in CPR, you can also open the airway with a head tilt and chin lift.
- Pinch the victim's nose closed. Take a normal breath, cover the victim's mouth with yours to create an airtight seal, and give two 1-second breaths as you watch for the chest to rise.
- Continue compressions and breaths—30 compressions, two breaths—until help arrives.

A defibrillator, which provides an electrical shock to start a stopped heart, is another tool found in more and more business settings. Training on how to use a defibrillator

is standard in many CPR courses, and some models have clear audio instructions that walk a user through the procedure.

When the heart stops, the absence of oxygenated blood can cause permanent brain damage within minutes. Death will occur within 8–10 minutes. The earlier CPR is initiated, the greater the chances of survival. If help is provided within 4 minutes, chances of survival are doubled. These few minutes can be the difference between life and death.

For more information go to: www.americanheart.org

Workplace Violence: Dealing with Dangerous Customers

U nhappy customers who harass and intimidate utility workers, either in a company location or in the field, pose a threat to the utility worker. The Occupational Safety and Health Administration (OSHA) singles out utility employees as being the most vulnerable to workplace violence. This is because they deliver services, often work alone or in small groups, and may exchange money with the public. The most at-risk workers are the billing service staff, meter readers, and field staff who make house calls to investigate customer complaints or install services. Those responsible for shutting off water services are perhaps the most likely to encounter customer hostility.

According to a survey conducted in the 1980s by Northwestern Mutual Life Insurance Company, 44 percent of workplace violence incidents are perpetrated by irate customers or clients.

A potentially violent customer may catch a utility worker off guard. This is when a cool head and violence-prevention training come into play.

A utility worker who encounters an angry customer at a company facility should never become defensive, confrontational, or patronizing. Instead, talk to the person in a calm, soft voice. This helps them realize the volume of their own voice and perhaps may prompt them to respond in kind.

Listen closely to the complaint, smile pleasantly, and treat the customer with respect. Empathize by acknowledging how the person is feeling—"I understand why you are upset." "I know that this is difficult . . ."

Ask open-ended questions: "What happened?" "What can we do to help you?" By getting customers to talk, instead of yell, you can break their train of thought and even diffuse their anger. No matter what, report the incident. Especially keep a record of volatile customers so other employees can be better prepared for future encounters.

In the field, all of the above suggestions apply. If the situation becomes uncomfortable, leave the premises, go to a safe place, and call for help. If the customer shows a weapon or physically threatens the utility worker, the incident needs to be immediately reported to the police as well as to utility management.

If a situation is potentially dangerous, such as shutting off service, OSHA recommends hiring an employee safety service or requesting police assistance. OSHA also recommends that employees who carry money should not work alone.

Other ways to increase staff safety include:

- Equipping field staff with cell phones, handheld alarms, or noise devices;
- Requiring staff to set check-in times to keep a contact person informed of their location throughout the day;
- Keeping utility vehicles in good working condition to avoid a breakdown in unsafe areas; and
- Providing drop safes to limit the amount of cash a bill collection employee carries.

If a violent incident occurs, the employer should provide the affected employees with emotional support such as crisis intervention and counseling.

A workplace violence prevention program is only as effective as top management is willing to make it. But it is every employee's responsibility to be aware, act on warning signs, and learn how to deal with threats.

-Adapted from Opflow, April 2004

For additional information go to: www.cdc.gov/niosh/violrisk.html or http:// crimeprevention.rutgers.edu/crime/violence/workplace/prevention.htm

Quick Equipment Checks: A Basic Safety Tool

B ecause of a concern for the safety of you and your family, you probably periodically conduct a safety inspection of your car, looking at things such as tire wear and working brake lights. But do you do the same type of inspection on the job?

Jobsite inspections can effectively reduce workplace accidents. Unfortunately, we usually neglect to keep a close watch for similar-type flaws in our tools and equipment that might give us an advanced warning of a hazardous condition.

Fiber rope is a much used, and often abused, tool that is seldom inspected for flaws. Fiber rope damage, wear, and strand failure often occur beneath the surface and can often only be detected by a visual inspection of unraveled strands.

Wire rope slings also require regular inspection because the first signs of failure often are not readily noticeable. A rope failure could result in a crippling injury or even death.

Safety checks of tools and equipment should be a regular part of the daily job routine. The inspections don't need to be a time-consuming chore. But they need to done to maintain safety.

Here are five work items you should regularly inspect:

- 1. Tool handles: Look for splinters, splits, and loose metal parts.
- 2. Air hose fittings: Look at their condition and security.
- 3. Pipe wrench jaws: Are they worn out?
- 4. Vibrating-type air tools: Look for cracks, flaws, or other failures.
- 5. Chains used for hoisting or pulling: Look for cracks, wear, link elongation, or deformed hoods.

Can you name five others?

For additional information go to: http://www.cdc.gov/niosh/docs/2004-101/chklists/r1n50p~1.htm

Don't Let Chemicals Get to You!

W ater utility operators and laboratory staff are frequently exposed to chemicals that, if not handled properly, can cause severe harm or even death. Many chemicals are extremely toxic and lethal, even in small quantities.

The effects of a chemical exposure can be local—at the point of contact—or systemic. Systemic exposure occurs when the chemical agent is absorbed into the bloodstream and distributed throughout the body's organs. This can easily happen by touch, inhalation, or ingestion. If you are exposed to a toxic chemical, the severity of damage will depend on the toxicity of the substance, its solubility, its concentration, and the duration of the exposure.

There are a variety of ways you can be accidentally exposed to dangerous chemicals:

Contact with the Skin

Spills and splashes in the laboratory, or when loading chemicals into vats or mixing bays, can easily contaminate exposed skin. When chemicals come in contact with the skin or mucous membranes, they can cause surface irritation at best and, at worst, be absorbed into the bloodstream, resulting in systemic poisoning.

Chemicals primarily penetrate the skin through hair follicles, sebaceous glands, sweat glands, and open wounds. Touching contaminated hands to the mouth, nose, and eyes can also cause chemicals to be absorbed into the body.

Inhalation

Inhalation is the most common form of toxic ingestion. Toxic vapors, mists, gases, particulates, and even dust can easily and quickly be absorbed through the mucous membranes of the mouth and nose. After that, the chemical quickly travels into the throat and lungs and causes serious tissue damage along the way. The damaging effects are further compounded if the substance passes through the lungs into the circulatory system.

Ingestion

Mouth pipetting in the laboratory can lead to the ingestion of toxic chemicals. But the more common cause of unintentional ingestion is from foods that were stored in containers that had previously been used to store nonfood items (paint, plant food, or other substances). Another common, but very unsafe, practice that can lead to ingestion is storing food in a place where chemicals are stored—or storing chemicals in a refrigerator used for food.

Ocular Exposure

Unprotected eyes are easily contaminated by chemicals due to splashing, aerosol contamination, or simply by being rubbed with contaminated hands. Many chemicals

can cause burns and even a loss of vision. Absorption into the bloodstream can also quickly occur because eyes contain many blood vessels.

Injection

Inattentive laboratory workers are particularly susceptible to needle accidents. When not handled properly, needles can easily and quickly inject chemicals into the body. Broken glass containers that held toxic chemicals can also cut the skin and expose a worker to blood contamination.

Avoiding Chemical Exposure

- Use all required personal protective equipment (PPE).
- Never eat, drink, or smoke while handling hazardous chemicals.
- Always read a chemical's material safety data sheet (MSDS) prior to use.



- Always wash your hands with soap and hot water after using chemicals.
- Never try to identify a chemical through smell or taste.
- Know, understand, and practice the emergency evacuation and containment procedures and equipment.
- Properly store all hazardous chemicals.
- Make sure all chemical containers are correctly labeled.
- Always use hazardous chemicals as intended.
- Avoid creating aerosols in the laboratory: do not use open vessels for processing chemicals.

For additional information go to: www.cdc.gov/niosh/topics/chemical-safety/

Be Kind to Your Body: Stretch Before Work

L ike it or not, we all need to exercise. Athletes need to warm up before the start of a workout or competition, and so do utility workers. This includes field *and* office workers! Utility work can be a physically demanding job. It frequently requires some workers to spend considerable time in awkward postures. Through stretching you can prepare your muscles to handle the load and possibly prevent the more frequent forms of work injury: sprains and strains.

Before the start of your shift, or before heading out to the field, take a few moments to stretch. A few simple movements help increase circulation and reduce fatigue—plus you might even become more relaxed! A stretch break any time during the day will also help you feel better and work better.

Why Stretch?

A flexible body is crucial for physical activity—whether it's for sports or for work. Stretching increases flexibility, minimizes the chances of pulling or tearing muscles, and improves performance. A flexible muscle can react and contract faster, and with more force. Flexibility also increases agility and balance.

Here are a few tips to help you get the most out of stretching and exercise:

- Start out easy. If you haven't been regularly exercising, don't try to do too much in the beginning.
- Stretch regularly: make it a routine at the beginning of every work shift.
- The warm-up should not be painful, but you should definitely feel the stretching and the working of all the muscles and joints.
- Hold each stretch for 10 seconds. Do not bounce. Breathe normally during the stretch.
- Pain and discomfort probably mean you did too much. Back off a little, and if pain persists, check with your doctor.

Here are some easy stretching exercises:

- Neck rotation: Turn your head to the side, stretching your chin toward your shoulder. Turn head back to center and repeat to the other side. Increase the range of the stretch by raising that shoulder. See if you can lower your head further.
- **Shoulder stretch:** Stand with feet shoulder-width apart. Raise one arm overhead and stretch as far as you can without bending the torso. Repeat with opposite arm.
- **Forearm stretch:** Extend your right arm straight out in front of you, palm downward. With the left hand, grasp the fingers of the right hand and pull back gently, stretching the wrist and forearm. Repeat with the left arm.
- **Tricep stretch:** Raise one arm straight up, so your upper arm is near your ear. Bend your arm at the elbow and let your hand fall to the back of your neck. With the other arm, reach behind your head and place your hand on top of the bent elbow. Gently pull down and back on the elbow. Repeat with other arm.
- **Trunk stretch:** Stand with your feet a little more than shoulder-width apart. Reach your left arm overhead and bend to the right at the waist. Repeat on the opposite side.
- **Torso twist:** Stand at arm's length from the wall, with the wall at your side. Reach one arm out and place your hand on the wall. Reach the other arm around the body, stretching the hand to the wall. Repeat on opposite side.

For additional information go to: http://physicaltherapy.about.com/od/flexibility exercises/a/stretchbasics

Lime Burns Can Be Life Threatening

N EWS BRIEF: An Ohio water treatment plant supervisor suffered third-degree burns over 75 percent of his body when excess lime spilled into a premixed batch of lime and water. When the excess lime fell into the vat, it splashed the near-boiling concoction onto the supervisor. The accident occurred because a void was created in the tank where the powdered lime was stored. The lime above the void tumbled down all at once, rather than in the usual measured increments.

The supervisor was placed into a medically induced coma for three months to prevent further pain while the hospital staff peeled off layers of his scarred and damaged flesh. This victim was burned on every part of his body except for the palms of his hands, his face, chest, and feet. He endured months of painful skin grafts, and his hospital stay lasted more than six months.

The plant where the accident occurred now has vibrators on the lime bin to keep the dry lime powder from clumping. In addition, the plant installed an automatic valve system, which shuts off operations if an excess of lime is being delivered. A shower stall was built in the lime room for quickly rinsing off hot lime that may get on employees' clothing or skin.

Chemical Reaction

Lime, particularly quicklime, is an alkaline material that reacts in the presence of moisture. When lime and water are mixed, a chemical reaction causes the mixture to quickly heat up to about 160° F. In the above incident, an excess of powdered lime falling into the previously mixed lime instantaneously produced temperatures to well over 200° F.

Handling Lime

The material safety data sheet (MSDS) for a specific lime product should always be consulted for detailed first aid information. The National Lime Association recommends that when working with lime, operators should wear personal protective equipment:

- Chemical goggles, safety glasses, or a face shield. Contact lenses should not be worn when working with lime products. Lime can cause severe eye irritation or burning, including permanent damage.
- Protective gloves and clothing that fully covers the arms and legs. Lime can irritate and burn unprotected skin, especially in the presence of moisture. Avoid prolonged contact with unprotected skin.
- Standard dust masks to avoid inhalation. In high-exposure situations, other respiratory protection may be necessary, depending on the concentration and length of exposure (consult MSDS for exposure limits).

First Aid

- If dry lime comes in contact with the skin, brush it off and wash the exposed area with large amounts of running water. If the skin burns, administer first aid and seek medical attention.
- If lime comes in contact with the eyes, first flush the eyes with large amounts of water and seek immediate medical attention.
- If lime is inhaled, immediately move to an area where there is fresh, uncontaminated air. Administer first aid and seek immediate medical attention.

 $\label{eq:formation} \textit{For additional information go to: } www.nationallimeassociation.org$

Lockout/Tagout: Water Under Pressure Poses Danger

Fire hydrants are not just for fire protection. Water utilities use them to flush water mains, to control pressure when working on water mains, and to supply potable water service in bypass situations. But when is it necessary to tag an open fire hydrant as being out of service?

A hydrant requires a visible notice when it is broken or when it is open and unattended. Verbal notifications are never sufficient. Here's an example of why:

Two water utility employees were seriously hurt when a firefighter closed a hydrant that had been left open to relieve pressure while they were working on valves in a nearby excavated pit.

Two valves were shut down to isolate a section of main so water department employees could cut and plug a 4-inch service branch. They opened a hydrant to prevent pressure buildup in the isolated main. Via telephone, they notified the fire department that the hydrant would be out of service until further notice—but they failed to attach an out-of-service tag to the hydrant.

At about the same time, a nearby homeowner noticed water running from a hydrant and reported the leak to the fire department. A firefighter went to the site and saw a small stream of water running from the hydrant. So he closed it! What he did not see were the water department crews working in the nearby pit.

The water department employees working in the pit had just replaced the fittings on the end of the pipe and were collecting their tools when the increasing water pressure blew off the push-on fittings with a high-velocity blast of water. One worker escaped with only minor injuries. But two others suffered broken bones, lacerations, and multiple injuries to the head, neck, back, and legs.

Tagging Out Fire Hydrants

The Occupational Safety and Health Administration (OSHA) cited and fined the water department for violating the standard for controlling hazardous energy through lockout or tagout. Subsequently, the department was required to create a job hazards

analysis for cutting and capping pipe and to develop an effective method of lockout/ tagout to warn when a hydrant is out of service.

The water department's solution was to purchase orange "out-of-service" bags that cover hydrants whenever a main is being isolated and a hydrant is opened to release pressure. The utility also met with the local fire agencies to demonstrate the bags and explain their purpose to the fire crews.

OSHA defines water under pressure as a hazardous energy and requires "employers to establish a program and utilize procedures for affixing appropriate lockout devices or tagout devices to energy-isolating devices (such as hydrants) and to otherwise disable machines or equipment to prevent unexpected energization, start-up, or release of stored energy in order to prevent injury to employees."

Utilities need to establish programs to teach employees about the dangers of water under pressure and when a tagout device must be used.

—Adapted from *Opflow*, April 2001

For additional information go to: www.osha.gov/SLTC/controlhazardous energy /index.html

Trench Safety: Serious Business

f you're involved with water utility maintenance or construction, sooner or later you're going to be involved in trenching operations. And, despite all the classic slapstick movie routines you may have seen through the years, safely excavating and working in an open trench are serious business.

Not all holes in the ground are trenches. A trench is defined as a narrow excavation made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) does not exceed 15 feet. However, a wider excavation can be considered a trench if forms or other structures are installed such that the distance from the edge of the form or structure to the side of the excavation is less than 15 feet.

Numerous precautions should be taken when excavating or working in trenches. If you work for a utility that is covered by the Occupational Safety and Health Administration (OSHA), there are specific regulations (29 Code of Federal Regulations 1926 Subpart P) that govern most subsurface excavations.

Requirements for Trenches and Excavations

A complete and detailed rundown of all the rules and regulations for trench and excavation safety would be far too lengthy to tackle in a tailgate safety meeting. But the following are a few points to remember. (For specific regulations, refer to the OSHA standard referenced above.)

- Before beginning any subsurface work such as trenching, contact the local utility alert service to establish the location of other underground services such as natural gas, sewer, telephone, electric power, and cable television.
- Every trench must have a safe and ready means of exit. If a trench is deeper than 4 feet, a stairway, ramp, ladder, or other means of exit must be available within 25 feet of a worker in the trench.
- Don't expose workers in trenches to overhead loads handled by lifting or digging equipment.

- If it is possible that an oxygen deficiency or hazardous atmosphere may exist in a trench or excavation, the air in the excavation must be tested before employees enter and while work is being conducted. If necessary, adequate ventilation must be provided.
- If hazardous conditions exist (or may exist), emergency rescue equipment, including a breathing apparatus, safety harness and line, and basket stretcher must be readily available near the trench.
- Unless the excavation is made in stable rock, any trench greater than five feet in depth must be inspected by a qualified person and if conditions warrant, a protective system (such as shoring) must be installed.

 $For \ more \ information \ go \ to: \ www.osha.gov$

An Open-and-Shut Case for Gate Valve Safety

W ater service often must be turned off temporarily while emergency repairs or routine maintenance are performed on a distribution system. Sometimes a gate valve must be manually operated to isolate the area where the work is being conducted. Manually operating gate valves can cause a variety of injuries, including sprains and strains of the back, knee, shoulder, elbow, and wrist.

Here are some safety tips to keep in mind when operating a large gate valve:

- Use warning lights and flashers if you stop your service vehicle in traffic.
- If the valve is located in the middle of the road, park your vehicle between the valve and oncoming traffic.
- Use traffic cones to mark your vehicle and work area to help protect you from oncoming traffic.
- Wear appropriate protective equipment, which may include a hard hat, steel-toe safety shoes, work gloves, and a reflective safety vest.
- Remove the gate lid with a pry bar or other appropriate tool.
- Use a valve key that is the correct size and length. You may have to use a key extension to get the proper length.
- Make sure the key fits tightly on the valve nut. Watch out for rounded or spalled nuts.
- When you are operating the valve, the key should be at chest level. Do not use a key that is too long (above your shoulders) or too short (below your waist).
- Know the proper direction for opening and closing the valve. Some valves are lefthand turn.
- Grip the valve key firmly with both hands when you turn it.

- When operating the valve, maintain good footing, with your feet at least shoulderwidth apart.
- Position your body as close to the valve key as possible.
- Turn the valve key with slow, controlled movements. Bend your knees if necessary.
- If the valve becomes too difficult to turn, ask another worker to help you, or use a valve-operating machine.
- Don't leave the key on the valve unattended because it may present a hazard for vehicles or pedestrians, or provide unwarranted access to the water system.
- Secure the gate lid when service is completed.

For more information go to: $http://www.ehow.com/list_6795855_osha-lock-out-tag-out.html$

Doggone It: Dealing with Customers' Canines

D ogs pose a potential danger to all utility personnel who must frequently enter a customer's yard to read a meter or work on piping. As such, these employees need to be prepared to protect themselves before entering a customer's premises and while they are working there. Before entering the site, contact the resident to find out if there is a dog in the yard. If so, ask about the dog's temperament, but remember that many dogs are friendly and docile until a stranger enters the yard. If possible, ask the owner to confine the dog indoors while you are on the grounds. Always make sure the dog is confined or that the owner has control of the dog before you enter the area.

When talking to a customer through a storm door, hold your foot on the door; a dog jumping against the door could force it open. If you must enter a yard when the resident isn't home, look for signs of a dog, such as a doghouse, a rope or chain, droppings, prints in snow or dirt, scratches on the door, or warning signs posted by the customer. Knock or rattle the gate; if a dog appears, determine what sort of temperament it has.

How to Approach a Strange Dog

- Observe the dog's body language. In an aggressive stance, the hair on the dog's back or near the tail is typically raised. The tail is held high and wagged stiffly. The dog growls and its fangs are bared. Signs of friendliness include a tail wagging in broad sweeps or in a horizontal position. A timid dog will hold its tail down, sometimes between its back legs. The dog may approach in a semicrouch.
- Don't make any sudden moves around a timid dog. Speak in a quiet, calm, friendly
 manner and let the dog come to you. Never force your attention on a dog, and don't
 look an unfamiliar dog in the eyes. Extend the back of your hand to the dog; this is
 a sign of friendliness.
- Don't pet a dog without allowing it to see and sniff you first.

- Be extremely careful around a dog that is tied or chained. As a rule, a restricted dog is an aggressive dog. Most dogs are loyal and protective; however, if they feel their territory or owners are threatened, they can become aggressive.
- Exercise extreme caution when approaching a dog that is eating, chewing a bone, playing with young children, or caring for newborn puppies.

If you are approached by a dog that may attack, the Humane Society recommends these steps:

- Never scream and run.
- Remain motionless, hands at your sides, and avoid eye contact.
- Once the dog loses interest in you, slowly back away until he is out of sight.

What to Do When a Dog Attacks

- Do whatever it takes to protect yourself.
- Don't face the dog squarely, but take a position at a right angle. Try to get something between you and the dog to act as a barricade and break the dog's visual contact.
- Extend an arm as a target, and be prepared to retract it quickly should the dog lunge at you. If the dog will go for it, offer it your notebook, flashlight, hard hat, or anything else you have handy. This may give you enough time to escape.
- Try to knee or kick the attacking dog. The areas that are most vulnerable are the nose, throat, and rib cage. Try picking up a stick or rock, or simply act like you are



reaching for something. It's not always necessary to throw something; sometimes pretending works as well.

- Use dog repellent. However, don't try this if you are upwind of the dog. You may get some of the spray in your eyes and give the dog the advantage.
- Report the incident to your supervisor, especially if you injure a customer's dog.
- If you fall or are knocked to the ground, curl into a ball with your hands over your ears and remain motionless. Try not to scream or roll around. Never run away from a dog, except as a last resort.
- Never turn your back on a dog. Act confident when you are around dogs. If you are bitten, immediately wash the wound thoroughly with soap and warm water. Contact your physician for additional care and advice, and report the incident to your supervisor. The bite should also be reported to your local animal care and control agency. Tell the animal control official everything you know about the dog, including the owner's name and address.
- Be alert and observant to avoid surprises. Determine the demeanor of the dog confronting you, and act accordingly.

For more information go to: www.cdc.gov; www.avma.org; www.nodogbites.org
Climbing Elevated Tanks: The Height of Safety

N EWS NOTE: A man working on the inside of a water storage tank was injured after he fell 25 to 30 feet to the bottom of the empty tank. He was working alone and not wearing a safety harness when he fell while repairing the roof of the water tower, officials said. He was trapped for three hours and was not missed until he failed to clock out at the end of his work shift.

The dangers of climbing elevated water storage structures should never be underestimated. Utility staff often must climb structures higher than 12 feet when climbing towers to check paint, look for rust or bullet damage, and inspect hatches, locks, and beacon lights. Without protection, the workers face falling several stories. Even if a worker is roped in, a fall in a safety harness can cause a loss of circulation and whiplash. Injury or sudden illness could also incapacitate an employee while he or she is working on a tower, requiring an emergency evacuation. A qualified high-angle safety trainer can teach staff proper climbing techniques and how to use safety climbing ropes and harnesses, as well as how to correctly handle a fall.

The transitions from ladder onto overhead catwalk or from ladder through a hatch (and vice versa) are the most dangerous areas of any climb. Climbers should always attach a fall-arrest lanyard onto good, thick steel before making a transition, or while working topside around an open hatch or near the edge. The physical exertion involved in utility-tower climbing should not be underestimated. For the average person in reasonably good condition, it can be a full-body workout—especially if carrying an extra load of tools attached to 15 or so pounds of harness and other personal protective equipment (PPE). Some water structures have fall-arrest rails on their ladders, so a climber merely attaches a rail-riding "slider" device into a D-ring on the harness the climber wears for protection. On older structures, however, climbers manually snap-hook lanyards onto the ladder's side rails—not its rungs—and maintain three points of contact (both hands and one alternating foot) while moving. Climbers should always use the buddy system. Someone, even a non-climber on the ground, should be on-site to phone 911 immediately if a climber gets into trouble and cannot get down.

Standard operating procedures for climbing any elevated structure should include these safety guidelines:

- Only personnel who have a legitimate need to climb and have completed basic climbing instruction with practical exercises will climb any water structure more than 12 feet high.
- Climbers will inspect and then don proper fall-arrest equipment, including a full-body harness, double lanyards with one-hand operation, and an ascender/ descender (slider) device if the structure is equipped with a fall-arrest rail in good working condition.
- Hard hats must be worn at altitude and while on the ground.
- Climbers should never ascend a structure while alone. At a minimum, an employee with a cellular phone should be stationed on the ground, having the climber in visual and/or shouting range. Otherwise, climbers will function according to a buddy system of two or more trained personnel at altitude.
- If a climber slips and falls, engaging the fall-arrest system, his or her body harness (and lanyard, too, if used) has been "shock loaded." When the climber returns to the ground, the harness must never be worn again and must be immediately taken out of service (as specified by the PPE manufacturer).
- If an emergency arises, the ground-safety spotter or fellow climber will have the responsibility of phoning 911 if a climber gets into trouble and is incapacitated. The second person cannot leave the structure until the stricken climber is safely down. The emergency call must:
 - Specify the address of the emergency,
 - Describe the nature of the problem, and
 - Identify the urgent need for "high-angle rescue and emergency medical services (EMS)."
- The ground-safety staffer or fellow climber must provide the rescue/EMS personnel with the approximate duration of time since the climber was stricken. This will help rescuers assess the medical effects of restricted blood circulation in the victim's legs from hanging in a harness.

—Adapted from *Opflow*, August 2005

For more information go to: http://www.laddersafety.org

Night Work: Reduced Visibility Increases Hazards

W orking at night presents some special safety challenges, particularly for drivers. The biggest challenge is finding a way to cope with the reduced visibility. At dawn and dusk, the sun is low in the sky and causes glare on a vehicle's windshield. Once the sun has set, the distance a motorist can see is restricted by headlight efficiency, and some drivers have poor night vision.

Statistics show 25 percent of workers killed on the job when struck by a vehicle were working between 6 p.m. and 6 a.m., but only 9 percent of the workforce is on duty during those hours. This means that crews working at night are three times more likely to be struck by a vehicle than their daytime counterparts.

Even when workers are wearing reflective safety vests, motorists aren't always able to determine that the object with the reflective tape is a human. When turned sideways, bending over, or while standing motionless, workers are often mistaken for traffic cones or other safety markers. Motorists are less likely to slow down for a marker on the roadside than for a worker. Safety experts also tell us that working near the road is more dangerous at night because traffic is lighter, allowing motorists to travel faster through the work zone.

The condition of drivers at night also presents a hazard to workers. A higher percentage of drivers at night are subject to fatigue or to alcohol or drug impairment. According to the National Transportation Safety Board, "drowsy driving" accidents have outpaced drunken driving accidents in the past decade.

Here are some things you can do to make the work zone safer at night:

- Make sure your work outfit has an abundance of reflective material. The bright orange or yellow that motorists can see so well during the day does little good at night unless it is accompanied with reflective material on your vest or jacket, hard hat, and pants.
- Place parked equipment so it serves as a boundary to protect work zones.

- Use floodlights to illuminate flagger stations, equipment crossings, and any other areas where crew members will be working. Floodlights can cause a disabling glare for drivers entering a work zone, so once the lights are set, a utility worker should drive through the area to observe their positioning and make adjustments as necessary.
- Because of reduced visibility, crew members need to slow down and work more cautiously, especially when working around excavations. Shadows and dark areas inside trenches make the simple job of getting in and out of trenches more difficult. Footing near trench walls may appear to be more stable than it actually is.
- Crew members signaling and operating excavation equipment also need to take extra care in their job duties. The glare from traffic headlights and the fact that some excavation areas are partially hidden in shadows make jobs more difficult.

Reduced visibility isn't just an issue at off-site work locations; because of dark areas and shadows created by floodlights, an area of the facility you are quite familiar with during daylight hours looks different at night. Outdoor filter beds, stairways and ramps, equipment storage areas, loading docks, and large water tanks are all areas that are more difficult to negotiate in the dark. Water storage tanks, for example, may be extra cold and have more moisture or ice on them at night, making footing or handholds more slippery and dangerous. Dew or ice may also exist on loading docks, stairways, and ramps, so slow down and take extra time and caution when walking across these areas.

When moving around the facility grounds at night, always carry a large flashlight with you to supplement whatever fixed lighting is available. It's a good idea to also carry a small backup flashlight in case the large light stops working during your rounds. Even though vehicular traffic is minimal on treatment plant grounds in the evening, you should still wear reflective clothing anytime you are outside the facility so co-workers and emergency personnel can see and identify you when they are on the facility grounds.

If you take the necessary precautions, your night-work duties can be performed without any problems. Don't get left in the dark; make the night shift safe and secure.

For more information go to: http://www.ehow.com/how_7343109_work-safely -dark-construction-sites.html

Setting Up a Safe Traffic Control Zone

M ore than a thousand people are killed each year in work-zone traffic accidents. Eighty percent of those fatalities are drivers and their passengers. Speed and driver inattention are the leading causes of these preventable accidents. However, don't get too comfortable—because according to the Occupational Safety and Health Administration (OSHA), employees in these highway work zones have one of the most dangerous occupations in the United States.

Here are a few simple tips for setting up a safe work zone:

- Expect the unexpected and never assume drivers see you!
- Understand that drivers may be confused, angry, or distracted when entering a work zone and may have difficulty negotiating the detours.
- When you set up a detour, try to avoid requiring drivers to make sudden lane changes or encounter unexpected road conditions.
- Always pay attention to the traffic. Beware of complacency.
- Never turn your back to oncoming traffic. If you do need to work with your back to the traffic, use a spotter. Have a communications plan between you and that spotter.
- All roadside workers must wear bright and highly reflective ANSI Class 3 protective garments. These are recommended for both day and night use, and they meet the requirement to be visible from 1,000 feet away at night.
- Flaggers need to stand on the shoulder and focus on approaching vehicles. Avoid standing in the lane unless visibility is an issue. Once traffic is stopped, flaggers should move back to the shoulder of the road.

Flagger Safety

Traffic flaggers manage the safe flow of vehicles, equipment, and pedestrians in temporary traffic control zones. Their responsibilities are critical to the safety and welfare of their fellow workers, passing drivers, and pedestrians. To be both safe and effective, flaggers need to understand the overall project, the flow of the construction work and the workers, the jobsite's equipment and machinery, and the ever-changing pattern of activities. They need to anticipate and adjust their work in fast-changing situations.

Two-way radio communication with the drivers of the construction equipment, with fellow flaggers with whom they need to coordinate traffic flow, and with the site manager are essential for maximum safety.

Perhaps the biggest mistakes a flagger can make are to get too comfortable with their job and to lose their concentration.

Work-Zone Personal Protection Equipment

Head protection must be worn at all times. In all heavy construction areas, required foot protection includes steel-toe shoes with heavy-duty soles to help prevent crushing and penetration. Flaggers are on their feet most of the time, so their shoes need to fit well and be comfortable. Hearing protection includes earplugs or high-tech earmuffs. For safety reasons, every worker should be able to hear the muted sounds of the construction site—and they should never wear headphones or headsets plugged into a music audio device. And don't forget a face mask for dust protection.

Frequent checks of the work-zone diversions and detours during construction will tell you if your temporary traffic control plan is being followed, that the traffic control devices are in their proper place and working, and that a safe, accessible pedestrian route is available at all times.

For additional information go to: www.publicworks.com; www.workzonesafety.org; www.atssa.com

Know What's Below: Call 811 Before You Dig!

- V ou've seen the local headlines before.
- For the second time in a week, the fire department had to evacuate residents of ...
- A construction crew ruptured a 2-inch gas line, forcing ...
- 20,000 customers were out of phone service for 9 hours ...

All of these instances involved someone digging into underground utilities. Unfortunately, across the United States these types of incidents occur thousands of times every year because excavators (and even homeowners) did not call their local locating service (such as Dig Alert or One Call) ahead of time. Sometimes these dig-ins result in serious injury or death caused by fires, explosions, and electrocutions. Remember also that it's becoming more commonplace for all utilities to be laid in the same trench, so if you are looking for your water lines, you may also find gas, electric, and communications lines.

Call 811: It's Free and It's Easy

It's easy to avoid digging into other utility lines. All it takes is a call to 811 from anywhere in the country, and you will automatically be connected to your local underground service operator. The name may change from community to community, but its function is the same: to protect you, your co-workers, and the public. It is imperative that this call be made before beginning any excavation. It is important, even for utilities, to use this service, because often "as built" maps and charts are inaccurate!

The Five Critical Steps to Safe Digging

- **1. Survey and mark:** Survey the proposed excavation areas and mark the dig sites in white paint or chalk.
- 2. Call before you dig: Call 811 and talk to your local utility locator service.



- **3. Wait the required time:** Allow two working days to have the lines located and marked.
- 4. Respect the marks: Maintain the marks and follow them when digging.
- 5. Dig with care: Hand excavate within 24 inches of each side of the lines.

If you don't call and you hit an underground utility line, you could be hurt or killed. You may also be liable to the other utilities for costly damages and lost service.

For additional information go to: www.call811.com

Safely Cutting Metal Pipe

M etal pipe is used more than any other kind of pipe in water distribution systems. When you are installing new pipe or repairing existing pipe, you may need to cut a section of metal pipe. This can be done using a target saw or a nonabrasive cutting tool. (A cutting tool is not as effective for ductile-iron pipe.)

Both types of cutting operations involve some hazards, which can be reduced if you remember the following:

Cutting with a Target Saw

- 1. If the section of pipe is not in service, chock each side of the pipe before cutting it to keep the pipe from rolling.
- 2. Before cutting the pipe, check the saw blade to be sure it is designed to cut metal pipe and that the rpm (revolutions per minute) rating on the blade is compatible with the saw specifications.
- 3. Before fueling the saw, find out whether an oil-fuel mixture is required.
- 4. Whether you are performing the cutting operation or assisting, wear appropriate personal protective equipment: a hard hat, face shield, safety glasses, work gloves, steel-toe safety shoes, and if necessary, hearing protection and a respirator.
- 5. Before starting the saw, be sure it is securely positioned on a flat surface.
- 6. Do not hold the saw with one hand when you start it.
- 7. Position the saw guards properly; do not remove them.
- 8. Maintain good footing, with your feet shoulder-width apart.
- 9. Keep the saw close to your body. Don't reach with the saw.
- 10. The cutting process will produce sparks that can burn your skin or ignite your clothing. Watch where the sparks fall.

- 11. Turn off the saw when you have completed cutting.
- 12. Be sure the saw blade stops moving before you place the saw on the ground.
- 13. Watch for steel burrs when handling freshly cut pipe.

Cutting with a Ratchet Cutting Tool

- 1. Before cutting the pipe, make sure the cutting tool is in good working order and the blades are sharp.
- 2. Before cutting the pipe, check to be sure there is enough space under the pipe to fully rotate the cutting tool.
- 3. If the section of pipe is not in service, chock each side of the pipe to keep it from rolling while you cut it.
- 4. Whether you are doing the cutting or assisting, wear appropriate personal protective equipment: a hard hat, safety glasses, work gloves, steel-toe safety shoes, and if necessary, a respirator.
- 5. Use extra caution when handling the cutting tool. The cutting wheels are very sharp.
- 6. Maintain good footing, with your feet shoulder-width apart.
- 7. Position your body as close to the pipe as possible. Don't reach with the cutting tool.
- 8. Work with slow, controlled movements. Bend your knees if necessary.
- 9. Watch out for burrs when handling freshly cut pipe.

For additional information about safe cutting techniques with hand power tools go to: http://www.essortment.com/home/toolssafetyuse_slua.htm

C-O Could Spell D-E-A-T-H

What if you knew a killer was stalking your home? A silent, deadly killer that could steal away your family's lives without any warning? Wouldn't you do something about it?

That can be the case with carbon monoxide poisoning. Carbon monoxide is an odorless, tasteless, colorless gas produced by the incomplete combustion of carbon-based fuels such as natural gas, fuel oil, charcoal, or wood. It can be emitted by any improperly installed or poorly maintained combustion source such as unvented kerosene or gas space heaters, furnaces, wood stoves, gas stoves, fireplaces, or water heaters.

Health Effects of Carbon Monoxide

Carbon monoxide interferes with the proper delivery of oxygen in the blood to the rest of the body. When you inhale high concentrations of this potentially deadly gas, it can displace the oxygen in your bloodstream and cause one or more of the following symptoms:

- Poor coordination
- Confusion and disorientation
- Fatigue
- Nausea
- Headache
- Dizziness
- Weakness

If the concentration is high enough and the exposure is long enough, it can even lead to death. Approximately 1,000 people die each year as a result of carbon monoxide poisoning.

A Little Prevention Goes a Long Way

There are a few simple precautions that can be taken to prevent carbon monoxide poisoning.

- Make sure that all combustion appliances (fireplace, stove, water heater, furnace, etc.) are (1) installed according to the manufacturer's specifications and (2) properly adjusted and maintained.
- Have a trained technician inspect all combustion sources on an annual basis.
- Confirm that all combustion sources are properly vented and that your furnace has an adequate supply of outside (combustion) air.
- Open flues when using either a wood-burning or natural gas fireplace.
- Always use the proper fuel in a combustion device.
- Don't use ovens or gas ranges to heat your home.
- Never burn charcoal inside a home, cabin, recreational vehicle, or any other enclosed space.
- Don't leave a motor vehicle or gasoline-powered lawn mower running in enclosed spaces such as a garage or shed.

First Aid for Carbon Monoxide Exposure

- Get fresh air immediately! Open a door or a window. If you can, turn off the combustion device and get outside!
- Seek emergency medical care. Be sure to tell the physician that you suspect carbon monoxide poisoning.

Carbon Monoxide Detectors

Small wall- or ceiling-mounted carbon monoxide detectors can be useful and part of an overall home safety program. But keep in mind the following:

- Most of today's home-use carbon monoxide detectors aren't as technologically reliable as smoke detectors, and
- The installation and use of carbon monoxide detectors is no substitute for the proper use and maintenance of combustion devices in the home.

If you do purchase a commercially available carbon monoxide detector, make sure that it meets Underwriters Laboratories Inc. (UL) standards. As is the case with smoke detectors, carbon monoxide detectors should be installed close to sleeping areas.

 $For \ additional \ information \ go \ to: \ www.carbon monoxide kills.com$

Worker Beware: Contact with Energized Electric Equipment Can Be Deadly

U tility workers often encounter situations in which they are required to work with energized electric tools or equipment. The most important thing to remember in these situations is to consider the electric circuits, the apparatus, and your tools to be energized and deadly. On average, a construction worker is electrocuted and killed once a day somewhere in the United States. And more than 3,000 field workers are severely burned or injured every year by electrical mishaps on the jobsite.

Electricity can hurt, burn, and kill you—even at low voltages. Always keep in mind that electricity travels at the speed of light and that it is trying to find the path of least resistance to get to ground. Your body is mostly made up of water and therefore is an excellent conductor of electricity. The effects of an electrical current passing through the body range from a mild tingling sensation to severe pain, muscular contractions, and even death. As the current passes through a body, it will burn from the inside out at about $6,000^{\circ}$ F.

Beware of Overhead Power Lines

Before you begin work, survey the jobsite to find overhead power lines, poles, and guy wires. Look for lines that may be hidden by trees or buildings. Conditions change, so check daily.

- Point out power lines at the daily work briefings.
- Assume all overhead lines are energized and potentially dangerous, including service drops that run from utility poles to buildings.
- Remember the 10-foot rule: Keep vehicles, equipment, tools, scaffolding, and people at least 10 feet away from overhead power lines.
- If you must work closer than 10 feet, contact your local electric utility in advance to make safety arrangements.
- Higher-voltage power lines require greater clearance. Contact your local electric utility for specific clearances.

- Clearly mark boundaries to keep workers and equipment a safe distance from overhead lines.
- Use a spotter! Equipment operators need a designated spotter who can help keep you clear of power lines and other safety hazards.

Call 811 Before You Dig!

Call your local dig alert service at 811 at least two working days before digging. If you don't call and you hit an underground line, you could be hurt or killed. You may also be liable for costly damages.

Avoiding Electrical Accidents and Electrical Shock

The easiest way to avoid electrical accidents is simply to avoid contact with energized components. Always presume that an electrical circuit is energized and dangerous until you are certain that it is not. Before working on a circuit, use a voltage meter to determine if the circuit is energized.

Before you work on electrical equipment, turn off the power to it. Use your standard lockout/tagout procedures before you begin working anywhere near the energized equipment.

To be safe, all electrical equipment and apparatuses must be double-insulated or grounded. If possible, avoid the use of extension cords. When extension devices (an enclosure with multiple sockets) must be temporarily used, the wire gauge of the device must be equal to or larger than the cord on the item being operated. Never attach extension devices to building surfaces using staples, nails, or similar attachments.

Extension devices equipped with surge protectors can be permanently used with equipment that contains microprocessors, such as computers, but surge protectors should not be used in areas subject to moisture, physical or chemical damage, or flammable vapors.

Follow these simple safeguards to avoid electric shock:

- Check your work area for water or wet surfaces near energized circuits. Water acts as a conductor and increases the potential for electrical shock.
- Check for metal pipes and posts that could become the path to ground if they are touched.
- Do not wear rings, watches, or other metal jewelry when performing work on or near electrical circuits. They are excellent conductors of electricity.
- Leather gloves will not protect you from electrical shock! They are cowhide, typically, and have inherent moisture in them.
- Never use metal ladders or uninsulated metal tools on or near energized circuits.

 Make it a daily habit to examine your electrical tools and equipment for signs of damage or deterioration. Do not use them if the electrical wires are damaged or if they are not insulated or grounded. Defective cords and plugs should be replaced or thrown away immediately.

Your local electric utility can provide you with specific safety information.

http://www.osha.gov/SLTC/electrical/index.html

May is Better Sleep Month

Shift Work: A Fact of Utility Life

B eing drowsy on the job can lead to tragic consequences. For example, consider shift work. It is not fun, but it is a fact of utility life. Water utilities are charged with delivering safe drinking water 24 hours a day, 7 days a week, 365 days a year—without fail. That means that many employees are working hours other than the typical 8:00 a.m. to 5:00 p.m.

Working odd shifts disrupts your body's normal circadian rhythm and interferes with your normal sleep pattern.

Shift work and long hours can produce several ill effects:

- Chronic fatigue
- Reduced attention span
- Inability to concentrate
- Slower reaction time
- Gastrointestinal and digestive problems
- Disruption in family and social life

These can all be contributing factors to on-the-job accidents and injuries.

The problems associated with shift work can be addressed two ways. The first is organizational. Unfortunately, there is no perfect shift work schedule. But the better ones typically incorporate plenty of employee input along with a thorough understanding of the job(s) that need to be accomplished. Organizational factors include the length of rotation (short or long), direction of rotation (moving from day shift to second shift or vice versa), and the start and length of shifts. All of these factors should be considered when drawing up a shift schedule.

The second way to address shift work is individual. There are several simple actions an individual worker can take to minimize the stress and physical problems associated with shift work.



- Maintain regular eating patterns and, if working the night shift, eat lighter, healthier foods.
- Limit your intake of caffeine, alcohol, and salt.
- Avoid the use of sleep aids.
- Sleep on a regular schedule.
- Keep your sleeping area dark and quiet. If necessary, use ear plugs and an eye mask. Turn off the telephone.
- Make sure your family and friends understand how important it is that you have a regular sleeping schedule.
- Keep physically active. Physical fitness reduces stress, helps impose a regular sleeping pattern, and can result in a deeper, healthier sleep.

Remember, too, that shift work has its benefits, like uncrowded shopping malls and weekday tee-off times—but only if you are alert and well rested!

 $For \ additional \ information \ go \ to: \ http://www.sleepfoundation.org/article/sleeptopics/shift-work-and-sleep$

Construction Site Safety Part 1: Moving Vehicles

S ooner or later you will work at or visit a construction site. Whether you are a utility worker, inspector, manager, or supervisor, a construction site may be the most hazardous environment in which you will ever work. Hazards include:

- Heavy equipment,
- High traffic areas, and
- Flying debris.

Heavy Equipment Movement

On construction sites of all sizes, you may find backhoes, front-end loaders, dump trucks, or other large equipment. The best way to prevent injuries from heavy equipment is to keep your distance. However, that is not always possible. When you can't keep a safe distance, remember a few simple rules:

- Make eye contact,
- Listen for backup alarms, and
- Watch out for pinch points and dump trucks.

When you approach heavy equipment, it is vital that you make eye contact with the driver or operator. When you make eye contact with drivers or operators, you make sure they know you are there. Sometimes it is necessary to make eye contact in the driver's mirror. Remember, if you can't see the driver, the driver can't see you.

Be sure that the backup alarm on each piece of equipment works. Many workers have been killed by equipment that is backing up. Do not disconnect backup alarms. Always listen for backup alarm warnings.

Pinch points are found near the boom or cab of rubber-tired backhoes. Do not approach the equipment at its pinch point. Instead, let the backhoe operator know you are going to approach and stand near the equipment's cab door as you talk. On excavator-type backhoes, pinch points are found near the rear. Avoid getting between the counterweight of an excavation backhoe and any fixed objects, such as mailboxes and power poles.

Stay away from dump trucks being loaded by backhoes. Rocks or clumps of dirt that are stuck in the teeth of the truck's bucket could fall or rocks could roll out of the truck. Always have an escape route in mind when working around heavy equipment.

Traffic Movement

On most construction sites, every precaution is taken to move traffic safely around the site. However, it takes only one mistake to cause an accident. Mark your work area with plenty of cones, signs, and flashing arrows. If possible, park a vehicle between you and the rest of the construction site. As an added precaution, point the wheels in the direction you want the vehicle to go if it is struck.

Make one person responsible for maintaining traffic control devices. Truck drivers who move in and out of the site regularly are the best candidates.

Finally, make eye contact with the driver of any vehicle whose path you must cross.

 $For \ additional \ information \ go \ to: \ www.ehow.com/list_6699259_heavy-equipment-safety-tips.html$

Construction Site Safety Part 2: Flying Debris and Neatness

D uring the course of construction, watch out for flying debris of all types including sparks, metal scraps, hydraulic fluid, and rocks.

Sparks from a cutoff saw or pipe saw are particularly dangerous. Wear safety goggles when working with or around these types of saws. Maintain a safe distance from flammable materials when using a saw, and position your work so sparks fly away from flammables. Watch out for how sparks may affect co-workers.

Watch for broken pieces of metal flying off flaring tools or other hammered pieces of steel. To prevent this hazard, grind off any burrs on the piece of metal being worked. Do the same for any striking heads of bars or flaring tools that are mushrooming. Whenever possible, use a brass or nonmetallic hammer.

Broken hydraulic hoses on loaders, excavators, and backhoes can expel hot hydraulic fluid. This is another reason to keep your distance from heavy equipment. If a hose breaks when you are working on a piece of equipment, turn off the equipment immediately.

Rocks and dirt can be launched by pipe ruptures or by rolling tires. Keep round rocks off construction roads and trafficked areas. Remind workers in trenches to watch out for flying rocks when dump trucks pull up to or away from a trench. If a water or gas line is broken, beware of dirt and rocks flying out of the trench.

Keeping the Site Neat

A lot of debris that can cause harm at a construction site can be stored elsewhere or put safely in a dumpster. What is true around the office or the lunchroom is also true on a construction site: a little housekeeping can go a long way toward a safer site. Here are some recommendations:

- Keep the construction site as clean as you can. Pick up and properly discard scrap materials and debris, including wood, protruding nails, forms, and fasteners. They can cause injury and are health hazards.
- Work areas, passageways, and stairs should be kept clear and free of debris.

- Provide separate waste containers for the collection of construction debris waste and rancid trash or garbage. Make sure trash is disposed of at regular intervals.
- Provide appropriate containers with lids for the collection of hazardous wastes, such as oily rags and flammable solvent. Keep incompatible materials separated.

Working on construction sites is a way of life for many utility workers. Most injuries at these sites are serious but preventable.

- Use common sense.
- Be alert.
- Make eye contact.

If everyone works together, accidents can be prevented. Remember, safety is everybody's job.

 $For \ additional \ information \ go \ to: \ www.ehow.com/list_6699259_heavy-equipment-safety-tips.html$

Preventing Heat-Related Illnesses

S ummer heat can increase your chances of developing a heat illness, especially if you work outdoors or occasionally in buildings without air conditioning.

It's important that you and your co-workers know how to recognize the symptoms of heat-related illnesses. By recognizing the symptoms of heat-related illnesses and knowing how to prevent and control them and respond to their effects, you can help make everyone's jobs more safe and injury free.

How to Help Prevent or Control Heat Illnesses

- Drink about a cup of cool water every 15–20 minutes. Avoid caffeine, sugary drinks, and alcohol. Use sports drinks in moderation.
- Limit exposure time to the heat; schedule hot jobs for cooler times of the day. Take frequent rest breaks in cool areas.
- Gradually adapt yourself to the heat. It takes up to 10 days for your body to adapt to high heat.
- Slow your pace and try to mechanize heavy jobs.
- Wear loose, lightweight clothing and a hat, and protect exposed skin.
- Do not use salt tablets.

When your body heats up faster than it can cool itself, mild to severe illnesses may develop. Air temperature, humidity, and clothing can increase the risk of developing heat illnesses. So can age, gender, weight, physical fitness, nutrition, alcohol or drug use, or pre-existing diseases like diabetes.

Strenuous activity can lead to a skin rash, stomach cramps, fatigue, or dizziness. If this happens, the victim should immediately seek rest in a cool, shady place, drink lots of water, and repeatedly wet and dry the skin.

If the symptoms increase to excessive sweating; cold, moist, pale, or flushed skin; thirst; extreme fatigue; headache; nausea; or a rapid pulse, the victim may be



experiencing heat exhaustion. The victim should immediately lie down in a cool, shaded place and sip lots of cool water until the symptoms disappear. If the symptoms worsen, or the victim becomes unconscious, immediately get medical help according to the emergency procedures specified in the Emergency Action Plan designated for your work location and your business unit.

Severe heat illness can lead to a heatstroke. This can be fatal or lead to permanent brain damage if the victim does not receive immediate medical treatment. Unfortunately there's little warning that a victim is about to reach this crisis stage.

Victims whose skin becomes hot, dry, red, or spotted, and who experience confusion, delirium, convulsions, or slip into unconsciousness, are likely experiencing a heatstroke, and they urgently need medical help. While waiting for that help to arrive, follow the same first-aid steps as for heat exhaustion, but also loosen the clothing and pour water over the entire body. Never try to force an unconscious victim to drink water.

For more information go to: www.stateca.com; www.bt.cdc.gov

June is National Safety Month

Time for a Workplace Safety Checkup

June is designated National Safety Month by the National Safety Council. This annual observance is aimed at emphasizing safety awareness on the highway, at home, and in the workplace.

According to the US Department of Labor's Bureau of Labor Statistics (BLS), a total of 5,702 work-related fatal injuries and a rate of 4.0 deaths per 100,000 workers occurred in 2005. The good news is that this represents an 8 percent decline in the number of deaths from 1992, when the data were first formally recorded, and a 23 percent decline in the fatality rate. The most (43 percent) fatal workplace injuries were attributed to highway incidents, followed by falls (falling from a ladder, roof, or scaffold; falling down stairs or steps; or falling through a floor or roof surface), being struck by an object, and homicides.

Of those who died on the job, 93 percent were men, a rate approximately 12 times higher than for females (6.9 per 100,000 workers versus 0.6). Workers aged 35–54 years accounted for 46 percent of workplace deaths. Rates increased with age, from 2.3 per 100,000 workers for those aged 16–19 years to 11.3 for workers 65 years or older. BLS reports that both high numbers of deaths and high fatality rates occur primarily in construction; transportation, warehousing, and utilities; and agriculture, forestry, and fishing.

This month, concentrate on workplace safety and continuing to reduce the number of fatal injuries. Start with this checklist for safety:

Is your workplace in compliance with applicable safety regulations?

Yes No

- Do employees properly use their safety equipment?
- □ □ Are spill kits and battery safety boards displayed in all battery rooms? Are employees trained and advised in these procedures?
- \Box \Box Have fire extinguishers been inspected annually by a certified person?

	Have employees been trained in fire extinguisher use in the past year?
	Are fire extinguishers and first-aid kits accessible and ready for use?
	Are hearing protection, safety glasses and goggles, hard hats, reflective safety vests, work gloves, work boots, and other personal protective equipment available and in good condition?
	Are floors, stairs, and handrails in good condition?
	Are exits properly marked, lighted, and clear of obstructions?
	Have employees been trained in first aid and cardiopulmonary resusci- tation (certificates current)?
	Are building sprinkler systems inspected annually (by an outside source)?
	Have employees received required annual training such as hazard com- munication, blood-borne pathogens, etc., in the past year?
	Are hand tools and ladders in good condition and inspected regularly?
	Do any power tools have frayed cords or other defects?
	Are extension cords in good condition, and properly rated for the load?
	Is permanent wiring being avoided by overuse of extension cords?
	Are flammable liquids stored in containers that are marked with the type of liquid they contain, and are containers self-closing and self-venting?
	Are emergency evacuation procedures posted, with emergency phone numbers displayed?
	Do all employees have accident-reporting packets?
	Are annual eye exams (optic laser) completed on designated employees?

If you checked "no" to any of these questions, take the time to correct those items and stay in compliance.

For more information go to: www.nsc.org

Water Safety Isn't All Wet

S ummer is here and with it many activities centered around water. Pools, lakes, rivers, or the ocean—all can be a lot of fun, but they can be deadly, too. Did you know that more than 3,000 people accidentally drown every year? And while this sobering statistic represents all age groups, children up to the age of four years have the highest death rate.

Sadly, nearly all of these tragic deaths could be prevented. Most infant and child drownings occur when a child falls into a pool or is left unattended in the bathtub. So this summer, to keep yourself—and more important, your children—safe, follow these recommendations from the National Safety Council.

- Always insist on adult supervision.
- Never leave a child alone near water—this includes the pool, at the beach, or in a bathtub. A tragedy takes only seconds.
- Be aware of all the neighborhood pools, both yours and all the others on the block. Toys and other flotation devices can attract children. Remove them from in and around a pool when the toys are not in use.
- Cover the pool when not in use. Make sure you drain rainwater from the cover; even a few inches of water is enough to drown a child.
- Always follow posted safety precautions when visiting water parks. And remember, lifeguards aren't babysitters, so keep an eye on your kids.
- Enroll children over the age of three years in swimming lessons taught by a certified instructor.
- Don't forget older children. They are at risk when they overestimate their swimming ability or underestimate the depth or speed of water.

- Teach your children four key swimming rules:
 - Swim with a buddy.
 - Don't dive into unknown bodies of water. Jump feet first.
 - Don't horseplay around the water.
 - Be prepared for an emergency.

If you're in a boat, make sure that all passengers are wearing US Coast Guard– approved personal flotation devices that fit their weight and body size. And never consume alcohol when driving a boat.

Don't underestimate the power of water. Even rivers and lakes can have undertows.

Unfortunately, water safety doesn't just involve large bodies of water. Bathtubs, buckets, toilets, and hot tubs present drowning dangers as well. It only takes 3 inches of water to drown.

For additional information go to: www.cdc.gov/HomeandRecreationalSafety/ Water-Safety or www.redcross.org

Safe Fuel Handling Practices

The safe handling of gasoline and diesel fuels is everyone's responsibility. You can take steps to ensure that your own safety and health, as well as that of those around you and the environment, are protected. The improper handling of fuel can result in serious injury or death caused by fire, explosion, or asphyxiation.

Environmental Safety

Fuel released into the environment contaminates soil and groundwater. As a water utility worker, you know that contaminated groundwater supplies can sicken people and animals. Gasoline vapors are also harmful to human health, even at low concentrations—and are especially dangerous at high concentrations!

Here are some safety tips for what you can, and should, do to ensure safe fuel handling.

Safe Fueling

- Turn off the engine.
- Never smoke or light matches or lighters.
- Stand upwind of the nozzle while refueling and try to not breathe the fumes.
- Do not top off the tank. Even the little drips that fall onto the pavement can contaminate soil, groundwater, or surface water.
- Do not leave your vehicle unattended while the pump is running.

Use the Proper Containers

- Use only containers approved by a reputable testing lab, such as Underwriters Laboratories (UL).
- Keep the container tightly sealed.
- Containers should be fitted with a spout to allow pouring without spilling and to minimize the generation of vapors.

- Keep gas containers out of direct sunlight.
- Always open and use gasoline containers in a well-ventilated area.

Safe Storage

Gasoline moves quickly through soil and into groundwater; therefore, store and use gasoline and fuel equipment as far away from water wells as possible.

- Store no more than 10 gallons.
- Keep a closed cap on the gasoline container.
- Store the gasoline in a cool, dry place.
- Store at ground level, not on a shelf. This minimizes the danger of falling and spilling.
- Do not store gasoline in a vehicle's trunk. There is a threat of explosion from heat and impact.

Fill Cautiously

- Always use a funnel and/or spout to prevent spilling or splashing when fueling portable and mobile equipment.
- Always fuel outdoors where there is good ventilation to disperse the vapors.
- Fuel equipment on a hard surface such as concrete or asphalt, rather than on soil or water.
- Portable cans and fuel tanks should be removed from the vehicle and filled while on the ground. A secondary containment device under the tank ensures even better spill protection.

Avoid Spills!

Spilled motor fuels impact the environment through evaporation into the air, diffusion into the soil, and releases into groundwater. Each year, Americans spill more than nine million gallons of gasoline—the equivalent of an oil supertanker. The environmental impacts of improper handling, storage, and disposal of gasoline largely stem from the sloppy filling of small engines, using inappropriate containers, overfilling motor equipment engines, storing gasoline in open containers, and disposing of excess gasoline improperly. If a spill occurs, use kitty litter, sawdust, or an absorbent towel to soak up the spill, then dispose of it.

Safe Disposal

Do not dispose of gasoline down the drain, into surface water, onto the ground, or in the trash. Use the local hazardous waste collection and disposal location for safe and convenient disposal of excess or old gasoline.

For more information go to: www.epa.gov; www.gas-care.org

New OSHA Crane and Derrick Safety Rules: Are You Compliant?

N ew Occupational Safety and Health Administration (OSHA) crane and derrick safety rules came into effect in November 2010. The revised standards are intended to prevent the leading causes of crane fatalities such as falls, crushing/striking, and electrocution. The new rules also include requirements related to ground condition assessments, crane operator qualifications, pre-erection inspections, and several other issues.

OSHA expects the new regulations to save dozens of lives and prevent nearly 200 fatalities every year. If you have not already done so, download the new standard from www.osha.gov. Be sure to get the official *Federal Register* version dated August 9, 2010. Unfortunately, space limitations prevent a thorough analysis here of the new regulations. In addition, some state safety agencies have their own variations to the crane safety standards, so be sure to contact them for additional details.

Mobile Crane Safety

Most utilities employ mobile cranes in their regular heavy-duty construction and repair operations. Mobile cranes are responsible for the most accidents, injuries, and fatalities of all of the crane types. If you use mobile cranes, you need to be aware of the potential work hazards, get the proper training regarding operation and load preparation, and know the proper personal protective equipment (PPE) for your crews such as hard hats, safety boots, and high-visibility clothing.

Falling Loads

Falling loads pose an extreme hazard to operators and nearby workers. Never exceed the load size and weight capacity of the crane. If you're unsure about your crane's capacity for size and weight, calculate the weight to ensure it meets the safety parameters. Load-indicating devices (called load moment devices) can prevent an accidental overload. Be sure to properly secure the loads to be lifted. Before the work begins, inspect the slings, chains, and hooks that will be used to lift and secure the load.

Always rotate, raise, and lower the crane boom slowly, and avoid sudden stops or accelerations. These movements could jar the load. When rotating the load, use

taglines or guidelines to control the arc and swing. Never lift loads over workers or over the crane's cab. If this type of lifting is necessary, use safety hooks and other approved securing devices. If two cranes are needed to lift a load, a qualified person should be in charge of planning and directing the lift.

Avoid Electric Contacts and Electrocutions

Cranes all too often come in contact with overhead electrical lines at work sites. You can reduce the risk by surveying the jobsite and looking for the electric hazards such as temporary power poles and power lines. You must consider all lines to be energized and dangerous unless they are certified to be de-energized by your local electric utility. Nobody else can make that guarantee—especially not the foreman, a fellow worker, or even a local electrician.

It could even be safer to have the utility move the wires before the crane work begins. Never allow the boom, load, or taglines to get any closer than 10 feet from a power line. Depending upon how much electricity is carried in the lines, an even greater distance may be required. Check with your local electric utility for details. Also, when the crane is moving its boom and a load near power lines, it's essential to have a spotter watch the load and the lines. Watching the lines and the crane's movement should be that spotter's only job! He's not holding a tagline or directing traffic. That spotter needs to be in constant eye contact with the operator (using industry-approved hand signals) and/or radio communications as the work progresses.

If a crane/load touches an energized power line, it's the workers on the ground touching the crane or standing near the crane who are in the greatest danger of electrocution. People need to stay far away from a crane when it's operating near power lines. If there is a power line contact, the crane operator is actually safe; he's like a bird on a power line. To safely clear the line, the operator will need to slowly move back the boom in the exact reverse manner as when contact was made.

Tip-overs and instability are another frequent safety hazard. Soft or uneven ground can cause a crane to tip. Always use the outriggers to stabilize the crane. Never operate the crane if the load or slope lifts the wheels off the ground. For stability when traveling, keep the boom steady in the direction of the movement. Boom stops should be used if there is a danger of the boom falling backward.

Workers near mobile cranes can also easily get run over if they don't pay attention and especially if the operator loses sight of them. Operators should use an audible warning and operating signal device to notify workers of movement. Workers should stay out of the way of the load as well as the crane and outrigger wheels. If the operator has a limited view, a qualified signals person should direct and communicate the operations.

For additional information go to: www.osha.com; www.elcosh.org

Ladder Safety

ear after year, falls from ladders rank as one of the leading single causes of occupational fatalities and injuries.

Regardless of the type of ladder you use, you risk a fall if the ladder is not safely positioned. It needs to be set on stable, level ground to keep it from slipping or moving. You can lose your balance by simply getting on or off an unsteady ladder.

Here are the key safety tips to keep in mind:

- Position the ladder so its side rails extend at least 3 feet above the landing.
- When a 3-foot extension is not possible, you need to secure the side rails at the top to a rigid support and use a grab device.
- Make sure the weight on the ladder can't cause it to slip off its support. Also, never put more weight on the ladder than it is designed to support. And be sure to include the weight of the tools and materials you are using. The safe weight load is labeled on the ladder.
- Before you use the ladder, inspect it for cracked or broken parts such as rungs, steps, side rails, feet, and locking components. By law, if it has any damage, it must be removed from service and tagged until repaired or discarded.
- Avoid electrical hazards! Never use a metal ladder near power lines or exposed energized electrical equipment. Look for overhead power lines before raising the ladder, and never allow the ladder to get closer than 10 feet to power lines. Also make sure that once you've climbed the ladder, your body and tools cannot come in contact with the power lines.
- Never use a self-supporting ladder (such as a stepladder) as a single ladder or in a partially closed position.
- Never use the top step/rung of a ladder as a step/rung unless it was designed for that purpose.

- Always maintain a three-point (two hands and a foot, or two feet and a hand) contact on the ladder when climbing. Keep your body near the middle of the step and face the ladder while climbing.
- Only use ladders and appropriate accessories for their designed purposes.
- Keep the rungs free of wet or slippery materials.
- Never place a ladder on boxes, barrels, or other unstable bases to obtain additional height.
- Do not try to move or shift a ladder while a person or equipment is on the ladder.
- The proper angle for setting up a ladder is to place its base a quarter of the working length of the ladder from the wall or other vertical surface.
- A ladder placed in any location where it can be hit or displaced by other work activities must be secured or a barricade must be erected to keep traffic away from the ladder.
- Be sure all locks on an extension ladder are properly engaged.

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FAILURE TO OBSERVE LADDER SAFETY CAN LEAVE YOU HANGING. U

For additional safety information go to: www.osha.gov

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Hand Grinder Safety

and grinders are being used more frequently in the water utility industry, typically with jobs involving fabrication, mechanical, contracting, masonry, and welding. If you don't use the tool properly, it can and will cause you or someone around you a serious injury.

The following basic safety tips should allow you to use a hand grinder without complications and accidental injury. To lower your risk of getting hurt or hurting someone else, take the time to know the different parts of a grinder and how they are to be used.

The Wheel

Most grinding wheels are resin-bonded conglomerations of various compounds. This means the wheels can be scratched, chipped, or broken. If the wheel is damaged, you need to throw it away immediately and start using a new one. Using a broken grinder wheel can cause serious injury to you or someone around you.

- Never grind with a wheel designed for cutting.
- Always inspect the wheel for damage. If it is nicked or scratched, don't use it. When in doubt, err on the side of caution and don't use it.
- New wheels need to run at full, no-load speed (with the guard in place) for at least a minute before they are used to grind or cut.
- Never exceed the maximum rpm rating for a particular wheel. For example, a typical 4.5-inch wheel should not exceed 9,000 rpm.
- Make sure you mount new wheels properly using the correct mounting flanges and that the outer mounting flange nut is not over-tightened.
- Do not force a wheel onto a grinder. Always use appropriately sized wheels.
- Never grind using the side of the wheel.
- Never jam the wheel in order to make it work.
The Grinder

- Never use the grinder without the guard. Make sure to use the proper wheel guard and that the guard is correctly adjusted so that the least amount of wheel is exposed.
- Never use a grinder if you don't know its rpm.
- Never use a grinder if the wheel is larger than what the grinder was designed for. (Don't use 7-inch wheels on a 6-inch grinder.)
- Don't use a grinder if it doesn't have a side handle. It's nearly impossible to safely control a grinder with just one hand.
- Keep the power cord clear of the wheel.
- Never put the grinder down until the wheel has completely stopped.
- Make sure the on/off switch is working properly; if it doesn't work right, you need to tag the grinder as being broken and make sure it cannot be used until it is fixed.
- Always unplug the grinder before you mount it or remove the wheel.
- Always be familiar with the instruction manual before you use the tool.

Safely Operating a Hand Grinder

- Always wear the proper personal protective equipment (PPE) such as gloves, safety glasses or face shield, hearing protection, dust mask, and any gear that will prevent abrasive materials from causing an injury.
- Don't wear loose-fitting clothes or jewelry. Keep long hair away from the moving parts of the grinder as well.
- Don't reach too far with a grinder. You need to have solid footing and balance. If you can't fully reach what you're working on, turn off the tool and reposition yourself.
- Make sure you are to the side of the grinder opposite of the wheel and wheel guard. Keep bystanders at a safe distance from the work area.
- Keep a firm grip on the grinder and be ready to resist a kickback.
- Only use accessories designed for the grinder that you're using. Never mix accessories.
- Never use any electrical tools in rain or wet conditions. This increases your chance of electrocution.
- Never use the unplugged cord to pull or carry the grinder.

Use common sense when it comes to using and working with power tools.

For more information go to: http://www.osha.gov/doc/outreachtraining/htmlfiles /tools.html

Forklift Safety

N o one starts out with the innate knowledge, skills, and abilities to safely operate a forklift. Operating a forklift without training is dangerous and can prove to be fatal to the operator or others.

According to OSHA, each year, tens of thousands of injuries related to forklifts occur in the United States. Many injuries occur when lift trucks are inadvertently driven off loading docks, lifts fall between a dock and an unsecured trailer, people are struck by a lift truck, or people fall while on elevated pallets and tines.

Most injuries can be directly attributed to lack of safe operating procedures, lack of safety-rule enforcement, and insufficient or inadequate training.

Operator Training

It's an Occupational Safety and Health Administration (OSHA) requirement for forklift drivers to be properly trained and evaluated for competency at least every three years. The rules require that forklift training be specific to the equipment drivers operate and specific to the conditions (location) under which the equipment is operated.

Training is required when:

- An unsafe operation is observed
- An accident or near miss occurs
- Operator evaluation indicates the need
- A different type of equipment is introduced
- Workplace conditions change

Keep It Low and Slow

Training can help prevent or reduce the severity of an accident related to the stability of a lift truck traveling with an elevated load. Keeping the load as low as possible increases vehicle stability and helps prevent tip-over accidents. Even if drivers ignore this rule, and the vehicle tips over, injuries are usually minor if they stay with the vehicle instead of jumping off. The normal tendency is for a person to jump downward, so the driver lands on the floor or ground—usually directly in the path of the overhead guard. The most common result is a crushing injury to the head, neck, or back where the overhead guard strikes the operator.

Forty-two percent of forklift fatalities are caused by the operator trying to jump from a tipping vehicle. To keep this from happening to you, always remember to keep the load as low as possible and stay with the vehicle if it tips over. Wearing a seat belt is the best safety measure!

For more information go to: www.osha.gov

Safety Tips for Employees Working Remotely or Alone

P eductions in manpower and increases in workload have increased the number of field employees who are working alone.

While lone work may not automatically decrease a worker's safety performance, there is no doubt that working alone increases a worker's vulnerability to a variety of safety issues. This vulnerability applies not only to those who regularly work outdoors, but to any employees whose work frequently takes them out into the community. All these workers may encounter threats to their safety.

The following four steps can help you reduce the safety vulnerability of remote workers. These tips apply to all employees, and their management, who must work alone or with others in remote locations where normal means of communication are unreliable or nonexistent.

1) Create a communications protocol.

- Designate a key point of contact (POC) who is not a part of the remote team.
- Know who is working remotely and how long the work should take.
- Set regular check-in times for the entire work period. At each check-in, the POC should record the time and the information given by the remote worker.
- Evaluate lighting conditions; are they sufficient to ensure worker safety?
- POCs should relay any anticipated changes in weather.

2) Establish an emergency communications protocol.

- If a check-in time is missed, the POC should try, for 30 minutes, to reestablish communications. If that fails, the POC must:
 - Assemble a search team and place them on standby.
 - Contact medical personnel, informing them that an emergency response may be needed.

• If an event includes an injury, after ensuring that medical attention has been provided, the responsible supervisor shall ensure that the appropriate incident/injury reporting process is initiated.

3) Evaluate the potential hazards to the remote worker with a detailed safety risk assessment.

- Before entering a remote work location, all team members should identify and discuss potential safety issues:
 - Planning for weather conditions—both forecast and unexpected.
 - Facing potential emergencies such as flooding, electrical contact, running out of fuel in cold climates, etc.
 - Handling serious injuries or illnesses that might occur far from medical facilities.
 - Guarding against animal attacks, snakes, and insects.
 - Making contact with emergency agencies.
 - Having the appropriate personal protective equipment (PPE).
 - Having the tools required to complete the job safely.
- Assess the risks and review work-related documentation such as a job hazards analysis to ensure all mitigation and control measures have been addressed.

4) Conduct a safety tailboard before work begins.

- Discuss potential hazards and special precautions the work requires.
- Discuss the job's processes, procedures, and tasks and the order they will be performed.
- Review appropriate safety procedures and PPE considerations. Inspect tools and ensure all PPE meets safety standards.
- Discuss assignments. Everyone must know their jobs and the jobs of their co-workers.
- Establish a "buddy system" where co-workers watch out for each other.
- Ensure those with new job assignments, new tools, or new equipment are properly and completely trained on safety processes, procedures, and tool/equipment operation.
- Everyone should regroup and discuss potential safety issues when new substances, processes, procedures, tools, or equipment are introduced to the work site.
- Report unsafe hazards and equipment to the supervisor before work begins.

- Discuss unusual and nonroutine situations.
- Discuss emergency procedures. Determine ahead of time who's in charge in an emergency situation and who is the backup.
- Know where all emergency resources are located: emergency plan, fire extinguisher, first-aid and burn kits, and communication devices.

For additional information and ideas go to: http://www.gs.gov.nl.ca/ohs/safety_ info/si_working_alone.html

Plan the Work, and Work the Plan: How to Conduct a Safety Tailboard

The first step to being injury-free is knowing that you can be injured, regardless of how safe you think you may be. On-the-job safety is typically not your only work goal, but it must be the highest work priority—both for you and your co-workers.

Employees are often forced to reconcile between competing goals: timeliness vs. safety. There really isn't a choice. You must always choose your safety and the safety of others ahead of everything else. If you see an unsafe work situation, you owe it to yourself and to your co-workers to immediately stop the work until the situation is made safe!

Most jobsite injuries happen with new workers who don't know the safety rules and with older workers who become complacent about established safe work practices. In essence, these veteran workers have learned over the years to take "shortcuts" in established safety procedures. These shortcuts eventually become the working norm and get passed through the workforce.

Conducting a Safety Tailboard

Within the utility industry, a standard work practice for field crews is to conduct a safety tailboard session before the work begins. While this article focuses on field crews, the basic principles apply to office projects as well.

A safety tailboard session is about good communications. It helps everyone involved in the project to fully understand the processes and procedures, and it can effectively reduce injuries.

Plan the Work

Basics of an effective tailboard include:

- It's conducted by the employee in charge.
- Simple and plain language is used so that everyone knows and understands exactly what is being said. Encourage questions.

- Hold the meeting just before work begins and again if any significant changes to the jobsite occur.
- Review all applicable safety rules regarding your company's procedures and the required personal protective equipment (PPE).
- Make a safety plan and an emergency plan—even if working alone!
- Analyze the job's processes and procedures and discuss what safety and rescue issues could come into play if there is an accident.

Work the Plan

- Discuss the potential hazards and special precautions the job requires and the jobsite might provide.
- Discuss the job's processes, procedures, and tasks to be performed and in what order they will be performed. Always include a review of all appropriate safety procedures and considerations.
- Discuss everyone's assignment. Make sure everyone knows their jobs and the jobs of their co-workers.
- Establish a worker "buddy system" where co-workers are assigned to watch out for each other when in a remote location.
- Ensure that those with new job assignments or new tools or equipment are properly and completely trained on the safety processes, procedures, and tool or equipment operation.
- Conduct inspections whenever new substances, processes, procedures, tools, or equipment are introduced and may present a safety issue.
- Discuss the tools and personal protective equipment needed to complete the jobs safely and without incident. Inspect the tools for proper and safe operation. Ensure all PPE is up to standard and safe to use.
- Report unsafe hazards and equipment to the supervisor before work begins.
- Discuss unusual and nonroutine situations.
- Discuss emergency procedures. Determine ahead of time who is in charge in an emergency situation and who is their backup.
- Know where all emergency resources are located: emergency plan, fire extinguisher, first-aid and burn kits, and communication devices such as a phone or radio.
- Before an accident occurs, discuss how to direct emergency help to get to your location.

For additional information go to: http://www.line-man.com/videos/safety-videos /1910.269-tailboard-breifing-requirement.html

Lightning: The Underrated Killer

here are an estimated 25 million lightning flashes each year in the United States. Over the last 30 years, lightning has killed an average of 58 people per year, which is greater than the annual average for either tornadoes or hurricanes. Nearly 75 percent of all US lightning fatalities occur during June, July, and August, and the most incidents occur between 2 and 6 p.m. The top five states reporting lightning-caused deaths are Florida, Minnesota, Texas, New York, and Tennessee. Because 9 out of every 10 lightning casualties involve only one victim, and there's typically no mass destruction, getting struck by lightning is unfortunately underrated as a safety risk.

The National Lightning Safety Institute recommends that all businesses, and especially those that typically have workers with outdoor jobs, prepare and distribute a lightning safety plan to all their employees. The core of the plan is to anticipate a highrisk situation and move to a low-risk location. These plans should be site-specific, but they all share a common outline:

- Watch for developing thunderstorms. Thunderstorms occur year-round. As the sun heats the air, pockets of warmer air start to rise, and dark, thick cumulus clouds form. Continued heating can cause these clouds to grow vertically into massive formations that often indicate a developing thunderstorm.
- Seek safe shelter. Lightning can strike as far as 10 miles from the area where it is raining. That's also about the distance you can hear thunder. Remember that if you can hear thunder, you are within striking distance. Seek safe shelter immediately.
- **Outdoor activities.** Most lightning deaths and injuries occur in the summer. Golfers and boaters are prime moving targets for a lightning bolt! Where organized outdoor sports activities take place, coaches, camp counselors, and other adults must stop activities at the first roar of thunder to ensure everyone has time to get to a large building or enclosed vehicle. Leaders of outdoors events should have a written plan that all staff are aware of and can enforce. And *never* seek shelter under a tree!
- **Indoor activities.** Get inside a building. Stay off corded phones, computers, and other electrical equipment that can put you in direct contact with a surge of



lightning-caused electricity. Also, stay away from pools (indoor or outdoor), tubs, showers, and other plumbing. Get surge suppressors for key electrical equipment. Install ground fault protectors (GFCIs) on circuits near water or outdoors. When inside, wait 30 minutes after the last clap of thunder before going outside again.

• Help a lightning strike victim. Lightning victims do not carry an electrical charge, so are safe to touch—and will likely need urgent medical attention. For those who die, cardiac arrest is the immediate cause. Some deaths can be prevented if the victim receives the proper first aid immediately. Call 911 and perform cardiopulmonary resuscitation (CPR) if the person is unresponsive or not breathing.

Lightning is dangerous. With common sense, you can greatly increase your safety and the safety of others. At the first clap of thunder, go to a large building or fully enclosed vehicle, and wait 30 minutes after the last clap of thunder before you go back outside.

For additional safety information go to: www.lightningsafety.noaa.gov; www.lightningsafety.com

Lifting Tips

A n improper lifting technique can lead to serious and possibly permanent back, leg, and arm pain. A poor lifting technique can cause both acute injury and serious chronic effects. Using the right lifting technique will help you avoid these problems.

Whether you work in an office environment or in the field, you may encounter instances where heavy lifting is involved. Even if the item you are lifting is not something that is perceived to be heavy, it is always important to keep in mind the following tips as you plan to lift, move, and lower the object.

Plan the Lift Before You Start

Prior to moving the load from point A to point B, take a minute to evaluate the following:

- Check the weight of the load by slightly tipping or pushing it. Ensure that the load is stable.
- Repack or secure the load or ask for assistance if the load is unstable.
- Ask for help or use mechanical equipment if the load is too heavy.
- Ensure that the path of travel is clear of items that might cause you to trip and fall.

Lifting

- Face the load with your feet shoulder-width apart.
- Bend your knees, *not your back!*
- Keep your back straight and your head up.
- Rest the load on your bent knee as you prepare to stand.
- Position the load close to your body.

Moving the Load

- Keep the load as close to your body as possible.
- Pay attention to where you are going.
- Avoid bending and twisting your back; turn with your feet when you need to change direction.
- If you can't see over the load, find another means to transport it.
- Face the direction you are walking. If you need to turn, stop and turn in small steps and then continue walking.
- Keep your eyes up. Looking slightly upward will help you maintain a better position of the spine.

Lowering the Load

- Use leg muscles—never your back—when lowering the load.
- Set the load on a table or in another location that is at waist level.
- Watch your fingers when lowering the load.

General Tips When Moving Heavy Loads

- Pushing is always easier on your back than pulling.
- When pushing, keep your elbows close to your body and use your leg muscles instead of your arm and back muscles.
- Wear shoes that have good support and traction.

Be aware of the early warning signs of back strain. If you experience back pain, such as burning or shooting pain, numbress, or a tingling sensation, seek immediate medical attention.

For additional information go to: http://familydoctor.org/online/famdocen/home /healthy/safety/safety/174.html; http://www.ehow.com/facts_5584595_proper -lifting-back-safety.html

Job Hazard Analysis: An Important Tool For Identifying and Reducing Hazards

A job hazard analysis (JHA) is a safety evaluation process. Many companies, both large and small, have successfully used a JHA to identify potential dangers of specific tasks in order to reduce the risk of injury to workers.

It takes a little time to do a proper JHA, but it's time well spent. Be sure to involve the employees in the process—they perform the work and often know the best ways to work more safely.

How to Conduct a JHA

- Start by talking to your employees. Tell them what you are doing and why. Explain that you are studying the safety of the work tasks they perform and not their work performance.
- Review your company's accident/injury/illness/near-miss history to determine which jobs pose the highest risk.
- Identify the Occupational Safety and Health Administration (OSHA) standards that apply to your jobs and incorporate the OSHA requirements into the JHA.
- Evaluate jobs where you have identified violations of OSHA standards and/or company safety procedures.
- List the jobs having the greatest potential to cause serious injuries or illness, even if there is no history of such problems.
- Make a note of the jobs in which a simple mistake could lead to severe injury.
- Evaluate jobs that are new or have been changed and those jobs that are so complex they require written instructions.

Break the job task into steps:

• Watch each worker perform his or her job in a routine manner. List each step of each task in the order in which it takes place.

- Begin each step with a verb; for example, "Turn on the saw."
- Do not make it too broad or too detailed.
- You may want to photograph or videotape each step for further analysis.
- Review the steps with all the workers who do the same job to make sure nothing's been left out.

Identify the hazards of each step and ask:

- What can go wrong?
- What are the consequences?
- How could an accident happen?
- Are there other contributing factors? The weather, seasonal workload, or new construction are examples.
- How likely is it that a hazard will occur?

Review the List of Hazards with Employees

Your employees can provide a tremendous amount of information. Take the time to talk to them—and be sure to listen! Asking for their honest input will engage them in the process and lead to a higher level of safety awareness. You will likely hear several practical ways they believe the job hazards and job processes affecting them can be eliminated or at least reduced.

Describe the Ways to Eliminate or Reduce the Safety Hazards

You've evaluated the findings in your analysis and concluded there's a safer way to do the job. Now your work begins. In your JHA you'll need to:

- First, make any changes to the equipment, tools, or engineering controls to eliminate a hazard. This might include adding machine guards, improving lighting, or having better ventilation.
- Change the work processes.
- Change the administrative controls or make changes in how the task is done if engineering controls aren't possible. Perhaps you could rotate jobs, change the steps in the process, or provide additional training.
- When engineering and administrative controls aren't possible or don't adequately protect the workers, make additions and changes in the required personal protective equipment.

Implementing Your JHA Changes

- To complete the JHA, you'll need to correct all unsafe conditions and processes. The resulting changes may require additional training for your employees. Make sure they understand the changes and the reasons behind those changes.
- Periodically review the JHA. You may find hazards you missed before. Update and review the document when the task or process changes or when injuries or a close call occurs when performing the recommended task.

You'll find your JHA to be a valuable tool. Not only will it help to reduce worker injuries, it's a document you can use for training purposes. It can also serve as a reference tool in the event of an accident investigation.

For additional information go to: www.osha.gov; www.setonresourcecenter.com /safety

Handy Tips for Hand Safety

C very year, about one million US workers receive emergency hospital treatment for acute and serious hand, finger, and wrist injuries. Unfortunately, in one recent year, almost 8,000 of these injuries resulted in amputations.

According to Occupational Safety and Health Administration (OSHA), close to 70 percent of victims experiencing hand, finger, and wrist injuries were not wearing personal protective equipment (PPE). The other 30 percent wore gloves or PPE that were inadequate, damaged, or wrong for the type of work being performed. OSHA now requires employers to determine the most appropriate types of PPE for employees' hands based upon the specific work conditions and potential workplace hazards of the task to be performed.

Many employers have found success in having their employees conduct their own hazard assessment for hand safety. It makes sense that involving employees in the assessment process increases their safety awareness. For example, when opening up a discussion about hand safety, ask the employees to list all the ways their hands might be injured on a particular job. This might include:

- Cuts, lacerations, punctures, and even amputations
- Abrasions from rough surfaces
- Broken fingers and bones in the hand
- Chemical burns and severe skin irritation
- Thermal burns from touching extremely hot objects
- Absorption of hazardous substances through unprotected skin

A study by the Liberty Mutual Research Institute for Safety found that wearing gloves reduced hand injuries by 60 percent. Although gloves will help protect against many of the above hazards, not just any kind of glove protects against all hazards.



So, how do you select the right gloves for the job? As with any PPE selection process, the first step is to conduct a risk assessment to identify and understand the potential hazards.

Identify the substances (particulates, liquids, and gases) present in the work site and the hazards associated with these substances. Survey the work site and list all physical and environmental hazards such as sharp instruments, rough surfaces, or machinery. Also, make a list of employees who will be wearing the gloves, the work each person will do, and what equipment will be used. Keep in mind that some hand injuries (lacerations, crushing, broken bones, amputations) cannot be prevented by gloves.

Gloves should be evaluated by the following criteria:

- Mechanical protection: resistance to cuts, punctures, and abrasions
- Chemical protection
- Full protection: no holes or tears
- Heat and flame protection
- Vibration reduction
- Allowing dexterity for the job at hand

In addition, consider other hand protection features such as length, size, and areas of coverage, type of cuff, surface finish, and any attributes affecting function or comfort. Also consider the materials the gloves are made of.

Select gloves that offer the optimal combination of features and performance. Periodically reevaluate your choices with your employees.

When it comes to the materials gloves are made from, keep in mind that some people may be sensitive to the proteins found in latex. This is an issue that has prompted the glove industry to find alternatives in materials. Gloves are now made of materials such as vinyl, nitrile, and neoprene.

Perhaps the best place to begin in choosing appropriate hand protection is the American National Standard for Hand Protection Selection Criteria. It was developed by the American National Standards Institute and the International Safety Equipment Association. The standard addresses the classification and testing of hand protection for specific performance properties related to chemical and industrial applications.

For additional safety information go to: www.osha.gov

Be Prepared for an Emergency

F ire. Flood. Tornado. Hurricane. Earthquake. You never know when an emergency situation may force you to leave your home or work to deal with disaster situations. In the event of a major disaster, you and your family should realistically plan to be self-sufficient for at least seven days before outside resources are available. A little preparation now could save lives and prevent injuries in the future.

- **Escape routes**. Every room in your house should have two designated escape routes. The whole family needs to know, understand, and practice the escape routes, especially children.
- **Evacuation plans**. Massive evacuations caused by fire, hurricanes, and flooding are becoming more and more common. You may have only minutes to leave. So be ready to move!
 - If you know there might be trouble soon, keep a full tank of gas in your car, and only take one car per family to evacuate.
 - Gather disaster supplies (see below) and have a battery-powered radio for official evacuation instructions. Don't forget the extra batteries!
 - Before you leave, lock up your home and unplug everything except the freezer and refrigerator.
 - Let others know where you're going, leave early to avoid being trapped, and follow recommended evacuation routes. Don't take shortcuts—they may be blocked!
- **Family communications**. Your family may not be together when a disaster strikes, so plan how you will contact one another in emergency situations. Pick a friend or relative who lives out of state for family members to notify they are safe.
- Utility shutoff. Every adult needs to know how to shut off the utilities: natural gas, water, and electricity. Because there are different gas shutoff procedures for different gas meter configurations, contact your gas utility for guidance on preparation and response.

- **Food.** When putting together your week's worth of nonperishable food supplies for every family member, try to avoid foods that will make you thirsty. Choose salt-free crackers, whole-grain cereals, and canned foods with high liquid content. Stock canned foods, dry mixes, and other staples that do not require refrigeration, cooking, water, or special preparation. You may already have many of these on hand. Be sure to include foods that meet special dietary needs. And do not forget to have a manual can opener!
- Water. Water can become a precious resource after a disaster. Keep an emergency water supply ample enough to meet the needs of the entire family for seven days or longer. Also plan on having enough water to meet your family's personal hygiene and sanitation needs.
- **Important documents**. Store documents like insurance policies, deeds, and property records in a bank safety deposit box away from home. Make copies for your disaster supply kit. Keep a small amount of cash or traveler's checks where you can quickly get to them.
- **Special needs**. A family member with a disability or a special need may require additional assistance in an emergency. Find out what assistance is available in your community and be sure to inform the local Office of Emergency Services and the fire department about your family's special needs.
- Pets. If you must evacuate, *don't leave your pets behind!* They may not survive on their own, and you may not be able to find them when you return. Create a "pet survival" kit that includes essential supplies like food, water, and medications. For more information, contact the Humane Society of America.
- Safety skills. Family members should know how to administer first aid and cardiopulmonary resuscitation (CPR). The American Red Cross frequently provides first aid and CPR classes. Everyone should also know how to use a fire extinguisher; your home should have an ABC-type extinguisher (see chart on page 100).
- **Sheltering.** You may want to consider having sheltering supplies such as tarps and tents to last you for up to two weeks.
- **Emergency kit for work.** This kit needs to be in one container, and ready to "grab and go" in case you are evacuated from your workplace. Besides food and water in the kit, have comfortable walking shoes in case an evacuation requires you to walk long distances.
- **Emergency kit for your car**. In case you are stranded, keep a kit of emergency supplies in your car. This kit should contain food, water, first-aid supplies, flares, jumper cables, and seasonal supplies.

Change stored food and water supplies in all your kits every six months and write the new date on all containers. You'll also need to rethink your supply needs every year and update your kit as your family needs change.

For more information go to: http://www.dhs.gov/index.shtm; http://www.fema.gov; http://www.redcross.org; and your city's emergency service organizations.

Eye Safety

N early 500,000 eye injuries occur in the workplace every year, just in the United States. Experts say that 90 percent of those injuries could have been avoided simply if workers were more safety conscious and if they used the proper eye protection.

Breaking down these injuries, it adds up to more than 2,000 work-related eye injuries each day! Most of those injuries occurred while the workers were performing their regular job. Of those injuries, between 10 and 20 percent are disabling. This means the damage to one or both eyes was serious enough to result in temporary or even permanent loss of sight.

The Occupational Safety and Health Administration (OSHA) reports that the majority of employees who injure their eyes were either not wearing any eye protection at the time of their accident, or weren't wearing the right kind of protective eyewear for the particular job.

The top causes for eye injuries in the workplace are:

- Flying objects (bits of metal and glass)
- Tools
- Dust and small particles
- Chemicals
- Harmful radiation
- A combination of these or other hazards

Protective Eyewear Basics

- Always wear the proper eye safety gear. There are several types from which to choose, depending on the task you are performing:
 - Glasses
 - Goggles

- Face shields
- Welding helmets
- Follow all operating procedures correctly.
- Know where the first-aid and eye cleaning stations are located and know how to use them properly.
- Always wear safety gloves and wash your hands after touching chemicals to prevent accidentally rubbing them in your eyes.
- Do not wear regular eyeglasses and assume they will protect your eyes. They are not designed to do this, and often they won't. Don't chance it.
- Make sure all protective eyewear fits properly and is not damaged. If it has been damaged, throw it away immediately!
- Safety is a choice you make every day. Preventing eye injuries can be easy if you choose to follow the proper work rules and safety procedures and use the correct personal protection equipment.

Protective eyewear should be made of polycarbonate plastic. If you are working with liquids, your goggles should be splash-proof. Never rely on eyewear that is not designed for safety, such as reading glasses or sunglasses.

By following a few safety precautions, you can greatly reduce your risk of eye injury. It takes only a few moments to think "eye safety" and put on safety goggles. A few seconds of eye protection could save you a lifetime of problems.

For additional information go to: www.preventblindness.org; www.cdc.gov/niosh

Biohazards and Worker Safety

W hat are biohazards? Simply put, they are materials and/or conditions that pose a risk to human health. Animal feces from dogs, rodents, and birds can all transmit diseases to humans if not handled and cleaned up properly. Blood-borne pathogens, human waste, and drug paraphernalia are also considered biohazards and can pose a significant health threat.

There are five general categories of biohazards:

- Bacteria (E. coli and Salmonella)
- Fungi (mold and yeast)
- Viruses (hepatitis, HIV)
- Parasites (Giardia and Cryptosporidium)
- Endotoxins (from decaying debris).

There are four ways in which the human body can be affected by a biohazard:

- Ingestion (eating, swallowing)
- Inhalation (breathing or smelling)
- Contact (broken skin or mucous membrane)
- Injection (being stuck with a sharp object such as a needle)

Biohazards in the Workplace

If your work typically brings you into close proximity to biohazardous materials, you likely already know the potential safety and environmental risks and the safe handling procedures. But it's essential that everyone in the area knows what to do in a biohazard emergency, both during the emergency and afterward, during cleanup.

A properly outfitted work area contains a safety shower, an eye wash station, and a hand washing sink as permanent fixtures. There should also be at least one wellstocked biohazard spill kit. This kit should contain goggles for eye protection, gloves to protect hands, shoe covers, breathing masks, biohazard waste bags, disinfectants, sharp-instrument containers, and instruments for picking up sharp tools or objects such as broken glass. It should also contain an absorbent material designed specifically for handling common biohazards, such as blood.

Be sure everyone is familiar with the biohazard safety procedures, the contents of the spill kit, the instructions for using the kit, and any material safety data sheet (MSDS) that may be included.

Are Biohazards Really a Health and Safety Threat?

Most people don't know what type of condition is considered a biohazard and are unprepared to safely deal with it. Let's say for example that a co-worker receives a serious cut while on the job. Is that a problem? According to the United States Centers for Disease Control, in the general public, one in 300 people are HIV positive; one in 20 have hepatitis; one in five have herpes; and one in three have some type of blood-borne disease.

What's more, the CDC says hepatitis B virus can survive for at least one week in dried blood. The virus may survive on environmental surfaces, contaminated needles, and/or instruments.

Diseases from air- and blood-borne pathogens or feces are spread to humans most often during cleanup because of improper safety equipment. For example, hantavirus is transmitted by infected rodents. Individuals become infected with hantavirus by breathing aerosolized urine, droppings, saliva, or nesting materials. A specialized respiratory mask (one that filters viruses) should be used when cleaning suspected nesting areas and rodent feces.

The Laws and Regulations for Proper Cleanup Procedures

It is especially important to pay close attention to the biohazard cleanup laws. They are imposed by multiple agencies to protect the public's health and safety. The Occupational Safety and Health Administration (OSHA) is one of the agencies that set standards in biohazard cleanup laws. According to OSHA, "personnel associated with the biological cleanup must be trained, immunized, and properly equipped to do so."

Proper Cleanup and Disposal

Biohazard restoration includes not only cleaning the visible but also the invisible. The standard for cleaning and restoration of biohazards is set by the American Bio-Recovery Association. As a general rule, for any blood or fluids, all visible areas should be cleaned, including all materials surrounding the affected area. When it comes to porous materials such as drywall, sometimes it is necessary to replace the drywall in that area. Cleaning of biohazard areas should include all surfaces—walls, ceilings, carpets, flooring, fixtures, switches, railings, and trim—using chemicals produced specifically to kill microorganisms. Disposing of biohazard materials after cleanup is regulated by the US Environmental Protection Agency (USEPA), the Occupational Safety and Health Administration (OSHA) and state and local governments. All of the guidelines and regulations are written with the specific intent of lowering your infectious risks and keeping you from contracting or spreading disease.

For additional information go to: www.epa.gov; www.osha.gov; www.cdc.gov

Distracted Driving: Conversations Are the Problem!

More than half the states in the United States have passed, or have proposed, laws that require drivers to use hands-free headsets or speaker phones when they make telephone calls from their vehicle. Most laws also prohibit text-messaging. Many utilities have adopted strict hands-free driving policies for their employees.

New research indicates that the hands-free laws will not necessarily prevent crashes. A 2008 Massachusetts Institute of Technology (MIT) research project concluded that conversations are the problem, not the phone. Conversations induce a form of inattention blindness in which drivers fail to see objects in their driving environment. Even when drivers appeared to be looking at the road, their attention was actually directed elsewhere.

A 2008 University of Utah study said hands-free phone conversations put drivers in a mental fog that's more distracting than a conversation with passengers in the car. The research concluded that drivers are better able to synchronize the processing demands of driving with in-vehicle conversations than with cell phone conversations.

Utah's test track study also showed that hands-free systems can distract drivers longer than handheld phones because motorists needed more attempts to dial the right phone number. The study found that motorists who talked on either handheld or hands-free cell phones drove slightly slower; were 9 percent slower to hit the brakes; displayed 24 percent more variation in following distance as their attention switched between driving and conversing; and were 19 percent slower to resume normal speed after braking. The bottom line: cell phone users—with or without headsets—were 5.36 times more likely to get in an accident than undistracted drivers.

A University of Utah psychologist associated with the study concluded that motorists talking on handheld or hands-free cellular phones were as impaired as drunken drivers intoxicated at the blood-alcohol limit of 0.08 percent (the minimum level that defines drunken driving in most states). Clearly the safest course of action is to not use a cell phone while driving.

The most current research released by the Harvard Medical School and the University of Warwick reveals that cell phone conversations impair a driver's visual



attention to such a degree that it can add significant braking distance to a car and cause nearly twice as many errors as drivers driving without the distraction of a hands-free cell phone conversation. The research concluded that simply using phones hands-free is not enough to eliminate significant impacts on a driver's visual attention. It's the generating of responses in a conversation that competes for the brain's resources. This leads to a cognitive "bottleneck" developing in the brain, particularly with the more complicated task of word generation.

For additional information go to: www.distraction.gov; www.osha.gov/distracted -driving/index.html; www.nsc.org/safety_road/distracted_driving

Asbestos Safety

e aware of the hidden and serious health dangers when working around asbestos.

Asbestos is recognized internationally as a serious and deadly health hazard. Every year, an estimated 1.3 million US workers in the construction and general trades face significant asbestos exposure. Heaviest exposures occur in construction, particularly during the removal of asbestos for a renovation, major repair, or demolition project.

For decades, asbestos was used to reinforce, insulate, and fireproof construction materials such as insulation board and asbestos cement. Although its use is now illegal, asbestos can be found in more than 3,000 products in the home and workplace: hot water or steam pipes, boilers, heaters and furnace ducts, floor tiles, textured paints, soundproofing material, roofing shingles, and siding. Fortunately, these products are dense and do not release significant amounts of fibers under normal use. However, deadly asbestos fibers can be released when these products are cut or damaged. Asbestos fibers pose the biggest threat when they become airborne and are inhaled into the lungs.

Construction and maintenance workers need to avoid creating asbestos dust from scraping, brushing, rubbing, or cutting products containing asbestos. When workers are assigned to an area that may contain asbestos products, it's extremely important to determine whether asbestos is present. Before work begins, your company's occupational health and safety manager should contact a qualified industrial hygiene firm to inspect the area for asbestos products. A proper assessment includes a complete visual examination and careful collection and analysis of samples.

If a sample comes back positive, the safest course of action is to contact a licensed abatement company to do the removal. They know how to remove the asbestos safely, and they have the right equipment to do it. Removal of asbestos without a license can endanger the health and safety of anyone exposed to the asbestos dust. Many county and state health or environmental departments provide lists of licensed asbestos-abatement contractors. If you still choose to tackle a small project with the potential to expose workers to airborne asbestos fibers, please be aware of the risks and follow these safety precautions:

Wear a Mask

Because breathing asbestos is the biggest problem, use a heavy-duty, single-use respirator approved by the National Institute for Occupational Safety and Health (NIOSH). Make sure the packaging says it's specifically designed for asbestos. Also, keep in mind that even with these masks, you may not be 100 percent safe.

Dress Properly

Your lungs aren't the only things asbestos will attach to. The fibers will latch on to any porous material, especially clothing. Wear nonporous clothing that can be thrown away afterward. And be sure to wear disposable head covering and gloves.

Wet Everything

Keep the asbestos material constantly wet while you're working to help eliminate the potential for dust. Also be sure there are no energized electrical components near the water! Professional abatement contractors typically use a special water/chemical mixture that helps keep the fibers from going airborne. You just have to make sure that the material remains moistened so it cannot get into the air. It's also a good idea to partition off the work area with plastic sheeting to isolate drifting dust and keep it from spreading.

As with any project that creates dust, it's important to also use the proper personal protective equipment, such as safety eyewear.

Safe Disposal

The proper and safe disposal of asbestos-contaminated materials is exceptionally important. It is illegal to dump it into a trash bin. All contaminated materials must be taken to a hazardous waste disposal facility. Also include the cleanup rags, clothing, head covering and gloves, and even the plastic used to seal off the work area.

Do not take these disposal suggestions lightly. Not following the law can lead to jail time. Yes, it's *that* serious!

Several strict federal and state environmental and safety laws are in place to limit asbestos exposure. These laws require employers to provide protection and training to the workers who may disturb asbestos. OSHA has also established a permissible asbestos exposure limit that places tight restrictions on the acceptable levels of airborne asbestos fibers.

For additional safety information and regulations go to: www.cdc.gov/niosh; www.osha.gov; and your state's health, environment, and safety organizations.

Fire Safety Part 1: Fire Prevention Comes First

ach year, fires cause 20 times more deaths than hurricanes, tornadoes, floods, and earthquakes combined. If your facilities were severely damaged by fire, you and your co-workers could be injured or even lose your lives. Your customers would lose, too, because they depend on your services.

So what can be done to prevent a fire? First, understand that there are three essential ingredients to all ordinary fires: air (oxygen), ignition source, and fuel (paper, wood, solvents, etc.). To extinguish a fire, simply remove one of the basic ingredients. This can be accomplished by

- Preventing ignition (usually temperature or heat control)
- Smothering (oxygen control)
- Isolation (fuel control)

Fires are classified according to what is burning (its fuel):

Class A fires involve general combustibles, such as wood, cloth, paper, or rubbish. These fires are usually controlled by using water to cool or smother the material.

Class B fires involve flammable liquids, such as gasoline, oil, grease, or paint. They are usually smothered by using foam, carbon dioxide, or dry chemicals.

Class C fires involve electrical equipment and are usually smothered by oxygen control but never by using water! Typically, carbon dioxide or dry-chemical extinguishers, nonconductors of electricity, are used.

Class D fires occur in combustible metals, such as magnesium, lithium, or sodium, and require special extinguishers and techniques.

Fire prevention is everyone's job, so prevent fires by doing the following:

- Practice daily good housekeeping
- Eliminate electrical hazards



- Keep fire and heat away from flammable liquids
- Make sure cigarettes and cigars are out completely

Practice good housekeeping. Work areas should be kept free of empty boxes and stacks of unused paper. Fire extinguishers and other firefighting apparatus should be accessible and their location clearly marked. All fire doors, emergency exits, stairways, hallways, and aisles must be clear of obstructions.

Eliminate electrical hazards. Check electrical cords for cracks, broken plugs, and poor connections. If you find damaged cords, replace them immediately. Never use makeshift wiring. Never overload extension cords. Too many appliances plugged into an extension cord can cause the cord to overheat and ignite the cord's insulation.

Protect flammable liquids. When you store flammable liquids, remember that they are just that—flammable! Carefully read the labels on all products you routinely use or keep in a storage cabinet to see if they are flammable.

Observe careful smoking habits. Smoking is the single largest cause of home fires. Discarded cigarettes and cigars left in waste cans and receptacles cause thousands of fires each year. Obviously, do not smoke while fueling a vehicle or when standing near vehicle fuel pumps. Always observe the "no smoking" rules in company buildings, facilities, and vehicles.

For more information go to: www.nfpa.org; www.osha.org

Fire Safety Part 2: Surviving a Fire

o survive a fire, you need to get away from it as quickly as possible. To safely get out of a burning building or room, remember the following:

- When entering a new work location, meeting room, or hotel room, make note of the fire exits.
- Stay calm and think clearly.
- If the door is closed, feel it from the bottom to top, including the knob. If you do
 not feel heat, you may open the door.
- Brace your foot and shoulder against the door and open it slowly. If there is light smoke, get down and crawl to the nearest exit with a wet towel or handkerchief over your nose and mouth.
- Stay low to avoid smoke and toxic gases that can collect near the ceiling.
- Close all doors behind you.
- Never use an elevator to escape a fire.
- Call 911.
- Never go back to get anything.

If You Are Trapped

- Feel the door from bottom to top and the knob; if hot or warm, stuff clothing or towels (wet if possible) in the cracks of the door to keep out the smoke and toxic gases.
- If possible, open a window at the top to let out the heat and smoke collecting on the ceiling. Open a window at the bottom and bend down to breath in fresh air. Never open a window if smoke is rising from a lower floor.
- Stand by the window, waving something, and wait for rescue.
If You Catch on Fire

- **STOP** where you are. Moving or running feeds air to the flames and will worsen the fire.
- **DROP** to the ground; if you stand up, the fire can burn your face.
- **ROLL** slowly on the ground, in a rug or blanket, if you can. Fold your arms high on your chest to protect your face.

Fire Extinguishers

A portable fire extinguisher can save lives and property by knocking down a small fire or containing it until the fire department arrives. Portable fire extinguishers are not designed to fight a large or spreading fire. Even against small fires, they are useful only under the right conditions:

- An extinguisher must be large enough for the fire at hand, in good working order, and fully charged;
- The operator must know how to use the extinguisher quickly, without taking the time to read directions during an emergency; and
- The operator must be strong enough to lift and use the extinguisher.

Using an extinguisher that is not rated for the fire you are fighting could make the fire worse. Make sure the extinguisher you are about to use matches the type of fire.

There are four types of fires with varying characteristics:

Fire Type	Extinguisher Types		
Type A: Ordinary combustibles. Wood, cloth, paper, rub- ber, many plastics. Other common materials that burn easily.	Water Multipurpose Dry chemical		
Type B: Flammable liquids. Gasoline and other flamma- bles such as oils, grease, oil-based paints, and flammable gases.	Dry chemical Carbon dioxide (CO ₂)		
Type C: Electrical equipment. Energized electrical equipment including wiring, fuse boxes, circuit breakers, machinery, and appliances.	Dry chemical Halon 1211 Carbon dioxide (CO ₂)		
Type D: Combustible metals. Metal and metal dust often used in industry.	Special extinguishers and techniques must be used.		

Knowing the fuel source of a fire is essential. Using water on a grease or electrical fire can be extremely dangerous. Although fire extinguishers are placed to fight the fires that would normally be expected, you should verify that the symbol on the fire extinguisher is appropriate for the fire you are about to fight. Some extinguishers are designed to be applied to multiple types of fires. These are clearly marked, such as "A-B-C."

If you discover a fire, give the alarm and put your fire emergency plan into action. Be sure the local fire department has been notified. Fight the fire only if you have been trained to use a fire extinguisher and the fire is small. Your safety is the first priority.

Using the Fire Extinguisher

Learn how to PASS:

- **Pull:** Pull the pin. Some units require the releasing of a lock latch, pressing a puncture lever, or other motion.
- Aim: Aim the extinguisher nozzle (horn or hose) at the base of the fire.
- **Squeeze:** Squeeze or press the handle.
- **Sweep:** Sweep from side to side at the base of the fire until it goes out. Shut off the extinguisher. Watch for re-flash and reactivate the extinguisher if necessary.

If the fire gets large, get out! Close doors behind you, which will help slow the spread of the fire. Always stay between the fire and an exit. Never let a fire block your escape path in case it gets out of control.

Knowing the right thing to do can mean the difference between life and death—for you and your co-workers.

For additional information go to: www.nfpa.org; www.osha.org

The Safe Use of Compressed Air

W hen we think of pressure, we think of power. And with the use of power, there are often inherent dangers. Such is the case when we work with one of the most useful tools of the workplace: pneumatic tools powered by compressed air. Many workers take pneumatic or compressed air tools for granted, often forgetting or ignoring the hazards involved in their use. Compressed air is not "just air." It is a focused stream of high-velocity air that can cause serious injury or death to the pneumatic tool's operator or persons in the immediate area.

Compressed air performs countless jobs, from filling tires, lubricating trucks, and operating lifts to the breaking, jacking, augering, and tamping of earth and rock on construction projects. Compressed air helps us complete our jobs better and faster. This discussion is geared to its use and the dangers of its misuse.

Using a compressed-air hose as a toy is particularly hazardous, especially if the air-stream is brought in too close or in direct contact with any portion of a worker's body or clothing. If this occurs and there is a break in the skin, air may be forced into the bloodstream, often with fatal results.

There are other ways compressed air can injure a worker. The majority of injuries are tied directly to carelessness and a lack of training. Unfastened safety chains on airhose lines account for more injuries than any other type of compressed-air accident. Hose couplings are tough and can be handled pretty roughly on construction jobs—such as being dragged over the ground or along streets, which can lead to the disconnection of couplings. That's why a safety chain must be connected from one hose to the other at each connection. When an unchained hose is accidentally disconnected, the escaping high-pressure air will whip the hose around with terrific force, causing damage to just about anything it hits.

Using compressed air to clean clothing, tools, or workbenches can blow foreign bodies into worker's eyes. Using compressed air for cleaning is not only unsafe, but it can be more a hindrance than help because it typically spreads dust and chips around. Eventually it creates a larger cleanup area.

Safety tips for using compressed air:

- Whenever you use compressed air, wear eye protection.
- Before you open a valve to an air hose, check the hose carefully to see that it is in good shape, free from cuts and abrasions.
- Make sure the trigger or operating valve on the tool is closed.
- Check the run of the line to see that it is protected from possible damage and is not a tripping hazard.
- Whenever you have to change the tool at the end of a compressed air line, be sure the valve is closed on the supply side of the coupling. No matter where the valve is, close it. Never simply kink the hose!
- After you close the valve, pull the trigger or open the operating valve to release the line pressure. Then make the required tool change.

Practice these safety measures when working with compressed air. Remember, there is power in pressure—and power means extra precaution.

For more information go to: http://www.osha.gov/doc/outreachtraining/htmlfiles /tools.html; http://www.statefundca.com/safety/safetymeeting/SafetyMeetingArticle .aspx?ArticleID=25

Jackhammer Safety

O ne of the most powerful tools used in the water utility industry is the jackhammer. Jackhammers are designed to break asphalt, concrete, and rocks. They come in either electric or pneumatic models. Without proper training and personal protective equipment (PPE), workers can inflict serious injury to their feet and other parts of the body, as well as injure others nearby, while operating this tool.

Here are safety guidelines to follow when inspecting, using, and maintaining jackhammers:

- Always wear proper PPE, which includes eye protection; long-sleeved clothing; sturdy, full-length pants; steel-toe boots or shoes; respiratory, head, and hearing protection; and safety gloves.
- Know how to safely operate the supply compressor—especially in emergencies.
- Place the compressor as far as possible from the work area to reduce the level of noise.
- Regularly inspect the jackhammer and other necessary tools for defects or damage. Check if all components are complete, securely in place (or tightened), and in good condition. Do this before every shift or start of operations.
- Check air hoses for breaks, cracks, and worn or damaged couplings.
- Ensure that the rating of the hose is sufficient for the job intended.
- Inspect the electrical cord for frays, wear, and other signs of damage.
- Sling the electrical cord onto your shoulder when in use to prevent the cord from accidentally swerving, which can cause electrocution.
- Always use the proper weight of the jackhammer for the job. For your back's sake, try to use a lighter jackhammer for the job as much as possible.
- Always lift the tool (jackhammer) properly by using your legs. This helps you avoid back strain or injury.

- Use the proper point for the material to be broken: rock point for rocks; spade point for asphalt; chisel point for concrete. Never use a broken or cracked point.
- When moving the jackhammer from place to place during operation, place your hand between the handle and the operating lever.
- Always operate the tool at a slight angle with it leaning back toward you. This way, you prevent the point from getting stuck in the material and the tool from getting out of control.
- Shut off the air supply and relieve pressure from the supply hose before changing tool points. Do the same when leaving the jackhammer unattended.
- Immediately remove defective or malfunctioning jackhammers and other tools until they are properly repaired.
- Barricade the work area as much as possible to keep spectators and untrained personnel from getting exposed to the hazards of jackhammer operations.

For additional information go to: www.osha.gov/Publications/osha3080.pdf; www.safetyservicescompany.com/blog/construction-safety-using-handling-andmaintaining-jackhammers

Vehicle Safety: Check, Inspect, Drive!

U sing a company vehicle means you have a responsibility to ensure not only your own safety, but that of your passengers and fellow drivers. Because the vehicle likely has been driven by other people, it's a good idea to take a few minutes before you drive away to check that the vehicle and its equipment are in safe and proper working order.



[Copy and distribute this checklist.]

Vehicle			Needs		Inspec-
Number	Item	Good	Attention	Employee	tion Date
	Lights (including				
	emergency flashers)				
	Horn				
	Mirrors & Visors				
	Windshield (including				
	wiper blades & washer				
	fluid)				
	All Glass				
	Brakes & Parking				
	Brakes				
	Tires & Wheels				
	Seat Belt & Shoulder				
	Harness				
	Interior Condition (floor				
	mats, seats, dashboard)				
	Exterior Condition				
	(including locks)				
	State Inspection & State				
	License				
	County, City, or Town				
	License & Safety				
	Stickers				
	First-Aid Kit & Accident				
	Report Kit (includes				
	Insurance card)				
	Ladders & Other Safety				
	Equipment				
	Exhaust System				
	Fine Extinguisher				
-	Fire Extinguistier				
	Logos & venicie				
	Tom on Trailon Healt		}		
	10w or 1 raller Hook				
	Items Secured in				
	Additional Items				

A Manhole May Look Simple, But ...

A confined space is an area with limited entry and exit containing known or potential hazards that is not intended for continuous human occupancy. The most common confined spaces in the utility industries are manholes and vaults.

At times, manholes and unventilated vaults must be entered for work. Confined-space operations in manholes pose hidden hazards. The most common of these hazards are exposure to:

- Combustible or flammable vapors and gases from underground storage or piping facilities.
- Oxygen deficiency by displacement with other gases and the introduction of nitrogen from cable pressurization.
- Toxic gases from decomposing vegetation and soil, chemical spills, and engine combustion exhaust (from vehicles and equipment).

Manhole Entry Equipment

Several pieces of equipment are required for safe entry into a confined space:

- Work-area protection devices, such as traffic (reflective) vests, traffic cones, manhole guards, and work-area protection signs.
- Manhole cover lifter and manhole hook.
- Atmospheric tester for oxygen deficiency, combustible gas, and other toxics.
- Power ventilator (blower).
- Manhole pump to remove water.
- First-aid kit.
- Portable fire extinguisher (dry chemical).

Atmospheric Conditions

Atmospheric conditions are considered unacceptable if oxygen levels are less than 19.5 percent or greater than 23.5 percent. The following levels of other hazards are unacceptable:

- A flammable gas, vapor, or mist greater than 10 percent of its lower flammable limit (LFL). LFL means the minimum concentration of the flammable material that will ignite if an ignition source is present.
- An airborne combustible dust at a concentration that obscures vision at a distance of 5 feet or less.
- An atmospheric concentration of a substance greater than the allowed limit in the material safety data sheet for that substance.

Testing Procedures

After all work-area protection devices are in place and the atmospheric test equipment has been tested as operational, proceed as follows:

- Lower the sampling hose approximately 6 inches through the hold in the manhole cover to make the first pre-entry test. If no combustible gas is found, remove the cover and proceed. If the flammable gas concentration is above 60 percent LEL (lower explosive limit), suspend operations and follow company procedures.
- After the manhole cover is removed, continue to test for combustible gas by lowering the sampling tube within 12 inches of the manhole or vault floor. If no flammable gas is found, purge the manhole with the power blower for the period of time based on the blower capacity and manhole configuration, following company procedures.

Ventilation

If flammable gas is detected and is above 10 percent but below 60 percent LEL, purge and ventilate the manhole for a minimum of 10 minutes, depending on the manhole or vault size. If combustible gas was detected but subsequently cleared, continue to monitor and ventilate to maintain the flammable gas level below 10 percent LEL.

When ventilating a manhole, insert the blower hose in the manhole opening, positioning the blower hose to direct the flow of air horizontally, midway between the manhole's floor and roof toward an end-wall, and away from the work area, if possible. To minimize the intake of exhaust fumes from passing vehicles, the blower intake should be positioned away from the flow of traffic. Wind direction also must be considered. Ventilation of the manhole must continue as long as the manhole is open to avoid the possible development of a hazardous atmosphere.

If the confined space is vacated for any period of time, the atmosphere of the confined space should be retested before re-entry is permitted. Further testing should be conducted with ventilation systems turned on to ensure the contaminants are removed and that the ventilation system is not causing a hazardous condition.

Remember, when entering any manhole, follow the written confined-space entry procedures.

PURGE—TEST—VENTILATE—BE SAFE!

For additional information go to: www.osha.gov/SLTC/confinedspaces/index.html; www.cdc.gov/niosh/pdfs/87-113.pdf; www.dir.ca.gov/dosh/dosh_publications /confspa.pdf

Backhoe Safety

The backhoe is a highly productive machine. It is the true workhorse at most projects involving trenching and moving earth. But a backhoe is also a complicated and dangerous machine that requires continuous safety vigilance during its operation. As a backhoe operator, you have the responsibility to analyze and react to all situations in order to keep your fellow workers safe and away from potential accidents.

The best way to get the job done safely and efficiently is to know yourself, the jobsite, and your equipment.

Here are a few safety tips to consider before you even start the engine and go to work:

- Make sure the machine is fit for the task. Walk around the machine and inspect every nook and cranny. Look for damaged or missing parts and check for fluid leaks, cracks, and excessive wear. Make sure the control levers are working properly.
- Review the equipment's warning and safety signs. They are there for a reason. Take the signs seriously and heed their warnings. Replace any damaged or missing decals.
- Is the work site safe for the backhoe? Look up and live! Make it a habit to always look for overhead power lines. If they are on the site, always keep them firmly in mind and point them out to your co-workers. Never allow a fully extended boom to get any closer than 10 feet from a power line. In fact, any distance greater than 10 feet is better! And never move the machine with the boom elevated.
- Call before you dig! Did you call 811 two working days in advance so the locations of all underground utilities, in addition to water, are clearly marked at the construction site? Don't rely solely on your company's charts. You need to be certain.

- Be honest and ask yourself: Am I qualified to operate the equipment? To be a qualified backhoe operator, you should not only have mastery of the operating skills but also have a strong sense of safety. A good operator will instinctively focus more on his safety sense than on his operating skills.
- A backhoe operator needs to know how to operate both a front-end loader and a backhoe scooper. The front-end loader is not as complicated as the backhoe attachment, but the operator must use a joystick control while simultaneously driving the tractor. The front-end loader will either remove excess dirt and material from the site or place it back in the trench. The front-mounted bucket can also tamp down loose soil and create a level grade.
- Think ahead and anticipate what you will be required to do to complete the job safely.
- Even though backhoe models vary, all have a few standard safety features. These
 include steps and grab handles for getting on and off of the machine. Frame lock
 levers and attaching levers are present to keep the backhoe securely fastened to
 the loader frame during operation, as well as when it's being transported.
- Some backhoes provide a safety chain to prevent the backhoe mounting frame from rotating backward and unexpectedly trapping the operator. Therefore, it is important to know and check all of the mounting and attachment points and the safety chain before you operate the backhoe.
- About every 8 hours, grease all of the Zerk fittings. Check the hydraulic fluid and oil daily. If the fluid is low, the backhoe will not operate properly.
- Anytime you leave the operator seat or lower the bucket or attachment to the ground, turn the engine off and remove the ignition key.

Here are a few additional safety tips:

- Select the right size bucket for the job. Make sure it matches the workload.
- Stake out the area to be excavated using marker flags. However, do not disturb the markings made by the underground utility locating service.
- Never work in areas that have inadequate overhead clearances. It is just too dangerous.
- Always lower the stabilizer feet to provide extra grip and leverage.
- Keep bystanders and other workers out of the bucket swing area.
- Always be aware if other people are around you and where they are standing.

- Make sure there's enough clearance to swing the bucket to one side for dumping.
- Double-check the lock on the backhoe attachment.
- You will need to wear some or all of the following personal protective equipment (PPE):
 - Sturdy pants and shirt
 - Safety shoes
 - Hard hat
 - Safety goggles or glasses
 - Gloves
 - Hearing protection
 - Respirator for dusty conditions
- Check the loader/backhoe to be sure the following safety devices are in good working order:
 - Rollover protective structure (ROPS)
 - Seat belt (if ROPS equipped)
 - Guards
 - Shields
 - Backup warning system
 - Lights and mirrors

Tips when operating the backhoe:

- Keep the loader bucket on the ground.
- Level the machine for maximum stability.
- Operate the backhoe only from the seat.
- Never swing the bucket over a truck cab.
- Dump the bucket uphill if possible when operating on a slope. If you must dump downhill, swing slowly to avoid tipping the machine.

- If using the backhoe as a hoist, do so with the weight over the back of the machine—*never to the side*—to avoid tipping.
- Be sure the load you are lifting is balanced, and move the boom slowly to avoid swaying the load.

For additional safety information go to: www.osha.gov

Powerful Protection with PPE!

You wouldn't think of wearing a blue three-piece suit to waterski. Nor would you drape a new cashmere sweater over your shoulders to install a sump pump. If you think these are examples of fashion gaffes, think again. A far more serious fashion misstep is tackling a job without wearing the right personal protective equipment (PPE). PPE is equipment designed to protect the eyes, face, head, respiratory tract, and body extremities from potentially hazardous conditions. It includes such items as goggles, face shields, hard hats, respirators, dust masks, gloves, protective clothing, welding aprons, and safety shoes.

The workplace (or work site) must be assessed to determine if hazards are, or may be, present that will necessitate the use of PPE. The right PPE must be selected and employees fitted and trained in its proper use. Let's briefly review some of the most common PPE.

Eye and Face Protection

Eye and face protection is necessary when there is potential exposure to flying particles and dust (wood, glass, metal), molten metal (welding spatter), potentially injurious light radiation (welding glare), or chemicals in any form—liquid, vapor, or gaseous. Eye and face PPE can include safety glasses with side shields, chemical goggles, or a full-face respirator. All devices must comply with strict federal standards.

Remember, not all eye or face protection will protect you from all hazards! Protective glasses with side shields are fine for particulates but provide no protection from hazardous chemical vapors. Remember, the PPE must fit the hazard.

Respiratory Protection

The first step in controlling potentially hazardous dusts, mists, fumes, smoke, or gases in the workplace is the installation of engineering controls such as mechanical ventilation systems. But if such measures are not fully effective (or infeasible, such as at a field work site), then respiratory PPE must be used. The two basic types of respirators are:

- Air-purifying, and
- Atmosphere-supplying.

The first device simply filters the ambient air by using an air-purifying filter, cartridge, or canister. The second type actually provides breathing air to the user from an independent source.

The category of respirator, i.e., air-purifying or atmosphere-supplying; style, whether half or full-face; and type of filter or canister all must be carefully selected. Employees must be properly fitted for PPE and trained in when and how to use it. A medical evaluation of a person's ability to effectively wear and use a respirator must also be conducted.

Head Protection

When working in an area where the potential exists for head injuries resulting from falling objects or impact hazards, employees must wear head protection, which usually comes in the form of hard hats. Again, as with other forms of PPE, hard hats must be manufactured to federal standards and worn properly to afford proper head protection.

Foot Protection

Just as with the head, there are potential hazards to the feet from falling or rolling materials, sharp objects that can pierce the sole, or electrical shock; employees must wear appropriate protective footwear. This commonly takes the form of steel-toe safety shoes, often equipped with steel shanks and heavy-duty soles.

Hearing Protection

Hearing is a precious gift. Continual exposure to elevated noise levels can seriously damage your hearing. If noise levels are too high, employees must be supplied with hearing protection. Hearing protection can be provided by simple disposable earplugs or high-tech earmuffs. It all depends on the nature of the hazard and the type of job.

Other PPE

Other PPE can take the form of gloves, welding aprons, chemical protective suits, coveralls, and back support braces. All are designed to protect a very important person—you—from potential hazards you might encounter on the job.

But remember, no PPE will protect your vision, your lungs, your head, or any other part of your body unless you wear it and wear it correctly. Be fashionable—be safe!

For additional information go to: www.osha.gov/SLTC/ personalprotectiveequipment

What You Don't Know About Radon Can Kill You!

adon is a radioactive gas formed by the natural decay of uranium in rock, soil, and water.

It's colorless, odorless, tasteless, and chemically inert. There's no way of telling if it is present, or how much is present, unless you specifically test for it. So why is this invisible gas a safety concern? Because, according to the Surgeon General of the United States, radon is the second leading cause of lung cancer in the country. It actually doubles the risk of getting lung cancer in someone who smokes cigarettes.

Extremely minute quantities of uranium occur widely in many types of rock and soil, and radon is found in all 50 states. The real risk from radon is derived from its products of natural radioactive decay, as damaging ionizing radiation in the form of alpha particles and other "daughter products" can be emitted.

The term *radon* usually is used in its broadest sense, referring to the gas itself and its decay products.

Radon exposure is typically an indoor air problem. Radon and other gases in the rock or soil below a building rise and eventually force themselves into the building through extremely small cracks and pores in the foundation, floors, or walls.

Once inside, the gases are trapped and can become concentrated, eventually reaching hazardous levels.

The areas of greatest risk of exposure are basements, unvented crawl spaces, and small confined spaces on the lower floors of a house or commercial building. These areas are closest to the source of the radon (the soil or rock) and may not be well ventilated.

Adverse Health Effects

The alpha particles and other daughter products formed when radon decays can be inhaled and become trapped in your lungs. As these particles decay even further, harmful ionizing radiation is released that can damage lung tissue and possibly lead to lung cancer. However, not everyone who is exposed to radon will develop cancer. There are no immediate observable short-term effects of radon exposure, such as coughing, shortness of breath, or mouth and throat irritation. Radon can only be detected by testing.

If you smoke cigarettes and are exposed to radon gas, your risk of developing lung cancer is especially high. But if you quit smoking and lower your potential exposure to radon, you can significantly reduce your cancer risk.

Testing for Radon

Contact the National Safety Council at its Radon Hotline, 1.800.767.7236, to order a brochure with information on low-cost, short-term test kits. Many major hardware stores also carry test kits.

The one-time test kits are easy to use. Most are opened and left on the building's lowest lived-in level for 2 to 90 days, depending on the device, and then the exposed kit is returned to a specified laboratory for analysis. The results will be mailed directly to you. But, if you don't feel comfortable conducting your own radon tests, many qualified professionals will conduct tests for a fee. Contact your state radon office or state air quality control program for more information about licensed testing companies.

If elevated or potentially hazardous radon levels are detected, there are many mitigation measures that can be taken to reduce exposure. The exact methods used will depend on the level of the gas and the design of the building. Some techniques are directed toward preventing radon from entering a building in the first place. Others are designed to reduce, by ventilation, the concentration of radon once it's in a structure.

Many states certify or license radon contractors. Again, contact your state radon office for more information on testing, mitigation contractors, or other information regarding radon gas.

For more information go to: http://www.epa.gov/radon/

Weld Well—And It Ends Well

The American Welding Society has identified more than 80 types of welding and allied processes in commercial use. Some of the more common types include oxygen–acetylene, gas–metal, gas–tungsten arc welding, shielded-metal arc welding, resistance welding, and brazing. Welding and cutting are not without risk and may lead to eye and skin injuries, respiratory hazards, electric shock, and fire in confined spaces.

Eye Injuries

Welding and cutting operations are a major source of eye injury. Related accidents occur when proper personal protective equipment is not worn. The most common eye injuries result from flash burn, metal flying into the eye, and particulates falling into the eye. The only measure that will prevent eye injury is the use of appropriate personal protective equipment. It is important not to wear contact lenses while welding or near where welding is taking place.

The welder also must be concerned about the effects of the welding operation on nearby personnel and should always use a welding curtain or wall.

Skin Injuries

Injuries to the skin usually result from ultraviolet rays or from hot metal. The hot metal may be the material being worked on, or it may be part of the equipment.

Unprotected skin is at risk for injury. In addition to burns, it is easy for exposed skin to be cut during work with sharp metal. Proper safety shoes, clothing, and personal protective equipment will greatly reduce the chances of skin injury.

Respiratory Hazards

Without adequate ventilation or when adequate personal protective equipment is not used, the threat of respiratory injury greatly increases. Before welding, the welder should know what the metal is and the potential effects of the fumes produced. Inhaling welding fumes or gas can produce metal-fume fever, the symptoms of which include a dry, metallic taste in the mouth; fatigue; nausea; and muscular and joint pain. Depending on the metal or alloy, the results can be fatal.

Adequate ventilation (natural, mechanical, or respiratory) must be provided for all welding, cutting, brazing, and related operations. Adequate ventilation means enough ventilation so that a person's exposure to hazardous concentrations of airborne contaminants is maintained below the level set by federal standards.

Electric Shock

Whenever electricity is used, a potential for electric shock exists. Only trained personnel should operate welding equipment. Be sure equipment is properly installed, inspected, operated, and maintained. Equipment should be inspected before every use. Consider the following:

- Placement of welding machines
- Placement of cables
- Load protection
- Use of electrodes and holders

Always be aware of the potential for electric shock when welding.

Fire Hazard

Welding and cutting should be done in designated areas that are free of flammable materials or conditions favorable to fire or explosion. If your utility has a hot-work permit program, make sure to follow its requirements. Before and during the welding operation, the welder and safety watch should

- Inspect the area for flammable and combustible material before welding or cutting begins,
- Cover cracks or floor openings, and
- Have fire extinguishers on hand.

During welding, constantly watch for fires between walls, on opposite sides of metal partitions, or in any concealed place.

Confined Spaces

Because of the small size and questionable atmosphere in most confined spaces, welding and cutting in such spaces require very serious thought and planning. The safety regulations dealing with welding and cutting in confined spaces should be reviewed.

For additional information go to: www.osha.gov/SLTC/weldingcuttingbrazing; www.ehow.com/video_4426772_general-welding-safety-tips-techniques.html

Listen Up to Protect Your Hearing

A good analogy to explain how hearing loss occurs is to visualize a thick grassy lawn. As you walk across the grass, the grass bends down because of your weight. After you pass, the grass stands back up. The more you walk across the same area, the longer it takes for the grass to stand back upright. If you continue to walk across the same area, eventually the grass will die and the area becomes a dirt path.

The same thing can happen to your hearing. When sound vibrations enter your ear, tiny hair cells in the inner ear change the vibrations into nerve impulses. The nerve impulses are then transmitted to the brain where they are translated into the sound we hear. When the hair cells are subjected to excessive noise, they begin to lie down just like the grass does when we step on it. After the noise subsides, the hair cells stand back up. Over time, the more noise the hair cells are exposed to, the longer it takes for them to stand back up. Eventually, they fail to return to normal, resulting in permanent hearing damage.

Wear Hearing Protection

The point behind wearing hearing protective equipment is to reduce the outside noise to below 85 decibels (dB). This is the level considered safe to work in throughout an 8-hour day. Prolonged exposure to any noise above 85 decibels can cause gradual hearing loss. The higher the decibel level of noise you are exposed to, the shorter the amount of the 8-hour day you are allowed to work around the noise. The Centers for Disease Control and Prevention says that regular exposure to 110 dB for more than 1 minute risks permanent hearing loss. This is the level of sound an average chain-saw makes. An ambulance siren is about 120 dB.

When the noise levels vary, a mathematical calculation is used to determine a timeweighted average of the noise exposure (11 dB = 0.5 hour). If the sound level is a constant 95 dB, you would be able to work in the noisy environment for a total of 4 hours out of your 8-hour work shift. If the sound level was a constant 100 dB, you would be able to work a total of 2 hours. The noise level can be reduced by wearing appropriate hearing protection. All hearing protection must be labeled to show its effectiveness. This is done via the noise reduction rating (NRR). The higher the NRR, the more protection provided. If the outside noise is 110 dB, hearing protection with an NRR of at least 25 dB would be needed to keep the noise level at 85 dB (110 dB – 25 dB = 85 dB). Additional protection can be obtained by wearing an earmuff over earplugs. Don't be fooled, however, into believing that the protection will be the total of both NRRs added together; the increased protection will only muffle about 2 to 5 dB.

The highest NRR ratings are provided by moldable earplugs—if they are worn correctly. This can be made of foam, wax, silicone, or other materials and fit directly in the ear canal. Next is the earmuff, which can be custom fitted. The least effective are semi-insert plugs that are two earplugs held over the ends of the ear canal by a ridge headband. But remember, there can be a wide range of NRR ratings for the same type of protection. Read the label and follow the manufacturer's recommendations for wearing and maintaining the products.

For more information go to: www.osha.gov/Publications/osha3074.pdf; http://www.cdc.gov/niosh/topics/noise/solutions/hearingchecklist.html

Make Holidays Happy for Everyone— Don't Drink and Drive

The holiday season can bring much joy, but it can also foster problems and tragedies. This time of year sees wet pavement, heavy traffic, crowded conditions, poor evening light, and many more drinkers than usual on the road. These conditions are just some of the additional hazards we are likely to encounter at this time of year both on and off the job.

Although there are some injury factors that you can do little about, others you can directly control. For example, drinking alcohol is a primary cause of many injuries and deaths, especially from motor vehicle accidents.

Drinking can be a deadly driving partner. Roughly one out of every three people in the United States will be in an alcohol-related auto accident in their lifetime. Alcohol is a factor in more than 33 percent of all traffic accidents. All this tragedy and expense could be prevented if everyone followed one simple rule:

If you drink, don't drive. If you drive, don't drink.

Drinking dulls your ability to make decisions. Even small amounts of alcohol impair driving ability. In your body, alcohol quickly enters the bloodstream from the stomach because it doesn't have to be digested. As it circulates through the body, it reaches the brain where it slows down functioning and acts to depress the central nervous system. The liver is able to break down the alcohol at a rate of about one ounce per hour. Alcohol in excess of that amount stays in the bloodstream and affects numerous critical brain functions:

- **Judgment.** Alcohol alters your perception. It makes you overconfident and encourages you to take reckless chances.
- **Coordination.** Your reaction time and ability to perform multiple tasks decrease with alcohol.
- Vision. Alcohol decreases your pupil reaction time, depth perception, and peripheral vision.

If you choose to enjoy alcoholic beverages, you can do many things to be a safer drinker:

- Eat. Food slows the absorption of alcohol into the bloodstream and reduces its effects.
- Pace drinks. Don't have more than one drink an hour if you're driving.
- Sip, don't gulp. It's okay to "nurse" your drinks. Sipping drinks allows the body to eliminate the alcohol before it accumulates in your blood. Sensible drinkers don't gulp drinks.
- Set a limit. Knowing when to stop helps you avoid intoxication. Responsible drinkers know their limits and stick to them. If it's going to be a long evening, alternate nonalcoholic drinks with alcoholic ones.
- Designate a driver. Have someone stay sober and drive.
- Taper off. Remember, it takes time to recover from the effects of alcohol.
- Don't mix alcohol with drugs. Even over-the-counter drugs can react adversely with alcohol.
- If you drink too much, give your keys to a nondrinker, catch a ride, take public transportation home, or sleep over.

Not drinking is an option, too. If you choose not to drink, just say "No thanks." Expect others to respect your choice—you don't need an excuse for not drinking.

Remember: It's your choice.

If you drink, don't drive. If you drive, don't drink.

For additional information go to: www.nsc.org/safety_ road/DriverSafety/Pages/ ImpairedDriving.aspx



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Chlorine Safety. When chlorine gas leaks, seconds can mean the difference between life and death. Everyone at your utility needs to know what to do in the event of a chlorine leak. Topics covered include the characteristics of chlorine gas; health effects of exposure to chlorine gas; gas masks and other safety equipment; storing, handling, transporting, and inspecting chlorine containers; proper procedures to follow in case of an emergency; and setting up a training program. This DVD provides vitally important safety information for all utility employees. (order #64189)

Elevated Water Storage Tanks: Safety, Security & Maintenance. This DVD trains water utility employees in elevated water storage tank maintenance, safety, and security. (order #64193)

Emergency Planning: The Big Picture for Water Utilities. First-hand accounts of how water utilities across the country have survived and learned from catastrophic events. Includes footage and testimonials from water utility professionals at these headline-making crises: earthquakes, floods, hurricanes, and the 1993 Milwaukee *Cryptosporidium* outbreak. (order #65068)

Ergonomics at Work Safety Set. Part 1: Office Ergonomics; Part 2: Lifting and Back Strain; Part 3: Laboratory Ergonomics. (order #64197)

Safety Basics Custom DVD. Here's a great way to get the exact safety-training program you want. Choose any of the safety topics listed here and we'll burn them onto a custom DVD for you. Each segment costs \$20 AWWA member price (\$30 list) and is about 2½ minutes in length. These topics were specially chosen to meet water utility employee safety-training requirements. Choose any of the following topics for your custom safety DVD:

Asbestos **Back and Lifting Safety** Barricades **Bloodborne Pathogens Body Mechanics** Call Before You Dig Chlorine Safety **Compressed Gases Confined Spaces Cranes and Lifting Equipment** Defensive Driving **Electrical Safety Ergonomics** Fall Protection Fire Safety Flagging Foot Protection Forklift Safety

Hand Tool Safety Hazard Communications HAZWOPER Hearing Protection Laboratory Safety Ladder Safety Lockout/Tagout **Machine Guards** Office Safety **Personal Protective Equipment Reporting Procedures Respiratory Protection** Shift Work Slips, Trips, and Falls Summer Heat Trenching and Excavation Safety Vehicle Safety Winter Cold

Combined with AWWA's *Let's Talk Safety 2011* (order #10123), these DVDs create a powerful safety training tool custom built for your utility or water company. Get the materials you need to succeed. Order your custom DVD at www.awwa.org/bookstore.

Safety First DVD Series. Safety First is AWWA's premier safety training DVD series for water utility employees. Each DVD tackles a single safety subject of critical importance for water operators in the plant or the field. AWWA's *Safety First* DVDs provide vital training for novice operators and remind veterans of the importance of safety on the job. These standard-length safety training DVDs costs \$195 AWWA member price (\$295 list), and run between 8 and 20 minutes each.

Safety First: Confined Spaces (order #64141) Safety First: Elevated Work Surfaces/Fall Protection (order #64217) Safety First: Eye Protection (order #64240) Safety First: Forklift Safety (order #64237) Safety First: Hazard Communication (order #64215) Safety First: Hazardous Spill Containment and Cleanup (order #64350) Safety First: Heavy Equipment Yard Practices (order #64286) Safety First: Hot Work (order #64242) Safety First: Indoor Crane Operation (order #64287) Safety First: Laboratory Safety for Water Professionals (order #64155) Safety First: Lockout/Tagout for Water Distribution Systems (order #64241) Safety First: Night Work (order #64243) Safety First: Night Work (order #64243) Safety First: Noise-Induced Hearing Loss (order #64288) Safety First: Pipe Handling Safety for Field Crews (order #64289)
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Safety First: Trenching and Excavation (order #64137)
Safety First: Water Utility Security (order #64140)
Safety First: Work Area Traffic Control (order #64292)
Safety First: Working With Hazardous Materials (order #64142)

Safety Now: Dog Attacks. Any utility employee working in the field is at risk of a dog attack. This safety training DVD shows employees how to manage encounters with dogs and how to protect themselves. (order #64179)

Shift Work. This DVD helps your shift workers improve both performance and safety by showing them how to successfully cope with the two biggest challenges of working nonstandard hours: fatigue and stress. Viewers learn symptoms to watch for and tips and techniques to help them reduce the chance of an accident. (order #64191)

Utility Driver Safety DVD. Part 1: Snow and Ice; Part 2: Road Rage; Part 3: Road Rules. (order #64238)

Water System Security: A DVD Field Guide. Managers and operations personnel of small- to medium-sized water utilities will find this DVD helpful as they assess and upgrade the physical and operational security of their systems. This guide emphasizes measures a water utility can take for better security against man-made threats. It covers the emergency preparedness plan; vulnerability assessments; mitigation measures for critical components; emergency response and recovery; and crisis communications. (order #64247)

To order any of these products or for more information, call our customer service line at 1-800-926-7337 or visit our online bookstore at www.awwa.org/bookstore.