

A. Lesson Goal:

By the end of the training sessions, workers will:

- Understand basic do's and don'ts about the safe use of electricity, including grounding
- Know what do to in common electrical emergencies.

B. OSHA Regulation: 29 CFR 1910.331-335

C. Have Handy

- A three-pronged plug
- An extension cord

D. Background for Instructor:

1. Introduction: Hazards of Electricity

Electrocution is one of the leading causes of death in the workplace. More than half of these deaths are caused by two things:

- Defective electrical equipment
- Failure to follow safe procedures

Even if an electric shock doesn't kill you, it can still cause serious injuries, such as burns, damage to muscles and internal organs, and heart attack. A shock also can be powerful enough to knock you down, causing injury from falling.

One of the most basic safeguards against electrical hazards is to provide a conductor to carry current into the ground, instead of to another conductor (such as the body). This is called *grounding*, and it is accomplished through such means as a three-pronged plug.

2. How Electricity Works

In basic terms, electricity flows from one point to another by means of a *conductor*, which is any material that allows electricity to flow through it. Some materials, like metal, are better conductors than others, like wood and rubber. Materials that do not conduct electricity are called *insulators*. That's why electrical wires, which are metal, are covered with rubber or similar material, which serves as the insulation.

Water and other liquids also are good conductors. Unfortunately, the human body also is a good conductor of electricity, primarily because of the amount of liquid it contains. So if the body contacts another conductor, it will directly receive the current of electricity, resulting in an electric shock.

3. Electrical Hazards

Hazards are created when there are opportunities for electric current to flow into the human body. Some hazards to watch out for include:

- Electrical cords that are damaged or have broken insulation
- Loose electrical connections
- Electric cords or connections near water or other liquids
- Electric tools that spark, shock, or smoke because they are damaged
- Loss of grounding by using a three-pronged plug in a two-pronged outlet.

Generally, if an item of electrical equipment, such as a tool or a cord, is not in good condition or can't be used without rigging up a system to make it work properly (such as using multiple extension cords or adapters), then it's probably an electrical haz-

ard.

4. Basic Electrical Safety Rules

OSHA's electrical standard (1910.331-335) includes rules pertaining to the types of electrical equipment to be used in different situations, the protective equipment and clothing to use, and requirements for special training for certain uses of electrical equipment. Basic safety rules for *all* workers include:

- Never use damaged or defective cords or electric tools.
- Never disable a grounding system.
- Be especially careful using metal equipment near sources of electric current.
- Wear insulating clothing, such as rubber gloves, when working with electrical equipment.
- Don't use electrical equipment near water (this includes wet hands).
- Don't use cords outdoors unless they're waterproof.
- Leave all electrical repair or specialized electrical work to qualified workers.

5. Proper Response in an Emergency

If there is an accident involving electricity, there are some basic rules on what to do and not to do:

- Don't touch someone who has received an electric shock—the current may still be present and could flow into you. Turn off the power, if possible. If not, move the victim from the source of the current with a *nonconducting* object, and summon medical help.
- Electrical fires are especially dangerous. Never fight them with water or attempt to touch the burning object. The proper response is to call trained firefighters, turn off power, and smother the blaze if possible.
- Electrical burns can be more serious than they might appear. Cover the burn with a sterile dressing and get medical help.

E. Practical Exercises:

- Show example of damaged electrical equipment, such as a frayed extension cord.
- Show a three-pronged plug, and explain why it should never be forced into a two-pronged outlet.
- Show examples of insulating clothing—gloves, boots, hats.
- Demonstrate how to move a victim of electric shock away from an energized source of current by using a *nonconducting* object.
- Ask workers about any near misses they might have had with electricity.
- Ask a worker to explain how, and why, some machines in your area are grounded.