GULF COAST ELECTRIC CO. LLC

ELECTRICAL SAFTEY MANUAL

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GENERAL:

OSHA and state safety laws have helped to provide safe working areas for electricians. Individuals can work safely on electrical equipment with today's safeguards and recommended work practices. In addition, an understanding of the principles of electricity is gained. Ask supervisors when in doubt about a procedure. Report any unsafe conditions, equipment, or work practices as soon as possible.

Gulf Coast Electric adheres to a strict NO DRUG policy. As a condition of employment, any employee of Gulf Coast Electric may be tested for drugs as ANY TIME.

A positive drug test may result in IMMEDIATE TERMINATION of employment.

FUSES:

Before removing any fuse from a circuit, be sure the switch for the circuit is open or disconnected. When removing fuses, use an approved fuse puller and break contact on the hot side of the circuit first. When replacing fuses, install the fuse first into the load side of the fuse clip, then into the line side.

GFCIs:

A groundfault circuit interrupter (GFCI) is an electrical device which protects personnel by detecting potentially hazardous ground faults and quickly disconnecting power from the circuit. A potentially dangerous ground fault is any amount of current above the level that may deliver a dangerous shock. Any current over 8 mA is considered potentially dangerous depending on the path the current takes, the amount of time exposed to the shock, and the physical condition of the person receiving the shock.
Therefore, GFCls are required in such places as dwellings, hotels, motels, construction sites, marinas, receptacles near swimming pools and hot tubs, underwater lighting, fountains, and other areas in which a person may experience a ground fault.
A GFCI compares the amount of current in the ungrounded (hot) conductor with the amount of current in the neutral conductor. If the current in the neutral conductor becomes less than the current in the hot conductor, a ground fault condition exists. The amount of current that is missing is returned to the source by some path other than the intended path (fault current). A fault current as low as 4 mA to 6 mA activates the GFCI and interrupts the circuit. Once activated, the fault condition is cleared and the GFCI manually resets before power may be restored to the circuit. See Figure 1-22.

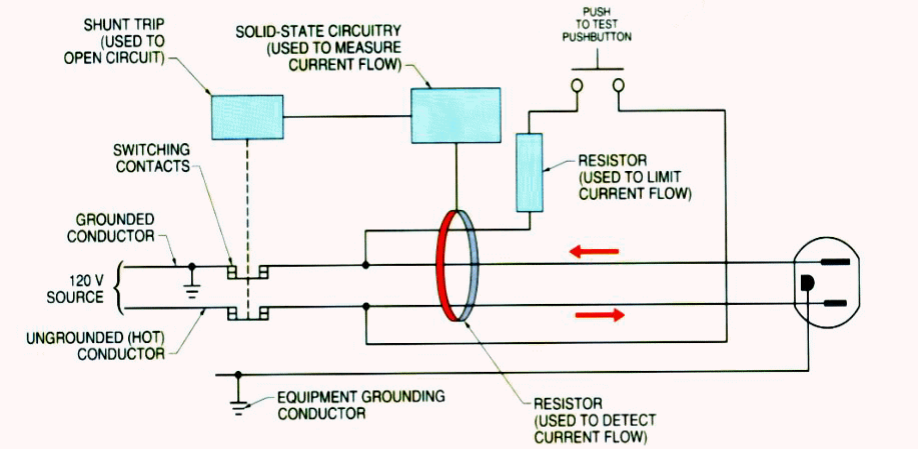

Figure 1-22. A GFCI compares the amount of current in the ungrounded (hot) conductor with the amount of current in the neutral conductor.

GFCI protection may be installed at different locations within a circuit. Direct-wired GFCI receptacles provide a ground fault protection at the point of installation. GFCI receptacles may also be connected to provide GFCI protection at all other receptacles installed downstream on the same circuit. GFCI CBs, when installed in a load center or

panelboard, provide GFCI protection and conventional circuit overcurrent protection for all branch-circuit components connected to the CB.
Plug-in GFCIs provide ground fault protection for devices plugged into them. These plug-in devices are often used by personnel working with power tools in an area that does not include GFCI receptacles.

Electrical Shock:

Strange as it may seem, most fatal electrical shocks happen to people who should know better. Here are some electromedical
facts that should make you think twice before taking chances.
It's not the voltage but the current that kills. People have been killed by 100 volts AC in the home and with as little as 42 volts DC. The real measure of a shock's intensity lies in the amount of current (in milliamperes) forced through the body. Any electrical device used on a house wiring circuit can, under certain conditions, transmit a fatal amount of current.
Currents between 100 and 200 milliamperes (0.1 ampere and 0.2 ampere) are fatal. Anything in the neighborhood of 10 milliamperes (0.01) is capable of producing painful to severe shock. Take a look at Table AI-1.

Readings		Effects
Safe Current Values	1 mA or less	Causes no sensation - not felt.
	1 mA to 8 mA	Sensation of shock, not painful; Individual can let go at will since muscular control is not lost.
Unsafe current values	8 mA to 15 mA	Painful shock; individual can let go at will since muscular control is not lost.
	15 mA to 20 mA	Painful shock; control of adjacent muscles lost; victim can not let go.
	50 mA to 100 mA	Ventricular fibrillation - a heart condition that can result in death - is possible.
	100 mA to 200 mA	Ventricular fibrillation occurs.
	200 mA and over	Servere burns, severe muscular contractions - so severe that chest muscles clamp the heart and stop it for the duration of the shock. (This prevents ventricular fibrillation).

As the current rises, the shock becomes more severe. Below 20 milliamperes, breathing becomes labored; it ceases completely even at values below 75 milliamperes. As the current approaches 100 milliamperes ventricular fibrillation occurs. This is an uncoordinated twitching of the walls of the heart's ventricles. Since you don't know how much current went through the body, it is necessary to perform artificial respiration to try to get the person breathing again; or if the heart is not beating, cardio pulmonary resuscitation (CPR) is necessary.

Electrical shock occurs when a person comes in contact with two conductors of a circuit or when the body becomes part of the electrical circuit. In either case, a severe shock can cause the heart and lungs to stop functioning. Also, severe burns may occur where current enters and exits the body.

Prevention is the best medicine for electrical shock. ***Respect all voltages***, have a knowledge of the principles of electricity, and follow safe work procedures. ***Do not take chances***. All electricians should be encouraged to take a basic course in CPR (cardiopulmonary resuscitation) so they can aid a coworker in emergency situations.

Always make sure portable electric tools are in safe operating condition. Make sure there is a third wire on the plug for grounding in case of shorts. The fault current should flow through the third wire to ground instead of through the operator's body to ground if electric power tools are grounded and if an insulation breakdown occurs.

FIRST AID FOR ELECTRIC SHOCK:

Shock is a common occupational hazard associated with working with electricity. A person who has stopped breathing is not necessarily dead but is in immediate danger. Life is dependent on oxygen, which is breathed into the lungs and then carried by the blood to every body cell. Since body cells cannot store oxygen and since the blood can hold only a limited amount (and only for a short time), death will surely result from continued lack of breathing.

However, the heart may continue to beat for some time after breathing has stopped, and the blood may still be circulated to the body cells. Since the blood will, for a short time, contain a small supply of oxygen, the body cells will not die immediately. For a very few minutes, there is some chance that the person's life may be saved.

The process by which a person who has stopped breathing can be saved is called artificial ventilation (respiration). The purpose of artificial respiration is to force air out of the lungs and into the lungs, in rhythmic alternation, until natural breathing is reestablished. Records show that seven out of ten victims of electric shock were revived when artificial respiration was started in less than three minutes. After three minutes, the chances of revival decrease rapidly.

Artificial ventilation should be given only when the breathing has stopped. ***Do not give artificial ventilation to any person who is breathing naturally.*** You should not assume that an individual who is unconscious due to electrical shock has stopped breathing. To tell if someone suffering from an electrical shock is breathing, place your hands on the person's sides at the level of the lowest ribs. If the victim is breathing, you will usually be able to feel movement.

Once it has been determined that breathing has stopped, the person nearest the victim should start the artificial ventilation without delay and send others for assistance and medical aid. The only logical, permissible delay is that required to free the victim from contact with the electricity in the quickest, safest way. This step, while it must be taken quickly, must be done with great care; otherwise, there may be two victims instead of one.

In the case of portable electric tools, lights, appliances, equipment, or portable outlet extensions, the victim should be freed from contact with the electricity by turning off the supply switch or by removing the plug from its receptacle. If the switch or receptacle cannot be quickly located, the suspected electrical device may be pulled free of the victim. Other persons arriving on the scene must be clearly warned not to touch the suspected equipment until it is deenergized.

The injured person should be pulled free of contact with stationary equipment (such as a bus bar) if the equipment cannot be quickly deenergized or if the survival of others relies on the electricity and prevents immediate shutdown of the circuits. This can be done quickly and easily by carefully applying the following procedures:

1. Protect yourself with dry insulating material.
2. Use a dry board, belt, clothing, or other available nonconductive material to free the victim from electrical contact. Do NOT touch the victim until the source of electricity has been removed.

Once the victim has been removed from the electrical source, it should be determined whether the person is breathing. If the person is not breathing, a method of artificial respiration is used.

CARDIOPULMONARY RESUSCITATION (CPR):

Sometimes victims of electrical shock suffer cardiac arrest or heart stoppage as well as loss of breathing. Artificial ventilation alone is not enough in cases where the heart has stopped. A technique known as CPR has been developed to provide aid to a person who has stopped breathing and suffered a cardiac arrest. Because you are working with electricity, the risk of electrical shock is higher than in other occupations. You should, at the earliest opportunity, take a course to learn the latest techniques used in CPR. The techniques are relatively easy to learn and are taught in courses available through the American Red Cross.

Note: A heart that is in fibrillation cannot be restricted by closedchest cardiac massage. A special device called a defibrillator is available in some medical facilities and ambulance services.

Muscular contractions are so severe with 200 milliamperes and over that the heart is forcibly clamped during the shock. This clamping prevents the heart from going into ventricular fibrillation, making the victim's chances for survival better.

Lockout/Tagout

Electrical power must be removed when electrical equipment is inspected, serviced, or repaired. To ensure the safety of personnel working with the equipment, power is removed and the equipment must be locked out and tagged out.
Per OSHA standards, equipment is locked out and tagged out before any preventive maintenance or servicing is performed. Lockout is the process of removing the source of electrical power and installing a lock which prevents the power from being turned ON. Tagout is the process of placing a danger tag on the source of electrical power which indicates that the equipment may not be operated until the danger tag is removed. See Figure 1-23.
A danger tag has the same importance and purpose as a lock and is used alone only when a lock does not fit the disconnect device. The danger tag shall be attached at the disconnect device with a tag tie or equivalent and shall have space for the worker's name, craft, and other required information. A danger tag must withstand the elements and expected atmosphere for as long as the tag remains in place. A lockout/tagout is used when:

- Servicing electrical equipment that does not require power to be ON to perform the service
- Removing or bypassing a machine guard or other safety device
- The possibility exists of being injured or caught in moving machinery
- Clearing jammcd equipment
- The danger exists of being injured if equipment power is turned ON

Figure 1-23.
Equipment must be locked out and tagged out before preventive maintenance or servicing is performed.

Lockouts and tagouts do not by themselves re move power from a circuit. An approved procedure is followed when applying a lockout/tagout. Lockouts and tagouts are attached only after the equipment is turned OFF and tested to ensure that power is OFF. The lockout/tagout procedure is required for the safety of workers due to modern equipment hazards. OSHA provides a standard procedure for equipment lockout/tagout. OSHA's procedure is:

1. Prepare for machinery shutdown.
2. Machinery or equipment shutdown.
3. Machinery or equipment isolation.
4. Lockout or tagout application.
5. Release of stored energy.
6. Verification of isolation.

Warning: Personnel should consult OSHA Standard 29CFRI910.147 for industry standards on lockout/tagout.

A lockout/tagout shall not be removed by any person other than the person that installed it, except in an emergency. In an emergency, the lockout/tagout may be removed only by authorized personnel. The authorized personnel shall follow approved procedures. A list of company rules and procedures are given to any person that may use a lockout/tagout. Always remember:

- Use a lockout and tagout when possible
- Use a tagout when a lockout is impractical. A tagout is used alone only when a lock does not fit the disconnect device
- Use a multiple lockout when individual employee lockout of equipment is impractical
- Notify all employees affected before using a lockout/tagout
- Remove all power sources including primary and secondary
- Measure for voltage using a voltmeter to ensure that power is OFF

Lockout Devices. Lockout devices are lightweight enclosures that allow the lockout of standard control devices. Lockout devices are available in various shapes and sizes that allow for the lockout of ball valves, gate valves, and electrical equipment such as plugs, disconnects, etc.
Lockout devices resist chemicals, cracking, abrasion, and temperature changes. They are available in colors to match ANSI pipe colors. Lockout devices are sized to fit standard industry control device sizes. See Figure 1-24.

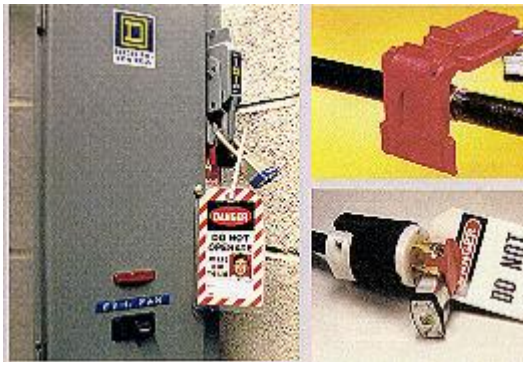

Figure 1-24.

Lockout devices are available in various shapes and sizes
that allow for the lockout of standard control devices.

Locks used to lock out a device may be color coded and individually keyed. The locks are rust-resistant and are available with various size shackles.
Danger tags provide additional lockout and warning information. Various danger tags are available. Danger tags may include warnings such as "Do Not Start," "Do Not Operate," or may provide space to enter worker, date, and lockout reason information. Tag ties must be strong enough to prevent accidental removal and must be self-locking and nonreusable.
Lockout/tagout kits are also available. A lockout/tagout kit contains items required to comply with the OSHA lockout/tagout standards. Lockout/tagout kits contain reusable danger tags, tag ties, multiple lockouts, locks, magnetic signs, and information on lockout/tagout procedures. See Figure 1-25. Be sure the source of electricity remains open or discon nected when returning to work whenever leaving a job for any reason or whenever the job cannot be completed the same day.

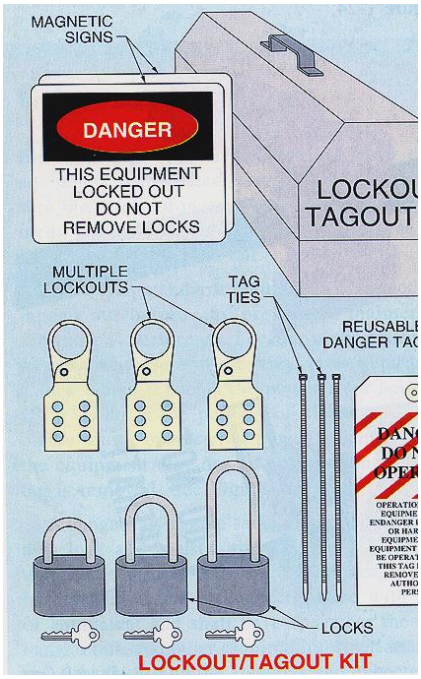

Figure 1-25.

Lockout/tagout kits comply with OSHA lockout/tagout standards.

Clothing and Personal Protective Equipment:

Clothing should fit snugly to avoid danger of becoming entangled in moving machinery or creating a tripping or stumbling hazard. See Figure 1-26.

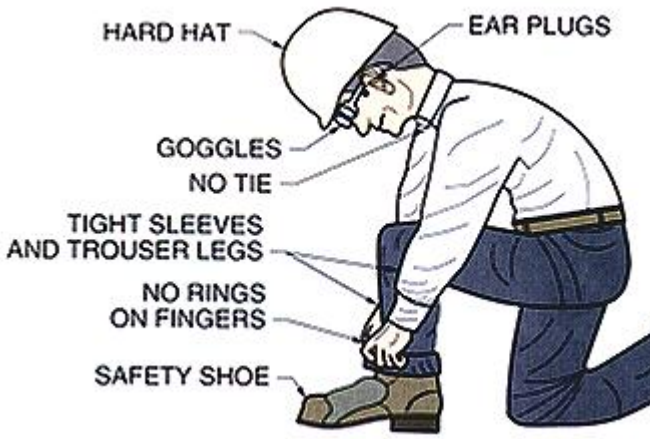

Figure 1-26.

Clothing should fit snugly to avoid danger of
becoming entangled in moving machinery or
creating a tripping or stumbling hazard.

Recommended safe work clothes include:

- Thick-soled work shoes for protection against sharp objects such as nails. Wear work shoes with safety toes if the job requires. Make sure the soles are oil resistant if the shoes are subject to oils and grease
- Rubber boots for damp locations
- A hat or cap. Wear an approved safety helmet (hard hat) if the job requires

Confine long hair or keep hair trimmed and avoid placing the head in close proximity to rotating machinery. Do not wear jewelry. Gold and silver are excellent conductors of electricity.

FIRE SAFETY:

The chance of fire is greatly decreased by good housekeeping. Keep rags containing oil, gasoline, alcohol, shellac, paint, varnish, or lacquer in a covered metal container. Keep debris in a designated area away from the building. Sound an alarm if a fire occurs. Alert all workers on the job and then call the fire department. After calling the fire department, make a reasonable effort to contain the fire.

Fire Extinguishers:

Always read instructions before using a fire extinguisher. Always use the correct fire extinguisher for the class of fire. See Figure 1-27. Fire extinguishers are normally red. Fire extinguishers may be located on a red background so they can be easily located.

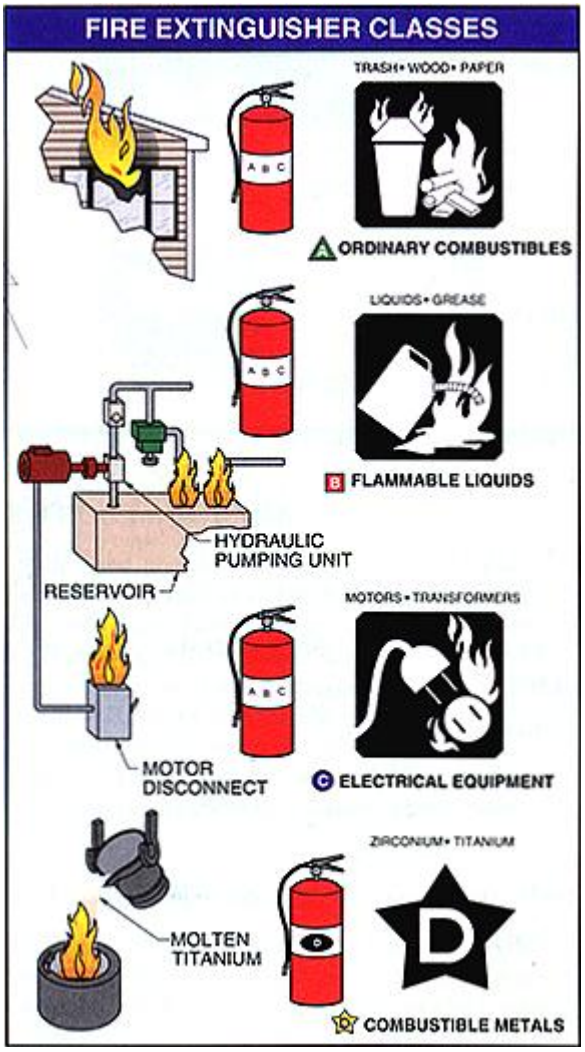

Figure 1-27.

Always use the correct fire extinguisher for the class of fire.

Be ready to direct firefighters to the fire. Inform them of any special problems or conditions that exist, such as downed electrical wires or leaks in gas lines.
Report any accumulations of rubbish or unsafe conditions that could be fire hazards. Also, if a portable tool bin is used on the job, a good practice is to store a C02 extinguisher in it.

In-Plant Training:

A select group of personnel (if not all personnel) should be acquainted with all extinguisher types and sizes available in a plant or work area. Training should include a tour of the facility indicating special fire hazard operations.
In addition, it is helpful to periodically practice a dry run, discharging each type of extinguisher. Such practice is essential in learning how to activate each type, knowing the discharge ranges, realizing which types are affected by winds and drafts, familiarizing oneself with discharge duration, and learning of any precautions to take as noted on the nameplate.

Extinguisher Maintenance Tips:

Inspect extinguishers at least once a month. It is common to find units that are missing, damaged, or used. Consider contracting for such a service. Contract for annual maintenance with a qualified service agency. Never attempt to make repairs to extinguishers. This is the chief cause of dangerous shell ruptures.

Hazardous Locations:

The use of electrical equipment in areas where explosion hazards are present can lead to an explosion and fire. This danger exists in the form of escaped flammable gases such as naphtha, benzene, propane, and others. Coal, grain, and other dust suspended in air can also cause an explosion. Article 500 of The Electrical Code National covers hazardous locations. Any hazardous location requires the maximum in safety and adherence to local, state, and federal guidelines and laws, as well as in-plant safety rules. Hazardous locations are indicated by Class, Division,
and Group.

To sum it all up...

Working with electricity can be dangerous. However, electricity can be safe if *properly respected.*

So be careful out there!

Tail Gate Safety Meeting Topics

THINK SAFETY!

EQUIPMENT AND TOOL SAFETY

PERSONAL SAFETY

SAFETY AND FIRE

Proper Use of Portable Fire Extinguishers #1

Proper Use of Portable Fire Extinguishers #2

What To Do In Case Of Fire

Flammable Liquids Safety

MISCELLANEOUS TOPICS

Getting Ready for Rain and Floods #1

Beware The Tiger

Getting Ready for Rain and Floods #2

Kids and Car Safety

Home and Workshop Safety

Holiday Safety Tips

Construction Equipment Dangers

Construction Equipment used on construction jobs often creates dangerous conditions. This week's Tail Gate Safety Topic examines a few situations which should be watched for at all times.

Any moving equipment such as skip loaders, back hoes, trenchers, cranes, hi-lifts, trucks, you name it, should be respected and avoided. Don't just assume that the operator sees you. You could wind up injured or worse. And don't depend on hearing a horn or an alarm to warn you that moving equipment is near. You may not be able to hear the equipment's alarm over other construction noise.

When you see that equipment is traveling backwards keep out of the way and stand clear until the operator has completed his maneuver. Never cut across the path behind any unit while it is backing. You could easily trip and full under the equipment. For the same reason you should never ride on the running boards, steps or drawbar or any equipment, even for a short distance.

During backing, the operator should have the project foreman clear the area behind the unit and provide direction. No operator should back a piece of equipment into and area without someone clearing the area and giving signals.

Watch out for swinging counterweights on equipment such as cranes. There is often a pinch-point between the counterweights and some obstruction when the unit swings. Make sure there is enough room for workers to pass and if there is not - shut off the area to any access.

Never ride on or near material that is being transported by equipment. The load could shift and you can be thrown to the ground. Also, clearance may not allow for your position and you can be crushed between overhead or side obstructions.

If you must ride on equipment, make sure that all parts of your body are inside the unit, including your arms and legs. In addition, it at all possible, get off any portable scaffold or work platform while the unit is being moved. The time it takes to get off will be much less than the time lost if you fall or the unit tips over.

Never walk alongside moving equipment. Keep in the clear in case it slides or turns, or the load shifts.

When you are working near equipment operating in the vicinity of power lines, don't touch or come in contact with the frame of the unit or the load cables. There is always the chance that the boom of the unit may hit the power lines. Warn the operator and the foreman any time you see this possibility and follow their instructions.

Don't walk under loads on cranes and hoists. Always take the path that avoids danger.

Never clean, adjust, lubricate, repair or work on a machine that is in operation. Stop the machine before working on it and replace the guards as soon as it is done and before operation is resumed.

The safest this to do around construction equipment is keep away while the equipment is in operation. If you must be near the equipment, make sure the operator knows you are working nearby and stay alert. Keeping your mind on where you are in relation to the equipment will not only prevent injuries but could save you life, and is an essential part of your comapany's safety program.

Ladder Safety - Part I

There is absolutely no reason for anybody to get hurt, disabled or killed while using a ladder. Yet it happens every single day. Somebody steps on the safety sticker that says "This is not a step!" and ends up with a broken leg. Another worker puts a rock under one of the legs because the ladder is "just not quite stable enough". On the way to the hospital, it occurs to her, through the pain of her broken arm, that maybe that was not such a good idea after all. On another job, a fellow reaches out just a little bit to far and...well...he's no longer with us. Virtually every single ladder accident could and should have been prevented. It only takes a little bit of common sense, LADDER SAFETY SENSE, to prevent a accident from occurring while using ladders. Stick to the following simple rules to ensure that you or your fellow workers are never injured while using a ladder.

1. CHOOSE THE RIGHT LADDER: Always select a ladder which is the correct length to safely reach the working height. Also ensure that the ladder is of the correct duty, or weight rating. The combined weight of the user, their tools and materials should NEVER exceed the rating of the ladder. Most ladders are available with weight ratings of 200, 225, 250 and 300 lbs. Select the right one or GET the right one. The proper sizes can be found in the relevant safety meeting.

2. CHECK THE CONDITION OF THE LADDER: Read all the labels on the ladder then check for split or cracked side rails, missing or broken rungs, loose rungs or other weaknesses. Also check for splinters and sharp edges.

3. PLACE THE LADDER WITH YOUR SAFETY IN MIND: Use your head and think safety before you setup the ladder. Make sure the ladder has firm footing and that it's feet are one-quarter the length of the ladder away from the upright surface to be climbed. Don't use a step ladder as a single ladder. If you are using a step ladder, make sure it is fully open with the spreaders properly locked.

4. CLIMB THE LADDER CAREFULLY. Keep your mind on where you are and what you're doing. Wear the proper shoes with good soles and that are free of grease or mud. Always face the ladder and use both hands when climbing up or down. Don't carry your tools or materials: raise and lower them with a hand line: *don't have someone toss them up to you or just drop them when you are finished.* If you don't feel well, DON'T climb the ladder. Always climb and work from the center of the ladder. Don't climb up the "back" side of a step ladder and never stand on the top of it.

5. *NEVER* OVERREACH! MOVE THE LADDER INSTEAD: Breaking this one simple rule causes more accidents than you can possibly imagine.

6. TIE OFF THE LADDER: Once you have climbed to your working height, tie-off the ladder and use a safety belt.

7. TAKE CARE OF YOUR LADDERS: When you are finished with your ladder, put it back where it belongs. Always keep them clean and free of excess material. Store them in a safe and dry place, out of direct exposure to the sun and the elements. Make sure your

ladders are tied down during transit. Never paint a wooden ladder. You can however use clear wood preservatives.

Your ladder is one of your most important tools. It is also is one or your most unforgiving if misused or mistreated; so use it safely and wisely. Always read the documentation from your safety training and/or safety manual.

Ladder Safety - Part II

Ladders are one of the biggest hazards of overhead work and result in many accidents. This week's **Tail Gate Safety Topic** expands on *Ladder Safety - Part I* by again covering certain rules which must be followed in the selection, use and care of ladders.

As mentioned in *Ladder Safety - Part I*, always inspect a ladder before using it. Look for:

1. Loose rungs or cleats
2. Loose nails, bolts or screws
3. Cracked, broken, split, badly gouged or worn rungs, cleats or railings
4. Slivers or splinters

You should always select a ladder that is long enough for the work to be done. As a rule of thumb, and to allow for reasonable safety, the ladder should be long enough so that you can work standing no higher than the fourth rung from the top. This allows you to grasp the side rails of the ladder.

The top of the ladder should never extend more than three or four feet above its upper support. Never step on a rung above the upper support since it's liable to make the base of the ladder "kick out."

When climbing or coming down a ladder, always face the ladder and keep both hands free for griping the side rails.

Wall grips on the tops of risers are useful to prevent side slipping when the ladder's leaning against a smooth surface. The top and bottom of the ladder should be secured to prevent shifting. Safety feet, cleats, lashing, etc., can be used to make portable ladders secure.

When placing the ladder make sure you don't rest it against a sash or window pane. A board securely fastened (not nailed) across the top of the ladder will provide a solid bearing at each side of the window.

If you must rest a ladder against a pole, or round column, be sure the upper end of the ladder is firm so it won't slip or cause the ladder to fall. When ladders are used this way, they are less likely to sway or fall if the upper end is equipped with a rung of webbing or similar material.

When carrying a ladder, balance it on your shoulder near the center. Keep the front end of the ladder high enough to clear the top of anyones head and the back end close to the ground. Be extra careful and keep your mind on where the ladder is in relation to the people and objects around you as you carry it. Pay particular attention when you approach passageways and doorways or any place where your view is obstructed.

NEVER stand a ladder on a box or barrel or any other makeshift objects so as to increase its reach. Another words, ALWAYS use a ladder that is the correct height for the work at hand. If

you don't have a ladder that is long enough then get one. If you must borrow a ladder be sure to thoroughly inspect it and make sure it is safe.

Before climbing a ladder make sure it is at the proper angle. The recommended angel is about 75 degrees from horizontal. If the base is out too far, the stress on the side rails is more severe and the wider angle can cause slippage. If the horizontal distance is much less that one-fourth of the incline length of the ladder, it is pitched to steep for safe work. Consult your safety program for more information.

Store your ladders in dry, well-ventilated locations where they are not exposed to the weather or excessive heat or dampness. When stored horizontally, support both ends and at in-between points to keep the middle from sagging, and maybe loosening the rungs or cleats and warping the rails.

Treat wood ladders periodically with a clear preservative such as clear varnish, white shellac or linseed oil. Never paint a ladder because it hides defects and deterioration.

Ladders are necessary and useful tools. Be sure to use yours safely and take care of them when not in use so that they remain useful and SAFE tools. Follow all documentation in the safety manual.

LOCKOUT PROCEDURES

The following procedure establishes the minimum requirements for lockout of energy sources that could cause injury to personnel. All employees will comply with these procedures, it is wise to make it a mandatory part of your safety program. All equipment and/or circuits will be locked out to protect against accidental or inadvertent operation when such operation of the equipment and/or circuits could cause injury to personnel. Do not attempt to operate any switch, valve, or other energy isolating device bearing a lock. Any employee found to be working, or causing others to work on, equipment and or/circuits that, in the opinion of management should have been locked out, will be subject to severe disciplinary actions up to and including termination.

Lockout Responsibility

The primary responsibility for the proper lockout of equipment and/or circuits on a project belong to the project Supervisor and/or Foreman. However, this does not alleviate the field employees from insuring that proper lockout procedures are followed at all times. The Supervisor and/or Foreman will insure that each employee is properly instructed in the safety significance of lockout procedures.

Preparation for Lockout of Circuits and Equipment

Employees will be certain as to which switch, valve, or other energy isolating devices apply to the equipment and/or circuits being locked. More that one energy source (electrical, mechanical, or others) may be involved. Any questionable identification of sources will be cleared by the employees with their Supervisor or project Foreman. Before lockout commences, authorization from the customer and project Supervisor will be obtained.

Sequence of Lockout Procedures

Special Note: In the following steps, when more than one individual is involved with the project and required to lock out the equipment and/or circuits, each employee will place their own personal lock on the energy isolating devices. A lock for each involved is the preferred method for locking out energy sources. If this is not feasible, the designated individual of the work crew (e.g. the project Supervisor or Foreman) with complete knowledge of who is on the crew may be designated by the work crew as the individual responsible for carrying out all steps of the lockout procedure. That individual will inform the work crew when it is safe to work on the equipment and/or circuits. Additionally, the designated individual will not remove a crew lock until it has been verified that ALL individuals are clear.

1. Notify all affected employees and customer that a lockout is required and the reason therefor.

2. If the equipment is in operation, after obtaining approval, shut it down by the normal stopping procedures.

3. Operate the switch, valve, or other energy isolating devices so that all energy sources (electrical, mechanical, hydraulic, etc.) are disconnected or isolated from the equipment and/or circuits. Stored energy, such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc., must also be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.

4. All affected employees are then required to lockout the energy devices with their individual lock.

5. After insuring that no personnel are exposed and as a check on having disconnected the energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate. In the event that electrical circuits have been locked out, insure that the circuits are de- energized by applying an appropriate voltage tester that itself has been tested on live circuits. Be sure to return all operating controls to the neutral position.

6. The equipment and/or circuits are now locked out.

Restoring Equipment and/or Circuits to Service

1. When the job is complete and the equipment or circuits are ready for testing or normal service, check the equipment and/or circuits to insure that no one is exposed.

2. When the equipment and/or circuits are clear, remove all locks. The energy isolating devices may be operated to restore energy to the equipment and/or circuits.

Preventing Slips, Trips, and Falls (Fall Protection)

Did you know that slips, trips, and falls are second only to automobile accidents in causing personal injury? On stairways alone, falls result in almost two million disabling injuries yearly. There are thousands more minor injuries caused by slips, trips, and falls each year. Most alarming of all is the fact that industrial falls cause over 1000 deaths each year. This week's **Tailgate Safety Topic** discusses what can be done to prevent slips, trips and falls. Most of the suggestions in this article can be used on the job and at home.

Slips occur when there is too little friction between a person's feet and the walking surface. Many factors can cause a slip. Ice, oil, water, cleaning fluids, and other slippery substances are probably the most obvious causes. However, the flooring may be inappropriate-perhaps it is a slick material-or the person who slips may not be wearing proper shoes. To prevent slips, avoid walking in areas which pose slipping hazards if at all possible. Always promptly clean up spills of slippery substances. Better yet, prevent the spills in the first place. If an area is a chronic problem, re-route foot traffic in order to avoid it. If flooring is a problem, replace it or coat it with a non-slip surfacing material. Always follow your company's safe shoe policy. Most safe shoe policies require a slip-resistant sole.

Trips occur when a person's foot contacts an object and they are thrown off balance. The main cause of tripping is obvious--anytime something is in a walkway it could cause someone to trip. Another culprit is an object which projects into the walkway--perhaps material stored low on a shelf. Poor lighting and uneven walking surfaces also cause tripping. Prevention of trips is simple but does require diligence. Keep objects that could cause someone to trip out of the way. Repair uneven flooring and install proper lighting if required.

Falls can be caused by a number of things. Slips and trips frequently result in a fall. Falls also occur for other reasons. Improper use of ladders and scaffolding can result in a fall-usually a very serious one. Falls also happen when people climb objects without using fall protection equipment. Don't risk serious injury by taking shortcuts. If you are working on a ladder, scaffold, or other elevated platform, make sure you know the requirements for using them safely. Always use fall protection equipment when it is required.

Slips, trips, and falls cause numerous injuries every day. But they are among the easiest hazards to correct. Take the time to look around your worksite for these hazards and work to prevent them. Take care not to cause any slip, trip, or fall hazards as you go about your daily activities. Follow the instructions set in your safety program. Don't let a slip, trip, or fall keep you from enjoying all that life has to offer.

Protecting Your Eyes

There really isn't much to be said about protecting your eyes other than you would be foolish not to do so at all times while on the job.

Eye protection devices have been used in the construction industries since 1910. While the original eye protection devices were somewhat limited, today there are eye protection devices for every type of exposure.

While the wearing of eye protection at all times is strongly encouraged, many projects demand that workers wear eye protection. Just a few of these are:

- Chipping, sledging and hammering on metal, stone or concrete
- Use of manual, pneumatic and power impact tools
- Caulking, brushing and grinding
- Drilling, scaling and scraping
- Babbitting, soldering and casting hot metals
- Handling acids, caustics and creosoted materials
- Gas welding, cutting and brazing
- Drilling overhead
- In environments of excessive dust
- Electric arc welding and cutting, and other operations that expose the eyes to flying particles, dust, hot liquids, molten substances, gases, fumes and liquids.

Some people just don't like to wear safety glasses and goggles. One of the complaints is that goggles tend to fog up. Fogging happens when sweat vaporizes and coats the inside of the lens. If you have this problem with goggles and glasses, wear a handkerchief or sweatband around your forehead to keep perspiration out.

Another complaint is that eye protection devices are uncomfortable, but usually this is because the eye protection device does not fit properly. Make sure that you have the device properly adjusted for the correct fit or simply get another that fits betters. You can see a lot better out of a properly fitted eye protection device that you can out of a glass eye.

Like all safety devices, eye protection is there for you and your eyes. Be smart and use eye protection at all times when on the job. What have you got to loose? Your sight? Ask your HR department for a copy of the relevant safety meetings for more info.

Safety Meeting Topics

THINK SAFTEY

1. Why Work Safely?
2. Ladders and Safety- Part 1
3. Ladders and Safety- Part 2
4. Power Tool Safety
5. Saving Lives with Lockout/Tagout
6. Examples of Lockout/Tagout Procedures
7. Scaffolds and Safety
8. Construction Equipment Dangers
9. Confined Space Safety
10. Slips, Trips, and Falls
11. Protecting Your Eyes
12. Work Clothes and Safety
13. What To Do In Case of Fire

Saving Lives with Lockout/Tagout

The federal lockout/tagout standard published by OSHA in 1989 was designed to prevent injuries and deaths caused by accidental start-up of equipment during maintenance or servicing. OSHA estimates that the lockout/tagout standard saves 122 lives and prevents 28,000 lost workday injuries each year. It's likely that well over 800 lives have been saved since the standard went into effect. That's more than 800 people who still go home to their families, friends, and loved ones; people who are there for the ones who depend on them. The lockout/tagout standard works. It saves lives. Yet unfortunate tragedies do still occur, but many of them could be prevented if the lockout/standard is applied correctly. This week's **TailGate Topic** provides a review of the lockout/tagout standard. Remember, the standard can only work if it's used correctly every time.

The lockout/tagout standard requires that hazardous energy sources be "isolated and rendered inoperative" before maintenance or servicing work can begin. These energy sources include electrical, pneumatic, hydraulic, mechanical, thermal, chemical, and the force of gravity. It is important to remember all of the energy sources must be "isolated and rendered inoperative." Overlooking an energy source has proved fatal on several occasions.

In order to "isolate and render inoperative" an energy source, an energy isolating device must be locked in place, or in certain cases, labeled with a tag warning against start-up of the equipment until servicing is finished. Stored energy sources, such as pressure, springs, and electricity contained in capacitors, must be released or "otherwise rendered safe" before servicing the equipment. Every person who will be working on the equipment applies a lock or tag to each energy isolating device. For complex equipment with many energy sources a group lockout is permitted.

After locks are applied, an attempt to re-start the equipment must be made to verify the equipment cannot be restarted before servicing begins. After servicing, each person who placed a lock or tag must remove it before the equipment is started.

OSHA regulations state three basic elements in a lockout/tagout program. These are training, written procedures, and inspections. **Safety Training** is required for two types of people- "authorized employees" and "affected employees." Authorized employees are people who do the maintenance or servicing work. They are the people who actually perform the lockout/tagout. Affected employees are people who may be affected by or work near equipment which is locked or tagged out. Affected employees are not permitted to perform servicing or maintenance work which requires a lockout or tagout.

Written Safety Procedures detailing the lockout/tagout procedure are required for equipment having two or more energy sources. Many companies require written lockout/tagout procedures for every piece of equipment, even those with only one energy source. Written procedures communicate important information to persons performing lockout/tagout. They identify energy sources, provide step-by-step instruction for locking or tagging out energy, releasing stored energy, and verifying the equipment cannot be re-started after lockout is applied. Group lockout/tagout procedures must also be clearly documented. Procedures must be kept up-to-date,

and changes must be communicated to everyone who may possibly be affected by them. They are only useful if all the information they contain is correct.

Procedures for performing lockout/tagout must be followed consistently. Don't be tempted to take shortcuts for small jobs, even if the lockout/tagout procedure takes longer than the job itself!

Inspections of the lockout/tagout program must be performed annually. The lockout/tagout standard specifies who may perform the inspection. Typically it is an authorized employee who is not directly involved with the procedure being inspected. Periodic inspections or performing a mock safety audit or osha inspection provide an opportunity to verify procedures are being followed and correct deficiencies in the lockout/tagout program. Of course, if you are aware of any problems with the lockout/tagout program don't wait for a routine inspection, report them immediately.

These three elements of the lockout/tagout standard work together to keep you safe. Lockout/tagout saves lives and prevents injuries-if procedures are followed consistently and correctly. Never take a shortcut when it comes to your safety, especially when you're working with hazardous energy sources.

Scaffold Safety

It is safe to assume that just about everybody has heard of a scaffolding accident or two. In many of those cases, faulty design and inadequate construction of the scaffolding was involved but, *in most cases*, scaffold accidents are caused by poor maintenance and improper use. To help keep your scaffolds safe, study your fall protection training and follow these simple procedures:

1. Inspect the scaffolds daily before using them; check the guard rails, connectors, fastening, footing, tie-ins and bracing.
2. Keep platforms closely boarded, fenced and securely fastened.
3. Don't stockpile materials on the scaffolds; remove all materials and tools at the end of the day.
4. Never overload scaffolds. Place the materials being used over ledger and bearer points to minimize platform loading.
5. Don't work on scaffolds during storms or high winds and clear all ice and snow from the platforms before using them.
6. Protect the scaffolds: don't bump or strike against the scaffolds with vehicles or materials and control hoisted material from the ground with taglines.
7. Keep the platforms and area around the scaffold cleared of debris and unneeded equipment, material and other hazards that will cause a worker to trip or fall.

Sudden Cardiac Arrest and Electrical Safety

Michael Fontaine

What is sudden cardiac arrest (SCA), and what does it have to do with electrical workplace safety? Every year, OSHA receives reports of around 400 workplace deaths from cardiac arrest. Therefore, each year around 13% of workplace fatalities are due to SCA. The out-of-hospital survival rates for cardiac arrest are from about one 1% to 5%, which emphasizes the need for cardiopulmonary resuscitation (CPR) and automated external defibrillator (AED) training, since most of these 400 deaths occur outside of a hospital . A normal heartbeat is the result of rhythmic electrical impulses. Ventricular fibrillation is when the electrical impulses in the lower heart chambers become erratic and cause the heart to stop pumping blood; these arrhythmias or abnormal heart rhythms are often the cause of SCA. If normal heart rhythm is not restored within a matter of minutes, death will occur. SCA is unpredictable – it can strike victims with no history of heart problems.

SCA is not a heart attack — the death of heart muscle caused by a lack of blood supply to a part of the heart. Typically, before a person experiences a heart attack, there are symptoms. SCA involves the heart's electrical impulses, not the lack of blood supply to the heart. According to the American Red Cross, when someone is experiencing an SCA event, the steps of the "cardiac chain of treatment plan," identified below, should be used:

- Immediately call 911 or other emergency medical service (EMS) for early access to care
- Start CPR as soon as possible
- Defibrillate using an AED as soon as possible
- Use early advance cardiac life support

All of the steps identified above help to increase a victim's chance of survival – but the most important step is the early application of an AED (a portable device used to defibrillate the heart) to perform defibrillation a. Defibrillation is the "resetting" of the heart's rhythmic electrical impulses by means of an appropriate external electrical current (shock) so as to return the heart to its normal rhythmic pulse. It "resets" the heart from an irregular, sporadic, or absent heart beat. It should be noted that defibrillation is most successful when performed within 4 minutes of a collapse. To assure the victim's best chance of survival, CPR and defibrillation must begin within 4 minutes of the collapse.

Advanced Cardiovascular Life Support (**ACLS**) refers to a set of clinical interventions for the urgent treatment of cardiac arrest, stroke and other life threatening medical emergencies – as well as the knowledge and skills to deploy those interventions. Broad medical knowledge and thorough hands-on training and practice are required to to become skilled at ACLS. ACLS is provided by qualified health care providers, as it requires the ability to manage the patient's airway, initiate IV access, read and interpret electrocardiograms, and understand emergency pharmacology. Lay rescuers and certain health professionals may be trained in basic life support (BLS), especially cardiopulmonary resuscitation (CPR) and AED use. When a sudden cardiac arrest occurs, immediate CPR is a vital link in the chain of survival along with early defibrillation, another vital link in the chain of survival, which has improved with the availability of AED(s) improving. However, the chance of survival is considerably improved when early ACLS is available. If an EMS crew's response time and the start of treatment cannot be assured to begin within 4 minutes for whatever reason, on-site personnel should be trained to begin the administration of CPR and the application of an AED. This means that an AED should be available for use within the 4 minute window of opportunity. Furthermore, this means that employees need to be trained in CPR and AED use, and an adequately maintained AED unit should be available on site. Most Americans spend a good amount of their waking hours at work. The Red Cross states that "wherever groups of people gather, the risk of an SCA is likely." Having well trained workers or first responders who are capable of starting treatment within the first 4 minutes of a collapse and capable of performing defibrillation is critical. An electrical shock is also capable of sending the heart into defibrillation, depending upon the strength of the electrical current passing through the body. An electrical current of 40 mA passing through the body for 1 second or more can send the heart into fibrillation.

In accordance with *NFPA 70E®*-2012, Section 110.2(C) for electrical safety, employees whose duties warrant such training are to be regularly instructed in methods of first aid and approved methods of resuscitation. Training in approved methods of resuscitation – CPR and AED use – must be certified by the employer on an annual basis. Certification in this case may be thought of as verification by the employer of the employee's demonstrated ability to perform CPR and to correctly use an AED. Since skills are lost without practice — and these skills are critical – they must be demonstrated to the employer by the employee on at least an annual basis. This does not mean that a "certificate of certification" from the American Heart Association or the Red Cross has to be obtained by the employee on an annual basis and provided to the employer; the certificate can be obtained every two years, provided the

employee demonstrates his ability to the employer's satisfaction on an annual basis. It is the employer's responsibility to provide or fund this training.

If first responders are available to start CPR or AED use within the first 4 minutes of the collapse of an employee undergoing fibrillation from an electrical shock, then all employees performing electrical work or work that may subject them to an electrical shock are not required to be trained in CPR or AED use. *However if first responders are not capable of responding and starting treatment within the 4 minute window, then these employees do need to be appropriately trained*. If trained employees are not able to procure an AED for use within this 4 minute window, the chance of the victim's survival decreases substantially. All employees exposed to electrical shock hazards and those additional employees responsible for taking action in case of an electrical shock emergency must be trained in methods of releasing a victim from contact with exposed energized electrical conductors or circuit parts. Since first responders are required to be trained in AED use common sense should indicate that an AED should be available for their use.

When using an AED, it is impossible to unnecessarily shock the patient. If a shock is not required, the device will not release the impulse, and it will state that CPR should be started. AEDs can be used on metal surfaces as long as the electrodes do not come in contact with the metal surface, and they are safe to use in rain or snow provided that neither the patient nor the rescuer is in a puddle. Proper training in CPR and AED use is an essential element in improving the survival rate for victims of sudden cardiac arrest (SCA) or fibrillation due to electrical shock. Also critical is having a well-trained workforce or first responders capable of responding within the first4 minutes of an event. FDA regulations require a doctor's prescription for the purchase of an AED. This is not a problem, however, since some suppliers of AEDs have made arrangements with medical service providers and are able to help the purchaser procure the needed prescription.

All new AEDs in the United States meet the following criteria:

- Federal Drug Administration (FDA) approved
- capable of performing the job they were designed to perform
- easy to use
- have visual and voice prompts to easily guide one through a rescue
- deliver a biphasic waveform – deliver a biphasic twin-shock
- perform electronic self-tests and let you know if they are ready-for-use
- come with a 5 or 7 year warranty

Electrodes can only be used once, and spare electrodes should be available. However, different models may have unique features, so the purchaser of an AED should become familiar with the different available options that may distinguish one unit from another. When purchasing an AED, accessory options — such as spare electrodes, spare battery, carrying case, wall cabinet, wall signs, and the like — should be considered. Some states require medical oversight of an AED program, and some purchasers seek medical help in writing company policies and procedures about how and when to use an AED, or about AED maintenance or training. Some suppliers of AEDs are capable of arranging these services for the purchaser.

In summary, employees who are trained in CRP and AED use, and who have an AED available for use, can substantially improve the chance of survival of a fibrillation victim, whether the fibrillation is due to an electrical shock hazard or sudden cardiac arrest.

Michael Fontaine currently is a Senior Electrical Engineer with the NFPA. He is a Registered Professional Electrical Engineer and also has licenses in several other areas. He has over thirty five years of electrical experience including over thirty years as a Registered Professional Electrical Engineer. His experience includes engineering, designing, drafting, purchasing, testing and inspecting, writing about, developing training programs, and teaching about electrical systems and electrical safety issues. He is well versed in the requirements of NFPA 70, the National Electrical Code®, and NFPA 70E®, the Standard for Electrical Safety in the Workplace.

Using Portable Electric-Power Tools Safety

Failing to properly use and maintain electric-powered tools causes thousands of cuts, punctures, pinches, amputations, and electrocutions each year. Tools can seriously injure or kill the user if not properly maintained or used. Everyone who uses tools must learn to recognize the hazards associated with the different types of tools and the safety precautions necessary to prevent those hazards. The Occupational Safety and Health Administration has specific rules for using electric-powered tools. Following these guidelines, along with using your own good judgment will help keep you safe.

Before you use a tool:

- Verify that it bears an electrical test label to indicate it successfully passed inspection and tests for electrical safety within the previous six months.
- Know the application, limitation, and potential hazards of the tool. Operate according to the manufacturer's instructions.
- Inspect the cord for the proper type. Electric-powered tools must either have a three-wire cord with ground or be double insulated. Never use a plug that has its ground prong removed.
- Inspect the tool for frayed cords, loose or broken switches, and other obvious problems. Tools that fail this inspection must not be used. These must be removed from service and labeled "Do Not Use" until repairs are made.

When using the tool:

- Do not use electric-powered tools in damp or wet locations.
- Keep guards in place, in working order, and properly adjusted. Safety guards must never be removed when the tool is being used
- Avoid accidental starting. Do not hold a finger on the switch button while carrying a plugged-in tool.
- Safety switches must be kept in working order and must not be modified. If you feel it necessary to modify a safety switch for a job you're doing, use another tool.
- Work areas should have adequate lighting and be free of clutter.
- Observers should remain a safe distance away from the work area.
- Be sure to keep good footing and maintain good balance.
- Do not wear loose clothing, ties, or jewelry when operating tools.
- Wear appropriate gloves and footwear while using tools.

Servicing and storing tools:

- Never modify a tool to use for a job it's not intended to do.
- Disconnect power tools while servicing or storing.
- Do not wrap the cord around the tool for storage.
- Store tools in a dry place.

What To Do In Case Of Fire

Most fires start out small, but after a few minutes they can be out of control. It's important to act fast to sound the alarm and just important to know what to do and to do it fast. This week's **Tail Gate Safety Topic** deals with what to do in case of a fire.

THINK FAST AND ACT WITH CAUTION: When you first discover a fire determine what to do immediately. If the fire is small and you have the proper fire extinguishers, **PUT IT OUT.**

SOUND THE ALARM: Do not underestimate any fire. If the fire is too much for you to handle, report it immediately.

WARN THE PEOPLE: Warn all people in the area immediately so they can get to places of safety. This is especially important in the case of fires in buildings.

STAND BY: Stay near, but at a safe distance from the fire. Meet and tell the fire fighters where the fire is. They can waste valuable minutes if they have to find it themselves.

FIRE FIGHTING: Everyone is responsible for preventing fires. But everyone is not obligated to fight major fires. In general, never join in the fire fighting unless your help is requested by the firemen.

CORRECT EXTINGUISHERS: Different fire extinguishers are recommended for each type of fire. For ***CLASS A*** fires (wood, textiles, rubbish) use foam or water. For ***CLASS B*** fires (grease, motor vehicle, flammable liquids) use foam, dry chemical, carbon dioxide or vaporizing liquid. **NEVER** use a water-type extinguisher on live electrical equipment. You can be electrocuted instantly by the electrical current following the water stream to you body. **NEVER** throw a stream of water on a ***CLASS B*** fire. You can splatter flaming liquids over a wide area, spreading the fire out of control.

To summarize what we have covered here you should adhere to the following guidelines:

NO MATER WHERE YOU ARE, KNOW WHERE THE FIRE EXTINGUISHERS ARE AND HOW TO USE THEM CORRECTLY SO THAT YOU WILL BE ABLE TO ACT QUICKLY.

KNOW WHAT TO DO AND DO IT QUICKLY

ACT SAFELY AND WITH CAUTION

SOUND THE ALARM

WARN OTHERS IN THE AREA

STAND BY TO DIRECT THE FIREFIGHTERS TO THE FIRE

STAY BACK AND OUT OF THE WAY UNLESS YOU ARE ASKED TO HELP

If you follow these simple guideline you may be able to put out a small fire or at least keep a small fire under control. Ask your HR department for a copy of the relevant safety meetings for more information.

Work Clothes and Safety

"Clothes To Die For". How many times have we heard that phrase before? But it takes on a bit of a different meaning when we apply the heading of safety to it. How many times has it occurred to you that your clothes may cause you to be injured?

The fact is that the clothes you wear to the job site can effect your safety. A simple example is the length of your pants. If they are too long you can easily catch your heel in them coming down a ladder or trip yourself while backing up.

Although you don't see very many construction workers wearing ties that can catch in moving machinery, you do see a lot of long sleeves which can pose the same threat as a tie. If your sleeves are long, keep them buttoned at the wrist. Don't roll them up or leave them loose. Also keep your shirt tucked in and your belt tight. This may all sound silly but there are many people who have been maimed or killed because their shirt got caught in moving machinery. Also, it is not a good idea to wear gloves around moving machinery.

Watch your shoes. Make sure they are in good condition and are suited for the job you are doing. Tennis shoes on a construction worker make as much sense as a fireman wearing sandals. Good leather work boots with rubber soles are best for the construction site. In many cases steel toed boots are a requirement. In cold weather, rubber boots should be worn with woolen inner boots or heavy woolen socks. Never work in wet boots or shoes.

Keep your clothes clean. Clothes that are dusty and greasy can cause skin irritations. Clothes that are soaked with oil and grease can catch fire from a spark or cigarette.

For keeping warm, wool is about the best. Two layers of lightweight wool are warmer than one very heavy layer. Wool absorbs perspiration but if it gets soaked the best thing to do if you can't change clothes is to keep moving. Wool gloves are also warmer than leather or cotton gloves. In cold weather, if you need leather gloves for protection, wear wool-lined leather or wool gloves inside the leather ones.

If you are in cold weather don't play Mr. Macho or Ms. Cool by not wearing enough to keep warm. You are most likely going to wind up sick if you're not careful. Remember that the clothes you are wearing don't create heat, they retain the heat of your body. Make sure that your gloves, shoes, collars and belts are loose enough to allow for circulation. And if you don't have enough to keep warm, some paper wrapped around you chest inside your shirt or jacket makes a good wind breaker in an emergency.

I am sure you have heard the phrase, "Dressing for Success". I guess that might be true in many cases but when it comes to personal protection let's start a new phrase in our safety program: "Dressing for Safety".

Working Safely in Confined Spaces

Do you ever work in a confined space? There are many types of confined spaces-tanks, silos, pits, tunnels, pipes, boilers-the list goes on and on. No matter what the type, confined spaces have something in common. They have limited ways to get in and out, and the atmosphere within them could be dangerous. This week's **Tail Gate Safety Topic** discusses what you should know to work in a confined space safely.

A confined space is a space that has these three characteristics: It has limited openings for entry and exit, it is large enough to permit a worker to enter, and it is not designed for continuous worker occupancy. The characteristics of a confined space cause it to present unique hazards. Yesterday's miners knew some of the dangers of a confined space. Have you ever heard about the canary that died? Miners once took a bird into the mine. When the bird died, the miners knew the atmosphere within the mine was getting dangerous. The death of the bird told the miners it was time to leave. Today we have more sophisticated ways of testing the atmosphere within a confined space, but the principle is the same: Check the atmosphere to make sure it's safe to work in the confined space.

Confined spaces present many dangers-some of which the miners of yesterday never knew. These are some of the common ones:

- lack of oxygen, presenting a suffocation hazard
- fire or explosion hazards from an accumulation of flammable vapors
- health hazards from toxic vapors
- difficulty exiting the space in the event of an emergency
- cramped spaces to work in, resulting in a danger of being caught in equipment
- poor visibility
- high levels of noise
- temperature extremes

Regulatory agencies require workplaces to have a plan for working in confined spaces safely. If you work in a confined space, you should know your company's procedures for safely entering into the space and working in it. Confined spaces should be identified and classified, and safe entry procedures developed. Some confined spaces are called "permit-required confined spaces," meaning a permit is required for entry into the confined space. In addition to the normal characteristics of a confined space, permit-required confined spaces present one or more of these hazards:

- has the potential to contain a hazardous atmosphere
- could contain material capable of engulfing someone entering the space
- has an internal configuration such that a person could be trapped or asphyxiated by inwardly converging walls or by a floor, which slopes downward and tapers off to a smaller cross section (e.g., a grain silo)
- contains any other recognized serious hazard

In general, these are the things you should be aware of before you enter a confined space:

- know how to enter it safely
- know how to exit quickly
- know that the atmosphere in the space is tested and found to be free of dangerous levels of toxic or flammable vapors, and that there is sufficient oxygen
- know that the atmosphere within the space is going to remain safe while you are working
- know the rescue plan in the event of an emergency, and make sure the proper rescue equipment is available and in good condition
- know that another person outside the confined space is keeping an eye on you as you work, and that they know the rescue plan, too
- know what other procedures are necessary to follow to work safely, such as locking out energy sources

Another very important thing to remember is what to do if someone working in a confined space becomes ill or injured. In the event of such an emergency, you should never enter a confined space to rescue someone without the proper equipment, training, and atmospheric testing. Chances are, whatever caused the illness or injury will claim you as a victim too.

It is possible to work safely in a confined space, but it's a task that requires careful planning and preparation. Don't be tempted to take shortcuts when it comes to confined spaces. Follow all safety precautions and osha regulations and don't hesitate to speak up if you are unsure of the correct procedures. You play the most important role of all when it comes to working safely. By consistently following safe work procedures and not taking chances, you will be working safely for a long time to come.

GULF COAST ELECTRIC CO. LLC

ELECTRICAL SAFTEY MANUAL

I _____ have received and read the electrical safety manual provided to me by Gulf Coast Electric Co. I understand that all accidents must be reported immediately to the superintendent of the job site and to the safety officer.

_____ _____

Name Date

Drug Policy

Gulf Coast Electric Co., LLC adheres to a strict NO DRUG policy. As a condition of employment, any employee of Gulf Coast Electric may be tested for drugs at ANY TIME.

A positive drug test may result in *immediate termination*.

Suspicion of drug use may result in immediate suspension until such time as a clean test may be obtained.

_____ _____

DATE

_____ _____

DATE

GULF COAST ELECTRIC CO. LLC

MONTHLY SAFETY MEETING

SIGN-IN SHEET

DATE:_____

1._____

2._____

3._____

4._____

5._____

7._____

8._____

9._____

10._____

Subjet:_____

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