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’ 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.