TAKE TIME FOR SAFETY

“Stay Current on Electrical Hazards”

Trainer Outline

1. **This safety session will teach employees to:**
   - Understand the causes and consequences of electrical hazards
   - Take proper precautions around electricity

   Electricity is an integral part of our lives both at home and in the workplace. Using safe work practices while working on or near de-energized electrical parts can decrease your chances of being injured from electricity. Employees who work on or near de-energized parts require training on how equipment is de-energized, locked out/tagged out, how to safely work on or near de-energized parts, and safeguards.

2. **Electrical hazards are a major cause of on-the-job injuries and accidents**
   Safety requires understanding how electricity works and when it’s hazardous.

3. **Electrical current travels through insulated conductors**
   - **Conductors** are the wires and cables that carry electricity from the power plant.
   - Conductors are wrapped in **insulators** – electricity-resistant materials like rubber, plastic, and glass that keep the electric current on its path and prevents accidents.
   - Don’t use anything electrical that has a missing or frayed cord, or wire insulation.

4. **Grounding connects electrical equipment to earth**
   - Grounding keeps the power on a low resistance path and helps protect against shock.
   - Most electrical equipment is grounded with metal frames, metal covers and/or 3-pronged plugs.
   - In outdoor or wet areas, special electric outlets called **ground fault circuit interrupters** (GFCIs) provide added protection. GFCIs monitor current and are designed to shut power off if an imbalance causes shock.

5. **Uninsulated or ungrounded electrical equipment can cause shock**
   - Shock occurs when you touch the ground and a live wire, or poorly insulated tool or machine at the same time.
   - When electric current goes through your body, it causes shock and may result in:
     - Pain
     - Loss of muscle control that can lead to falls or contact with powered equipment
     - Nerve, muscle, or tissue damage
     - Internal bleeding
     - Cardiac arrest
     - death
   - The longer your contact with live power, the greater the shock (especially if the current enters your body near your heart).
   - Water, even moisture in the air, can turn you, your equipment, or even wooden items into conductors.
   - Don’t touch anything electrical with wet hands or if standing in a wet area.
   - Wear rubber boots for work in a damp area that contains electrical equipment.
   - Metal is a conductor; don’t wear metal jewelry when working with electricity.

6. **Electricity can burn your body**
   - Contact with electrical arcs, flashes and fires, or overheated electrical wires or equipment can burn the skin.
   - Electric current that enters your body can also burn body tissue.

7. **Electricity can cause fires and explosions**
   Overheated currents or electrical contact with flammable liquids, or vapors, or combustible dust can cause fires or explosions.

8. **Check equipment to prevent accidents and injuries**
   - Be sure cords have good insulation and coding that shows they are adequate for the voltage, wire size, and conditions.
   - Don't bend 3-pronged plugs or try to force them into 2-pronged outlets.
   - When working around flammable materials, use only tools designed for such use.
   - If an electrical tool shocks, smells, or sparks, turn it off. Don't use it.

9. **Extension cords**
   - Are commonly used without thinking about the potential risks involved.
   - There are two types of extension cords:
     - Two-wire extension cords are used for small appliances and should not be used in the workplace.
     - Three-wire grounded extension cords are much safer and should be used with power tools and for other temporary applications.
   - Extension cords are not intended to be used in place of permanent wiring, so notify your supervisor if you need additional outlets.
   - Do not place cords under carpets or furniture and never string them through doorways, walls, windows, ceilings or floors.
   - Never pull on the cord to disconnect it, instead remove it by the plug.
   - Only a qualified person should make repairs on a cord. Wrapping the damaged section with electrical tape is not "repairing" the cord.
   - Take damaged cords out of service, tag it for repair or replacement and advise your supervisor.
   - When discarding a bad cord, cut the cord into several pieces to render it useless.

10. **Know and follow electrical safety precautions**
    - Don't work on or with live power unless you're trained as a qualified worker.
    - Be sure electrical equipment is properly locked and tagged out before testing, repair, or maintenance is done.

11. **Discussion points**
    - Use grounded plugs, insulated wires, etc., to illustrate this training session.
    - Ask participants what electrical precautions they presently take on the job and how they might change their approach following this discussion.

12. **Conclusion: Be aware of electrical hazards**
    Electrical shock can be deadly. Take precautions to keep power on its proper path and keep yourself from becoming an electrical conductor.

13. **Test your knowledge**
    Ask employees take the Electrical Hazards Quiz. By testing their knowledge, you can judge their ability to understand how electricity works and whether they need to review this topic again.

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Quiz

Electrical hazards quiz

1. **What are electrical conductors?**
   a) Wires and cables that carry electricity
   b) Electric resistant wire coverings like rubber, plastic or glass
   c) Metal boxes around electric equipment

2. **What are insulators?**
   a) Wires and cables that carry electricity
   b) Electric resistant wire coverings like rubber, plastic or glass
   c) Metal boxes around electric equipment

3. **Grounding connects electrical power to earth.**
   a) True b) False

4. **Two-pronged plugs provide grounding.**
   a) True b) False

5. **When does shock occur?**
   a) Your body becomes a conductor
   b) You wear rubber around electricity
   c) You use a ground fault circuit interrupter

6. **You can get shocked if you:**
   - Touch the ground and a live wire at the same time
   - Touch electrical equipment with wet hands
   - Both a and b

7. **Electrical shock is unpleasant, but not dangerous.**
   a) True b) False

8. **The longer your contact with electricity, the greater the shock.**
   a) True b) False

9. **Electrical fires are a special danger when electrical equipment is:**
   a) Grounded
   b) Locked out
   c) In an area that contains flammable substances or vapors

10. **If an electrical tool smells, sparks, or smokes, you should:**
    a) Wear rubber gloves
    b) Turn it off and don't use it. Turn it in to a supervisor.
    c) Check its plug

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Quiz Answers

Answers to electrical hazards quiz

1. Wires and cables that carry electricity.

2. Electric resistant wire coverings like rubber, plastic, or glass.

3. True.

4. False. Three -pronged plugs provide grounding.

5. Your body becomes a conductor.

6. Both *a* (touch the ground and a live wire) and *b* (touch electrical equipment with wet hands).

7. False. It can cause serious internal damage, cardiac arrest, and even death.

8. True.

9. In an area that contains flammable substances or vapors.

10. Turn it off and don't use it. Turn it in to a supervisor.

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Handout

You're Usually Safe When:

- Electrical currents travel through insulated conductors to your tools, lights, and equipment.
- Grounding creates a low-resistance path that connects the current to the earth.

You May Be Unsafe When:

Electrical equipment that's poorly insulated or not grounded could make your body an electrical conductor. A current that enters your body can cause:

- Shock Pain
- Loss of muscle control
- Muscle, nerve, or tissue damage
- Internal bleeding
- Cardiac arrest
- DEATH

You're Likely To Get Shocked When:

- You touch water or other liquid – wet hands, wet floor, or damp environment
- You're in contact with metal jewelry, belt buckles, or conductive metal tools.

Warning! Electricity Can:

- Burn skin
- Burn body tissue
- Cause fires or explosions