Worker Beware®

Electrical Safety Facilitator's Guide

Contents

Introduction

The *Worker Beware* safety program from Tampa Electric is designed to provide contractors with information that will assist them in working safely around overhead power lines. For specific requirements, consult the Florida Occupational Safety and Health Administration (OSHA).

This facilitator's guide will help you make the most of the *Worker Beware* program. It contains five sections:

- **Know Your Audience.** An overview of contractors' learning preferences.
- **Electricity Basics.** Information on how electricity works and some terms to know.
- **Plan Your Session.** Tips for preparing an effective session.
- **Your Five-Step Facilitation Guide.** Step-by-step guidance.
- **Before and After Quiz.** Reproducible electrical safety quiz to help facilitators and participants evaluate the program's impact.

Section One: Know Your Audience

Understanding how contractors learn best will help you tailor your session to this unique audience. Take into consideration the following:

- **Contractors are very focused on working efficiently.** Contractors may face pressure to cut corners where safety is concerned, in the interest of saving time and money. Acknowledging this from the start—and cautioning against it—will put you all on the same page.

- **Contractors tend to be action-oriented learners** who do best when given an opportunity to practice and repeat recommended behaviors.

- **Contractors prefer practical (rather than theoretical) information.** Keep the focus on real-life situations.

Section Two: Electricity Basics

This section will help you answer questions about electricity from session participants.

What Is Electricity?

Electricity results from the flow of electrons between atoms that occurs when atoms carry different charges. Electrons are negatively charged and flow to positively charged atoms until the charge is level or neutral.

- The flow of electrons is called **current**.
- Current is measured in **amperes**, or **amps** for short.
- The force propelling the flow of electrons is measured in **voltage**, or **volts** for short.
- When an object or substance limits the flow of current, this property is called **resistance**. Resistance is measured in **ohms**.
- Materials with a high level of resistance are called **insulators**. Common insulators include porcelain, plastics and air. These materials do not allow electricity to pass through them easily; however, even insulators can conduct electricity under certain conditions.

- Materials with a low level of resistance are called **conductors**. Common conductors include water, most metals and the human body. Electricity can pass easily through these materials under almost all conditions.

The Electricity Distribution System

Most of the nation's electricity is generated at power plants. A thick coil of wire spins inside giant magnets at the plant, moving the electrons in the wire and making electricity flow.

Wires on tall transmission towers carry high-voltage electricity from power plants to substations, where the voltage is typically reduced. From substations, electricity travels on smaller wires that branch out down streets, either overhead or underground.

Overhead and underground power lines carry electricity to transformers, which can be found on poles, on the ground in metal structures or underground in vaults. These transformers are where the voltage is reduced again to a level that is practical for typical use. From transformers, electricity travels into buildings through service wires. These wires connect to the meter panel, which is connected to all the wires that energize wall outlets and switches.

Note that electric-line workers receive extensive training and are experts in handling power lines. They also have special equipment for handling electric infrastructure. Contractors should understand that even with instruction their understanding of electricity is basic, and their personal protective equipment is not designed for electrical work.

Section Three: Plan Your Session

A well-organized, informed instructor will gain participants' respect and be far more effective. Below are some recommendations to help you prepare for the electrical safety session with confidence.

Know Your Material

Always preview the materials before showing them to session participants. Gathering information in advance can be useful and make the materials more relevant. Review all the materials and rehearse your presentation well before the session.

Make the Material Relevant

Identify the key situations that contractors in your session may encounter, and focus the group's attention on these topics during your meeting:

- **What job site situations** bring them close to overhead power lines?
- **What type of long or tall equipment do they use** that might come into contact with overhead power lines?
- **What type of digging or earth-moving activities** might bring them close to underground power lines?
- **What electrical hazards** have participants encountered in the past? Recently?

Tailor the Session to the Space, Audience Size and Allotted Time

Remember that contractors are hands-on, action-oriented learners. The session will need to include opportunities to simulate recommended practices and to discuss potential applications of the material. Room size and arrangement can have a measurable impact on the participation level.

Consider:

- **Will all materials be visible** to all participants, or do you need additional space or equipment?
- **Are the seats arranged in a way** that will foster discussion?
- **Is there adequate space** for participants to conduct simulations?
- **Is there adequate lighting** for all participants to see the instructor and materials, and to take notes if necessary?
- **Will everyone be able to hear?**

Just as room and audience size can impact the effectiveness of learning, so can session time. No one learns well sitting for long periods. On the other hand, cramming too much information into a short session can reduce retention. Plan your session to allow time for discussions and simulations. If there is not time for all the materials, consider which ones will be most effective for participants.

Section Four: Your Five-Step Facilitation Guide

Follow these steps for a high-impact meeting that will keep participants involved and reinforce essential safety information:

1. Advertise the meeting.

Post a notice well in advance of the meeting in a highly visible location.

2. Pass a sign-in sheet.

Keep attendance records of all safety meetings. Someday you may have to show who attended the meeting, what the session covered and when it was held.

3. Offer an overview.

Tell participants what you will cover in the meeting and what you hope they will learn. This is a good time to convey the importance of this information, and that it can help protect contractors, their coworkers and the public from electricity-related injury or death.

4. Present the Worker Beware *materials.*

Discuss the electrical safety information in these materials and the electrical emergencies that participants might encounter. Review these vital safety tips with participants periodically to refresh their memories.

5. Conduct a discussion.

Participants will retain more information if they get involved in a discussion. Here are some ideas:

- **Remind participants of the circumstances of any recent power line contacts** in your region. Discuss how information in the materials is relevant to those incidents.
- **Stress the necessity of maintaining the required safety clearances from overhead power lines:**
    - Participants must keep their bodies and all tools, equipment and materials *at least* **10 feet away** from overhead lines carrying up to 50 kV. Greater voltages require

greater distances. Consult Tampa Electric at **1-813-635-1500** to confirm voltages and safe clearances before work begins.

    - Discuss how these rules apply to them and situations they may encounter.

- **Review the proper "811 notification" procedures and the utility color code.** Discuss why following the law and allowing extra time for a utility locate can save time and money in the long run. Discuss additional safety measures, such as pre-marking the dig area, conducting a visual site survey and asking the property owner about underground lines.
- **Invite participants to ask questions** about the materials and the safety procedures they outline. If they have questions you can't answer, research the answers yourself, and provide that information as soon as possible.
- **Ask participants to brainstorm a list of key safety issues** identified in the materials. Review these key issues and discuss incidents that resulted when related safety precautions were ignored. What were the consequences?
- **Ask each participant to name one thing they learned** from the materials or discussion that will help them be safer in the future.

Remember that discussion is intended to reinforce proper behavior—NOT to call out or embarrass participants. Maintain a cooperative, supportive atmosphere at all times, and encourage participants to ask questions and provide feedback.

Section Five: *Worker Beware* Electrical Safety Quiz

The quiz on the next page is intended to help instructors and participants assess the program's effectiveness. Administer it before beginning the session and ask participants to record their answers in the "Before" column. Then administer it again at the end of the session and ask participants to list answers in the "After" column. The quiz is designed for two-sided copying.

Quiz Answers:

1. C
2. B
3. B
4. D
5. D
6. A
7. B
8. A
9. D
10. B
11. C
12. A

Name: _____ Date: _____

Worker Beware Electrical Safety Quiz

Before	Questions	After
_____	**1. What is the *minimum* safe clearance you must maintain between a metal ladder and overhead power lines?** A. 6 inches B. 100 feet C. 10 feet D. 5 feet	_____
_____	**2. What is the color of the locator marks for underground electric power lines?** A. Yellow B. Red C. Orange D. None of the above	_____
_____	**3. If you must work closer than the safe clearance distance from overhead power lines, which of the following should you do?** A. Attempt to disconnect electrical service B. Call Tampa Electric in advance to make arrangements C. Evacuate nearby homes D. Both A and C	_____
_____	**4. What does the law <u>require</u> that you do to determine the location of underground power lines before digging on a job site?** A. Look for right-of-way markers B. Check your maps C. Call Tampa Electric D. Notify Sunshine 811	_____
_____	**5. How should you assist a coworker who contacts a power line while operating heavy equipment?** A. Call 911 and Tampa Electric at 1-877-588-1010 B. Encourage them to stay on the equipment until Tampa Electric personnel arrive C. If forced off by fire or another hazard, tell them to jump clear of the equipment, land with feet together and shuffle *at least* **20 feet away**, keeping their feet together and on the ground at all times D. All of the above	_____

Before **After**

6. True or false? Before digging, you should ask the property owner about any private underground lines that may not be marked by the 811 service or utility locator.

A. True
B. False

7. What is the job of a spotter?

A. To stabilize a load
B. To prevent equipment from contacting power lines
C. Both A and B
D. None of the above

8. True or false? Your body can conduct electricity.

A. True
B. False

9. If your equipment contacts a power line and you are not in imminent danger, you should:

A. Stay put and tell others to stay far away from the equipment
B. Have someone immediately call 911 and Tampa Electric
C. Move the equipment away from the line only if you can do so safely
D. All of the above

10. True or false? You cannot be shocked by a service wire.

A. True
B. False

11. How can you confirm all buried facilities have been marked before you dig?

A. Call each utility operator individually
B. Ask the property owner to count the locator marks
C. Using the Sunshine 811 ticket number, go to sunshine811.com or call 800-852-8057
D. All of the above

12. True or false? Prior to using power digging equipment within 24 inches from the outer edge of either side of a marked underground utility line, the law requires you to use hand tools or vacuum technology to verify the exact location of the marked facility.

A. True
B. False