

Don't Be Shocked by Charged Pipes!

According to an AWWA study, more than 350 shock incidents occur annually to water utility workers. Minor shock incidents occur each year, many of which are caused by electric shock. Electric shock is a danger to water utility workers from water pipes and meters. Water pipes are often grounded. If there is a fault in the electric system, the pipe or meter can become energized. A severe or even fatal shock can occur if an electrician touches a meter.

Some utilities insulate the water service at the connection of water services has proven to be very effective in reducing shock incidents. However, many uninsulated services are still in use. Workers take to avoid being shocked on the job?

Understand the Hazard

Electricity always wants to return to its source to complete the circuit. A circuit has two conductors: one that flows from the source and one that returns the current to the panel. A neutral wire connects the electrical ground; the neutral wire completes the circuit back to the source from the plugged-in electrical device. The ground wire carries the current away from a device when the circuit or plug is disconnected.

Grounding wires are connected to all outlets and equipment by attaching it to either a metallic rod or a water pipe. The water meter or

Use Proper Procedures and Safety Equipment

Every case will be a little different, but here are some approaches for dealing with approaching meters or pipes that are part of a home's electrical system.

- Identify the composition of the service line to be worked on. This will help determine the likelihood of a shock. Materials that allow an electrical current to travel from a neighbor's meter to yours and act as an electrical conductor are ductile iron, copper, and steel.
- Voltage-rated rubber gloves with leather "glove liners" provide protection for workers and should be worn when working on a meter, or when cutting and repairing a service line. These gloves are rated for maximum use voltage of 500 volts. Be aware of the shock hazards associated with residential electrical work. Consult the glove manufacturer to determine the appropriate voltage rating. Both pairs of gloves should be inspected prior to use and replaced periodically.
- Using voltage-rated gloves, check for current with a non-contact voltage tester. If an indication of amperage indicates a potential electrical problem, notify the building owner. If the owner cannot determine the source and eliminate the problem (e.g., door opener) and safety equipment should be used.
- A voltage-rated jumper or bridging conductor can be used to restore the carrying capability of a pipe during repairs by connecting the mainline to the service line. When using voltage-rated gloves, use an emery cloth or a metal file to remove any paint or metal. Connect the jumper, mainline side first. Spring clips should not be used. If current is present on the service line, that current is passing through the jumper pipe to the mainline. Because electricity can take multiple paths, the jumper pipe used as the only protection, voltage-rated gloves should be worn. When removing the jumper, disconnect the customer's meter. The jumper should be inspected prior to use and need to be tested before reuse.
- If a worker is shocked, he or she should seek medical attention immediately. An electrical injury can cause arrhythmia that can be fatal.

Eyes on Safety

Nearly 500,000 eye injuries occur in the workplace each year. Experts say that 90 percent of those injuries could have been avoided if workers were more safety conscious and if they used the proper eye protection.

Breaking down these injuries, it adds up to more than 100 eye injuries per day! Most injuries occurred while the workers were performing their normal job duties. Injuries, between 10 and 20 percent are disabling. In many cases, the eye injury was serious enough to result in temporary or permanent vision loss.

OSHA reports that the majority of employees who are injured do not wear any eye protection at the time of their accidents. This is often because they do not use protective eyewear for the particular job.

The top causes of 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

- o Face shields
- o Welding helmets
- Follow all operating procedures correctly.
- Know where the first aid and eye cleaning station is located and use it properly.
- Always wear safety gloves and wash your hands thoroughly after accidentally rubbing harmful substances into your eyes.
- Do not assume that wearing regular eyeglasses provides adequate eye protection. They are not designed for protection, and often they can be damaged.
- Make sure all protective eyewear fits properly. If your eyewear is damaged, aged, or does not fit properly, throw it away immediately.

Protective eyewear should be made of polycarbonate. Regular eyeglasses and your goggles should be splash-proof. Never rely on ordinary eyewear such as reading glasses or sunglasses.

By following a few safety precautions, you can prevent eye injury. It takes only a few moments to think "eye safety" and proper eye protection could save you a lifetime of problems.

For additional information go to Prevent Blindness.

Built-in Safety

The safest strategy for workers who must work at elevations is to use built-in safety features, such as

- Permanent guardrails that meet OSHA height and strength requirements
- Built-in anchor points with appropriate personal fall protection
- Other forms of fall protection such as safety nets

On-the-Job Safety

Workers at elevations with vertical drops of 6 ft or more must use a personal fall-restraint system that secures the worker via an anchor point and a full-body harness. This system is designed to prevent a fall.

A personal fall-arrest system also uses an anchor point and a full-body harness, but allows exposure to the fall and is designed to stop a fall once it has begun.

Key points about a personal fall-arrest system include:

- Connectors should be made of drop-forged, pre-engineered materials and covered with a corrosion-resistant coating to prevent damage to interfacing parts of the system.
- D-rings and snaphooks should have a minimum tensile strength tested to a minimum tensile load of 3,600 lb without permanent deformation.
- Locking snaphooks must prevent disengagement when the keeper contacts the snaphook keeper.
- Unless designed for it, locking snaphooks must be attached:
 - directly to webbing, rope, or wire rope;
 - to each other;
 - to a D-ring to which another snaphook or connector is attached;
 - to a horizontal lifeline; or

- When vertical lifelines are used, each person must
- Lifelines must be protected against being cut or abraded.
- Self-retracting lifelines and lanyards that automatically limit free fall distance must sustain a tensile load of at least 3,000 lb.

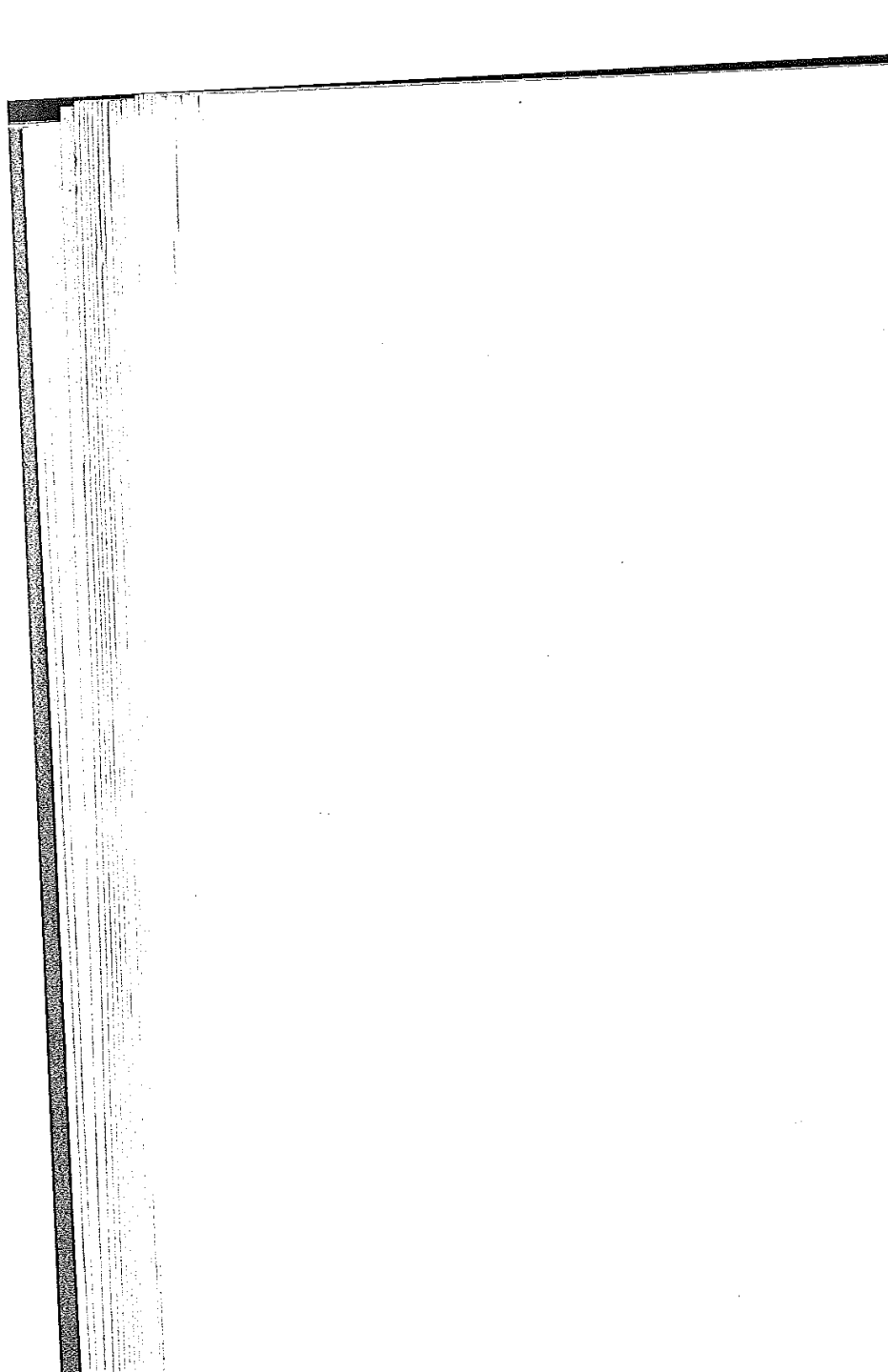
When stopping a fall, personal fall-arrest systems must

- limit the maximum arresting force on a person to 1,800 lb.
- prevent a free fall of more than 6 ft or contact with any object.
- bring a person to a complete stop and limit maximum deceleration to 6g.
- withstand twice the potential impact energy of a person falling the free fall distance permitted by the system (5 ft).

Use body harnesses and components only for personal fall protection to hoist materials. Inspect personal fall protection systems and components that are subjected to impact before use. Do not use again for protection unless inspected and determined to be undamaged and suitable for reuse.

For more information, see the OSHA Fall Prevention and Protection Manual, stopfalls/.

Additional



Safe Fuel Handling P

The safe handling of gasoline and diesel fuels is essential. Steps to ensure that your own safety and health, and the environment, are protected. The improper handling of fuel can result in death caused by fire, explosion, or asphyxiation.

Environmental Safety

Fuel released into the environment contaminates soil and water. If you, as a worker, you know that contaminated groundwater is a problem. Gasoline vapors are also harmful to human health—especially dangerous at high concentrations.

Here are some safety tips for what you can, and should, do.

Safe Fueling

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

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

Safe Storage

Gasoline moves quickly through soil and into groundwater and fuel equipment as far away from water wells.

- 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. Ground level prevents container falling and spilling.
- Do not store gasoline in a vehicle's trunk, well, or
- Fill cautiously.
- Always use a funnel and/or spout to prevent spills on and mobile equipment.
- Always fuel outdoors where there is good ventilation.
- Fuel equipment on a hard surface such as concrete.
- Portable cans and fuel tanks should be kept off the ground. A secondary containment device provides extra protection.

Avoid Spills

Spilled motor fuels impact the environment by entering into the soil, and releases into groundwater. One gallon of improper handling, storage, and disposal of gasoline—the equivalent of a small engine, using inappropriate containers for gasoline in open containers, and disposing of it with kitty litter, sawdust, or an absorbent material properly.

An Open and Shut Case Gate Valve Safety

Water service often must be turned off temporarily for maintenance are performed on a distribution system, such work often requires traffic control measures. A gate valve must be manually operated to isolate the area. Manually operating gate valves can cause a variety of injuries of the back, knee, shoulder, elbow, and wrist. Some of the injuries that can occur when operating a large gate valve follow.

In Traffic

- Use warning lights and flashers if you stop your vehicle in traffic.
- If the valve is located in the middle of the road, position your vehicle to allow for oncoming traffic.
- Use traffic cones to mark your vehicle and work area to warn of traffic.
- Wear appropriate protective equipment, which may include hard hats, safety shoes, work gloves, and a reflective safety vest.

Operating the Valve

- Remove the gate lid with a pry bar or other appropriate tool.
- Use a valve key that is the correct size and length.

- Grip the valve key firmly with both hands when
- When operating the valve, maintain good footing apart.
- Position your body as close to the valve key as possible.
- Turn the valve key with slow, controlled movements.
- If the valve becomes too difficult to turn, ask an authorized person to operate the machine.
- Don't leave the key on the valve unattended because of children or pedestrians, or provide unwarranted access to the valve.
- Secure the gate lid when service is completed.

Additional

The Right Glove

So, how do you select the right gloves for the job? The first step is to conduct a risk assessment to identify

Identify the substances (particulates, liquids, and gases) and environmental hazards associated with these substances. Surveys of employees who will be wearing the gloves and the equipment will be used. Keep in mind that some hazards (e.g., cuts, lacerations, amputations) cannot be prevented by gloves.

Gloves should be evaluated by the following criteria:

- Mechanical protection: resistance to cuts, lacerations, and abrasions
- Chemical protection
- Full protection: no holes or tears
- Heat and flame protection
- Cold protection
- Vibration reduction
- Dexterity for the job at hand
- Voltage rating

In addition, consider other hand protection attributes such as the fit, cuff, surface finish, and any attributes of the materials the gloves are made of. Select gloves based on their durability and performance. Periodically reevaluate the gloves.

When it comes to the materials gloves are made of, be sensitive to the proteins found in latex. Some people are allergic to the proteins found in latex. The glove industry to find alternative materials such as vinyl, nitrile, and neoprene.

Perhaps the best place to begin when selecting gloves is the ANSI Standard for Hand Protection (ANSI Z39.31).

Listen Up to Protect

A good analogy to explain how hearing loss occurs is: As you walk across the grass, the grass bends down. As you pass, the grass stands back up. The more you walk across the grass, the more the grass bends down. If you continue to walk across the grass, the grass will die and the area becomes a dirt path.

The same thing can happen to your hearing. When sound waves enter the ear, the hair cells in the inner ear change the vibrations into nerve impulses that are transmitted to the brain where they are translated into sound. If the hair cells are subjected to excessive noise, they begin to lie flat. As you step on it, the hair cells are exposed to the noise. After the noise subsides, the hair cells should stand back up. If they fail to return to normal, the longer it takes for them to return to normal, the longer it takes for them to return to normal, resulting in permanent hearing loss.

Wearing proper protective hearing equipment reduces the noise level (dB). This level is considered safe to work in throughout your life. Any noise above 85 dB can cause gradual hearing loss. The longer you are exposed to, the shorter the time you are allowed to work. The National Institute for Occupational Safety and Health says that regular exposure to 110 dB for more than 15 minutes can cause hearing loss. This is the level of sound an average chainsaw makes.

When the noise levels vary, a mathematical calculation can be used to determine the average of the noise exposure (11 dB = 0.5 hour). If the noise level is 110 dB for 15 minutes, you would be able to work in the noisy environment for a total of 15 minutes. If the noise level is a constant 100 dB, you would be able to work in the noisy environment for a total of 1 hour.

wearing an earmuff over earplugs. Don't be fooled. The total protection will be the total of both NRRs added together, not about 2 to 5 dB.

The highest NRR is provided by moldable earplugs made of foam, wax, silicone, or other materials. The highest NRR is the earmuff, which can be custom fitted. That is, if there are two earplugs held over the ends of the earmuff, there can be a wide range of NRR ratings for the combination. Follow the manufacturer's recommendations for the best protection.

For more information go to OSHA's Hearing Protection Page at <http://www.osha-slc.gov/otm/noise/hcp/index.html>.

Additional

Don't Get Bit or Stung

Insects can be more than annoying; they can be carriers of diseases that, when severe, can be deadly.

Mosquitoes

Mosquitoes may carry West Nile virus, which can cause even death from a fatal brain infection. The mosquito season is in full swing this summer, particularly August and September, and few people are known about the virus only since 1999. The mosquito season is here, but West Nile can't be transferred from human to human. Many people even know they have been and never develop symptoms.

To prevent a proliferation of mosquitoes, don't leave your back yard for them to breed in. Turn empty flower pots upside down and don't let water accumulate in old tires or tire swales. Empty a pool, change the water at least once a week, and store your swimming pool cover so mosquitoes and their larvae.

Wear long-sleeved shirts and pants outside, especially during peak mosquito feeding. And use a sunscreen with DEET, which repels mosquitoes and other insects. The virus is particularly dangerous for children. Use a repellent with 10 percent DEET or less. The repellent also repels other insects as well. A chemical called Permethrin, found on clothing, tents, shoes, etc., and it retains its effectiveness through

For bee stings and spider bites:

- Make sure you and the victim are safe from further stings. If the victim tells you he is allergic to insect bites or stings, summon medical help by calling 911.
- If he is stung by a bee, look for the stinger. Scrape it out with something with a dull edge, like a credit card, held between your hands. Squeezing the attached venom sac can cause more venom to be injected.
- Wash the bite or sting area with running water and mild soap or hand cleaner.
- Use ice wrapped in a towel, if available, to reduce swelling.
- Benadryl® or calamine lotion can help with itching.
- Watch victim for at least 30 minutes for signs of a bad allergic reaction.

Signs of a bad allergic reaction are:

- Trouble breathing
- Swelling of the tongue and face or hands
- Fainting

If any of these occurs, call 911, get the first-aid kit, and if the victim is aware that he is subject to adverse reactions, give him the epinephrine pen. If the victim stops responding, begin CPR.

For poisonous spider and scorpion bites, call 911 for medical help. For spider injuries, if the victim stops responding, begin CPR.

Ticks

Ticks are found on the bodies of animals and humans. Some ticks carry Lyme disease, which can be fatal if not treated.

As soon as you find a tick, remove it and clean the area. The greater the chance of getting a disease, the more important it is to remove it.

Lyme disease, which is spread by ticks, is common in the Northeast. Ticks transmit Lyme disease to humans via their bite, which the victim may even not notice until several days later. Symptoms include joint and muscle pain, headache, fever, and severe tiredness that can last for up to a month, and the victim may long have forgotten the tick was not found after the walk.

The first step is to remove any tick from victim as soon as possible. Lyme disease usually spreads the first 36 hours. The first symptoms include a round, red rash, and a blood test showing antibodies. Other symptoms include tingling and numbness, memory, weakness of the muscles in your face, and the disease can be successfully treated with antibiotics.

For more information, visit the Mayo Clinic's website at www.mayoclinic.com.

Product	Active Ingredient
Off! Deep Woods	23.8%
Sawyer Controlled Release	20%
Off! Skintastic	6.7%
Bite Blocker for Kids	2% S
Skin-So-Soft Bug Guard	Plus 7.5
Natrapel	10% C
Herbal Armor	12% C
	2.5% Pepp
	2% C
	1% Lem
Green Ban for People	0.05% Ge
	10% C
Buzz Away	2% Pepp
Skin-So-Soft Bug Guard	5% C
Skin-So-Soft Moisturizing Sun Care	0.1%
Cone Original Wristband	0.05%
	9.5

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Jackhammer Safety

One of the most powerful tools used in the water, Jackhammers are designed to break asphalt, concrete, electric or pneumatic models. Without proper training, injury to their feet and other parts of the body, as well as using this tool.

Before Operation

- Always wear proper PPE, which includes eye protection, long pants; steel-toe boots or shoes; respirator and gloves.
- Know how to safely operate the supply compressor.
- Place the compressor as far as possible from the work area.
- Regularly inspect the jackhammer and other equipment.
- Check if all components are complete, securely attached. Do this before every shift or start of operation.
- Check air hoses for breaks, cracks, and worn or damaged sections.
- Ensure that the rating of the hose is sufficient for the application.
- Inspect the electrical cord for frays, wear, and damage.

- Always lift the tool jackhammer properly by using your back strain or injury.
- Use the proper jackhammer point for the material: spade point for asphalt; chisel point for concrete.
- When moving the jackhammer from place to place, keep the handle and the operating lever together.
- Always operate the tool at a slight angle with it leaning away from you to prevent the point from getting stuck in the material and losing control.
- Shut off the air supply and relieve pressure from the hose and points. Do the same when leaving the jackhammer.
- Immediately remove defective or malfunctioning tools. Tools that are not properly repaired should not be used.
- Barricade the work area as much as possible to prevent others from getting exposed to the hazards of jackhammering.

Rules on Silica Dust

OSHA has proposed rulemaking for respirable crystalline silica, which puts workers at risk of silicosis, lung cancer, lung disease, and kidney disease. Dust can occur when cutting, sawing, grinding, and abrading brick, block, mortar, and industrial sand (including

For additional information see the OSHA booklet [Publications/osha3080.pdf](https://www.osha-slc.gov/Publications/osha3080.pdf); [Safety Services Company blog/construction-silica/](https://www.safetyservicescompany.com/blog/construction-silica/); [safety-services-company.com/blog/construction-silica/](https://www.safetyservicescompany.com/blog/construction-silica/); or the OSHA website on [Crystal Silica](https://www.osha-slc.gov/silica/index.html) at [silica/index.html](https://www.osha-slc.gov/silica/index.html).

Job Hazard Analysis: Identify and Reduce

A job hazard analysis (JHA) is a safety evaluation process that large and small, have successfully used a JHA to identify hazards 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. Employees in the process—they perform the work and often identify the best ways to work more safely.

How to Conduct a JHA

- Start by talking to your employees. Tell them what you are studying the safety of the work tasks and their performance.
- Review your company's accident/injury/illness/near-miss records to identify jobs that pose the highest risk.
- Identify the OSHA standards that apply to your jobs and incorporate them into the JHA.
- Evaluate jobs where you have identified violations of company safety procedures. List the jobs having the most injuries or illness, even if there is no history of safety incidents.
- Make a note of the jobs in which a simple mistake has been changed

While you are making a record of the job, you may want to step for further analysis. Review the steps with all the workers to make sure nothing's been left out.

Identify the hazards of each step and ask:

- What can go wrong?
- What are the consequences if something does go wrong?
- How could an accident happen?
- Are there other contributing factors? The weather, season, etc. are examples.
- How likely is it that an accident will occur?

Review the List of Hazards With Employees

Your employees can provide a tremendous amount of information about the job—and be sure to listen. Asking for their honest input can lead to a higher level of safety awareness. You want to make sure they believe the job hazards and job processes affected by the JHA are reduced.

Eliminate or Reduce the Safety Hazards

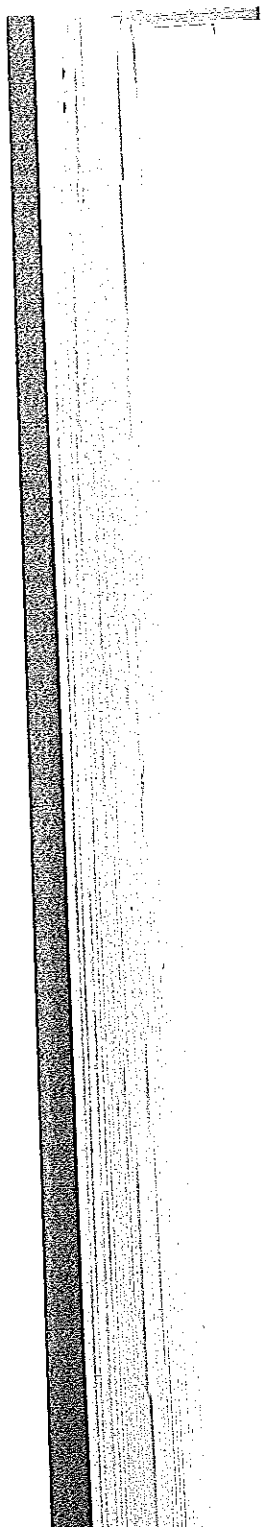
You've evaluated the findings in your analysis and identified the hazards. Now your work begins. In your JHA you'll need to identify the hazards and the work processes affected by the JHA.

- First, make any changes to the equipment, tools, or materials that create the hazard. Such changes might include adding more guards, better ventilation.
- Change the work processes.
- Change the administrative controls or make engineering controls aren't possible. Perhaps you could change the work process or provide additional training.
- When engineering and administrative controls aren't possible, you may need to add additional and changes to the JHA.

You'll find your JHA to be a valuable tool. Not only will it help you identify and control hazards, but also it's a document you can use for training purposes. In the event of an accident investigation.

For additional information read the OSHA booklet on Job Hazard Analysis, [Publications/osha3071.pdf](#), or see AWWA M3, *Safety Manual*.

Additional Notes



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

You've seen the local headlines before.

- For the second time in a week, the fire department had to ev
- 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

Unfortunately, across North America these types of incidents occur every year because excavators or homeowners did not call the Dig Alert or One Call, ahead of time. Sometimes these digs result in death caused by fires, explosions, and electrocutions.

Remember also that it's becoming more commonplace for all types of trench, so if you are looking for your water lines, you may also find communications lines.

Can You Dig It? 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 in the United States, and you will automatically be connected to a service operator. In Canada, each province has a discrete One Call free number. The name may change from community to community, but it's the same: to protect you, your co-workers, and the public. It is important, even

3. Wait the required time: Allow two working days to have the
4. Respect the marks: Maintain the marks and follow them w
5. Dig with care: Hand excavate within 24 in. of each side of t

If you hit an underground utility line, you could be hurt or kill
the other utilities for costly damages and lost service.

For more information about specific requirements by state, ch
Alliance website: www.call811.com. In Canada, the TransCan
www.transcanada.com/call-before-you-dig.html.

Additional Notes

Avoid Harm from Laboratory Hazards

Water utility operators and personnel work in laboratories to complete daily process tests, compliance monitoring. According to OSHA, these professionals are a part of more than 1 million employed in laboratories in the United States.

Being in a laboratory can leave workers exposed to many biological, and radioactive materials, as well as physical dangers.

When in a laboratory, keep yourself safe by remembering the following:

- Think safety first.
- Know emergency responses.
- Know what you're working with.
- Use the smallest possible amount.
- Follow all safety procedures.
- If you don't know...ask!

Think Safety First

Engaging in horseplay or pranks can have devastating consequences. Always conduct yourself in a professional manner with constant awareness of exits with work materials to

It is important to promptly clean up spills, remembering to have supplies for cleaning up spills and any associated paper in the immediate vicinity of the laboratory. Every lab should have a spill kit maintained properly in case of chemical ocular exposure.

Know What You're Working With

Always know the hazards for each material that is being used. Read the Safety Data Sheet. When working with aerosols or volatile liquids, Fume hood sashes should be kept closed as much as possible. Always use fume hoods.

Remember, it is better to be safe than sorry; treat every chemical as if it is hazardous.

Use the Smallest Possible Amount

Use the smallest amount of chemicals possible, but never use empty bottles. Never mouth pipette, always use a bulb. Be aware of exposure routes: dermal contact, inhalation, ingestion, ocular exposure.

Follow all Safety Procedures

Wear proper PPE and follow personal safety practices in the laboratory. Lab coats, gloves, and safety glasses should be worn. Open-toed shoes should not be worn in the laboratory. No jewelry, clothing, or long hair before working to prevent any exposure. Always wear proper eye protection when using chemicals.

If you Don't Know ... Ask!

In all situations, ask if you are unsure of

- Emergency procedures
- Laboratory rules
- Safety information
- Chemical locations
- Proper disposal of chemicals

Climb on to Ladder Safety

Year after year, falls from ladders rank as one of the leading fatalities and injuries. Fall protection and prevention are OSHA.

Regardless of the type of ladder you use, you risk a fall if it needs to be set on stable, level ground to keep it from shifting 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 ft beyond the work area. If this extension is not possible, secure the side rails at the top and bottom of the ladder.
- Make sure the weight on the ladder can't cause it to slip. Don't put more weight on the ladder than it is designed to support. Consider the weight of the tools and materials you are using. The weight should be evenly distributed along the ladder.
- Before you use the ladder, inspect it for cracked or broken rungs, side rails, feet, and locking components. By law, if it has any defects, it must be taken out of service and tagged until repaired or discarded.
- Avoid electrical hazards. Never use a metal ladder near overhead power lines. Stay at least 10 ft from power lines.

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 in the same direction.
- If you can't see over the load, find another means to transport the load.
- Face the direction you are walking. If you need to turn, then continue walking.
- Keep your eyes up. Looking slightly upward will help you maintain a neutral 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 to use 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 any of the following symptoms, pay attention: burning or shooting pain, numbness, or a tingling sensation.

For additional information go to [The Family Doctor website](http://TheFamilyDoctor.com/familydoctor/en/prevention-wellness/staying-healthy/prevent-back-injuries.html).

- Always maintain a three-point (two hands and a foot, or the ladder when climbing.
- Keep your body near the middle of the step and face the
- Only use ladders and appropriate accessories for their de
- Keep the rungs free of wet or slippery materials.
- Never place a ladder on boxes, barrels, or other unstable
- Do not try to move or shift a ladder while a person or e
- The proper angle for setting up a ladder is to place its b
of the ladder from the wall or other vertical surface.
- A ladder placed in any location where it can be hit or d
must be secured or a barricade must be erected to keep
- Be sure all locks on an extension ladder are properly e

For additional safety information go to the American La
www.laddersafety.org.

Additional Notes:

Take a Load Off:

Tips for Safe Lifting

An improper lifting technique can lead to serious and prolonged arm pain. A poor lifting technique can cause both acute and chronic effects. Practice using the right lifting technique to help avoid injury.

Whether you work in an office environment or in the field, where heavy lifting is involved. Even if the item you are lifting is perceived to be heavy, it is always important to keep in mind proper lifting, move, and lower an object.

Plan the Lift Before You Start

Prior to moving the load from point A to point B, take a moment to plan the lift.

- Check the weight of the load by slightly tipping or pushing it.
- Ensure that the load is stable. Repack or secure the load if it 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 obstruct the path.

Lifting

- Face the load with your feet shoulder-width apart.

tubs, showers, and other plumbing. Get surge suppressors for
Install ground fault circuit interrupters on circuits near water
wait 30 minutes after the last clap of thunder before going o

- *Help a lightning strike victim.* Lightning victims do not carry
safe to touch—and will likely need urgent medical attention
arrest is the immediate cause. Some deaths can be prevented
proper first aid immediately. Call 911 and perform CPR if the
not breathing.

Lightning is dangerous. With common sense, you can greatly
safety of others. At the first clap of thunder, go to a large building
and wait 30 minutes after the last clap of thunder before you

For additional safety information go to the National Weather
www.lightningsafety.noaa.gov, or the National Lightning Safety
www.lightningsafety.com.

Additional Notes

Lightning: The Undern

An estimated 25 million lightning flashes occur each year. In the past three decades, lightning has killed an average of 24 people in the US, a number greater than the annual average for either tornadoes or hurricanes. Most US lightning fatalities occur during June, July, and August, between 2 p.m. and 6 p.m. The top five states reporting lightning fatalities are Minnesota, Texas, New York, and Tennessee. Because lightning strikes typically involve only one victim and there's typically no mass evacuation, lightning is unfortunately underrated as a safety risk.

The National Lightning Safety Institute recommends that employers develop a lightning safety plan for those that typically have workers with outdoor jobs, particularly in the construction industry. The core of the plan is to have workers move to a low-risk location. These plans should be site-specific and include the following outline:

- *Watch for developing thunderstorms.* Thunderstorms develop when the sun heats the air, pockets of warmer air start to rise, and moisture condenses into clouds. Continued heating can cause these clouds to grow vertically. Dark, heavy clouds often indicate a developing thunderstorm.
- *Seek safe shelter.* Lightning can strike as far as 10 miles from a storm. That's also about the distance you can hear thunder. If you can hear thunder, you are within striking distance. Seek safe shelter immediately at first thunder. Most lightning

Lockout/Tagout: Water Pressure Poses Danger

Fire hydrants are not just for fire protection. Water utility mains, control pressure when working on water mains in bypass situations. But when is it necessary to tag an open service?

A hydrant requires a visible notice when it is broken unattended.

Verbal notifications are never sufficient. Here's an example. Several water utility employees were hurt, two seriously, when they closed an untagged hydrant. The hydrant had been left open for a bypass operation. A valve was closed on the main so water department employees could cut a bypass line. The fire department employees had opened a hydrant to prevent pressure buildup in the isolated section. The fire department had notified the water department that the hydrant would be out of service, but they failed to attach an out-of-service tag to the hydrant.

At about the same time, a nearby homeowner noticed a stream of water running from the hydrant. A firefighter working in the nearby pit reported the leak to the fire department. A firefighter working in the nearby pit reported the leak to the fire department. So he closed the hydrant. The water department employees working in the pit had not been notified and were collecting their tools when the hydrant was closed.

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

The water department's solution was to purchase orange out-of-service hydrants whenever a main is being isolated and a hydrant is out of service. The utility also met with the local fire agencies to demonstrate the hazard and the exposure 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 to energy-isolating devices (such as hydrants) and to other equipment to prevent unexpected energization, start-up, or release of stored energy to prevent injury to employees."

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

For additional information go to the OSHA website on control of hazardous energy at www.osha.gov/SLTC/controlhazardousenergy/index.html.

Additional Notes

Keep Trouble Out and In with Access Control

When an emergency occurs at a water facility, emergency responders need unhindered access to respond to the situation. Medical personnel, fire departments, police, and law enforcement personnel must have access to the facility (person, device, vehicle, or event) to prevent a security breach.

Frequently emergency responders will pull up to locked gates and enter a passcode for entry, only to punch the code in the keypad and find the gate closed. They may then resort to tailgating another car through to get in. It is not a good idea to be forced to go. Otherwise, the emergency center dispatcher may be forced to send a security guard to get the responding party to get them to "buzz in" the responders, delaying the response.

Mandating Access

Emergency access control might be addressed in local ordinances, but it is not. Many current codes were written years ago and do not take advantage of recent advancements in the access control industry. New codes of emergency entry meet firefighters' approval, other codes have been consulted in the selection process.

Local ordinances should guide water professionals to the best access control method, but the absence of applicable codes should not be a deterrent. If you want periodic facility patrols and quick response times, police officers and firefighters, access to your facility had better be guaranteed.

Traditional Access Systems

Examine the options and develop a comprehensive, holistic approach with your local authorities. Remember, the safety of your employees depends on quick, simple, and reliable access to gated facilities.

For more information, see the AWWA book *Security and Emergency Preparedness for Wastewater Utilities*.

Additional Notes

However, although fire equipment typically rolls to calls without waiting for the arrival of law officers this way may be the last thing to do. Sound-activated systems also preclude entry of officers on foot. Providers, such as security and utility staff, who otherwise require an access card, code, or key.

Radio signal. A gate equipped with a radio receiver can be opened by a user, an "always on" transmitter, or a radio frequency identification (RFID) tag. Users can push a button to open a gate. This technology is used by active transmitters that require no user action; they continue to transmit until detected by a gate receiver, which in turn activates the gate. A transmitter is mounted on the underside of a vehicle where the loop is similar to those used to detect cars at traffic signals.

Radio signal identification is quick (less than four seconds) and can be set from within inches of the receiver to about one-quarter mile. Vehicle-mounted radios can be used to open the gate. A database maintains details on what agency gained access and when the gate was opened. Transactions.

Problems here include the probable number of different agencies in any given jurisdiction, the compromising of receivers with the loss or theft of a transmitter or transponder, and the possibility of a user inadvertently activating a gate when driven past a gate.

Forced entry. More of a method than a system — and certainly not a good access option — is forced entry. Crashing fences, cutting through them, or other proven means for public safety personnel to get where they need to go usually result in damage to facility equipment or emergency responders at risk of injury and leaves them without access.

System Override

What happens when there is a loss of power at your facility? Security gates should also include the ability to override a power or mechanical failure. Such systems include manual override and backup power supplies.

A battery backup system can automatically open a gate when power supply is restored. If the battery is depleted, the gate will remain closed.

Night Work: Reduced Visibility Increases Hazards

Working at night presents some special safety challenges when working in traffic areas. The biggest challenge is finding a work zone with good visibility. At dawn and dusk, the sun is low in the sky and can create a glare shield. Once the sun has set, the distance a motorist can see is reduced, and some drivers have poor night vision.

Statistics show 25 percent of workers killed on the job when struck by a vehicle between 6 p.m. and 6 a.m., but only 9 percent of the workers killed during the day. This statistic means that crews working at night are struck by a vehicle more often than their daytime counterparts.

Even when workers are wearing reflective safety vests, motorists can still miss them. One reason is that the object with the reflective tape is a human. When workers are standing motionless, workers are often mistaken for markers. Motorists are less likely to slow down for a marker than for a worker. Safety experts also tell us that working near the road at night is more hazardous because traffic is lighter, allowing motorists to travel faster.

The condition of drivers at night also presents a hazard to workers. Drivers at night are more likely to be fatigued or to have consumed alcohol or drugs.

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

- Make sure your work clothing has an abundance of reflective tape so that motorists can see you so well during the day that they can see you at night.

- Because of reduced visibility, crew members need to slow down, especially when working around excavations. Shallow trenches make the simple job of getting in and out of trenches. Trench walls may appear to be more stable than they actually are.
- Crew members signaling and operating excavation equipment are in their job duties. The glare from traffic headlights and shadows makes jobs more difficult.

Reduced visibility isn't just an issue at off-site work locations. Shadows created by floodlights, an area of the facility you see during daylight hours looks different at night. Outdoor filter beds, storage areas, loading docks, and large water tanks are all difficult to negotiate in the dark. Water storage tanks, for example, can have moisture or ice on them at night, making footing or handling difficult. Dew or ice may also exist on loading docks, stairwells, etc. Take extra time and caution when walking across these areas.

When moving around the facility grounds at night, always use a backup flashlight in case the large light stops working. If vehicular traffic is minimal on treatment plant grounds, wear reflective clothing anytime you are outside the facility. Personnel can see and identify you when they are on the facility grounds.

If you take the necessary precautions, your night-work problems. Don't get left in the dark; make the night shift work safe.

Hurricane Preparedness

Katrina, Ike, Rita, Ivan, and Sandy. All devastating weather events that have caused havoc on Eastern and Southern states, as well as islands, at the beginning of the 21st century. Hurricanes' destruction of infrastructure, including power utilities, and the loss of potable water further exacerbates the damage.

Common storm impacts on utilities include:

- Loss of water pressure or sewage spills from pipe breaks, leaks, and other events
- Loss of power from downed power lines
- Combined sewer overflows from flooded storm drains
- Flooded facilities, particularly those near rivers and coasts
- Impeded roadways from debris, floods, and fallen trees, leading to limited access to broken mains
- Loss of water quality testing capability because of damaged testing equipment
- Staffing shortages while personnel deal with their own damage or are unable to get to work because of impassable roads

Advance Preparation

Utilities in hurricane-prone areas should plan and be prepared for the possibility of a major storm.

- *Agency coordination.* Plug into the Water/Wastewater coordinated through the US Environmental Protection Agency to know who to call for help with equipment, manpower, and supplies during strikes.
- *Emergency response plans.* Review, update, and practice disaster strikes. Make sure that everyone knows the roles and responsibilities as necessary, and coordinate with key response agencies.
- *Establish service priorities.* Identify priority water customers, their contact information and location, and make a plan to provide service during strikes.
- *Emergency water supply.* Establish a plan to provide water during strikes through bulk water hauling, temporary bypass lines, mobile water supply units, and other water supply agencies.
- *Emergency operations/Incident command centers.* Work with other agencies to establish and understand how a community emergency response team will be activated, who will be in charge, and what the utility's role will be.
- *Public notification.* Create public outreach materials with information they need during a hurricane, and distribute them during and after an event about water advisories and service disruptions.

When Landfall Looms

Readiness for an event means that the utility is prepared for an event near and predicted to make landfall. Actions to take include:

- *Facility readiness.* Secure equipment, clear storm debris from flood-prone areas. Protect exposed pipes and pumps.
- *Water readiness.* Fill finished storage tanks to full capacity. Empty holding tanks, ponds, and lagoons to prepare for high water.
- *Vehicle readiness.* Fill gasoline tanks, pack with emergency supplies, and move to higher ground or send home with on-call staff. Fill up before the event.
- *Personnel readiness.* Identify essential staff to shut down non-essential operations. Outfit them with proper equipment, gear, vehicles, and communication systems – radios may be needed.

Facing up to Stress

How much do you know about stress? Surveys and re-

- An estimated 75–90 percent of all visits to primary care physicians are for stress-related complaints or disorders.
- More than 40 percent of all adults suffer from stress-related health problems.
- Stress has been linked to all the leading causes of premature death: heart disease, cancer, respiratory ailments, accidents, cirrhosis, and depression.

But stress is a normal part of life. Many events, some happy and some sad, such as a promotion, marriage, or the birth of a child—can be stressful. Other events, such as divorce or a death in the family, can be stressful. A new car can cause stress.

Everyone responds differently to stress-inducing events. Some people who ignore or find challenging may cause stress in another person.

Symptoms

Some of the most common signs and symptoms of stress are:

- Constant fatigue
- Muscle tightness or tension

- General complaints such as weakness, dizziness, headache, Many of these symptoms may be caused by other health problems you have one or more of these symptoms that last longer than a week. You may be suffering from stress.

Reducing Stress

So, you're under stress. How can you learn to reduce the stress consequences? Here are a few simple tips that can help reduce or control stress.

- Identify the causes of stress in your life.
- Share your thoughts and feelings with someone else.
- Avoid sad thoughts; try not to get depressed.
- Simplify your life as much as possible.
- Learn to manage your time effectively.
- Understand that drugs and alcohol cannot solve life's problems.
- Exercise regularly.
- Practice relaxation techniques, such as deep breathing.
- Develop your sense of humor, and make time for fun.
- If necessary, seek professional help.

Many sources of help are out there. Often, just talking to a friend doesn't work, talk to your minister, priest, rabbi, or other spiritual leader. In addition, many companies provide access to an Employee Assistance Program (EAP), which can provide a wealth of confidential professional help for you, your family, or your fellow employees through difficult times.

Finally, remember: it's your life. Successfully managing stress can lead to a healthier and more productive life.

For more information, go to Mayo Clinic's recommendation at mayoclinic.com/health/coping-with-stress/SR00030, or CDCCentersforDiseaseControlandPrevention/violenceprevention/pub/coping_with_stress_tips.html.

How to Conduct a Safety

The first step to being injury-free is knowing that you can be safe you think you may be. On-the-job safety is typically must be the highest work priority—both for you and your co-workers. You are often forced to reconcile between competing goals: timeliness versus safety. You must always choose your safety and the safety of your co-workers. If you see an unsafe work situation, you owe it to yourself and 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 rules, or older workers who become complacent about established safety procedures. These veteran workers have learned over the years to take shortcuts. These shortcuts eventually become the working standard for the workforce.

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

A safety tailboard session is about good communications. It's about taking the time to fully understand the processes and procedures for the project to fully understand the processes and procedures to prevent injuries.

Plan the Work

Effective tailboard include the following:

- Review all applicable safety rules regarding your company's 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 could come into play if there is an accident.

Work the Plan

- Discuss the potential hazards and special precautions that the jobsite might provide.
- Discuss the job's processes, procedures, and tasks to be performed. Always include a review of all applicable safety considerations.
- Discuss everyone's assignment. Make sure all know their roles and responsibilities.
- 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 are completely trained on the safety processes, procedures, and equipment.
- Conduct inspections whenever new substances, processes, or equipment are introduced and may present a safety issue.
- Discuss the tools and PPE needed to complete the jobs safely. Inspect the tools for proper and safe operation. Ensure that all workers know how to use them.
- Report hazards and unsafe equipment to the supervisor immediately.
- Discuss unusual and nonroutine situations.
- Discuss emergency procedures. Determine ahead of time who is the primary responder and who is the backup.
- Know where all emergency resources are located: emergency first aid kits, fire extinguishers, and communication devices such as radios.

Quick Equipment Check

Because of a concern for the safety of you and your family, you may regularly conduct a safety inspection of your car, looking at things like the engine, oil, and brake lights. But do you do the same type of inspection on your work equipment?

Jobsite inspections can effectively reduce workplace accidents. Don't neglect to keep a close watch for similar-type flaws in our equipment. Regular inspections give us an advanced warning of a hazardous condition.

Fiber rope is a much used, and often abused, tool that is subject to significant rope damage, wear, and strand failure often occur beneath the surface and are not detected by a visual inspection of unraveled strands.

Wire rope slings also require regular inspection because their damage is not readily noticeable. A rope failure could result in a crippling injury.

Safety checks of tools and equipment should be a regular part of your jobsite routine. The inspections don't need to be a time-consuming chore. They are essential to maintain safety.

Here are other work items you should regularly inspect:

- Tool handles: Look for splinters, splits, and loose metal.
- Air hose fittings: Look at their condition and security.
- Pipe wrench jaws: Are they worn out?

hazards. Or customize your own to identify areas of concern
corrective action before any maintenance situation becomes

For additional information go to the OSHA checklist: http://Mach_SafeGuard/checklist.html

Additional Notes

Safety Tips for Employees Remotely or Alone

Reductions in manpower and increases in workload have left many employees who are working alone.

While lone work may not automatically decrease a worker's vulnerability, there is no doubt that working alone increases a worker's vulnerability. This vulnerability applies not only to those who regularly work in remote locations but also to employees whose work frequently takes them out into the community where they may encounter threats to their safety.

The following four steps can help you reduce the safety risks associated with lone work. These tips apply to all employees and their managers, especially those who work with others in remote locations where normal means of communication are nonexistent.

Routine Communications Protocol

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

- If an event includes an injury, after ensuring that medical aid is provided, the responsible supervisor shall ensure that the appropriate reporting process is initiated.

Evaluate the Potential Hazards

Before entering a remote work location, all team members should identify potential safety issues:

- Planning for weather conditions—both forecast and unexpected
- Facing potential emergencies such as flooding, electrical contact, and cold climates, and so on
- Handling serious injuries or illnesses that might occur far from home
- Guarding against animal attacks, snakes, and insects
- Making contact with emergency agencies
- Having the appropriate PPE
- Having the tools required to complete the job safely

Team members should also assess the risks and review work procedures. Conduct a job hazard analysis to ensure all mitigation and control measures are in place.

Conduct a Safety Tailboard

- Discuss potential hazards and special precautions the work location presents.
- Discuss the job's processes, procedures, and tasks and the order in which they will be performed.
- Review appropriate safety procedures and PPE considerations. Ensure that the PPE meets safety standards.
- Discuss assignments. All must know their jobs and the job location.
- Establish a buddy system where co-workers watch out for each other.
- Ensure those with new job assignments, new tools, or new work locations are completely trained on safety processes, procedures, and tools.
- Everyone should regroup and discuss potential safety issues before leaving the work location.

- Know where all emergency resources are located: emergency aid and burn kits, and communication devices.

For additional information and ideas, see Service NL (Newfoundland) Alone Safely Guidelines for Employers and Employees: www.si_working_alone.html

Additional Notes

Setting Up a Safe Traffic Control Zone

More than a thousand people are killed each year in construction accidents. About 10 percent of those fatalities are drivers and their passengers. Construction accidents are the leading causes of these preventable accidents—according to the Occupational Safety and Health Administration. Highway work zones have one of the most dangerous work environments 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 out of control and may have difficulty negotiating the detours.
- When you set up a detour, try to avoid requiring drivers to encounter unexpected road conditions.
- Always pay attention to the traffic. Beware of complacency.
- Never turn your back to oncoming traffic. If you do, use a spotter. Have a communications plan.
- All roadside workers must wear bright and highly reflective clothing. These garments are recommended for both day and night. The requirement is to be visible from 1,000 ft at night.

To be both safe and effective, flaggers need to understand the construction work and the workers, the jobsite's equipment and the changing pattern of activities. They need to anticipate and adapt to various situations.

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

Perhaps the biggest mistakes a flagger can make are to get distracted and to lose concentration.

Work-Zone Personal Protective Equipment

Head protection must be worn at all times. In all heavy construction, eye protection includes steel-toe shoes with heavy-duty soles and slip-resistant treads. Flaggers are on their feet most of the time, so they should be comfortable. Hearing protection includes earplugs or high-earmuffs.

For safety reasons, every worker should be able to hear the construction site—and they should never wear headphones or hearing aids. And don't forget a face mask for dust protection.

Frequent checks of the work-zone diversions and detours are essential. Your temporary traffic control plan is being followed, that the workers are in their proper place and working, and that a safe, accessible route is available at all times.

For additional information see the National Workzone Safety website: www.workzonesafety.org, or the US Department of Transportation topic: www.ops.fhwa.dot.gov/wz/traffic_mgmt/tcg.htm.

Temperature Extremes

Hypothermia and Heat

Fresh air and sunshine can be benefits of working outdoors. However, temperature extremes are not always comfortable. They can also cause health hazards with deadly consequences.

It's important that you and your co-workers know how to recognize hypothermia, frostbite, and heat-related illnesses, and how to respond.

Hypothermia

Hypothermia is a life-threatening condition that occurs when the body loses heat faster than it can be generated. Obviously, hypothermia can occur in winter when it is cold, but it can happen during any season, for example, when a person is immersed in water that is colder than body temperature or when working in a cold meter pit underground for a long time.

The early symptoms include uncontrollable shivering, impaired judgment, and awkward or clumsy body movements.

As the body temperature continues to drop, nausea, apathy, and confusion occur. Often a severely affected victim will lie down, fall, or lose consciousness. In the final stages can result in coma and death.

If you identify any of the above symptoms in yourself or a co-worker, take the following steps immediately:

1. Move the victim to a warm location that is sheltered from the wind.

If the victim does not respond and the symptoms become p

- Call 911 immediately in accordance with your emergency
- Monitor the victim's breathing and start CPR if the breath stops.
- Keep the victim immobile until medical help arrives.

Winter: Frostbite

Frostbite occurs when the fluids and underlying soft tissue accelerated by wind and humidity. That is, although the temperature of the skin may still freeze because of a wind chill factor. The most common areas affected are the nose, cheeks, ears, fingers, and toes.

Symptoms of frostbite include gray or yellowish patches of skin that are usually numb but feel cold. Pain is sometimes felt early but later the skin becomes soft and flexible, but after it thaws it becomes red and flaky.

If the frostbite is severe (deep), the skin is generally waxy and turns purple when thawed. Large blisters may also appear.

First aid for frostbite includes bringing the victim indoors and providing warm beverages. Warm the frozen area by immersing it in warm water. Cover the area with blankets or clean clothing. Do not rub the affected area; that can cause further damage. Seek medical assistance as soon as possible.

Summer: Heat-Related Illnesses

When your body heats up faster than it can cool itself, mild heat-related illnesses can occur. Air temperature, humidity, and clothing can increase the risk. Age, gender, weight, physical fitness, nutrition, alcohol or drug use, and medical conditions like diabetes, can also increase the risk. Heat-related illnesses include:

- Heat rash (prickly heat): When the sweat ducts to the skin become blocked, causing discomfort and itching
- Heat cramps: When muscles cramp up after exercise because they lose water, salt, and minerals (electrolytes)
- Heat edema: When legs and hands swell after sitting or standing for long periods

- Heat exhaustion (heat prostration): Usually happens when a person is working in hot weather and does not drink enough liquids to replace the fluids lost.
- Heatstroke (sunstroke): When the body fails to regulate its temperature, the temperature continues to rise, often to 105°F (40.6°C) or higher. This is a medical emergency. Even with immediate treatment, it can be life-threatening and cause long-term problems.

Knowing how to recognize the early symptoms of heat illness, prevent, control, and respond to the effects can help make every day safer.

Preventing or Controlling Heat Illnesses

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

If skin rash, stomach cramps, fatigue, or dizziness occur, stop working, seek rest in a cool shady place, drink lots of water, and rest.

If the symptoms increase to excessive sweating; cold, clammy skin; extreme fatigue; headache; nausea; or a rapid pulse; the victim has heat exhaustion. The victim should immediately lie down in a cool shaded area and drink cool water until the symptoms disappear. If the victim becomes unconscious, immediately get medical help according to the instructions on the label.

Severe heat illness can lead to a heatstroke, which can be fatal. There is little warning when a victim reaches this crisis stage. The victim's skin becomes hot, dry, red, or spotted and the victim may lose consciousness.



Trenching: Don't Dig In

If you're involved with water utility maintenance or construction, you're going to be involved in trenching operations. And, despite the fact that trenching is a routine, safely excavating and trenching are serious business.

Not all holes in the ground are trenches. A trench is defined as a narrow excavation below the surface of the ground. In general, the depth is greater than the width of a trench (measured at the bottom) does not exceed 15 ft.

However, a wider excavation can be considered a trench if it is installed such that the distance from the edge of the form to the edge of the excavation is less than 15 ft.

Numerous precautions should be taken when excavating for a utility that is covered by OSHA, specific regulations (29 CFR 1926, Subpart P) govern most subsurface excavations.

Requirements for Trenches and Excavations

A complete and detailed rundown of all the rules and regulations would be far too lengthy to tackle in a tailboard, but there are a few points to remember.

- Before beginning any subsurface work such as trenching, you should alert the local utility alert service to establish the location of all electric

- If it is possible that an oxygen deficiency or hazardous atmosphere exists in an excavation, the air in the excavation must be tested before work is being conducted. If necessary, adequate ventilation must be provided.
- If hazardous conditions exist (or may exist), emergency rescue equipment, including breathing apparatus, safety harness and line, and basket strops, must be available near the trench.
- Unless the excavation is made in stable rock, any trench greater than 4 feet deep must be inspected by a qualified person and if conditions warrant (e.g., shoring) must be installed.

For more information go to the OSHA website on the topic: https://www.osha-slc.gov/Publications/trench/trench_safety_tips_card.pdf.

Additional Notes

Vehicle Safety: Check, Inspect, Drive!

Using a company vehicle means you have a responsibility for the safety of your passengers and fellow drivers. If a vehicle has been driven by other people, it's a good idea to take a few minutes to check that the vehicle and its equipment are in safe and good condition.

Vehicle Safety Checklist		
Vehicle Number	Item	Good
	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)	
	Locks (including locks)	

Vehicle Safety Checklist			
Vehicle Number	Item	Good	Needs Attention
	Fire Extinguisher		
	Logos & Vehicle Numbers		
	Tow or Trailer Hook		
	Items Secured in Vehicle		
	Additional Items		

Additional Notes

Weld Well to End Weld

The American Welding Society has identified more than 100 allied processes in commercial use. Some of the most common are acetylene, gas-metal, gas-tungsten arc welding, shielded metal arc welding, and brazing. Welding and cutting are not without risks. Injuries, respiratory hazards, electric shock, and fire in commercial

Eye Injuries

Welding and cutting operations are a major source of eye injuries when proper PPE is not worn. The most common eye injury is flying into the eye, and particulates falling into the eye. The most common eye injury is the use of appropriate PPE. It is also important to wear eye protection when welding or near where welding is taking place.

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

Skin Injuries

Injuries to the skin usually result from ultraviolet rays from the material being worked on, or it may be part of the welding process.

Unprotected skin is at risk for injury. In addition to burns, skin can be cut during work with sharp metal. Proper safety shoes and clothing are essential for skin injury.

Adequate ventilation (natural, mechanical, or respiratory) must be provided for welding, cutting, brazing, and related operations. Adequate ventilation must be provided 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. Workers should operate welding equipment. Be sure equipment is properly installed, operated, and maintained. Equipment should be inspected before use. The following are some safety precautions:

- Placement of welding machines
- Placement of cables
- Load protection
- Use of electrodes and holders
- Always be aware of the potential for electric shock when working with electrical equipment.

Fire Hazard

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

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

During welding, constantly watch for fires between walls, on floors, 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. Safety precautions for welding and cutting in confined spaces should be followed.

Reducing the Risk of Workplace Violence

Unhappy customers who harass and intimidate utility workers in the office or in the field, pose a threat to those workers as being the most vulnerable to workplace violence. The utility services, often work alone or in small groups, and may be on-call. The most at-risk workers are the billing service staff, who make house calls to investigate customer complaints and for shutting off water services are perhaps the most li

According to a survey conducted by Northwestern Mutual, 15 percent of workplace violence incidents are perpetrated by customers. However, notes that workplace violence can occur anytime and

However, once risk factors are assessed, occurrences can be prevented by knowing and using suitable precautions.

For utility workers, a potentially violent customer may be in a situation, a cool head and violence-prevention training. who encounters an angry customer at a company face-to-face, confrontational, or patronizing. Instead, talk to the customer so the person realize the volume of their own voice and respond in kind.

- Listen closely to the complaint, smile pleasantly, and respond by acknowledging how the person is

physically threatens the utility worker, the incident needs to be reported to police as well as to utility management.

If a situation is potentially dangerous, such as shutting off service, calling an employee safety service or requesting police assistance. Only trained employees who carry money should not work alone.

Other ways to increase staff safety include:

- Equipping field staff with cell phones, handheld alarms, or non-lethal weapons.
- Requiring staff to set check-in times to keep a contact person informed throughout the day.
- Keeping utility vehicles in good working condition to avoid a breakdown.
- Providing drop safes to limit the amount of cash a bill collector carries. If a violent incident occurs, the employer should provide the affected employee with support such as crisis intervention and counseling.

A workplace violence prevention program is only as effective as the training to make it. But it is every employee's responsibility to be aware, alert, and to learn how to deal with threats.

For additional information go to the OSHA Safety and Health topic page at [osha.gov/SLTC/workplaceviolence/](https://www.osha.gov/SLTC/workplaceviolence/).

Powerful Protection f

You wouldn't think of wearing a parka to waterski or you think these are examples of extreme fashion gear. A serious misstep is tackling a job without wearing the right PPE. PPE is designed to protect the eyes, face, head, respiratory system in potentially hazardous conditions. It includes such items as hard hats, respirators, dust masks, gloves, protective clothing, and safety glasses.

The workplace (or jobsite) must be assessed to determine what tasks that will require PPE use. The right PPE must be selected and used in its proper use. Let's briefly review some of the most common types of PPE.

Eye and Face Protection

Eye and face protection is necessary when there is potential for eye or face injury from dust (wood, glass, metal), molten metal (welding spatter), welding glare, or chemicals in any form—liquid, vapor, or gas. PPE includes safety glasses with side shields, chemical goggles, and face shields. PPE must comply with strict federal standards.

Remember, not all eye or face protection will protect against all hazards. PPE with side shields are fine for particulates but provide no protection against vapors. Remember, the PPE must fit the hazard.

Respiratory Protection

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be carefully selected. Employees must be properly fitted for PPE, know how to use it. A medical evaluation of a person's ability to wear PPE must also be conducted.

Head Protection

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

Foot Protection

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

Hearing Protection

Hearing is a precious gift. Continual exposure to elevated noise levels can 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 ear muffs. The protection needed all depends on the nature of the hazard.

Other PPE

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

But remember, no PPE will protect your vision, your lungs, your skin, or your body unless you wear it and wear it correctly. Be fashionable!

For additional information go to the OSHA website on PPE: www.osha.gov/SLTC/personalprotectiveequipment.

Handling the Load: Fo

An often overlooked safety precaution is proper training. If your utility has instituted formal forklift operator training, these practices will help you operate a forklift safely, both in a building and outdoors.

- Always inspect the vehicle at least once per shift. This includes checking the brakes, controller, fuel system, horn, lights, lift system, and tires. Don't operate any vehicle found to be in need of repair.
- Look in the direction of travel and don't move the vehicle until you are clear of the path.
- Don't exceed the authorized safe speed.
- Don't pass trucks traveling in the same direction at intersections or other dangerous locations.
- Maintain at least three truck lengths' distance between trucks.
- Slow down and sound the horn at cross aisles and other narrow or obstructed areas.
- Carry the forks as low as possible.
- Cross over railroad tracks diagonally whenever possible.
- Don't load forklift trucks in excess of their rated capacity. Never load a vehicle until the load is secured.

- Don't tilt a load forward with the load-engaging means elevated a load. Don't tilt an elevated load forward unless you are depositing a load. When stacking or tiering, tilt a load backward only as much as needed to secure the load.
- If you leave the vehicle and will be 25 ft (7.6 meters) or more away from the vehicle, bring the mast to the vertical position, shut the power to the mast, if necessary, and set the brakes.
- If you leave the vehicle and are within 25 ft (7.6 meters) of the vehicle, bring the load-engaging means fully, neutralize the controls, and set the brakes.

Additional Notes

Understanding Safety

Whenever you work with hazardous materials, you need to know the hazards as well as their properties and the hazards they present. You need to know the procedures and protective equipment, handling and storage instructions, and the symptoms of spills, fires, or injuries. Container labels don't always tell you everything you need to know about hazardous materials.

The OSHA Hazard Communication Standard (HCS) requires manufacturers, distributors, and importers to provide Safety Data Sheets (SDSs), formerly known as Safety Data Sheets, or MSDSSs) to inform users about chemical hazards. Employers must ensure that SDSs are readily accessible to employees. The HCS is part of the Globally Harmonized System of Classification and Labeling of Chemicals, or GHS), with the section numbers listed below.

1. Identification: Product identifier; manufacturer or distributor name; emergency phone number; recommended use or restrictions on use
2. Hazard(s) identification: All hazards regarding the chemical, including physical, health, and environmental hazards
3. Composition/information on ingredients: Information on the chemical composition of the product, including secret claims
4. First-aid measures: Important symptoms/effects, both acute and chronic, and appropriate first-aid treatment

8. Exposure controls/personal protection: OSHA's permissible exposure limit values (TLVs); appropriate engineering controls
9. Physical and chemical properties: The chemical's characteristics
10. Stability and reactivity: Chemical stability and possibility of reaction
11. Toxicological information: Routes of exposure; related symptoms and effects; numerical measures of toxicity
12. Ecological Information: * Information provided here helps environmental agencies in the event of a release.
13. Disposal Considerations: * Provided here is information about federal and state laws for waste-disposal laws.
14. Transport information*
15. Regulatory Information: * This section contains information about the material for the OSHA and other federal agencies.
16. Other information: Date of preparation or last revision

*Note: Other (non-OSHA) agencies regulate sections 12-15.

For more information go to the OSHA QuickCard: https://www.osha-slc.gov/hazcomm/QuickCard_SafetyData.html.

Additional Notes

Texting and Working D

It is well documented and understood that texting while driving. NHTSA found that drivers who use hand-held devices while driving are more likely to get into crashes serious enough to injure themselves.

What about the risks caused by mobile phone and/or smart device use while operating machinery or while on a construction site? These risks in the workplace can be significant but can have the same fatal consequences. For instance, a worker was killed while one of his hands was holding a chop saw; he was holding the saw with his other hand and ear when the accident occurred.

Some of the main issues presented by mobile phone and smart device use while operating machinery, using vehicles, or on a construction site are discussed below.

Distractions

Use of mobile phones or smart devices requires cognitive, visual, and auditory attention, which means that any time a worker is using one of these devices, they are not fully engaged on the job at hand. Using mobile phones can also distract workers from their work.

In a workplace environment that requires a high level of self-awareness and focus, distractions can result in high consequence accidents, including loss of life.

Entanglements

Mobile phones or smart devices can get entangled in machinery, such as power tools, which can cause serious injury or death.

Distractions and entanglements are issues that workers do not want to deal with on their jobs that often require both hands and always requires their full attention.

Operating heavy machinery is particularly hazardous; tens of thousands of accidents involving forklifts occur every year. Many injuries happen when lift truck drivers who inadvertently drive off loading docks, drive into fuel tanks, or the forklift tips over; some accidents happen when a driver drops an elevated pallet. Many heavy machinery jobs common on a construction site require every person on site to have their full attention on the job.

How do you start to change the culture regarding use of mobile devices?
Create a policy that includes the following:

- A Purpose Statement that explains why it is dangerous to use mobile devices in the working environment
- A limit on a broad range of devices that should not be used while working
- Who the policy applies to—explicitly state that not only the regular employees, but also tractors, consultants, temporary workers, and all personnel and subcontractors that are on the job site
- A clear definition of where and when workers can and cannot use mobile devices while on the job site or using vehicles

The Right Attitude

Even if employees recognize the dangers of using mobile devices, they may not commit to following the policy. They must:

- Recognize situations where use of cellphones can interfere in a way that could result in injury or from completing jobs in a timely manner.
- Be willing to speak up when they see co-workers putting the phone away, not texting or talking on the phone while performing their job duties, or not responding to the receiving end of a text from a co-worker who is performing a task that requires a response in kind.

When used appropriately, mobile devices can make our lives easier and more productive. When used at the wrong time and in the wrong manner, these devices can cause serious injury.

Additional AWWA Safety Products

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

Handbooks

Environmental Compliance Guidebook: Beyond US Water Quality addresses the safe handling, disposal, and storage of all regulatory compliance with the laws. The book tells you which environmental and when they apply; what the laws say and mean; which US violations are most common with utilities. (order #20745)

Security and Emergency Planning for Water and Wastewater Utilities covers the crucial knowledge learned and the regulatory changes made since 2001, terrorist attacks on the United States and the devastating (order #20605)

Selecting Disinfectants in a Security-Conscious Environment helps utilities of all sizes in choosing chemical disinfectants that comply with USEPA security guidelines and the Department of Homeland Security Facility Anti-Terrorism Standards. (order #20707)

Water System Security: A Field Guide. This book provides the medium-sized water utility needs to develop an emergency plan; determine the threats; implement security policies; respond to an emergency event; and much more. (order #20501)

M19 *Emergency Planning for Water Utilities*. This manual provides guidelines for water utility emergency planning such as national malevolent acts. (order #30019)

Standards

ANSI/AWWA G430 Security Practices for Operation and Maintenance

ANSI/AWWA G440 Emergency Preparedness Practices. (order #30019)

ANSI/AWWA J-100 Risk Analysis and Management for Critical Infrastructure. This Standard for Risk and Resilience Management of Water and Wastewater Treatment Standard describes the application of RAMCAP, a seven-step process for identifying and managing risks associated with malevolent attacks against critical infrastructure. (order #40119)

DVDs

Let's Talk Safety 2016 Dual Disk Set. The DVD contains 12 videos related to 12 talks found in the Let's Talk Safety 2015 book. The DVD is available from Let's Talk Safety 2016 on PDF. (order #10125-16)

Excavation Safety Set. Excavation is one of the most dangerous jobs for utility employees. These two programs on a single DVD show employees working at the excavation site. Program 1, Backhoe Safety, provides essential safety information for employees who work on and around backhoes. It covers worksite preparation, safety checks, and proper use of backhoes while digging, backing up, and working on pipe. Program 2, Trenching and Shoring Techniques, covers OSHA requirements for equipment, shoring, sloping, shields, and ladders. (order #6423)

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. This DVD provides vitally important safety information for all employees. Topics covered include employee training, basic properties of chlorine gas, equipment for working with chlorine, transportation and storage, work practices, and feed equipment, emergency response, and basic first aid. Includes a Chlorine Safety Pocket Guide. (order #64382)

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

Safety First: Confined Spaces (order #64141)
Safety First: Confined Spaces—Alternative Procedure and Non-Per
Safety First: Eye Protection (order #64240)
Safety First: Forklift Safety (order #64237)
Safety First: Handling Water and Wastewater Treatment Chemical
Safety First: Hazard Communications for Water and Wastewater U
Safety First: Hazardous Spill Containment and Cleanup (order #64
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 DVD (order #64410)
Safety First: Lockout/Tagout for Water Distribution Systems (order
Safety First: Lockout/Tagout of Electrical Equipment (order #64285)
Safety First: Night Work (order #64243)
Safety First: Workplace Hearing Loss (order #64288)
Safety First: Personal Protective Equipment (order #64358)
Safety First: Pipe Handling Safety for Field Crews (order #64289)
Safety First: Pipe and Street Saws (order #64381)
Safety First: Process Safety Management (order #64319)
Safety First: Protecting Against Bloodborne Pathogens (order #642
Safety First: Respirator Safety (order #64211)
Safety First: Safe Handling of Compressed Gas in the Laboratory (o
Safety First: Safety and Security Practices for Contractors (order #6

Safety First: Work Area Traffic Control (order #6492)

Safety First: Working With Hazardous Materials (order #6411)

Safety First: Workplace Hearing Loss (order #64288)

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

Shift Work. This DVD helps your shift workers improve both their health and safety by showing them how to successfully cope with the two biggest stressors of the standard hours: fatigue and stress. Viewers learn symptoms and techniques to help them reduce the chance of an accident. (order #64237)

Utility Driver Safety, Part 1: Snow and Ice; Part 2: Road Rage; (order #64238)

To order any of these products or for more information, email service@awwa.org, 1.800.926.7337 or visit our website at www.awwa.org

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