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ELECTRICAL SAFETY FOR NON-ELECTRICIANS: *Give It Some Respect* (Concise)

**Leader's Guide, Fact Sheet
& Quiz**

Item Number: 3827
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This easy-to-use Leader's Guide is provided to assist in conducting a successful presentation.

PREPARING FOR THE MEETING

Here are a few suggestions for using this program:

- a) Review the contents of the Fact Sheet that immediately follows this page to familiarize yourself with the program topic and the training points discussed in the program. The Fact Sheet also includes a list of Program Objectives that details the information that participants should learn from watching the program.
- b) If required by your organization, make an attendance record to be signed by each participant to document the training to be conducted.
- c) Prepare the area and equipment to be used for the training. Make sure the watching environment is comfortable and free from outside distractions. Also, ensure that participants can see and hear the TV screen or computer monitor without obstructions.
- d) Make copies of the Review Quiz included at the end of this Leader's Guide to be completed by participants at the conclusion of the presentation. Be aware that the page containing the answers to the quiz comes before the quiz itself, which is on the final page.

CONDUCTING THE PRESENTATION

- a) Begin the meeting by welcoming the participants. Introduce yourself and give each person an opportunity to become acquainted if there are new people joining the training session.
- b) Introduce the program by its title and explain to participants what they are expected to learn as stated in the Program Objectives of the Fact Sheet.
- c) Play the program without interruption. Upon completion, lead discussions about your organization's specific policies regarding the subject matter. Make sure to note any unique hazards associated with the program's topic that participants may encounter while performing their job duties at your facility.
- d) Hand out copies of the review quiz to all of the participants and make sure each one completes it before concluding the training session.

3827 ELECTRICAL SAFETY FOR NON-ELECTRICIANS: *Give It Some Respect (Concise)* FACT SHEET

LENGTH: 10 minutes

PROGRAM SYNOPSIS:

Electricity is so common in our lives that we often take it for granted. This can cause us to disregard its power. In fact, every year more than 1,000 people are killed and another 30,000 are injured in electrical mishaps. We are all familiar with the great things electricity can do for us, but we also need to know what it is and how it works in order to use it safely.

This video is designed to provide basic electrical safety training for employees who work around electrical equipment but aren't qualified electricians. Featured are several injury reenactments that illustrate the consequences of committing unsafe acts with and around electricity. Training topics of the program include electrical insulators and conductors, circuits and circuit-breaking devices, how electricity is measured, basic electrical terminology, safe work practices for work around electrical equipment, awareness of electrical hazards and responding to electrical injuries.

PROGRAM OBJECTIVES:

After viewing the program, participants will have a basic understanding of the following:

- How electricity is measured and the characteristics of these measurements;
- Safe work practices designed to keep employees safe when working near electrical equipment;
- Electrical hazards that workers must always be aware of to prevent deaths and injuries;

PROGRAM OUTLINE

WHAT IS ELECTRICITY?

- Conductors are materials that allow electricity to flow through them easily. Most metals are good conductors, including silver, copper, gold, aluminum and iron.
- Water is another good conductor because it contains dissolved salt and minerals. Our bodies are about 70 percent water, making us good conductors too.

INSULATORS

- Insulators are materials that hold back the flow of electrical current. They are sometimes called non-conductors.
- The outside of an extension cord is made of rubber, a good insulator. On the inside is copper wire, a good conductor. The electricity flows through the copper wire and the insulator keeps it there; if the insulation was damaged and you grabbed the cord, the electricity could jump to your body and do some serious damage.
- An important thing to remember is that certain conditions can cause insulators to become conductors. For example, an insulator such as a dry two-by-four will become conductive if it is wet, dirty, painted, varnished or treated with preservative.

CIRCUITS & PROTECTIVE DEVICES

- In most uses, electricity flows in a pathway called a circuit. Circuits typically have a source of electric power, a conductor like copper wire, a load such as a motor or light and a switch.
- A short circuit is when electricity unexpectedly takes a new path with much less resistance and bypasses the load or switch in a circuit. This can produce a dangerous electrical surge with intense heat.
- Fuses and circuit breakers are protective devices that stop the flow of electricity when it reaches a dangerously high level. Circuit breakers and fuses help protect equipment and prevent fires, but they won't protect a person from getting shocked.
- Another important protective device is the ground fault circuit interrupter, which can be located in outlets or in a portable cord.
- Ground fault circuit interrupters, called GFCI's, detect very small changes in current and almost instantly stop the flow of electricity. Because they work so quickly and respond to small changes in current, they can protect a person from shock.

MEASURING ELECTRICITY

- One of the most common terms in measuring electricity is voltage, which is the force that moves electrons in the current. 110 volts is found in typical wall outlets and in some industrial equipment and lighting.
- You may also work around equipment that uses higher voltages such as 240, 277 or 480 volts. High voltage circuits such as these can be especially dangerous.
- No one should be involved with these circuits unless they are licensed electricians who are qualified to work with high voltage circuits.

- Watts is a term you see on a variety of electrical devices. Watts tells you how much electricity the device consumes; the higher the watts, the more power it uses.
- The amount of electrical current is measured in amperes, usually called amps.
- You should remember that the greatest danger is from the amount of electrical current, the amps. In fact, less than one-tenth of an amp can kill a person.
- Resistance is the ability of a material or device to restrict or resist the flow of current. Resistance is measured in Ohms. Insulators have a lot of resistance; conductors have very little resistance.

TERMS ASSOCIATED WITH THE USE OF ELECTRICITY

- Ground is an important electrical term. Objects are “grounded” if they are connected to the earth with a conductor.
- For example, a barn is grounded when a lightning rod on top of the barn is connected to the ground by a metal cable. If lightning hits the rod, the electric current will go through the cable and into the ground without damaging the barn.
- Grounded tools and equipment are also connected to the earth with a conductor. That’s the purpose of the ground prong on a cord.
- The ground prong is connected to a separate grounding wire inside the cord. If there were a short circuit, the surge of electricity would flow safely through the ground wire and into the earth rather than into a person or equipment.
- Shock is what happens to us when electric current passes through our bodies. Shocks can produce quite a range of effects, from mild tingling to severe burns, nerve damage, cardiac arrest and death.
- The two types of electrical current are alternating current (called AC) and direct current (called DC).
- Alternating current is produced at electrical generating plants and is distributed to our homes, businesses and industrial settings. Alternating current is the most widely used type of electricity. It is called alternating current because the current rapidly alternates back and forth in a circuit.
- Direct current flows in only one direction and is the type of current produced by batteries. It’s also used in precise electronic control devices.
- Direct current can create hazards. For example, vehicle and forklift batteries that are handled unsafely can produce dangerous sparks capable of igniting gases and causing an explosion.
- Static electricity is an electrical charge that builds up in objects, such as inside a storm cloud or in a person as they walk across a carpet.
- Static electrical charges can range from a tiny spark with very little current to a bolt of lightning carrying several thousand amps of current and several million volts. Even a tiny spark can be dangerous near flammable liquids and in work settings with explosion hazards.
- For this reason, containers and tankers are first grounded with a bonding cable during the transfer of flammables and explosives. This helps prevent the buildup of static electricity and the release of dangerous sparks.

BEING AWARE OF ELECTRICAL HAZARDS

- Staying alert for hazardous conditions in our surroundings is another way we can protect ourselves from electrical mishaps. For example, watch out for missing covers and loose sockets.
- Defective or exposed wiring, disconnected conduits and overloaded circuits are other common hazards to watch for and should be reported to your supervisor so they can be fixed.
- Other hazards such as loose, exposed or cracked wires can be found in walls, ceilings and crawl spaces. These spaces are often cramped and poorly lit, which just increases your risk of injury; to help you spot any hazards, add lighting before you start work.
- The wrong frame of mind can cause hazardous behavior, such as taking shortcuts and being inattentive. We should keep our attention focused on our work, avoid shortcuts and make a commitment to safety.

SAFE WORK PRACTICES

- Whether you’re on or off the job, it is important that you have been trained and are authorized to do the work. If you have questions, check with your supervisor or hire a qualified electrician.
- Go to the source and turn off the power. Make sure the power can’t be turned on accidentally while you’re working.
- In many situations, OSHA regulations require that the power be locked out by a person authorized to perform lockout.
- Use your personal protective equipment. Safety glasses with side shields are appropriate in most situations. If you’re working around potential electrical sources, the glasses should not contain metal.
- Wearing leather or insulated gloves will give you added protection.
- The correct PPE will vary depending on the situation. If you have any questions, ask your supervisor.
- Using insulated tools will help protect you from electric shock. Double-insulated tools will give even greater protection. Insulated tools are designed to protect against shock up to the voltage level shown on the tool.
- If you are working near any potential electrical sources, use a fiberglass or wooden ladder. Remember that a wood or fiberglass ladder that is wet, very dirty, painted or varnished becomes conductive and reduces its protective qualities.
- Again, before you actually start work, check to be sure the power is off.

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ANSWERS TO THE REVIEW QUIZ

1. b

2. b

3. c

4. d

5. c

6. a

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REVIEW QUIZ

The following questions are provided to determine how well you understand the information presented in this program.

Name _____ Date _____

1. _____ are materials that hold back the flow of electric current.
 - a. Conductors
 - b. Insulators
 - c. Circuits

2. Fuses and circuit breakers help protect equipment and prevent fires as well as protecting people from getting shocked.
 - a. True
 - b. False

3. Which of the following measurements tells you how much electricity an electrically-powered device consumes?
 - a. Voltage
 - b. Amperes
 - c. Watts

4. Which of the following would be conductive and hazardous to use?
 - a. A wet wooden ladder
 - b. A painted fiberglass ladder
 - c. A varnished wooden ladder
 - d. All of the above
 - e. None of the above

5. What should you do if you discover any defective or exposed wiring on your job?
 - a. Attempt to repair it
 - b. Let someone else take care of it
 - c. Report it to your supervisor

6. Less than one-tenth of an amp of electricity can kill a person.
 - a. True
 - b. False