



Before darkening the room, offer a welcome and overview.

Begin by introducing the program and its topic:

Today's training session focuses on working safely around electric power lines. By following the procedures we'll cover here today, you can keep yourself and your coworkers safe and on the job. On the other hand, if you cut corners where power lines are concerned, you put yourself and your coworkers at risk of serious injury and even death. Please pay careful attention, and ask questions if you don't understand.

Darken the room.

Click for the next slide. (Throughout this presentation you will need to click to bring up new slides.)

Respect the Power of Electricity

- **When you arrive at a job site, always identify power lines and high-voltage equipment**, and point them out to your coworkers.
- **Look for overhead lines** hidden by trees or buildings.
- **Assume ALL overhead power lines are energized and potentially dangerous**, including service drops running between poles and buildings.
- **Check the site daily** because conditions may change.
- **Check for overhead power lines** before raising equipment, moving any load, or repositioning ladders or materials.
- **Review your emergency plan** before work begins so everyone knows what to do in case of power line contact.



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Respect the power of electricity. Follow some simple best practices before starting work.

- When you arrive at a job site, always identify power lines and high-voltage equipment, and point them out to your coworkers. Review proper safety procedures before beginning work.
- Look for overhead lines hidden by trees or buildings.
- Assume all overhead power lines are energized and potentially dangerous, including service drops running between poles and buildings. These wires may look insulated, but any coating you see may be designed to protect the lines from weather, not to protect you from shock. Contact can still be deadly so keep your distance.
- Check the site daily because conditions may change. Always survey the site before beginning the day's work.
- Check for power lines before using a forklift, raising a dump truck bed or moving any load, and before raising or repositioning ladders, equipment and materials.
- Review your emergency plan before work begins so everyone knows what to do in case of power contact.

For Tools and Equipment Other than Cranes and Derricks Used in Construction, Observe the 10-Foot Rule

- OSHA requires that you keep yourself and your equipment (other than cranes or derricks used in construction) **AT LEAST 10 feet** away from overhead power lines carrying up to 50 kV.
- Higher-voltage lines require greater clearances. Contact Dominion Energy for clearance information.
- If your job requires you to work closer than 10 feet from power lines, call Dominion Energy well in advance to make safety arrangements.
- Electrical safety distances given here are minimums.
- Always use the maximum possible clearance, and clearly mark boundaries to keep workers and equipment the required distance away.

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For tools and equipment other than cranes and derricks used in construction, always observe the 10-foot rule. (Cranes and derricks on construction sites may require greater clearances, which we will discuss on the next slide.)

- OSHA requires that you keep yourself and your equipment at least 10 feet away from overhead power lines carrying up to 50 kV. This applies to all personnel, tools and equipment other than cranes or derricks used in construction. Be aware that wind can move materials and equipment so build in some extra distance in case of an unexpected shift.
- Higher-voltage lines require greater clearances. Contact Dominion Energy for clearance information. Remember that your best practice is always to stay as far away as possible from power lines.
- If your job requires you to work closer than 10 feet from power lines, call Dominion Energy well in advance to make safety arrangements. They will take steps to help you work safely. Cutting corners and failing to call could have life-threatening and livelihood-threatening consequences.
- Electrical safety distances given here are minimums.
- Always use the maximum possible distance, and clearly mark boundaries with tape, signs or barricades to keep workers and equipment away.

Cranes and Derricks in Construction

- **Cranes and derricks used in construction must remain a minimum of 20 feet away** from lines up to 350 kV and **50 feet away** from lines greater than 350 kV, if operated up to the equipment's maximum reaching radius. In addition to these minimum safe working distances, the operator must implement specific encroachment prevention precautions. For more information, consult osha.gov.
- **As voltage increases, clearance distances also increase.** Consult the OSHA regulations at osha.gov for specific clearance requirements and encroachment prevention precautions. NOTE: Virginia, South Carolina and North Carolina have State Occupational Safety and Health Plans. For further information, visit the State OSHA Program website at osha.gov/stateplans, and click on your state. In Texas, follow federal regulations.
 - Once you have established the required clearance, clearly mark a boundary with tape, signs or barricades.
- **If any part of the equipment can get closer than 20 feet (for lines up to 350 kV) or 50 feet (for lines greater than 350 kV), or you must work closer than regulations allow,** contact Dominion Energy well in advance so any necessary facility protection arrangements can be made, and implement encroachment prevention precautions.

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Cranes and derricks used in construction require different clearances than other equipment, due to an OSHA rule effective November 2010. (Virginia, South Carolina and North Carolina have State Occupational Safety and Health Plans. For further information, visit the State OSHA Program website at osha.gov/stateplans, and click on your state. In Texas, follow federal regulations.)

- Cranes and derricks used in construction must remain a minimum of 20 feet away from lines up to 350 kV and 50 feet away from lines greater than 350 kV, if operated up to the equipment's maximum reaching radius. In addition to these minimum safe working distances, the operator must implement specific encroachment prevention precautions. For more information, consult osha.gov.
- As voltage increases, clearance distances also increase. Consult the OSHA regulations at osha.gov or the State OSHA Program website for specific safety clearance requirements and encroachment prevention precautions.
- Once you have established the correct clearances, mark an obvious boundary to keep workers and equipment the required distance away.
- If any part of the equipment can get closer than 20 feet (for lines up to 350 kV) or 50 feet (for lines greater than 350 kV), or you must work closer than regulations allow, contact Dominion Energy well in advance so any necessary facility protection arrangements can be made, and implement encroachment prevention precautions.

Encroachment Prevention Precautions

- **Conduct a planning meeting with the operator and other workers.**
- **Tag lines must be non-conductive (if used).**
- **Erect and maintain an elevated warning line, barricade or line of signs in view of the operator, at 10 feet from the power line.**
- **If the operator is unable to see the warning line, always use a dedicated, qualified spotter on the ground.**
- **In addition to the above precautions, the operator must implement one of the following:**
 - Use a proximity alarm, designed to give the operator sufficient warning to prevent encroachment.
 - Use a dedicated spotter who is in continuous contact with the operator.
 - Use a device that automatically warns the operator to stop (range control warning device).
 - Use a device that limits the range of movement, set to prevent encroachment.
 - Use an insulating link between the end of the load line and the load.

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Here are the encroachment prevention precautions required when operating cranes and derricks on construction sites.

- Conduct a planning meeting with the operator and other workers.
- Any tag lines used must be non-conductive.
- Erect and maintain an elevated warning line, barricade or line of signs in view of the operator, at 10 feet from the power line.
- If the operator is unable to see the warning line, a dedicated spotter must be used.
- In addition to the encroachment prevention precautions, the operator must implement one of the following:
 - Use a proximity alarm, designed to give the operator sufficient warning to prevent encroachment.
 - Use a dedicated spotter who is in continuous contact with the operator.
 - Use a device that automatically warns the operator to stop (range control warning device).
 - Use a device that limits the range of movement, set to prevent encroachment.
 - Use an insulating link between the end of the load line and the load.

Use a Dedicated Spotter



- **Always use a dedicated, qualified spotter on the ground** to safely judge distances between hoisting equipment and power lines.
- **Crane and derrick operators:** You must maintain continuous contact with a dedicated spotter to comply with electric line clearance requirements.
- **The spotter's only responsibility should be power line safety.** Don't divide the spotter's attention with other tasks.

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Use a dedicated spotter when working with hoisting equipment around overhead lines.

- Always use a dedicated, qualified spotter on the ground to safely judge distances between hoisting equipment and power lines. From the ground, they will have the clearest vantage point and best be able to judge distances correctly.
- Crane and derrick operators must maintain continuous contact with a dedicated spotter to comply with electric line clearance requirements.
- The spotter's only responsibility should be power line safety. Don't divide the spotter's attention with other tasks. To be effective, the spotter must make spotting and clear communication with the equipment operator the top priorities.

If Your Equipment Contacts a Power Line

- **Consider the equipment and the line energized.**
- **Move the equipment away from the line**, if you can do so safely.
- **Tell others to stay far away.**
- **Remain on the equipment.**
- **Have someone call 911 and Dominion Energy immediately.**
- **If fire or other imminent danger forces you off:**
 - Do NOT touch the equipment and the ground at the same time.
 - Jump clear and land with your feet together.
 - Shuffle at least 30 feet away, keeping your feet together and on the ground at all times. Do not allow any distance between your feet.
- **Never touch fallen power lines or anything they may be contacting.**
- **Do not return to the equipment** until utility personnel tell you it is safe.



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If your equipment contacts a power line, it's critical to follow proper safety procedures.

- Both the equipment and the line should be considered energized.
- Move the equipment away from the line, if you can do so safely.
- Tell others to stay far away. Anyone on the ground who touches the equipment may be injured or killed.
- Remain on the equipment until utility workers signal you off. Anyone on the equipment is safe from shock as long as they stay put.
- Have someone call 911 and Dominion Energy immediately. Their personnel will respond, switch off the power and tell you when it is safe to leave or move the equipment. Wait for their instructions.
- If fire or other imminent danger forces you off the equipment, take these steps:
 - Do NOT touch the equipment and the ground at the same time.
 - Jump clear and land with your feet together.
 - Shuffle at least 30 feet away, keeping your feet together and on the ground at all times. Shuffle by sliding your feet on the ground in a heel-to-toe motion. Do not allow any distance between your two feet, as this increases your risk of electrical shock.
- Never touch fallen power lines or anything they may be contacting. Stay far away and call 911 and Dominion Energy to report the emergency.
- Do not return to the equipment until utility personnel tell you it is safe.



**Know what's below.
Call before you dig.**

Call 8-1-1 Before You Dig

- **Call 811 well in advance of digging** so lines can be marked and you can dig a safe distance away. Call 811, or use the online ticket-entry system:
 - **NC:** nc811.org
 - **VA:** va811.com
 - **SC:** sc811.com
 - **TX:** texas811.org
- **Before you call, pre-mark your proposed excavation area** with white paint, flags or stakes so locators can easily identify and mark affected utilities.
- **If you don't call 811, you risk hitting an underground line.** You or your coworkers could be hurt or killed. You may be held liable for any damages, as well as repairs and outage costs.

Always contact your state 811 center before digging and for the most current requirements.

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Call 811 before you dig. Underground electric lines can pose an unseen but very real danger.

- Notify your local one-call system well in advance of digging by calling 811 or using the online ticket-entry system. They will arrange to mark underground utility lines so you can dig safely. Be sure to leave adequate time in your job schedule. The service is free, but the cost of not calling can be very high. Building a few extra days for the job costs less in the long run than spending months or years recovering physically and financially from a power line incident. And remember, it's the law.
- These are the URLs for online ticket entry when digging in North Carolina, Virginia, South Carolina and Texas:
 - NC: nc811.org
 - VA: va811.com
 - SC: sc811.com
 - TX: texas811.org
- Before you call, pre-mark your proposed excavation area with white paint, flags or stakes so locators can easily identify and mark affected utilities.
- If you don't call 811, you risk hitting an underground line. You or your coworkers could be hurt or killed. You may be held liable for any damages, as well as repairs and outage costs.
- Always contact your state 811 center before digging and for the most current requirements.

Wait the Required Time

- **Wait for utilities to mark their lines.** Do not dig until all utility owners have marked their lines or advised you that the area is clear to dig. Wait time for each state is as follows:

- **NC, SC:** Wait **three full business days**, excluding the date you call 811, weekends and legal holidays
- **VA:** Wait **48 hours** beginning at 7 a.m. the next business day
- **TX:** Wait **48 hours**, excluding weekends and legal holidays

- **If you wait the required time and the locate is not completed, do not dig.** Notify the 811 service that your locate request has not been fulfilled.

Always contact your state 811 center before digging and for the most current requirements.



Wait the required amount of time before starting on any digging project.

- Wait for utilities to mark their lines. Do not dig until all utility owners have marked their lines or advised you that the area is clear to dig.
 - The wait time in North Carolina and South Carolina is three full business days, excluding the date you call 811, weekends and legal holidays.
 - In Virginia, you must wait 48 hours beginning at 7 a.m. on the next business day after your call.
 - In Texas, you must wait 48 hours, excluding weekends and legal holidays.
- If you wait the required time and the locate is not completed, do not dig! Notify the 811 service that your locate request has not been fulfilled.

Conduct a Visual Site Survey



- **Do not rely exclusively on the locate marks.** Look for visual indicators of underground facilities that have not been marked.
- **Check with property owners about any private underground lines** that would not have been marked by the locator.
- **Also check for signs of something buried after the locate was completed,** such as a fresh trench.

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Conduct a visual site survey before beginning any digging.

- Do not rely exclusively on the locate marks. Look for visual indicators of underground facilities that have not been marked, such as meters and pad-mounted transformers. Use your common sense and industry knowledge.
- Check with property owners about any private underground lines that would not have been marked by the locator because they do not belong to a utility.
- Also check for signs of something buried after the locate was completed, such as a fresh trench.

Respect the Marks and Dig with Care

- **Not all utilities are 811 members.** You are responsible for notifying non-member utilities about your project. Check with 811 for more information.
- **Respect the locator marks.** Maintain utility indicator marks, and follow them when digging.
- **Dig with care.** Hand dig to expose marked utility lines and verify their location. Exercise extreme caution when digging near buried utilities, and have a spotter present to observe the excavation whenever heavy equipment is used.
- **Know the underground utility color code:**

AMERICAN PUBLIC WORKS ASSOCIATION COLOR CODE FOR LOCATOR MARKS

			Electric power lines
			Gas, oil or steam pipelines
			Communications lines, cables or conduit
			Potable water
			Reclaimed water, irrigation and slurry lines
			Sewers and drain lines
			Temporary survey markings
			Proposed excavation

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Respect the marks, and dig with care. After you contact 811, the underground utility locator service will arrange for each member utility to send someone out to your dig site to mark the underground lines.

- Not all utilities are 811 members and may not be notified. You are responsible for notifying non-member utilities. Check with 811 for more information.
- Respect the locator marks. Maintain utility indicator marks for the duration of the job, and follow them when digging. If lines become indistinguishable, notify 811 to refresh them—do NOT use paint to refresh fading marks yourself!
- Dig with care. Hand dig to expose marked utility lines and verify their location. Exercise extreme caution when digging near buried utilities, and have a spotter present to observe the excavation whenever heavy equipment is used.
- Know the underground utility color code. Utilities use these colors to mark their lines. Learn the code to stay safe.

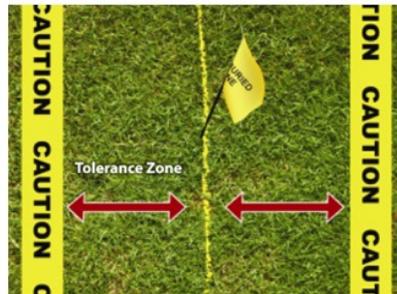
Point to the chart as you speak.

- Red: Electric power lines
- Yellow: Gas, oil or steam pipelines
- Orange: Communications lines, cables or conduit
- Blue: Potable water
- Purple: Reclaimed water, irrigation and slurry lines
- Green: Sewers and drain lines
- Pink: Temporary survey markings
- White: Proposed excavation

Respect the Tolerance Zone

- Follow state laws for digging within the “tolerance zone,” a safety area that spans the width of a marked utility plus a specified distance from each indicated outside edge.
- The tolerance zone is a *minimum* safety clearance. Protect yourself by using the *maximum* possible distance.

Always contact your state 811 center before digging and for the most current requirements.



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Respect the tolerance zone. This not only protects buried utilities from damages, but it also protects you from injury.

- Adhere to state laws for digging within the “tolerance zone,” a safety area that spans the width of a marked utility plus a specified distance of up to 24 inches on either side of the indicated outside edge of the utility on a horizontal plane. Refer to state laws for the appropriate distance. Use hand tools or vacuum technology **ONLY** within this safety zone.
- The tolerance zone is a minimum safety clearance. Locator marks are only the locator’s most reasonable interpretation of the equipment’s signal. So protect yourself by using the maximum possible distance.

Know When to Stop Digging



- **If there are no locate marks after you have waited the required time**, do NOT dig. Call 811, and wait until utility lines are marked or you have been notified that the area is clear of lines.
- **If you do not understand the locate marks**, do NOT dig. Ask your supervisor what you must do to work safely.
- **If you cannot visually verify the location of marked power lines by hand digging**, STOP digging and contact Dominion Energy immediately.
- **If you find unmarked, mismarked or seemingly abandoned facilities**, STOP digging. Assume all utility lines are in service, and report them to 811.
- **If you see signs of something buried after the locate was complete**, such as a fresh trench, STOP digging. Call 811.
- **If the marks fade or are destroyed**, STOP digging and call 811 to request a new ticket. Do not resume digging until the area is re-marked.

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Know when to stop digging. When you work around buried power lines, knowing when to stop a job could save your life.

- If there are no locate marks after you have waited the required time, do NOT dig. Call 811, and wait until utility lines are marked or you have been notified that the area is clear of lines.
- If you do not understand the locate marks, do NOT dig. Ask your supervisor what you must do to work safely.
- If you cannot visually verify the location of marked power lines by hand digging, STOP digging and contact Dominion Energy immediately.
- If you find unmarked, mismarked or seemingly abandoned facilities, STOP digging. Assume all utility lines are in service, and report them to 811.
- If you see signs of something buried after the locate was complete, such as a fresh trench, STOP digging. Call 811.
- If the marks fade or are destroyed, STOP digging and call 811 to request a new ticket. Do not resume digging until the area is re-marked.

Utility Safety Review

- Identify all power lines and electrical equipment upon arrival at a job site. Recheck the site daily, and review your emergency plan.
- Keep yourself and all tools and equipment (other than cranes and derricks used in construction) **AT LEAST 10 feet away** from *all* overhead power lines carrying up to 50 kV. Always assume that lines are energized.
- Cranes and derricks used in construction must remain a minimum of **20 feet away** from lines up to 350 kV and **50 feet away** from lines greater than 350 kV, if operated up to the equipment's maximum reaching radius. In addition to these minimum safe working distances, the operator must implement specific encroachment prevention precautions. For more information, consult osha.gov.
- Always use a dedicated spotter.
- If a power line contact occurs, follow proper safety procedures, and immediately call **911** and Dominion Energy.
- Notify the underground utility locator service by calling 811 or using the online ticket-entry system before you dig.

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So let's review the key safety points of this presentation.

- Identify all power lines and electrical equipment upon arrival at a job site. Recheck the site daily, and review your emergency plan.
- Keep yourself and all tools and equipment (other than cranes and derricks used in construction) **AT LEAST 10 feet** away from all overhead power lines carrying up to 50 kV. Always assume that lines are energized.
- Cranes and derricks used in construction must remain a minimum of 20 feet away from lines up to 350 kV and 50 feet away from lines greater than 350 kV, if operated up to the equipment's maximum reaching radius. In addition to these minimum safe working distances, the operator must implement specific encroachment prevention precautions. For more information, consult osha.gov.
- Always use a dedicated spotter.
- If a power line contact occurs, follow proper safety procedures and immediately call 911 and Dominion Energy.
- Notify the underground utility locator service by calling 811 or using the online ticket-entry system before you dig.

811 Information

■ To reach your state's underground utility locator service, call 811 or use the online ticket-entry system:

- NC: nc811.org
- VA: va811.com
- SC: sc811.com
- TX: texas811.org

■ Wait time for each state is as follows:

- NC, SC: Wait **three full business days**, excluding the date you call 811, weekends and legal holidays
- VA: Wait **48 hours** beginning at 7 a.m. the next business day
- TX: Wait **48 hours**, excluding weekends and legal holidays

Always contact your state 811 center before digging and for the most current requirements.

And now let's review the 811 URLs and wait times.

- To reach your state's utility locator service, call 811 or use the URLs shown here for online ticket entry.
- The wait time in North Carolina and South Carolina is three full business days, excluding the date you call 811, weekends and legal holidays.
- In Virginia, you must wait 48 hours beginning at 7 a.m. on the next business day after your call.
- In Texas, you must wait 48 hours, excluding weekends and legal holidays.

Contact Information

- In case of an electrical emergency, call 911 and Dominion Energy:
 - North Carolina and Virginia: 1-866-DOM-HELP (366-4357)
 - South Carolina: 888-333-4465
 - Texas: 911
- For additional information, visit Dominion Energy's website at domsafety.com/contractors

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Last but not least, here is some important contact information to keep handy:

- In case of an electrical emergency, call 911 and Dominion Energy.
 - In North Carolina and Virginia, the number is 1-866-DOM-HELP (366-4357).
 - In South Carolina, the number is 888-333-4465.
 - In Texas, simply call 911.
- For additional information, visit Dominion Energy's website at domsafety.com/contractors.

 Dominion Energy®

worker
beware

Working Safely Around Electric Lines

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Thank you for your attention.

Take questions, and begin discussion. If you are using the trainer's guide, in it you will find more detail about the properties of electricity, when to contact Dominion Energy and other information.

Discuss how this information conflicts with what your audience believed about electrical safety, and ask how they may have put themselves or others at risk in the past. Ask what they would have done differently had they had this training before.

Dominion Energy thanks you for helping to keep workers safe.