



TDCJ Risk Management's *Training Circular*

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Electrical Safety Safety isn't Shocking!



Respect the Power of Electricity

Electricity is a strong invisible force that gives power to machinery, lights, heaters, air conditioners, and many other forms of equipment that we have come to depend upon. However, electricity can be very dangerous, too.

Accidental contact with electrical currents can cause injury, fire, extensive damage and even death. It is very important to remember that working with and around electricity requires your full attention and respect.

Wear Protective Clothing

You should make it part of your routine to wear rubber gloves and rubber-soled shoes or boots, especially if you are working around electricity in a damp environment. Of course, you know that water and electricity do not mix, but how often do you think about other liquids, such as

grease, oil, or solvents? Operating a drill with sweaty hands can also be a potential for electrical shock. However, do not make the mistake of believing that, regardless of your action, protective articles alone will protect you.

Remember to do your best to avoid making any contact with electricity. Never perform work on unprotected live electrical circuits.

Follow RM-20 "Control of Potentially Hazardous Energy (Lockout/Tagout)" to verify a zero energy state prior to beginning electrical work. Refer to NFPA 70E for information regarding Arc Flash Safety.



Regularly Inspect Your Electrical Tools

Inspect your electrical tools on a regular basis, including the large tools such as table saws, drill presses and bench grinders. Test your equipment first before starting to work. If any tool gives you a slight shock, or smokes and sparks when the power is turned on, don't use it, and notify your supervisor immediately.

Inspect the Power Cord

Check the insulation around the power cord to make sure it is in good condition. You should not see any exposed wires or frayed ends.

Power cords in poor condition should be replaced, never taped or spliced. Check the plug at the end of the cord to make sure the prongs are secure in the



plug and none are missing. If one of the prongs is missing, do not use the tool. If you notice one of the prong on the plug is slightly larger than the other, do not attempt to trim the prong down to match the smaller one. These prongs are polarized to prevent you from shock.

When you unplug cords from the outlet, remember to pull on the plug and not the cord.

Make Sure Electrical Equipment Is Properly Grounded

Properly grounded electrical equipment can protect you if the equipment should malfunction electrically. If your electric tool states that it's double insulated on the manufacturer's tag, this means there is insulation on the inside of the tool to protect you from shock.

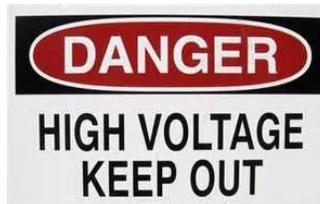
The symbol to identify if a tool is double insulated is a square within a square, typically found on the manufacture printed table on the tool.



This type of tool will only have a two prong plug. If the tool doesn't state that it is double insulated, then you must have a third prong on the plug. This third prong, or ground prong,

plugs your tool into ground or earth so that in the event of a malfunction, the electricity will go through this ground prong to earth and bypass your body. If the prong is broken off, you have no protection and all the electricity will go through your body.

A Ground Fault Circuit Interrupter should be used where there is a chance you could make contact with the moisture on the ground, such as when working outside. Vending machines and water fountains are required to be GFCI protected.



Watch Out For Overhead Power Lines

It is very important to keep your distance from overhead power lines.

Each year, construction and farm workers are injured or killed because they have accidentally made contact with the high voltage lines that pass overhead.

To prevent this from happening to you, preplan your job. Go out to the area you plan to move large equipment into, stack bales within, or where irrigation pipe will be laid, and look around for overhead wires and electric poles. Then

plan your job around them.

Remember, high voltage power lines are not insulated. Also, be aware that there are laws that prohibit any work within six feet of lines that carry between 600 and 50,000 volts, and require a minimum distance of 10 feet from these lines when operating boom-type lifting equipment. Stay out of areas marked HIGH VOLTAGE.

Do Not Misuse Extension Cords

Extension cords appear harmless, but they can do quite a bit of damage if they are misused. No extension cord can be kinked, tied in a knot, crushed, cut, or bent and still insulate the electrical current safely. An extension cord that is misused in this manner may cause a short circuit, fire or even electrical shock.

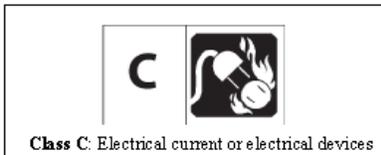
Don't use extension cords in areas that receive a lot of traffic because not only will it cause someone to trip, but constant traffic will wear out the insulating rubber cover. If you have no choice and must use cords in high traffic areas, make sure the cords are taped securely to the flooring or are hanging high overhead. Exten-



sion cords are to be used temporarily and never as a permanent source of power to equipment.

Never Throw Water on an Electrical Fire

As mentioned, water and electricity do not mix. In fact, water is an excellent conductor of electricity, and if water is thrown on an electrical fire, it will only spread the fire. Instead, use an appropriate ABC dry chemical fire extinguisher.



Make sure you know how to operate a chemical fire extinguisher and where the nearest one is in case of emergency. If you have questions or have difficulty locating an extinguisher, ask your supervisor for help.

Practice Good Housekeeping

Electrical safety involves more than just ensuring that electrical equipment is in good working order, it also involves ensuring that you can get to the main power source as quickly as possible without climbing over obstructions in the event of an emergency.

Keep the aisles and walkways clean and clear of garbage,

and make sure all flammable liquid, such as gases or chemicals, are stored away from the area where any elec-



tric tool will be operated. Many electric tools produce sparks, which could ignite the flammable liquid's fumes and cause extensive damage.

Types of Common Electrical Hazards

Poorly maintained or exposed electrical wiring increases the likelihood of fires and electrical shocks in the workplace. Employee safety is particularly at risk if wiring is prone to accidental contact.

Both the Occupational Safety and Health Administration (OSHA) and the National Fire Protection Association (NFPA) require the insulation and protection of wiring energized at 50 volts or higher if the wiring is equal to or below eight feet off the ground. Both OSHA and NFPA also prohibit direct contact between wires and conductive materials, such as metal or water.

Junction boxes without covers are the most common places to find exposed and hazard-

ous wires. Electricians use junction boxes to connect new installations or extend existing installations.



When energized junction boxes are uncovered, the wiring is vulnerable to damage and accidental contact. If easily combustible materials, such as paper or cardboard, are stored near unprotected energized wiring, a spark or electrical arc could easily start a fire.

Electrical outlets and light switches with broken, displaced, or missing covers may also expose wiring which endangers any employee plugging in an appliance or turning on a light. Both OSHA and NFPA require that outlets and switches remain covered.



Electrical hazards may also be found in light fixtures. Uncovered fluorescent lights, incandescent light fixtures without bulbs, or light fixtures hanging by wiring are all dangerous. Fluorescent lights have energized wiring, starters, and ballasts under their protective covers. If the light's cover is not properly replaced, these hazards are exposed.

When an incandescent bulb is removed and not replaced, the open socket presents a hazard if it remains energized; and therefore, it is best to leave the burnt bulb in the socket to cover the electrical contact until the bulb is replaced. Storing items too close to light fixtures poses a fire hazard; and unprotected bulbs within 8 feet or in warehouse operations can be dangerous to those who work near them.



Modular furniture provides electrical power and must protect occupants from shock hazards. Because the furniture has live electrical wiring running through it, it is important to enclose and protect the wiring within each module. Corner and baseboard wiring covers are needed to prevent accidental shock hazard contact

and damage to wiring.



Inform Your Supervisor of Faulty Equipment

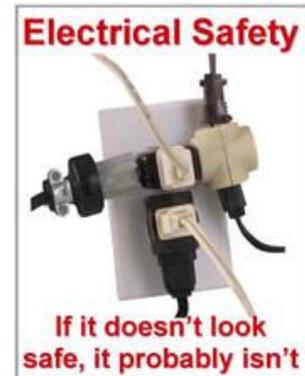
Contact with electricity does not have to happen if you follow a few simple guidelines. It is very important that you immediately inform your supervisor of any faulty equipment so it can get repaired or replaced. Don't attempt to repair the equipment yourself.

Lock out the equipment or, at the very least, tag it so others are aware that the equipment is damaged. Follow procedures outlined in AD-10.20 for state owned units and facilities or the Office of Space Management (OSM) Tenant Manual to report and deficiencies.

References:

U.S. Congress and the Legislative Branch Office of Compliance
<http://www.compliance.gov/wp-content/uploads/2010/08/Exposed-Energized-Wiring-Fast-Fact-February-2010.pdf>

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