

Formaldehyde Safety: Staying Safe Around a Hidden Hazard

Course Description

This course will cover what formaldehyde is, why it's used, what it does to your body, and—most importantly—how to protect yourself.

FUNDAMENTAL 55: Chlorine Safety

Key Takeaways:

- Understanding the forms, uses, properties, exposure limits, and hazards around with chlorine
- Recalling the symptoms associated with different types of chlorine exposures
- Knowing the engineering and administrative controls designed to reduce chlorine exposure
- Knowing which personal protective equipment protect from the different types of chlorine exposures
- Explaining the actions you should take if you have been exposed to an unsafe level of chlorine

Course Description

The United States produces more than 13 million tons of chlorine annually, most of which is shipped by rail. The worst chlorine incident in the U.S. happened in 2005 at Graniteville, S.C., where 18 freight train cars derailed and released 120,000 pounds of chlorine gas, killing 9 people, exposing another 1,400, and resulted in 550 hospitals visits. Many of the exposed gained serious lung injuries. As well, 5,000 people were evacuated from the surrounding area.

When picturing chlorine, you may think of the chemical added to swimming pools, the stuff that makes eyes itchy and bloodshot, and also makes hair have an odd green hue, right? Besides that, it's fairly harmless, right?

Chlorine is a dangerous chemical, although. The highly reactive gas is incompatible with many substances. In fact, in World War I, chlorine gas was used effectively, and horrorifically, by both sides as an agent of chemical warfare.

Today, chlorine is used as an indispensable part of the manufacturing process for the production of pretty much every consumer product. When you drink water, read the newspaper, drive, or brush your teeth you are using chlorine in some form. As well, chlorine is used in the manufacturing of pharmaceuticals, pesticides, paper, and resins. Commonly, it is referred to as the most effective disinfectant and bleaching agent available. In 99% of our treated drinking water chlorine prevents the spread of disease. Significantly, chlorine disinfects equipment and utensils in hospitals and food processing plants. In addition, chlorine is even used to disinfect sewage and to control odor.

The greenish-yellow gas has a characteristic suffocating, pungent, and irritating odor. At very cold temperatures or at high pressures, it condenses to an amber liquid. Exposure to chlorine happens at the workplace and surrounding environment after accidental releases. It can inhaled through contaminated air.

The naturally-occurring element is used in a variety of ways because of how easily it bonds with other elements. Although, it is chlorine's bonding ability that makes it so dangerous. Alone, chlorine is a stable, non-flammable element . When combined with other elements, chlorine is extremely reactive. In addition, because chlorine gas is heavier than air, it stays close to the ground and tends to collect in low areas and confined spaces, where it replaces clean breathing air. Lastly, if chlorine collects in low areas, it will create a very hazardous atmosphere if there are combustibles present.

Despite chlorine being classified as non-flammable, it supports

the burning of most combustible materials, just as oxygen does. Chlorine and combustible substance contact should be avoided, because of the potential for fires and explosions exponentially increases. Also, chlorine readily combines with moisture, steam, and water. A powerful oxidizer and corrosive to most metals, when in solution with water, chlorine forms a corrosive material that disintegrates many forms of plastics, rubber, and other coatings. Can you imagine how it damages the human body?

The gas is a strong irritant to the eyes, the upper respiratory tract, and the lungs. Acute exposure to chlorine is both blinding and completely suffocating, stealing air through displacement and chemically scorching the lungs – all of which are panic-inducing.

Chlorine exposure seriously affects the lungs when inhaled. It makes airways close up and fluid develop in the lungs. Also, chlorine can be ingested with chlorine contaminated food or water, and it can be absorbed into the blood stream when it contacts the eyes and skin.

As well, exposure can cause eye and respiratory tract irritation, runny nose, sneezing, coughing, choking, and chest pain. There may be severe breathing difficulties later. During severe chlorine exposures, fluids may leak into the lungs, causing pulmonary edema. High concentrations can irritate, inflame, and blister the skin, in addition to causing burning and prickling sensations. On the other side of things, liquid chlorine can cause frostbite burns to the skin and eyes on contact. Severe exposures to the liquid may be fatal.

Effects of chlorine exposure are a function of the concentration – meaning how much chlorine the employee is exposed to – as well as the length and frequency of exposure. Also, effects depend on the health of a person. Scientific American states that “Studies show 40-60 ppm produces lung injury; 430 ppm usually causes death in 30 minutes, and 1,000 ppm is fatal within a few minutes. Under federal standards, workers are never supposed to be exposed to concentrations exceeding 1 ppm.”

OSHA: Hazard Communication Overview

Key Takeaways:

- Understanding the purpose and importance of a hazard communication program
- Comprehending common physical and health hazards associated with hazardous chemicals
- Observing chemicals and their hazards, through labeling, markings, pictograms, and warning practices
- Learning the purpose and components of a Safety Data Sheet

Course Description

OSHA estimates that the Globally Harmonized System (GHS) covers over 43 million workers who produce or handle hazardous chemicals in more than 5 million workplaces across the country. Annually, the GHS prevents over 500 estimated workplace injuries and illnesses and 43 fatalities, and thus results in cost savings to American businesses of more than \$475 million in productivity improvements, fewer safety data sheet and label updates, and simpler new hazard communication training.

The Globally Harmonized System (GHS) standardizes how we communicate about chemical hazards in the workplace. As well, OSHA has adapted its Hazard Communication Standard to align with the globally harmonized system.

Hazard Communication Standard

It's organized into these categories of physical hazards:

- Flammables
- Explosives
- Reactives
- Corrosives
- Oxidizers
- Gases under pressure

Every industrial businesses is required to have a written hazard communication program and to provide workers with additional training regarding site-specific chemicals.

Effective hazard communication programs must consist of three key areas:

Chemical Inventories and Safety Data Sheets (SDS)

- Always record updated inventory of the hazardous chemicals present at the workplace.
- Every hazardous chemical needs to have a Safety Data Sheet (SDS).
- Safety Data Sheets need to communicate required information and be easily understandable and accessible.

Labels and Warnings

- Signal chemicals and their hazards through labels and warning information.

Hazard Communication Training

- Further improves safety practices through a hazard communication training program.
- Teaches employees the hazards of non-routine tasks.

Safety Data Sheets (SDS)

- The best source of information about a hazardous chemical is the SDS, a technical bulletin of the chemical's hazards. OSHA standards ensure that the information is consistent between manufacturers. By federal law, both chemical manufacturers and distributors are required to furnish SDSs for hazardous products and OSHA requires employers to make them easily available to workers.

An example of safe handling precautions for hazardous chemicals is general hygiene (i.e. no eating and drinking in the work areas). Safe storage conditions include practices such as ventilation needs, storage room designs and packaging requirements.

In the case that an employee is assigned to respond to accidents and spills, it is especially important that these workers are trained in related responsibilities and properly equipped – and

part of being properly equipped is to have easy access to the Safety Data Sheet collection.

Employees are responsible for always reading the SDS prior to working with any new chemical. OSHA standards ensure that SDSs are readily available during all work shifts, for every employee. It is possible that your facility keeps SDS binders in a central location, or has electronic SDSs and provides access through computer terminals. Every safety professional needs to know where SDSs are located and make this location plain to the workforce.

A company might allow cleanup of small amounts of specific chemicals by people who are not part of a qualified spill response team. Although, only trained and properly equipped individuals who have access to spill response kits should clean up spills, even the smallest of them.

The Hazard Communication Standard necessitate pictograms on manufacturer and supplier labels of chemical containers as warnings of potential hazards of exposure. Pictograms are part of the globally harmonized symbols and each represents a distinct hazard. Supplementary to the original manufacturers' label, employers are allowed to use in-house labels, sometimes referred to as secondary labels. Although, it is worth knowing that these labels must meet the Hazard Communication Standard requirements.

The Workplace Hazardous Material Information System and the National Fire Protection Association offer allowed alternative labeling systems and are often used for workplace containers. In the case that an in-house label is used on a container already labeled by the manufacturer, it is an addition and must not block out any of the manufacturer's label.

When your facility implements optional in-house labels, you need to understand the labels' coding and information.

Best practices for employers:

- It is crucial that employers review the new SDSs in a timely fashion upon receipt.
- In the case that the employer does not receive the SDSs in a

timely fashion, they should promptly communicate with the manufacturer to obtain the SDSs.

- Continuously, employers should evaluate the workplace using the SDSs to identify hazardous chemicals and how their employees may be exposed.

- When employees work with or around hazardous chemicals, their employers must make sure that employees review the updated SDSs and assess each of the employer's underlying compliance programs (e.g., emergency action plan, storage of flammable and combustible materials, PPE, respiratory protection, etc.) that may be impacted by the SDSs.

- It is a good idea for employers to ensure that employees who work with or around hazardous chemicals are trained to recognize the pictograms and hazard warnings that will be required under the new Hazard Communication Standard. As well, employers should document this training and develop mechanisms to guarantee that employees understand the hazards of working with or around hazardous chemicals.

Electrical Safety Work Practices and Standards / includes Arc Flash

Key Takeaways:

- Understanding the difference between arc flash and electric shock
- Recognizing hazards and injuries related to arc flash and electric shock
- Learning how approach protection boundaries are determined
- Connecting approach boundary criteria with worker qualifications
- Identifying the primary elements of an electrical safety program

Course Description

This course will provide a standard for safety-related work

practices for the construction, maintenance, operation and demolition of electrical systems in the workplace. As well, this course covers awareness-level information for workers who have jobs or assignments bringing them into contact with electrical hazards, such as arc flash and electric shock. However, it should be noted that accomplishing this lesson does not designate an employee as an electrically-qualified worker.

OSHA: Arc Flash and Electrical Safety Best Practices (NFPA 70E) Overview

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Criticality Safety: Preventing the Unthinkable

Course Description

Criticality safety is about managing materials so they stay subcritical—safe, stable, and harmless. This course will talk about – what it means, why it matters and how you play a role in preventing accidents.

OSHA: Slips, Trips, and Falls Overview

Key Takeaways:

- Learning about the physical and behavioral hazards that can lead to slips, trips, and falls.
- Understanding the different ways both you and your employer are responsible for providing safe work spaces.
- Recognizing proper housekeeping practices and personal behaviors that can eliminate/prevent slip, trip, and fall hazards.
- Learning how to fall properly to avoid serious injury and how to respond to a fall injury.

Course Description

This course on slips, trips, and falls reinforces good behaviors for workers on how and where to avoid areas where these hazards reside.

Recently, the Congressional Accountability Office of Compliance released statistics that indicate falls are the private industry's third leading cause of workplace fatalities. Nearly 600 workers die from a fatal slip, trip, or fall, annually.

In fact, most falls occur on flat surfaces like plant floors. Often, they happen because of slippery areas, improperly stored items, foreign objects, and floor surface issues.

Documenting hazards you see in and around the workplace and following good housekeeping practices are the best defenses from a serious fall. Good housekeeping means that when a worker encounters a spill, or finds debris in a walkway, they first recognize the impact this material might have for colleagues negotiating the path, and then act immediately to clear the hazard. Typically, good housekeeping will mean keeping all areas of employment clean, orderly, and sanitary, including storerooms, service rooms, passageways, and bathrooms. It is easy to understand the idea when you think of picking up trash on the floors at home or children's toys left out on a staircase.

In part with good housekeeping practices, safety professionals need to be able to answer “yes” to these questions:

- Does every stairway and stairwell have smooth, continuous handrails and slip-resistant stair surfaces?
- Is adequate lighting present in work areas and passageways?
- Proper drainage for wet processes and dry places to stand exist where practical?
- Do all exposed walking surfaces supply sufficient texture or treatment for safe traction?

Slips, Trips, and Falls – Spanish

Key Takeaways:

- Learning about the physical and behavioral hazards that can lead to slips, trips, and falls.
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OSHA: Winter Weather Driving

Key Takeaways:

- Observing hazards of winter driving while operating a vehicle
- Learning about items you should prepare and check before a trip when weather conditions may present a driving hazard
- Gaining tips for driving safely in inclement weather conditions
- Realizing actions available if your vehicle becomes stalled and you are stranded in winter weather

Course Description

The goal of this course is to provide information on the weather and road-related hazards found when driving in winter weather. The United States Department of Transportation Federal Highway Administration reported that on average there are over 560 000 crashes due to winter conditions, annually. This leads to an average of over 137 000 injuries and over 1 600 deaths annually, from these crashes. In other words, winter conditions are common cause of crashes.

Numerous winter weather conditions lead to crashes, including limited visibility in storms, icy pavement, reduced traction, and unpaved roadways. This lesson will teach you general driving skills to ensure your safety in winter conditions, in addition to why these conditions are hazardous. Not only will you learn how to prevent accidents, you will learn how to prepare for and act during accidents, should they happen. These skills will apply to more than just the workplace, and they are worthwhile for your entire life.

Winter Weather Driving Course

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Course Description

The best way to stay safe during winter driving conditions is to avoid them altogether. If it's possible for you to avoid driving in the snow and ice, stay put. But hunkering down isn't always an option. If you have to hit the road when it's snowy, icy, or wet, make sure both you and your car are prepared for safe winter driving.

ESSENTIAL 29: Cold Stress

Key Takeaways:

- Knowing the hazards of working in cold environments including physical signs, symptoms, and treatments.
- Recalling ways to protect against cold stresses, including observing environmental protections, undertaking other preparations and practices, and dressing appropriately.

Course Description

Cold stress is hazardous in emergency response situations like natural disasters. People in this line of work may have to work in cold environments for extended periods. Below there are frequently

asked questions to make employees facing a hazardous situation aware of what cold stress is, how affects health and safety, and how it can be prevented.

How cold is too cold? If the body cannot warm itself, then cold-related stress may result. There is a possibility of tissue damage and death. Four contributing factors: – Cold temperatures – Strong and fast wind – Damp air – Contact with cold water and/or surfaces

Wind chill is the consideration of air temperature with wind speed. An example of this is when the air temperature is 40°F, but the wind speed is 35 mph, exposed skin experiences conditions equivalent to the air temperature being 11° F. Although it is obvious that freezing conditions and inadequate clothing can cause cold stress, it is important to understand that cold stress can also come from temperatures in the 50's coupled with some rain and wind. How do cold conditions affect the body? Cold environments force the body to work harder at maintaining its core temperature. While in cold environments, majority of the body's energy is used to keep your internal temperature warm because the cold air, water, and snow draw away heat. Eventually your body shifts blood flow from the hands, feet, arms, legs, and outer skin to the core (the organs within the chest and abdomen). This makes everything besides the core to cool rapidly. Older workers often are at more risk than younger ones, since older bodies do not generate heat as quickly. As well, medications like anti-depressants, sedatives and tranquilizers can prevent the body from generating heat normally.

What are the most common cold induced problems? Hypothermia

Hypothermia happens when body heat disappears faster than it can be replaced. If the core body temperature drops below the normal 98.6° F to 95° F range, workers will experience an onset of symptoms: – You may shiver and need to stomp your feet to generate heat. – You may lose coordination, have slurred speech, and fumble items in your hand. – Skin turns pale and cold. – While the body temperature keeps falling, these symptoms will worsen and shivering will stop. – You may not be able to walk and stand. When body temperature falls to around 85° F severe hypothermia develops and the person may become unconscious; at 78° the person could die.

Mild Hypothermia Treatment – Move to somewhere warm and stay active. – Remove all wet clothing and replace them with dry

clothes or blankets, in addition to covering the head. – Drink a warm, but not hot, sugary drink to increase metabolism and raise internal core temperature – Avoid caffeinated drinks. Severe Hypothermia Treatment – Do all of the mild hypothermia treatments. – Call 911 for emergency personnel – Cover all everything completely and place very warm objects, such as hot packs or water bottles, on the victim's head, neck, chest and groin. Warm the arms and legs last. – Do not apply external heat to re-warm and treat the worker very gently. – Hospital treatment is necessary. – When a worker is in water and unable to exit, secure collars, belts, hoods, etc. to maintain warmer water contact against the body. Move the limbs as close to the torso as possible to conserve body heat. Frostbite Frostbite happens when the skin actually freezes and loses water. During severe cases, amputation of the frostbitten area might be necessary. Although frostbite typically happens when the temperatures are 30° F or lower, wind chill factors can cause frostbite to occur in above freezing temperatures. Frostbite usually affects the extremities, particularly the feet and hands. Frostbite Symptoms – Affected body part becomes cold, tingles, stings or aches before numbing. – Skin color goes from red to purple then white, and is cold when touched. – Blisters appear in severe cases. Frostbite Treatment – Do not rub the area to warm it. – Wrap the area in a soft cloth, move the worker to a warm area, and contact medical personnel. – Do not leave the worker alone. – Do not pour water on the affected body part. If there is a chance that the affected part will get cold again do not warm. Warming and re-cooling will cause severe tissue damage. Trench Foot Trench foot or immersion foot happens when feet are immersed in cold water at temperatures above freezing for long periods of time. Similar to frostbite, but trench foot is considered less severe. Symptoms include: – Tingling, itching or burning sensation – Blisters may be present Trench Foot Treatment – Soak feet in warm water and wrap with dry cloth bandages. – Drink a warm, sugary drink. What preventive measures can be taken? Employers and employees must plan ahead when working in cold conditions. Remember the following recommendations when working in cold environments: The best way to avoid cold stress is protective clothing. Fabric type also makes a

difference, so keep the following recommendations in mind: – Wear a minimum of three layers. Use an inner layer of wool, silk or synthetic to keep moisture away from the body, a middle layer of wool or synthetic to provide insulation, and an outer wind and rain protection layer that allows some ventilation. – Wear a hat or hood to prevent the up to 40% of body heat that can be lost from exposed heads. – Use insulated boots or other footwear. – Bring a change of dry clothing in case work clothes become wet. – Except the innermost layer, do not wear tight clothing. Loose clothing provides better ventilation for heat to go away from the body. – Do not disregard the wetting effects of perspiration. Often, wicking and venting of the body's sweat and heat are more important than protecting from rain or snow. Drink lots liquids; it is easy to become dehydrated in cold weather. – Avoid caffeine and alcohol. – Do extraneous work during the warmer parts of the day. – Implement a buddy system to watch for signs of cold stress. – Avoid fatigue when possible since energy is needed to keep muscles warm. – Frequently rest and consume warm, high calorie food and complex carbohydrates to maintain energy reserves. Control temperatures to the best of your ability. – Shielding work areas from drafts or wind will reduce wind chill. – Use insulating material on equipment handles, especially metal handles, when temperatures drop below 30° F. – Use heaters to warm workers. Increase training to promote safety awareness. Discuss vital information on cold stress recognition and treatment. – Supervisors, workers and coworkers need to watch for signs of cold stress and encourage workers to interrupt their work when they are extremely uncomfortable. Losing an employee is worse than losing minutes. – Supervisors are responsible for ensuring work schedules in cold conditions provide appropriate rest periods. They should also ensure liquids are available. – Supervisors should implement appropriate engineering controls, personal protective equipment and work practices to reduce the potential for cold stress. – Every prevention measure should be incorporated into relevant health and safety training plans.

Cold Stress – Spanish

Key Takeaways:

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Trench Foot Treatment – Soak feet in warm water and wrap with dry cloth bandages. – Drink a warm, sugary drink.

What preventive measures can be taken? Employers and employees must plan ahead when working in cold conditions. Remember the following recommendations when working in cold environments: The best way to avoid cold stress is protective clothing. Fabric type also makes a difference, so keep the following recommendations in mind: – Wear a minimum of three layers. Use an inner layer of wool, silk or synthetic to keep moisture away from the body, a middle layer of wool or synthetic to provide insulation, and an outer wind and rain protection layer that allows some ventilation. – Wear a hat or hood to prevent the up to 40% of body heat that can be lost from exposed heads. – Use insulated boots or other footwear. – Bring a change of dry clothing in case work clothes become wet. – Except the innermost layer, do not wear tight clothing. Loose clothing provides better ventilation for heat to go away from the body. – Do not disregard the wetting effects of perspiration. Often, wicking and venting of the body's sweat and heat are more important than protecting from rain or snow. Drink lots liquids; it is easy to become dehydrated in cold weather. – Avoid caffeine and alcohol. – Do extraneous work during the warmer parts of the day. – Implement a buddy system to watch for signs of cold stress. – Avoid fatigue when possible since energy is needed to keep muscles warm. – Frequently rest and consume warm, high calorie food and complex carbohydrates to maintain energy reserves. Control temperatures to the best of your ability. – Shielding work areas from drafts or wind will reduce wind chill. – Use insulating material on equipment handles, especially metal handles, when

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First Aid: Medical Emergencies

The purpose of this course is to educate employees on how to appropriately respond to medical emergencies such as respiratory distress, diabetes, hypoglycemia, seizures, fainting and stroke.

First Aid: Medical Emergencies – Spanish

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OSHA: Heat Stress Overview

Key Takeaways:

- Learning what hazards can result from working in hot environments, including physical signs, symptoms, and treatments of heat stresses.
- Understanding how to protect yourself from heat stresses, including observing your employer's heat stress protective strategies, along with other preparations and practices.

Course Description

Every year, heat stroke, a serious side effect of heat stress, kills more than 300 people.

If you are exposed to heat in your work environment—and if you work outside it is likely that you will be—then the risk of heat stress illness and injury needs serious attention.

Majority of people that are most affected by heat stress work in outdoor conditions, but it is easy to forget about those working indoors where there is insufficient building insulation, ventilation, or cooling, or with tasks where heat is generated or warm conditions are needed. Perhaps obviously, working outdoors presents greater risk depending on location; in the American southwest, summer is simply hotter and the climate is more arid than in other parts of the country, so risk of heat stress is naturally greater. Nonetheless, in many occupations it is crucial to be clear that heat stress can and does happen when working inside.

Everyone who must work in extremely hot conditions must understand the types of heat stress and ways to protect and prevent heat related illnesses and injuries.

Heat stress may lead to heat stroke, heat exhaustion, heat cramps, heat syncope, or heat rashes. As well, heat can increase the likelihood of other injuries to workers because of: sweaty palms,

which make gripping activities more difficult; fogged-up safety glasses make it hard to see clearly; dizziness can make working at heights dangerous; burns may also occur as a result of accidental contact with hot surfaces, steam or sunlight. Lastly, heat can bring high-risk working conditions to another level.

Here are some of the common effects of heat stress: Firstly, heat syncope is a fainting episode or dizziness that occurs during activities in a hot environment. Some factors that create heat syncope include dehydration and lack of acclimatization. Heat syncope symptoms include light-headedness, dizziness, fainting, dry mouth, excessive thirst and sweating, headache and possibly nausea or vomiting. Be sure to make workers with heat syncope sit or lie down in a cool place, slowly drink water, clear juices or sports beverages, and cool their body with tepid water. Typically, heat cramps affect workers who sweat a lot during strenuous activity, such as construction laborers who use the entire body over the course of a day. Their symptoms will usually include muscle pain or spasms in the abdomen, arms, or legs. In order to treat heat cramps, first stop all activity and sit in a cool place. Proceed to drink a clear juice or a sports beverage, preferably one with electrolytes; the body needs salt in these situations, which is why you may have heard that pickle juice is a remedy for muscle cramping. Lastly, a heat rash is a skin irritation caused by excessive sweating during hot, humid weather. Luckily, heat rash typically disappears in a few hours or days without medical treatment. Treatment Employers can utilize various actions to protect workers from heat stress. For example, scheduling maintenance and repair jobs in hot areas for cooler months and particularly hot jobs for the cooler part of the day. When the day is hottest, do work shaded areas if possible. A great idea is to acclimatize workers by exposing them for progressively longer periods to hot work environments. Restrict the physical demands on workers and, whenever possible, use relief workers or assign extra workers for physically demanding jobs. Ensure everyone has easy access to cool water or liquids with electrolytes. As well, avoid drinks with caffeine, alcohol, or large amounts of sugar because they increase the rate of dehydration. Allot adequate rest periods, with water breaks, in

cool areas. Work in increased air cooling, if possible, through air conditioning or fans. Remember, that although fans cool the body, they can reduce awareness of the loss of fluids through sweating. When conditions are warm, wear light-colored, loose-fitting, breathable clothing (such as cotton), and avoid non-breathing synthetic clothing as much as possible. Keep in mind that certain personal protective equipment (PPE) can increase suffocating insulation, which in turn can compound heat stress through added physical exertion and resultant perspiration. In these cases, extra precautions must be taken. For further illustration, hazmat suits and heavy welding gear can exponentially intensify the effects of direct exposure to full sun and high temperatures, not allow the body to breath or for natural air to provide circulation that makes sweating effective.

ESSENTIAL 29: Heat Stress – Spanish

Course Description

After completing this course learners will be able to identify heat related hazards, types of heat illnesses (heat stroke, heat exhaustion, heat rash, etc.), symptoms and treatment of heat related illnesses and how to protect against heat stress. (Spanish Version)

CPR – Cardiopulmonary Resuscitation

Key Takeaways:

- Understanding the steps and actions needed to administer CPR correctly.
- Learning the purpose of an AED, the precautions for its use, and the correct method of use.

Course Description

There is a 4 to 6 minute window in which the human brain can survive without oxygen; afterwards, irreversible brain damage or death is certain.

The technique of cardiopulmonary resuscitation (CPR) is used to inhibit the process of brain death by restarting the heart and getting a person breathing again. CPR forces oxygen to the brain and other vital organs of a person who, by every indication, is dead. When performed early and correctly, the technique can buy time for the victim until proper medical attention can be given. Typically, CPR will be used for someone undergoing cardiac arrest.

Cardiac arrest occurs when the heart malfunctions and unexpectedly stops beating. Cardiac arrest can be triggered by an electrical irregularity in the heart that causes an arrhythmia (an irregular heartbeat or interruption of the heart's normal rhythm) and disrupts or shuts down the organ's pumping action completely. If the heart shuts down, blood fails to reach other vital organs and causes them to fail. approximately 10,000 incidents of cardiac arrest occur at work each year and according to the American Heart Association, nearly all cardiac arrest victims die before reaching the hospital.

Heart attack is another common cause of cardiac arrest. Heart attacks (myocardial infarction) are the death of heart muscle because of sudden blockage from plaque or a blood clot of the coronary artery supplying the heart with oxygenated blood from the lungs. Majority of heart attack victims do survive the first

attack. Common treatment for heart attacks include angioplasty and drugs that destroy the plaque or blood clot.

Lastly, heart stoppage can be related to a disease-induced heart attack where heart muscles die from lack of oxygen. For every case without immediate medical attention, the victim collapses, loses consciousness, becomes unresponsive, and dies. Unfortunately, the survival rate for such incidents occurring away from the hospital setting is only between 1 and 5 percent.

In order to increase the survivorship rate of cardiac arrest events, the Occupational Safety & Health Administration (OSHA), the American Heart Association, and the Red Cross now recommend and encourage the use of automated external defibrillators (AEDs) and CPR when responding to a victim of cardiac arrest. AEDs have become smaller, more affordable, and increasingly portable over time, and they help fix the condition of arrhythmia with restorative electrical impulses.

In the case that someone is suffering cardiac arrest, defibrillation is the sole way to re-establish a regular heartbeat. CPR by itself will not restart a heart in cardiac arrest. You should know that CPR is just a temporary measure used to continue a minimal supply of oxygen to the brain and other organs. Other treatment for cardiac arrest involves CPR, drugs, and defibrillation.

Studies have proven that 90% of victims survive if they are defibrillated during the first minute after collapse and up to 70% are more likely to survive if they are defibrillated within the first five minutes after the onset of an attack. Although, each minute of delay in defibrillation causes 10% fewer survive, so by 10 minutes survival is unexpected.

Keep in mind that even if someone is worried their knowledge or abilities aren't 100 percent complete, it's far better to do something than nothing. You could mean all the difference between someone's life or death.

CAB Method for Cardiopulmonary Resuscitation (CPR) Training:

- Chest compressions
- Airway
- Breathing

Here are 7 common CPR mistakes you should watch out for:

1. Never become another victim. Quickly assess the situation before beginning CPR, especially when you are at risk of drowning, electrocution or poisoning.
2. Never forget to call for help first. Prior to performing CPR, call for help so additional support is on the way. Majority of people cannot perform adequate CPR for more than a few minutes.
3. Never stop CPR by attending to minor injuries. The victim's chances of survival are lowered every minute without chest compressions.
4. Never give mouth-to-mouth resuscitation priority over chest compressions. Especially if you're not trained in mouth-to-mouth breathing, it's more important to only do chest compressions.
5. Never do compressions too slowly or quickly. Make sure to follow standard protocol of around 100 chest compressions per minute.
6. Never bend your elbows, keep them straight and fingers interlocked to help you apply the right amount of pressure.
7. Never forget to exert sufficient force when performing chest compressions. You cannot be scared of hurting the victim. Although, you may hear a pop or crack in their chest, you aren't putting them in any more danger than they are already in. Try to compress the chest in about 2 inches for adults and 1 inch for young children.

CPR – Cardiopulmonary Resuscitation – Spanish

Knowing how to perform CPR could be the difference between life and death. This course covers how to respond to a cardiac or

respiratory emergency using CPR or abdominal thrusts and tips on CPR safety for youth.

Wastewater and Storm Water Management

Key Takeaways:

- Understanding why your facility needs to manage and discharge industrial wastewater properly
- Learning about your facility's wastewater management responsibilities
- Observing the actions you should take to support your facility's wastewater management efforts

Course Description

The aim of this course is to explain the importance of proper wastewater and storm water management. Often, our water sources can get contaminated, resulting in poisoned populations and widespread illnesses. Industrial process wastewater, generated during commercial or industrial activity (such as washdown or process clean-up), can become contaminated with regulated pollutants before it is discharged as a wastewater. Stormwater is contaminated during precipitation events at industrial facilities where the run-off picks up materials that can adversely affect water quality.

The most dangerous water contaminants made by human activities are microbial pathogens, nutrients, oxygen-consuming materials, heavy metals and persistent organic matter, in addition to suspended sediments, nutrients, pesticides and oxygen-consuming substances, much of it from non-point sources, according to the World Water Assessment Program.

In some areas, mercury and lead from industrial activities,

commercial and artisanal mining and landfill leachates threaten human and ecosystem health, with emissions from coal-fired power plants being a major source of the mercury accumulating in the tissues of fish at the top of fish trophic levels.

Common options for industrial wastewater discharge include:

- Discharge to a municipal sewer system
- Direct discharge to surface water

Another option for sanitary wastewater discharge:

- Discharge to a septic system

Regulatory Requirements

- The Clean Water Act (CWA) ensures facilities discharging to surface water get a National Pollutant Discharge Elimination System (NPDES) Permit.
- Local Sewer Use Ordinances govern all discharges to municipal sewer systems, and may require pretreatment.
- The Safe Drinking Water Act (SDWA) govern all water discharged from municipal sewer systems.
- Septic system discharges are regulated most directly by the SDWA and local health departments.

Possible Sources of Industrial Process Wastewater

- Washdown operations
- Process clean-up
- Boiler/compressor blowdown
- Cooling tower water
- Water treatment system discharge
- Boiler water backflow
- Industrial Wastewater Discharges
- Many facilities discharge wastewater to a municipal sewer, or Publicly-Owned Treatment Works (POTW).

Your Options for Discharging to a Municipal Sewer System (or POTW)

- POTW might allow discharges with no pretreatment when it is low volume with few pollutants
- Will have a good treatment system allowing for easy treatment of waste stream
- POTW might require pretreatment and/or apply a surcharge

- POTW needs to comply with their discharge permit
- Might require hard-to-treat contaminants to be removed
- Might offer to perform expensive treatments for a surcharge

Typical prohibited discharges include:

- Fire or explosion hazards
- Wastewater outside an acceptable pH range
- Solids that could cause obstruction
- Discharges that could cause upsets at the POTW
- Extreme heat
- Toxic fumes or vapors
- Trucked or hauled pollutants, unless approved

Plants discharging into municipal systems will be required to maintain certain records in addition to meeting certain reporting requirements, which can be found either in the facility permits or the POTW ordinance. Common reporting requirements include test results and compliance certifications.

Due to the Clean Water Act, discharging directly to surface water requires a National Pollutant Discharge Elimination System (NPDES) permit. All facilities which discharge industrial process wastewater directly into surface water are required to obtain an NPDES permit and comply with all its conditions; some conditions include pretreatment systems, testing and reporting requirements, water quality requirements, and flow restrictions.

Every manufacturing facility needs a Storm Water Permit unless:

- They are not part of the regulated SIC Code categories.
- All storm water runoff from industrial areas is contained on-site, goes into a public sanitary sewer system which goes to a POTW, or goes to an already permitted discharge.
- No storm water runoff from industrial areas exists, in which case you must apply for a “No Exposure Certification”.

The Storm Water Pollution Prevention Plan needs to designate the members of a Pollution Prevention Team. As well, the team’s responsibilities must be clearly identified in the plan, including developing the Storm Water Pollution Prevention Plan and assisting with the implementation, maintenance, and revision of the Storm

Water Pollution Prevention Plan.

Also, the Storm Water Pollution Prevention Plan needs to include a topographic and site layout map. The topographic map needs to include the location of the facility, surface water bodies, wells, seepage pits, and filtration ponds.

On the other hand, the site layout map needs to include storm water conveyance and discharge structures, an outline of storm water drainage areas for each outfall, paved areas and buildings, material storage, handling, and disposal areas exposed to storm water, and the locations of major spills and leaks that have occurred within the last three years. In the case that you have a major spill after completing your Storm Water Pollution Prevention Plan and that spill could affect storm water runoff, you'll need to amend your plan to describe that spill. As long as all of the required elements are included, the topographic and site maps may be combined.

Stairways and Ladders – Construction

#N/A

OSHA: Ladder Safety Overview

Key Takeaways:

- Recognizing common ladder types used in industry.
- Understanding common hazards associated with ladder use.
- Learning the requirements and best practices for ladder safety.

Course Description

Ladders seem simple, but the injury statistics indicate that it is one of the most abused tools we have. Especially in the domestic setting, accidents are frequently caused by overreaching or overextending from ladders to complete certain tasks, rather than doing the safe thing: climbing down and shifting to a better access point. Studies done by OSHA show that 100% of ladder-related accidents could have been prevented using proper safety.

There are many jobs that involve ladders, including cleaning, painting, changing light bulbs, accessing storage areas, reaching platforms, and more. Climbing up and down a ladder all day can cause fatigue, which is why workers will naturally want to maximize the effort they've spent to climb the ladder. Occasionally, they will stretch themselves or their tools to accomplish little jobs a little faster, which makes an inherently risky situation even more dangerous.

Ladder usage creates safety hazards like slips and falls, tip-overs, electric shocks, failure due to defects and damage, and failure from overloading. These hazards can stem from using a ladder that is too short, using the wrong type of ladder, not using a ladder when one should be used, reaching too far to the side, and not using it as intended.

When ladders are overloaded, they can break or collapse, sending workers and materials tumbling onto floors or other workers. Even when properly used, if the ladder is defective in some way there's always the possibility of a fall injury. It is important to always examine tools for defects before using them.

Ladder Tips and Precautions Stationed Near Electrical Lines Prior to handling a ladder look for electrical hazards such as overhead power lines. Never use a metal ladder near power lines or exposed energized electrical equipment. As well, ladders need to be free of any slippery material on the rungs, steps or feet. Also, ensure no power cords or rope can get tangled in the rungs. – Keep the minimum clearance distances for maximum voltage listed. – Work with the shortest ladder available to reach the target area. – Think about the heights of conductive materials that must be

extended beyond the ladder. □Dodging Electric Shock – Work on a ladder made of non-conducting material; the safest ladders are the newer fiberglass reinforced plastic (FRP) types. – Do not use aluminum or metallic ladders. – Do not use wooden ladders around power sources since wood absorbs moisture and can become a conductor. – Never use any kind of ladder that is wet when there is the possibility of an electric exposure. – Always work on non-conducting ladders with power tools. – Only use double insulated and properly grounded tools; avoid any contact between a ladder and power transmission and distribution lines. – Take care when changing ladder locations near any energized conductor equipment and tools. Minimizing Fall Hazards – Acknowledge fall hazards. – Regularly perform safety inspections. – Identify then avoid unsafe ladder conditions and practices. – Always work with protective equipment. – Do not force a worker to climb a ladder. More common hazardous workplace situations involve ladders being used in busy areas such as passageways, doorways, or driveways. It is possible for the ladder and the worker using it can be displaced by workplace activities or traffic. To reduce the amount of falls or other accidents in these situations, install a barricade around the area you're working to keep traffic or activities away and ensure the ladder is secured to prevent movement, or have someone direct traffic away from the area. If feasible to do so, a personal fall arrest system may be additionally employed as a precaution. Preventive Measures Understand the labels: Prior to mounting a ladder, always read and follow all instruction and warning labels. Make sure to check for weight limits. Every ladder is designed to hold a certain amount of weight, the weight of the individual climbing the ladder along with all additional weight from tools, equipment and carry-on weight. Test stability: Make sure the ladder is sturdy with no cracked or damaged parts. If the circumstances allow it, aluminum is a stronger and lighter material than wood. Every bolt and screw needs to be secured and working properly. In the case that the ladder is damaged, remove from service until repaired or discarded. Finally, if possible, choose a ladder with stabilizers on the feet. Check positioning: Take care to position the ladder on firm and level ground such as concrete. If the ladder is positioned against a wall, ensure the

angel is no wider than 75 degrees or about 4 feet from the ground to the wall. Learn the 3-point rule: While working, keep three points of body contact with the ladder, either two hands and a foot or two feet and a hand when climbing. Take care to step on the middle of the step and face the ladder. In the circumstance that you need different tools, wear a tool belt to hold them. Dress correctly: Use a hardhat or safety helmet while on a ladder, wear work boots or shoes with tread, and never wear sandals or go barefoot when working on a ladder. Slipping is very easy if you are wearing smooth soled shoes; it's not difficult to wear the correct footwear, and it could save your life. Only wear footwear in good condition, with heels and skid-resistant soles. Be cognizant of your movements: Do not stand on the top few rungs. It is far safer to choose an extension ladder that is long enough. A good sign is when the top of the ladder reaches past your belt when standing near the top. One of the major causes of injuries comes from standing too close to the top. Do not lean out or overreach from either side when working, leaning will throw you and the ladder off balance and you should keep your center of gravity aligned. – Get off before moving a ladder. – Always clear clutter from the top and bottom ladder areas. – Never hold loads that prevent you from using both hands on the ladder. – Place tools in belt or hoist rather than in your hands. – Only take slow and cautious movements.

ESSENTIAL 29: Ladder Safety

Key Takeaways:

- Recognizing common ladder types used in industry.
- Understanding common hazards associated with ladder use.
- Learning the requirements and best practices for ladder safety.

Course Description

Ladders seem simple, but the injury statistics indicate that it is one of the most abused tools we have. Especially in the domestic

setting, accidents are frequently caused by overreaching or overextending from ladders to complete certain tasks, rather than doing the safe thing: climbing down and shifting to a better access point. Studies done by OSHA show that 100% of ladder-related accidents could have been prevented using proper safety.

There are many jobs that involve ladders, including cleaning, painting, changing light bulbs, accessing storage areas, reaching platforms, and more. Climbing up and down a ladder all day can cause fatigue, which is why workers will naturally want to maximize the effort they've spent to climb the ladder. Occasionally, they will stretch themselves or their tools to accomplish little jobs a little faster, which makes an inherently risky situation even more dangerous.

Ladder usage creates safety hazards like slips and falls, tip-overs, electric shocks, failure due to defects and damage, and failure from overloading. These hazards can stem from using a ladder that is too short, using the wrong type of ladder, not using a ladder when one should be used, reaching too far to the side, and not using it as intended.

When ladders are overloaded, they can break or collapse, sending workers and materials tumbling onto floors or other workers. Even when properly used, if the ladder is defective in some way there's always the possibility of a fall injury. It is important to always examine tools for defects before using them.

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aluminum or metallic ladders. – Do not use wooden ladders around power sources since wood absorbs moisture and can become a conductor. – Never use any kind of ladder that is wet when there is the possibility of an electric exposure. – Always work on non-conducting ladders with power tools. – Only use double insulated and properly grounded tools; avoid any contact between a ladder and power transmission and distribution lines. – Take care when changing ladder locations near any energized conductor equipment and tools. Minimizing Fall Hazards – Acknowledge fall hazards. – Regularly perform safety inspections. – Identify then avoid unsafe ladder conditions and practices. – Always work with protective equipment. – Do not force a worker to climb a ladder. More common hazardous workplace situations involve ladders being used in busy areas such as passageways, doorways, or driveways. It is possible for the ladder and the worker using it can be displaced by workplace activities or traffic. To reduce the amount of falls or other accidents in these situations, install a barricade around the area you're working to keep traffic or activities away and ensure the ladder is secured to prevent movement, or have someone direct traffic away from the area. If feasible to do so, a personal fall arrest system may be additionally employed as a precaution. Preventive Measures Understand the labels: Prior to mounting a ladder, always read and follow all instruction and warning labels. Make sure to check for weight limits. Every ladder is designed to hold a certain amount of weight, the weight of the individual climbing the ladder along with all additional weight from tools, equipment and carry-on weight. Test stability: Make sure the ladder is sturdy with no cracked or damaged parts. If the circumstances allow it, aluminum is a stronger and lighter material than wood. Every bolt and screw needs to be secured and working properly. In the case that the ladder is damaged, remove from service until repaired or discarded. Finally, if possible, choose a ladder with stabilizers on the feet. Check positioning: Take care to position the ladder on firm and level ground such as concrete. If the ladder is positioned against a wall, ensure the angle is no wider than 75 degrees or about 4 feet from the ground to the wall. Learn the 3-point rule: While working, keep three points of body contact with the ladder, either two hands and a

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Ladder Safety – Spanish

Key Takeaways:

- Recognizing common ladder types used in industry.
- Understanding common hazards associated with ladder use.
- Learning the requirements and best practices for ladder safety.

Course Description

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Electrical Safety – Spanish

Key Takeaways:

- Learning about how electricity works regarding hazards on the job
- Understanding basic safety controls and practices at work
- Recognizing and understanding how to respond to electrical emergencies

Course Description

This lesson will provide an overview to prepare workers for working safely with and around electricity. However, this lesson will not address arc-flash hazards and controls, lock-out/tag-out procedures, or high voltage (220V or 440V) electrical safety.

annually, there are nearly 230 electrical related fatalities. The

National Institute for Occupation Safety & Health (NIOSH) discovered that, “61% of electrocutions occur in two occupation divisions: 46% among craftsmen and 15% among laborers. These two groups also had the highest rates of electrocution death: 1.4 per 100,000 workers each.”

NIOSH also stated that “Electricity is the flow of an atom’s electrons through a conductor. Electrons, the outer particles of an atom, contain a negative charge. If electrons collect on an object, that object is negatively charged. If the electrons flow from an object through a conductor, the flow is called electric current. Voltage is the fundamental force or pressure that causes electricity to flow through a conductor and is measured in volts.”

Typically, fatal electrical accidents happen in the high-risk workforce when an aerial lift or boom, or scaffolding set up, results in the unexpected connection with a power line, creating a circuit.

You should always remember that electrical hazards can cause burns, shocks and electrocution (death).

- Always assume that overhead wires are energized at lethal voltages. Do not assume a wire is safe to touch, even if it is down or appears to be insulated.
- Do not touch a fallen overhead power line. Instead, always call the electric utility company to report fallen electrical lines.
- Maintain at least 10 feet (3 meters) distance from overhead wires during cleanup and other activities. While working at heights or handling long objects, always survey the area before starting work for the presence of overhead wires.
- In the case that an overhead wire falls across your vehicle when you are driving, stay inside the vehicle and continue to drive away from the line. When an engine stalls, never leave your vehicle. Warn anyone nearby not to touch the vehicle or the wire. Call, or get another person to call, the local electric utility company and emergency services.
- Do not operate electrical equipment when you are standing in water.
- Do not repair electrical cords or equipment unless qualified and

authorized.

- Always get a qualified electrician to inspect electrical equipment that has gotten wet before energizing it.
 - In the case that you are working in damp locations, inspect electric cords and equipment to ensure that they are in good condition and free of defects, and use a ground-fault circuit interrupter (GFCI).
 - Remember to be cautious when working near electricity.
-

OSHA: Electrical Safety Work Practices and Standards

Key Takeaways:

- Understanding the hazards associated with electricity: shock and fire
- Observing how electricity works regarding hazards on the job
- Recognizing basic safety controls and practices at work
- Learning how to respond to electrical emergencies

Course Description

Electricity is able to cause burns, shocks and electrocution, and without the proper electrical safety, electricity can cause fatal accidents.

Around 230 electrical related fatalities happen annually. The National Institute for Occupation Safety & Health (NIOSH) reported that “61% of electrocutions occur in two occupation divisions: 46% among craftsmen and 15% among laborers. These two groups also had the highest rates of electrocution death: 1.4 per 100,000 workers each.”

Everywhere there is electricity, which is so reliable and useful these days that it is often taken for granted. It is somewhat shocking how little is actually understood about electrical

properties by the general public, which is another reason why electrical safety training is important.

Typically, fatal electrical accidents occur in the high-risk workforce when an aerial lift or boom, or scaffolding set up, connects unexpectedly with a power line, creating a circuit.

Here are the three primary electrical hazards:

1. Electric shock: Contact with electricity can cause a current to run through your skin, muscles or hair, and makes you become part of an electrical circuit. Electric shock can range from nearly unnoticeable to devastating, with electrocution or death as the severest form of electric shock.
2. Source of ignition and cause of a fire or explosion: Static electricity, or static discharge, can quickly shock an environment, providing an ignition source for combustible material. Typically, static events are not dangerous in household and office situations, though they may be painful. Although, in industrial situations, such as those with sawdust or fuel sources, static electricity can be quite damaging.
3. Electrical burn: Such burns are for the most part internal, caused by electricity flowing through tissue or bone, generating heat and causing tissue damage. It is possible for this to happen after an electric shock, or from a lightning strike. You will be burned from the inside, out.

Safety controls available for electrical safety:

- Engineering controls: Exposure to hazards can be eliminated or reduced through the use of engineered machinery or equipment; the equipment you use or the environment you work in has built-in measures designed to protect against specific hazards.
- Administrative controls: Rules and regulations regarding safe work practices are in place because the government or your employer wants to protect your health and safety. Administrative controls can include regulations like requiring breaks when doing repetitive work that puts strain on the body, limiting the time a worker is exposed to certain work conditions, or requiring the use of personal protective equipment.
- Personal protective equipment (PPE): There is equipment

available to minimize exposure to a variety of hazards, examples include safety glasses, hardhats, steel-toed boots and gloves.

Fantastic electrical safety tips to avoid electrical accidents:

- Prior to plugging in a device, inspect both the device and its cord for damage. Search for corroded, loose or bent plugs.
- Inspect the cord for cracks or frayed insulation at the plug end.
- Also, inspect at the tool or appliance end. In the case that a tool or cord becomes hot to the touch or sparks or shocks, repair or replace it, but never attempt to repair broken cords or components on your own. A qualified electrician needs to do that job.
- Avoid holding a tool or appliance by the cord because that invites damage. As well, ensure cords are kept away from heat and water.
- Anytime you are removing plugs from outlets, pull on the plug, not the cord.
- Never tamper with plugs. Do not break off the third (ground) prong to fit a plug into a two-plug outlet; you should replace the outlet instead. When the third prong is removed, the equipment ceases to be grounded. Every cord without that prong needs to be taken out of service.
- Never overload circuits and always use a Ground Fault Circuit Interrupter (GFCI).
- Keep in mind that extension cords are meant for temporary use only. Having them in the workplace as a permanent wiring solution is a fire code violation.
- If you are working outside, don't forget to identify electrical sources over your head and below your feet. For instance, when using an extension ladder, ensure you stay no less than 10 feet away from overhead power lines.
- "Low voltage will not hurt me." A common myth, but currents over 10 milliamps or 2.5 volts can indeed paralyze muscles, impacting the ability to release grips on tools, wires, or objects you have in hand. Then when you can't let go, the current flows through your body, increasing muscle constriction in areas such as the muscles that control your breathing.
- Have there ever been smoky looking marks on an outlet somewhere

at work or home? Watch out for those. The outlet may have been wired incorrectly (hot and neutral connections wired backwards) and it could present a shock hazard. You are able to purchase an electrical tester to check correct polarity and, if you diagnose a problem, find a licensed professional to correct it.

– “I am allowed to work on live (energized) parts if I keep one hand in my pocket.” The misconception is that you’ll be safe when you don’t “ground yourself out” by placing both hands on the work in front of you, because electrical current won’t be able to cross your heart. Here’s some science to debunk myth: if you have a foot on the ground, then you’re grounded.

– Stand aside, look away, trip. Imagine a breaker panel; one at work or the one in your house. Perhaps you need to trip (turn on or off a breaker). Decide the one you need to trip, stand to the side of the panel, turn your face away from the panel, and then trip the breaker. In the case that the breaker fails while you are doing this and blows up (“arc flash”), you won’t be in the blast zone.

– Have you ever had a plug continually falling out of the socket? A cord is plugged into an outlet, but always appears half-way out of the socket. There’s no commitment problem; this is a strain-relief problem. Outlets actually have a lifespan, and will need to be replaced when they get like this. Anytime a device is not fully plugged in, it builds heat and risks a fire hazard.

– Don’t believe that breakers save people, only Ground Fault Circuit Interrupters (GFCI) do. Breakers are only designed to save equipment from an overloaded circuit. For illustration, 15 amp breakers will trip when the draw is over 15 amps. On the other hand, a GFCI will trip at 4 or 5 milliamps, which is better for your flesh.

– Cut power at the source, such as breaker panels, knife switches, or main disconnects. It’s also a good idea to verify that the power is truly off using an electrical tester. Keep in mind that many devices have more than one energy source – not just electricity. Hydraulic, pneumatic, chemical, thermal, and gravity are all examples which occasionally need to be turned off, including residual energy being drained or effectively locked out.

– A daisy chain is not a necklace. Ever seen one power strip

plugged into another power strip, plugged into another? Is that under your desk or somewhere in your house? This practice is not only unfashionable, but it's also a fire hazard and is building heat.

- Never shut a door on a cord. Are there power cords running under a door? Does door keep getting closed on the cord, squishing it flat and until the insulation protecting you from the live wires is worn through? Is the door frame made of metal? Yikes! Now you risk energizing the door frame once the insulation on the wire is worn through. Ensure that cords are not passed through doors.

- As well, never run cords under rugs – abrasion can damage them.

- Never duct or duck it. No matter what you call gray sticky tape, many of us believe can fix anything; however, you should never use it to fix the cut on the cord you squished in the door. Never use electrical, masking, or any other tape to repair cuts, abrasions or burns in electrical cords. Why? Tape cannot supply the same insular qualities as the original covering.

Electrical safety training is incredibly important and is often required workplace safety training. Despite electrical safety training not making anyone a licensed electrician, it will teach you limitations as an unlicensed person and how to identify unsafe conditions to save your life.