



TOOLBOX TALKS

Electrical Safety—Toolbox Talk # 1

Precautions for avoiding electrical shocks include, but not limited to the following:

General safety precautions:

Safety to personnel and safe operation of machines and tools should be of utmost importance in all considerations of using electricity on the jobsite. Electrical hazards are among the most frequently cited OSHA violations. There are many specific standards that address electrical safety. Refer to Subpart K—Electrical (1926.400-449) for more information.

Ground Fault Circuit Interrupters:

The **GFCI** is a fast acting device that senses a small current leakage to ground. Within 1/40 of a second it shuts off the electricity and “interrupts” the current flow. It provides effective protection against shocks and electrocution. OSHA requires GFCIs or an assured equipment grounding conductor program on all construction sites and projects.

Extension Cords:

Extension cords are convenient ways to provide power to portable equipment. However, they are often misused, resulting in injuries and possible shock hazards. It is important thing to remember that extension cords are for temporary use only. Inspect extension cords for physical damage before use; check rating on the tool being used with an extension cord; do not use an extension cord that has a lower rating; do not plug one extension cord into another.

Electrical Fires:

On construction sites, an electrical fire that may occur when portable tools overload a power source. If possible to do safely, immediately disconnect the tool or power cord from the power source. This usually results in the electrical fire being extinguished. If the electrical fire has not been extinguished, a trained employee can use a Class “C” or multi-purpose fire extinguisher to PASS over the fire.

PASS – Pull Aim Spray Sweep



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TOOLBOX TALKS

Electrical Safety—Toolbox Talk # 2

How can we prevent electrocutions while using power tools?

[Presenter to ask the following questions and give time for answers.]

What are the hazards? Bodily contact with electricity.

What are the results? Shock, fire, burns, falls or death.

What should we look for? Tools that aren't double-insulated, damaged tools and cords, incorrect cords, wet conditions, tools used improperly.

[Presenter to ask the following question and ensure every item is covered.]

NOTE: Review common hand tool owner's manuals for inspection and use requirements

How can we stay safe while using power tools?

- Get proper training on manufacturers' tool use and specs.
- Inspect tool before each use according to manufacturers' instructions.
- Do not use damaged tools, remove them from service.
- Use only battery-powered tools in wet conditions.



[Presenter to ask the following questions about this site and ensure every item is covered.]

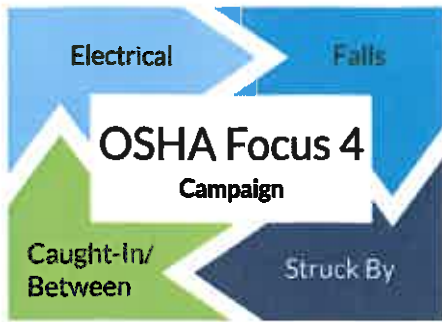
Let's talk about this site now.

- What can lead to an electrocution while using power tools? *Non double-insulated tools, damaged cord, wet conditions*
- Have you seen or used any defective power tools?
- What should you do if you find a defective power tool?



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Electrical Safety—Toolbox Talk # 3

Be aware of the power lines where you live and work

Always assume power lines are energized. This includes power lines on utility poles as well as those entering your home or buildings. Always keep yourself, your equipment, and anything you carry at least 10 feet from power lines. Even though you may notice a covering on a line, NEVER assume it is safe to touch. Stay Away!



Ladders—Never stand ladders near power lines. When working on or near ladders, keep all tools, the ladder, and anything you carry well away (at least 10 feet) from power lines.



High Reach Equipment—Keep all cranes, scaffolding, and high reach equipment away from power lines. Contact with a power line can cause serious burns or electrocution. Remember to work a safe distance from all power lines. When performing construction activities, keep equipment at least 10 feet from power lines and 34 feet from transmission tower lines.



Fallen Power lines-Keep yourself and others away from any fallen power lines. You never know when they might be energized. Call local utility provider right away and report the location of the downed wires. If a line falls on your car, stay in your car. If you must get out of the car, jump clear, do not touch any part of your car and the ground at the same time and stay clear of the fallen line.



Trees Near Power lines- Do not climb or trim trees near power lines and keep children from doing the same. Hire a qualified contractor to trim trees near power lines. Contact your local electrical utility if you have any questions about removing limbs or trees near power lines.



Digging—You are required by law to call One Call at 811 to locate gas, electric, and other underground utility lines before you dig. Whether you are planting a tree, building a fence or laying foundation, contacting a line with a shovel or pick can damage power lines and injure or kill you or others.



Working Near Power lines

Contact your local electrical utility (i.e. PECO) if you are conducting any work or activity that may bring yourself, your equipment, and anything you carry within 10 feet of a power line.



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Electrical Safety—Toolbox Talk # 4

Electrical Safety and First Aid Assistance

Actual Incident:

At approximately 4:15 p.m., an employee installing a ground conductor inside a 277/480 VAC 3-phase panelboard was shocked when his wrench came into contact with the “A” phase lug of the three-wire system. The employee sustained first and second degree burns from the arc flash created by the contact with the “A” phase lug. The employee was hospitalized and treated for these burns for more than one month.

Assistance:

- * Ensure your own safety, by making sure the scene is safe.
- * If possible, and if it is safe to do so, shut off the source of electricity.
- * Call 911 with explicit address & inform them the source of the current such as a downed pole, etc.
- * Do not hang up on the 911 operator until told to do so.
- * If you cannot shut off the source of electricity, attempt to move the source away from both you and the injured person using a dry, nonconductive object made of cardboard, plastic or wood; all without placing yourself at risk of electrocution.
- * Begin CPR and use an AED if the person shows no signs of circulation, such as breathing, coughing or movement until EMS arrives.
- * Try to prevent the injured person from becoming chilled.
- * Apply a bandage. Cover any burned areas with a sterile gauze bandage, if available, or a clean cloth. Don't use a blanket or towel, because loose fibers can stick to the burns.

Source: The Mayo Clinic



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TOOLBOX TALKS

Electrical Safety—Toolbox Talk # 5

Working Near High Voltage Energized Electrical Lines

[Presenter to ask the following questions and give time for answers.]

What are the hazards? Bodily contact with electricity

What are the results? Electrocutation, shock, fire, burns, falls or death

What should we look for? Overhead service lines, temporary service feeds to the construction project

[Presenter to ask the following question and ensure every item is covered.]

How do we prevent these results?

- Maintain a distance of at least 10 feet from energized powerlines
- Never use metal ladders while working near energized electrical lines
- Pay particular attention to the location of overhead powerlines when setting up ladders, scaffolding, and/or work platforms



[Presenter to ask the following questions about this site and ensure every item is covered.]

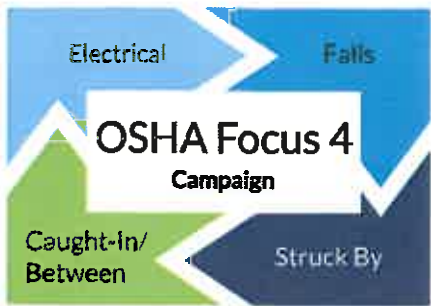
Let's talk about this site now.

- Where are the overhead powerlines on this site? Service drops to the project? Feeds for temporary electrical cabinets?
- Do you have to work in close proximity to the source? Can the line be de-energized or insulated?
- How do you know if an electrical line is energized or creates a hazard? Unless it is verified, always assume lines are energized. Stay at least 10 feet away. **ALWAYS ASK QUESTIONS**



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Electrical Safety—Toolbox Talk # 6

PRECAUTIONS WHEN USING EXTENSION CORDS

- * Use extension cords that are the correct size or rating for the equipment in use. The diameter of the extension cord should be the same or greater than the cord of the equipment in use.
- * Always inspect the cord prior to use to ensure the insulation isn't cut or damaged. Discard damaged cords, cords that become hot, or cords with exposed wiring.
- * Use extension cords only when necessary and only on a temporary basis. Do not use extension cords in place of permanent wiring.
- * Do not remove the prongs of an electrical plug. If plug prongs are missing, loose, or bent, replace the entire plug.
- * Do not use an adapter or extension cord to defeat a standard grounding device. (e.g., Only place three-prong plugs in three-prong outlets; do not alter them to fit in a two-prong outlet.)
- * Only use cords rated for outdoor use when using a cord outside; cords should be selected and utilized for the applicable work environment.
- * Do not run cords above ceiling tiles or through walls.
- * Keep electrical cords away from areas where they may be pinched and areas where they may pose a tripping or fire hazard (e.g., doorways, walkways, under carpet, etc.).
- * Never unplug an extension cord by pulling on the cord; pull on the plug.



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Electrical Safety—Toolbox Talks # 7

ARC FLASH PROTECTION AND CONSIDERATIONS

- * Establish a written electrical safety program with clearly defined responsibilities covering all of your company's electrical safety policies, including lockout/tagout, internal safety policies and responsibilities for electrical safety.
- * Have an engineering firm conduct an electrical system analysis to determine the degree of arc flash hazard present at your workplace. The analysis will define the type of personal protective equipment (PPE) that your workers must use while performing any work when energized parts are exposed.
- * Conduct arc flash safety training for all employees. It should be specific to the hazards of arc flash, arc blast, shock and electrocution. Ensure adequate personal protective clothing and equipment is on hand.
- * Ensure the proper tools are on hand for safe electrical work. This includes insulated voltage-rated hand tools and insulated voltage sensing devices that are properly rated for the voltage application of the equipment to be tested.
- * Any electrical equipment that is likely to require examination, adjustment, servicing or maintenance while energized must have arc flash warning labels posted in plain view. Such equipment includes switchboards, panel boards, industrial control panels, meter socket enclosures and motor control centers.
- * Appoint an electrical safety program manager. This should be a well-organized, responsible person who is familiar with electrical code requirements and other safety issues.
- * Maintain all electrical distribution system components. Modern, properly adjusted over-current protective devices are able to detect an arcing condition almost instantly and clear the fault quickly. This capability significantly reduces the amount of incident energy that is released.
- * Finally, maintain and update all electrical distribution documentation. This is especially critical when expanding or revising facilities.

Sources: Square D and NFPA



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Electrical Safety—Toolbox Talk # 8

General Construction Electrical Hazards

An electrocution occurs when enough electrical current flows through a person's body to cause death. Electrocution is a cause of death to a large number of construction workers each year.

Electricity is very safe as long as it only flows inside a circuit—through conductors, tools, lights, equipment, appliances, etc. If something goes wrong, electrical current can flow outside of the circuit. When electricity goes outside the circuit, bad things happen: shocks, equipment damage, arc flashes, and electrocutions. **Consider these five electrical hazards on the jobsite:**

- 1. Overhead Power Lines** are very dangerous. The minimum clearance is 10 feet. As the voltage increases, so does the required clearance. Everything has to be kept clear of the lines, including tools, equipment, ladders, machines, scaffolds, taglines, and you. Assume that all overhead power lines are energized. They are not safe until the utility company de-energizes them. You should be able to see that the lines are grounded.
- 2. Extension Cords** are invaluable on a construction site, but you have to use them properly and carefully. Don't attach them to walls or 2x4s with nails or tie them up with bailing wire. Don't pull or drag them over rough or sharp objects like metal studs. Don't use them as ropes, even to lower the tool connected to the cord. Never remove a ground prong. Ground prongs allow leaking current from a damaged or malfunctioning tool to flow to earth ground; without the ground prong, that current could flow through you and electrocute you.
- 3. Exposed Electrical Components** in equipment, switchgear, and motor control centers can kill you in a heartbeat. Among electricians, the most serious concern is working near live wires. The best choice is to de-energize and lock out the circuit. Never work on energized equipment unless you are trained to do so and are wearing the necessary PPE. Many employers prohibit all work on live circuits. Know what rules apply to you.
- 4. Wet Conditions** increase the likelihood of electrocution because water conducts electricity much better than air. Avoid using electrical tools in wet areas or when you're standing in water. Keep extension cords out of puddles.
- 5. Using Damaged Tools and Equipment** can cause serious injury and death. Make sure electrical tools are connected properly and working correctly. If a tool creates a burning smell, gets hot, sparks, or frequently trips circuit breakers, there's something wrong. Remove damaged tools from service and tag them "Do Not Use".

Electricity is everywhere and we expect it with the flip of a switch. Do not get complacent about electrical safety. When you don't respect electricity, the results can be quite shocking.



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