Protecting Against Electrical Hazards



What's at Stake?

Thousands of non-disabling and disabling injuries occur annually from work with electricity and on average one person dies every day from an electrical incident on the job. Electrical injuries can cause immediate and severe injuries, permanently disabling injuries, and life-long suffering in the form of pain, sensitivity and other restrictions on mobility and activities.

What's the Danger?

The four main types of electrical related hazards are: shock, electrocution, burns, and falls.

First is shock. The result of electric shock includes any of the following: burns; cardiac arrest; involuntary muscle contraction; organ damage; internal hemorrhages; and destruction of tissues, nerves and muscles.

Shock can happen when a person comes in contact with both conductors in a circuit; provides a path between an ungrounded conductor and the ground; or provides a path between the ground and a conducting material that is in contact with an ungrounded conductor.

The extent of injury depends on the:

- Strength of current – the stronger the current the more severe the shock.
- Duration of contact – the longer the contact the more severe the shock and greater the potential injury.
- Moisture on the body – sweat and wetness make the body a better conductor and more prone to shock and injury; and the
- Path of the current. The two most dangerous paths that current can take through your body are from hand to hand and from left hand to either foot.

The second hazard is electrocution, which is the fatal result of contact with electricity. Electrocution is always fatal.

The third hazard of electricity is fire and explosion. Electric arcs produce some of the highest temperatures known to occur on earth – up to 35,000 degrees Fahrenheit or 19,500 degrees Celsius – four times higher than the temperature on the surface of the Sun. The intense heat from an arc causes sudden expansion of air resulting in a blast. It's possible that a blast could produce enough energy to propel a 170-pound

person through the air at 330 feet per second.

The fourth hazard is falls. Falls can be caused by muscle contractions, or a startle reaction when a person is shocked. This can cause a person to fall from a ladder, scaffold or aerial bucket. The fall can cause serious injury or death.

How to Protect Yourself

Protecting against these electrical hazards is as easy as following safe work practices, using the right devices and equipment and wearing PPE designed for electrical work.

- All energized equipment must be locked and tagged out prior to beginning work on it, by following procedures for safe de-energization and re-energization of equipment.
- Never bypass locks and tags.
- Always obey all approach boundaries and safe clearance distances.
- Wear and use the right kind of electrical protective equipment for the job, including insulated tools, blankets, gloves, sleeves, face shields and arc flash clothing when appropriate.
- Inspect insulated equipment prior to use and immediately following an incident for holes, tears, cuts, punctures, ozone cutting, embedded foreign objects, swelling, softening, hardening or any other defect. Place defective equipment out of service.
- Use the proper size extension cords and fuses for equipment and machines.
- Ensure electrical equipment is not located in a hazardous environment, such as a flammable storage area or where it will be exposed to moisture.
- Know where emergency shutoffs are on equipment and tools.
- Never use metal ladders when doing electrical work.
- Remove all metal jewelry before starting any electrical work.
- Be aware of overhead and underground power lines.

Final Word

Electricity can be just as harmful as it is powerful. You can keep yourself and others safe by following safe work practices and using the right equipment.