



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 overhead and underground electric power lines and near natural gas pipelines. 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 utility 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.

 **Respect the Power of Electricity**

- **When you arrive at a job site, always check for overhead power lines, poles and support wires, and point them out to your coworkers.**
- **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.**




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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 check for overhead power lines, poles and support wires, and point them out to your coworkers. Review proper safety procedures before beginning work.
- 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 is 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.

Beware of Overhead Power Lines


- **Always check for overhead power lines when parking vehicles with extensions, using a forklift or raising a dump truck bed.**
Determine the maximum safe lift height before you start the job.
- **Check for overhead lines before throwing tie-downs when securing a load.**
- **Carry ladders, pipes and long tools parallel to the ground to avoid hitting power lines.**



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Beware of overhead power lines that may run through or near a farm or ranch.

- Always check for overhead lines when parking vehicles with extensions (such as scissors, cranes or cherry pickers), using a forklift or raising a dump truck bed. Determine the maximum safe lift height before you start the job.
- Check for power lines before throwing tie-downs when securing a load.
- Carry ladders, pipes and long tools parallel to the ground to avoid hitting power lines.




**For Tools & Equipment Other Than Cranes & Derricks
Used in Construction: Always Observe the 10-Foot Rule**

- OSHA requires that you **keep yourself and your equipment AT LEAST 10 feet away from overhead power lines of 50 kV or less.**
- **Higher voltages require a larger safety zone.** If you have questions about power line voltages, contact PG&E at 1-800-743-5000.
- **If your job requires you to work closer than 10 feet from power lines,** contact PG&E well in advance to make safety arrangements.
- Electrical safety distances given here are **minimums.**
- **Always use the maximum possible distance, and clearly mark boundaries** to keep workers and equipment the required distance away.

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For tools and equipment, always observe the 10-foot rule. (Cranes and derricks on construction sites 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 of 50 kV or less. This applies to all personnel, tools and equipment other than cranes or derricks used in construction. Be aware that wind can move long or tall equipment, so build in some extra distance in case of an unexpected shift.
- Higher voltages require a larger safety zone. If you have questions about power line voltages, contact PG&E at 1-800-743-5000. 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 PG&E 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 the required distance away.




Cranes & Derricks Used in Construction

- **Keep the crane boom and load AT LEAST 20 feet away** from lines up to and including 350 kV and **50 feet away** from lines greater than 350 kV but at or less than 1,000 kV until the operator has taken specific safety measures. Consult Cal/OSHA for all requirements.
- **Always assume the line is energized** and allow nothing closer than the Cal/OSHA minimum distances unless you have confirmed with PG&E that the line has been de-energized.
 - Once you have established the required clearance, clearly mark a boundary with tape, signs or barricades.
- **Whenever cranes or derricks are used in construction on your job site,** contact PG&E well in advance at 1-800-743-5000 so any necessary safety arrangements can be made.


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Cranes and derricks used in construction require different safety precautions than other equipment.

- Keep the crane boom and load at least 20 feet away from lines up to and including 350 kV and 50 feet away from lines greater than 350 kV but at or less than 1,000 kV until the operator has taken specific safety measures. Consult Cal/OSHA for all requirements.
- Always assume the line is energized and allow nothing closer than the Cal/OSHA minimum distances unless you have confirmed with PG&E that the line has been de-energized.
 - Once you have established the correct clearances, mark an obvious boundary to keep workers and equipment the required distance away.
- Whenever cranes or derricks are used on your job site, contact PG&E well in advance so any necessary facility protection arrangements can be made.

 **Use a Dedicated Spotter**


- **Always use a dedicated spotter on the ground** to safely judge distances between heavy equipment and power lines.
- **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 heavy equipment around overhead lines.

- Always use a dedicated spotter on the ground to safely judge distances between heavy equipment and power lines. From the ground, they will have the clearest vantage point and be best able to judge distances correctly.
- 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 Heavy Equipment Contacts a Power Line**

- **Stay on the equipment** until PG&E says it is safe to get off.
- **Warn others to stay away.** Anyone on the ground who touches the equipment may be seriously injured.
- **Call 911 immediately and then call PG&E at 1-800-743-5000.**
- **If you must exit the vehicle because of imminent risk from fire or other serious safety hazard:**
 - Remove loose items of clothing, jewelry, seat belts and anything else that could obstruct you.
 - Jump entirely clear of the vehicle and the line, as far away as possible.
 - As you jump, keep both feet together and land without touching the ground and equipment at the same time.
 - After you land, do not touch the vehicle or line.
 - Shuffle away with small steps, or hop away on two feet, keeping both feet close together at all times.

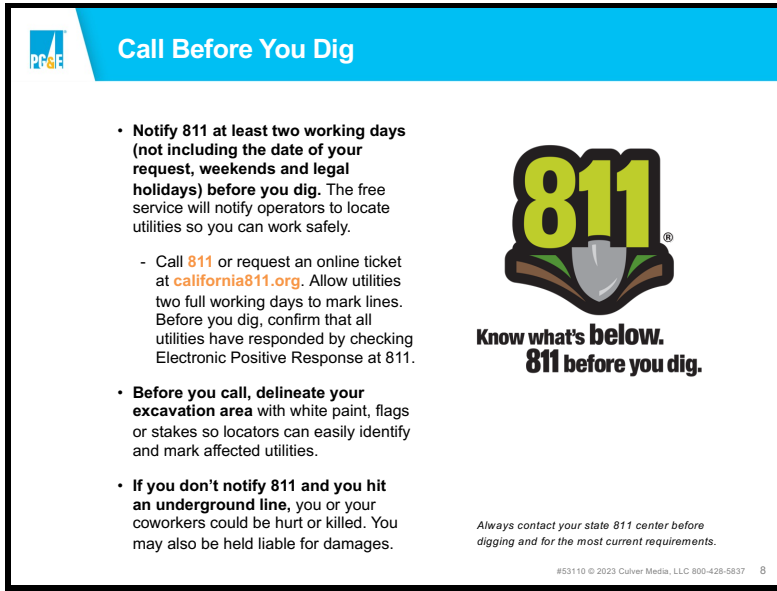


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If heavy equipment contacts a power line, it's critical to follow proper safety procedures.

- Stay on the equipment until PG&E says it is safe to get off. Both the equipment and the line should be considered energized.
- Warn others to stay away. Anyone on the ground who touches the equipment may be seriously injured or killed.
- Call 911 immediately and then call PG&E at 1-800-743-5000. Their personnel will respond quickly, switch off the power and tell you when it is safe to move the equipment. Wait for their instructions.
- If you must exit the vehicle because of imminent risk from fire or other serious safety hazard:
 - Remove loose items of clothing, jewelry, seat belts and anything else that could obstruct you.
 - Jump entirely clear of the vehicle and the line, as far away as possible.
 - As you jump, keep both feet together and land without touching the ground and equipment at the same time.
 - After you land, do not touch the vehicle or line.
 - Shuffle away with small steps, or hop away on two feet, keeping both feet close together at all times.

Demonstrate the jump-off procedure.



The poster features a blue header with the text 'Call Before You Dig' and a logo on the left. The main content is white with black text. It includes a large '811' logo with a shovel and the slogan 'Know what's below. 811 before you dig.' Below this is a small disclaimer: 'Always contact your state 811 center before digging and for the most current requirements.' At the bottom, there is a small copyright notice: '#53110 © 2023 Culver Media, LLC 800-438-5837 8'.

Call Before You Dig

- **Notify 811 at least two working days (not including the date of your request, weekends and legal holidays) before you dig.** The free service will notify operators to locate utilities so you can work safely.
 - Call **811** or request an online ticket at california811.org. Allow utilities two full working days to mark lines. Before you dig, confirm that all utilities have responded by checking Electronic Positive Response at 811.
- **Before you call, delineate your excavation area** with white paint, flags or stakes so locators can easily identify and mark affected utilities.
- **If you don't notify 811 and you hit an underground line,** you or your coworkers could be hurt or killed. You may also be held liable for damages.

811
Know what's below.
811 before you dig.

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

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Call before you dig. Underground power and natural gas lines can pose an unseen but very real danger.




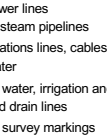
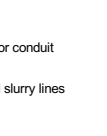

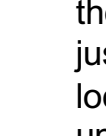
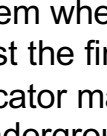
- Notify 811 at least two working days (not including the date of your request, weekends and legal holidays) before you dig. The free service will notify operators to locate utilities so you can work safely.
 - Call 811 or request an online ticket at california811.org. Allow utilities two full working days to mark lines. Before you dig, confirm that all utilities have responded by checking Electronic Positive Response at 811.
- This service is free, but the costs of not using it can be very high. Building in extra days for the job costs less in the long run than spending months or years recovering physically and financially from a utility-line accident. And remember, it's the law!
- Before you call, delineate your excavation area with white paint, flags or stakes so locators can easily identify and mark affected utilities.
- If you don't notify 811 and you hit an underground line, you or your coworkers could be hurt or killed. You may also be held liable for damages. Don't risk it. Call before you dig.

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

PC&E **Dig Safety**

- **Talk to the property owner.** Ask about any private underground lines that may not belong to a utility and so would not be marked by the locator.
- **Respect the locator marks.** Maintain utility indicator marks and follow them when digging.
- **Dig with care.** The law requires you to hand excavate within 24 inches of each side of marked utilities.
- **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
	Your proposed excavation

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


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Dig safely. After you call, the underground utility locator service will arrange for each utility to send someone out to mark underground lines.


- Talk to the property owner. Ask about any private underground lines that may not belong to a utility and so would not be marked by the locator.
- Respect the marks. Maintain utility locator marks and follow them when digging. Remember that calling for a locate is just the first step. This system works only if you follow the locator marks whenever you dig in the vicinity of underground utilities.
- Dig with care. The law requires you to hand excavate within 24 inches of each side of marked utility lines. Too many accidental utility contacts have occurred when someone dug with a backhoe or other power-operated equipment instead of a shovel.
- Know the underground utility code. Utilities use these colors to mark their lines. Learn the code to stay safe.

Point to each color 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: Your proposed excavation

 **Look for Pipeline Markers**

- **Always be aware of pipeline markers** that indicate the need for extra care around a high-volume natural gas transmission line.
- **These markers specify the line's approximate location**, but not all pipelines follow a straight path between markers.
 - **Never use these markers as a substitute for notifying 811** before you dig or move earth in any way.
- **If your proposed excavation is within 10 feet of a natural gas transmission line 60 PSI or greater**, you will be notified that a meeting with PG&E at the job site is required.




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Look for pipeline markers. It is important to be aware of gas transmission pipelines in the vicinity of your job site.

- Always be aware of pipeline markers that indicate the need for extra care around a high-volume natural gas transmission line.
- These red and white markers specify the line's approximate location, but not all pipelines follow a straight path between markers.
 - Never use these markers as a substitute for notifying 811 before you dig or move earth in any way.
- If your proposed excavation is within 10 feet of a natural gas transmission line 60 PSI or greater, you will be notified that a meeting with PG&E at the job site is required.

Recognizing a Natural Gas Pipeline Leak


- **PG&E adds a highly recognizable sulfur-like odor to natural gas to assist in leak detection. But don't rely on your nose alone. Be alert for any of these gas leak warning signs:**
 - A sulfur-like or rotten-egg odor
 - Hissing, whistling or roaring sounds
 - Dirt spraying into the air
 - Dead or dying vegetation in a landscaped area over or near a pipeline
 - Continuous bubbling in water
 - Exposed pipeline after an earthquake, fire, flood or other disaster
 - Damaged connections to gas appliances




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Recognizing a natural gas pipeline leak. It is important to learn the warning signs.

- PG&E adds a highly recognizable sulfur-like odor to natural gas to assist in leak detection. But don't rely on your nose alone. Be alert for any of these gas leak warning signs:
 - A sulfur-like or rotten-egg odor. (Not all gas is odorized, so don't rely on smell alone to detect a leak.)
 - Hissing, whistling or roaring sounds coming from underground. The sound will vary with the pressure in the line.
 - Dirt spraying into the air.
 - Dead or dying vegetation in a landscaped area over or near a pipeline.
 - Continuous bubbling in water. This will vary with pressure as well.
 - Exposed pipeline after an earthquake, fire, flood or other disaster.
 - Damaged connections to gas appliances.

 **Responding to a Natural Gas Pipeline Leak**


- If you suspect a gas leak or if you contact a gas pipeline:
 - Leave equipment; don't turn off engines or generators.
 - Warn others and leave the area quickly.
 - Do not operate pipeline valves or stop the flow of gas.
 - Leave the excavation open.
 - Immediately call 911 and PG&E at 1-800-743-5000. Call even if damage is a minor nick or scrape.
 - Notify the Underground Safety Board at california811.org within two hours.
 - Do not light a match, start an engine or operate any electrical device—even a phone.
 - Stay away from the area until utility workers say it is safe to return.



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Responding to a natural gas pipeline leak. The single greatest risk from natural gas leaks is explosion. Even the smallest spark can ignite the gas, and sparks can come from some unexpected sources. So it's important to know the proper dos and don'ts for dealing with a natural gas leak.

- If you suspect a leak or if you contact a natural gas pipeline, even if a leak is not obvious, assume there's a danger.
 - Leave equipment; don't turn off engines or generators.
 - Warn others and leave the area quickly.
 - Do not operate pipeline valves or stop the flow of gas.
 - Leave the excavation open.
 - Immediately call 911 and PG&E at 1-800-743-5000. State law requires you notify PG&E immediately if you contact, scrape, dent, nick or otherwise damage any gas line, so call even if damage is a minor nick or scrape.
 - Notify the Underground Safety Board at california811.org within two hours.
 - Do not light a match, start an engine or operate any electrical device—even a phone.
 - Stay away from the area until utility workers say it is safe to return.




Utility Safety Review

- Identify all power lines and electrical equipment upon arrival at a job site. Recheck the site daily.
- Keep yourself and all tools and equipment **AT LEAST 10 feet away** from all overhead power lines of 50 kV or less.
- Cranes and derricks used in construction require clearances of 20 feet or greater until the operator has taken specific safety measures.
- Always use a dedicated spotter.
- If a power line contact occurs, follow proper safety procedures and immediately call **911** and PG&E.
- Contact 811 before you dig.
- Know the warning signs of a natural gas leak.
- If you contact a natural gas pipeline, leave the area, avoid spark hazards and call **911** and PG&E.

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

- Identify all power lines and electrical equipment upon arrival at a job site. Recheck the site daily. Always alert your coworkers to the presence of power lines and electrical equipment.
- Keep yourself and all tools and equipment **AT LEAST 10 feet away** from all overhead power lines of 50 kV or less. Always assume lines are energized.
- Cranes and derricks used in construction require clearances of 20 feet or greater until the operator has taken specific safety measures.
- Always use a dedicated spotter to monitor distances between equipment and overhead power lines.
- If a power line contact occurs, follow proper safety procedures and immediately call 911 and PG&E.
- Contact 811 to have buried utility lines marked before any digging or other earth-moving operations. Respect the marks, and hand dig within 24 inches of each side of marked utilities.
- Know the warning signs of a natural gas leak.
- If you contact a natural gas pipeline, leave the area, avoid spark hazards and call 911 and PG&E immediately. Even if a gas leak is not obvious, always follow the safety procedures presented here.

 **Underground Service Alert Contact Information**

- Notify **811** at least two working days (not including the date of notification) ahead of digging. Call **811** or use the online ticket entry system at california811.org.


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



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

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Notify 811 at least two working days (not including the date of notification) ahead of digging. Call 811 or use the online ticket entry system at california811.org.




Report All Utility Contacts

- If you contact a gas pipeline or electric power line, call **911** and PG&E at **1-800-743-5000** immediately.
 - Report all utility contacts, even if damage appears minor.
- If you contact a gas pipeline or suspect a gas leak, also notify the Underground Safety Board at **california811.org** within two hours.
- For additional information, visit our website at **pgesafetyeducation.com/contractor**.

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- If you contact a gas pipeline or electric power line, call 911 and PG&E at 1-800-743-5000 immediately. Report all utility contacts, even if damage appears minor.
- If you contact a gas pipeline or suspect a gas leak, also notify the Underground Safety Board at california811.org within two hours.
- For additional information, visit PG&E's website at pgesafetyeducation.com/contractor.



Work Safely Around Electric and Gas Lines

Thank you for helping to keep you and your coworkers safe.

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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 and natural gas, when to contact PG&E and other information.

Discuss how this information conflicts with what your audience believed about electric and natural gas 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.

PG&E thanks you for helping to keep workers safe.