

# Electric Equipment Guarding and Workspaces Meeting Kit



## What's At Stake

Exposure to electric current can cause shock, injury, and electrocution. Workers who service electrical sources need training on electrical safety, assuming electrical equipment and lines are live and use lock-out/tag-out procedures. Proper guarding and clearance around electrical equipment can prevent accidental worker exposure to electrical currents.

## What's the Danger

### FOUR MAIN TYPES OF INJURIES FROM ELECTRICAL CURRENTS

**Electrical shock** happens when current passes through the body. Electricity travels through closed circuits, and people, sometimes tragically, can become part of the circuit. When a person receives a shock, electricity flows between parts of the body or through the body to the ground. This can happen if someone touches both wires of an energized circuit, touches one wire of the circuit while standing unprotected, or touches a metal part that has become energized.

**Electrocution** refers to the injury or lethal dose of electrical energy. Electricity can also cause forceful muscle contraction or falls. The severity of the injury depends on the amount of current flowing through the body, the current's path through the body, the length of time the body remains in the circuit, and the current's frequency.

**Thermal burns** include burns from heat generated by an electric arc and flame burns from materials that catch on fire from heating or ignition by electrical currents or an electric arc flash. Contact burns from being shocked can burn internal tissues while leaving only very small injuries on the outside of the skin.

**Falls.** Muscle contractions, or a startle reaction, can cause a person to fall from a ladder, scaffold, or aerial bucket. A fall can cause serious injuries.

### PREVENT ELECTRICAL INJURIES – PRECAUTIONS

- Inspect electrical wires and equipment before using.
- Make sure electrical equipment is properly grounded.
- Don't climb a metal ladder around live electricity.

- Use electrical equipment only as intended.
- Wear protective gear, such as rubber boots and rubber gloves when working with electrical equipment.
- Avoid using extension cords.

**Effective Electrical Equipment Guarding.** Guarding involves locating or enclosing electric equipment to make sure people do not accidentally contact live parts. Effective guarding requires equipment with exposed parts operating at 50 volts or more to be placed where it is accessible only to authorized people qualified to work with it. Recommended locations are:

- a room, or similar enclosure.
- a balcony, or elevated platform; or
- a site elevated 8 feet above the floor.

Conspicuous signs must be posted at the entrances to electrical rooms and similarly guarded locations to alert people to the electrical hazard. Signs may contain the word "Danger," "Warning," or "Caution," and beneath that, appropriate concise wording that alerts people to the hazard or gives an instruction, such as "Danger/High Voltage/Keep Out."

**Insulation And Electrical Protective Devices.** Insulators stop or reduce the flow of electrical current, which can have a huge impact on the number of shocks and short circuits. However, not only does the insulation material (glass, rubber, plastic, etc.) have to be suitable for the voltage, but it also has to be the right material for the environmental conditions as temperature, moisture, and foreign substances can all affect an insulator's performance or cause it to fail.

Circuit protection devices such as fuses, circuit breakers, and ground-fault circuit interrupters are required. If there is an overload, ground fault, or a short circuit within the system, these devices limit, stop or interrupt the flow of electricity or de-energize the circuit. This can save a life when a fault occurs.

**Grounding.** Grounding is intentionally creating a low-resistance path that connects a tool or electrical system to the earth. Safety professionals and every employee who works with electrical systems should be aware of the difference between a service/system ground and an equipment ground. While the former protects equipment or insulation, the latter is designed to protect the user. This way, there are two grounding paths for the current, which means that even if the piece of equipment becomes energized, the additional ground protects the worker.

**Training and safe work practices.** Many workers are inexperienced and yet do not receive appropriate training or equipment. As a result, they are at a greater risk of being hurt or killed by electricity every day.

Thorough training and regular refreshers should always accompany all the necessary safety equipment. Electrical safety training may make a worker question or reconsider something they otherwise wouldn't deem hazardous.

The right training can make employees more aware of their surroundings when performing electrical work and allow them to recognize the states of mind that can lead to distraction. As a result, workers will be less likely to trust the "off" button without realizing that faulty wiring might still be carrying power and be better able to consider the danger of overhead cables when working on the ground.

## **BEST SAFETY ELECTRICAL TAKEAWAY**

One of the most important ways to protect yourself from electrical accidents is to

always follow safety precautions. When working with or near electricity, make sure you are wearing the proper clothing and equipment. This includes rubber gloves and non-conductive shoes. Never touch electrical equipment with your bare hands. If you must work with exposed wires, use a tool made of non-conductive material, such as a plastic or wood stick.

## **FINAL WORD**

Always follow safety precautions when working with or near electricity. If you experience an electrical shock, seek medical attention immediately. If you see sparks or smoke coming from electrical equipment, unplug it and call an electrician.