



worker
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Work safely around natural gas and electric lines

Before darkening the room, offer a welcome and overview. Begin by introducing the program and its topic:

- Today's education session focuses on working safely near natural gas pipelines and around overhead and underground electric power lines. Following the procedures we'll cover here today will assist you in keeping 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 identify power lines and high-voltage equipment**, 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.
- **Review your emergency plan** before work begins so that 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.
- 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.
- Review your emergency plan before work begins so that everyone knows what to do in case of power line contact.

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 (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 BGE for clearance information.
- **If your job requires you to work closer than 10 feet from power lines,** call BGE 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.

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 long or tall equipment, so build in some extra distance in case of an unexpected shift.
- Higher-voltage lines require greater clearances. Contact BGE 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 BGE 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 in construction

- **When cranes and derricks are used in construction:** Keep the crane boom and load *at least 20 feet away* from lines up to 350 kV and **50 feet away** from lines greater than 350 kV but at or less than 1,000 kV. Always assume the line is energized, and allow nothing closer unless you have confirmed with BGE that the line has been de-energized.
 - If voltage is unknown, contact BGE before work begins.
- **As voltage increases, clearance distances also increase.** Contact BGE and consult the OSHA regulations at [osha.gov](https://www.osha.gov) for specific clearance requirements and encroachment prevention precautions.
 - 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 BGE well in advance so any necessary facility protection arrangements can be made.

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

- When cranes and derricks are used in construction, keep the crane boom and load at least 20 feet away from lines up to 350 kV and 50 feet away from lines greater than 350 kV but at or less than 1,000 kV. Always assume the line is energized, and allow nothing closer unless you have confirmed with BGE that the line has been de-energized.
 - If voltage is unknown, contact BGE before work begins.
- As voltage increases, clearance distances also increase. Consult BGE and the OSHA regulations at [osha.gov](https://www.osha.gov) for specific 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.
- Whenever cranes or derricks are used on your job site, contact BGE 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 hoisting equipment and power lines.
- **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.



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

- Always use a dedicated 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 be best able to judge distances correctly.
- Cranes 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 priority.

If heavy equipment contacts a power line

- **Remain on the equipment.**
- **Tell others to stay away.**
- **Have someone call 911 and BGE 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.
 - Take very short hops, keeping feet together and making contact with the ground at the same time.



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

- **Remain on the equipment.**
- **Tell others to stay away.** Anyone who touches the equipment or even the ground nearby may be injured or killed.
- **Have someone call 911 and BGE immediately.**
- **If fire or other imminent danger forces you off, follow the proper jump-off procedure:**
 - Do not touch the equipment and the ground at the same time.
 - Jump clear, and land with your feet together.
 - Take very short hops, keeping feet together and making contact with the ground at the same time.

Demonstrate the jump-off procedure.

Call before you dig. It's the law!

- **The law requires you to call Miss Utility at 811 at least two full business days but not more than 10 days prior to digging.** This free service will arrange to have underground utility lines marked so you can dig a safe distance away.
- **Before you call, PRE-MARK your excavation route** so locators can easily identify and mark affected utilities.
- **If you don't call 811, you risk hitting an underground utility line, resulting in possible outages, fire or explosion.** You or your coworkers could be hurt or killed, and you may be held liable for any resulting damages, as well as outage and repair costs.

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



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

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

- The law requires you to call Miss Utility at 811 at least two full business days before digging (excluding the date of your request, weekends and legal holidays), but not more than 10 days prior to digging. This free service will arrange to have underground utility lines marked so you can dig a safe distance away. Be sure to leave adequate time in your job schedule. The service is free, but the costs of not calling 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, pre-mark your excavation route so locators can easily identify and mark affected utilities.
- If you don't call 811, you risk hitting an underground utility line, resulting in possible outages, fire or explosion. You or your coworkers could be hurt or killed, and you may be held liable for any resulting damages, as well as outage and repair costs. Don't risk it. Call before you dig.
- **Always contact your state 811 center before digging and for the most current requirements.**

Wait the required time

- In Maryland, wait two full business days, excluding the date of your request, 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.



After you notify 811, wait the required time for buried utility lines to be marked before you dig:

- This wait time varies by state. In Maryland, wait two full business days, excluding the date of your request, weekends and legal holidays.
- If you wait the required time and the locate is not completed, do not dig! You must 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, such as meters, valves and pad-mounted transformers.
- **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.
 - If you find a newly installed or unmarked facility, call 811.



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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, valves 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.
 - If you find a newly installed or unmarked facility, call 811.

Respect the marks, and dig with care

- **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.
- **Exercise extreme caution when digging near buried utilities and the tolerance zone,** and have a spotter present to observe the excavation whenever heavy equipment is used.

AMERICAN PUBLIC WORKS ASSOCIATION COLOR CODE FOR LOCATOR MARKS



Red	Electric power lines
Yellow	Gas, oil or steam
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

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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 their underground lines.

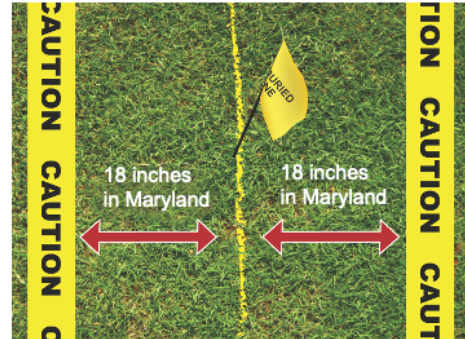
- Not all utilities are 811 members and may not be notified. You are responsible for notifying non-member utilities. Check with 811 for more information.
- Respect the locator marks. Maintain the marks and follow them when digging. Remember that calling for a locate is just the first step. This system works only if you follow the locator marks whenever you dig in the vicinity of underground utilities.
- Dig with care. Exercise extreme caution when digging near buried utilities and the tolerance zone, which we will discuss on the next slide. Have a spotter present to observe the excavation whenever heavy equipment is used.
- Know the underground utility code. Utilities use these colors to mark their lines. Learn the code to stay safe.

Click for chart and point as you speak.

- | | |
|---|--|
| – Red: electric power lines | – Purple: reclaimed water, irrigation and slurry lines |
| – Yellow: gas, oil or steam | – Green: sewers and drain lines |
| – Orange: communications lines, cables or conduit | – Pink: temporary survey markings |
| – Blue: potable water | – White: your proposed excavation |

Respect the tolerance zone

- **Adhere to state laws for digging within the “tolerance zone.”**
This safety area spans the width of a marked utility line plus a state-mandated distance from each indicated outside edge of the line: 18 inches in Maryland.
- **Hand dig or use vacuum excavation equipment prudently in this zone.**
- **Once visual identification has been achieved, do not use mechanized digging equipment within 18 inches of the outermost surface of buried utility lines.** Use a spotter to observe the excavation and help prevent damage when heavy equipment is used near utility lines.
- **The tolerance zone is a *minimum* safety clearance.** Protect yourself by using the maximum possible distance.



Respecting the tolerance zone protects buried utility lines from damage and 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 line plus a state-mandated distance from each indicated outside edge of the line.
 - In Maryland, this distance is 18 inches.
- Hand-dig or use vacuum excavation equipment prudently in this zone. Use extreme care and caution. Too many accidental utility contacts have occurred when someone dug with a backhoe or other power-operated equipment instead of a shovel.
- Once visual identification has been achieved, do not use mechanized digging equipment within 18 inches of the outermost surface of buried utility lines. Use a spotter to observe the excavation and help prevent damage when heavy equipment is used near utility lines.
- 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.
- If you do not understand the locate marks, do NOT dig.
- If you cannot visually verify the location of marked utility lines, STOP digging.
- If you find unmarked, mismarked or seemingly abandoned facilities, STOP digging.
- If you see signs of something buried after the locate was complete, such as a fresh trench, STOP digging.
- If the marks fade or are destroyed, STOP digging and contact 811 to request a new ticket.



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When you work around buried power lines and natural gas pipelines, 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. Notify the 811 service that your locate request has not been fulfilled.
- 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 utility lines by hand-digging, STOP digging and notify 811 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. Notify 811.
- If the marks fade or are destroyed, STOP digging and contact 811 to request a new ticket. Do not resume digging until the area is re-marked.

Natural gas basics

- **Natural gas travels through pressurized underground pipelines of varying diameters.** The size of a gas line is NOT a reliable indicator of the internal pressure.
- **BGE adds a distinctive, sulfur-like odor to natural gas to assist in the detection of leaks.** However, in certain conditions, you may not be able to smell this odorant.
- **Leaking natural gas can be ignited by a tiny flame or spark—**even from a lit cigarette or a phone.



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Understanding natural gas basics will help you prevent accidents around natural gas pipelines.

- Natural gas travels through pressurized underground pipelines of varying diameters. These pipelines range from 1 inch to 4 feet wide. There are three types of pipes used in the system: transmission pipelines, main lines and service lines. It pays to be careful around ALL types of pipelines. Pipeline pressure can vary from $\frac{1}{4}$ pound to 1,000 pounds per square inch. The pressure is what moves the gas through the pipes. It's also what makes damaging a pipeline so dangerous.
- BGE adds a distinctive, sulfur-like odor to natural gas to assist in the detection of leaks. However, in certain conditions, this smell may not be apparent. Additionally, weather and soil conditions can strip the odorant from the gas.
- Leaking natural gas can be ignited by a tiny spark or flame—even from a lit cigarette or a phone. To avoid spark hazards, do not turn anything electrical on—or off—in the vicinity of a gas leak.

Watch out around pipeline markers

- **High-visibility pipeline markers indicate the need for extra care around** our natural gas transmission pipelines.
- **These markers are general indicators only.** For security purposes, they do not show the exact location, path or depth of gas pipelines.
- **The markers should never be used as a substitute for calling 811.**
- **Call the number on the marker if you notice any type of suspicious activity** or construction occurring nearby without gas utility personnel present.



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It's critical to be aware of gas transmission pipelines in the vicinity of your job site.

- High-visibility pipeline markers with the BGE 24-hour emergency phone number indicate the need for extra care around our natural gas transmission pipelines. These markers are usually found at roadways, railroad crossings and other points along the pipeline route.
- These markers are general indicators only. For security purposes, they do not show the exact location, path, depth or number of gas pipelines in the area, and not all pipelines follow a straight course between markers. Maps can also be viewed to identify the approximate locations of major natural gas pipelines (but not gas distribution main lines or service lines). You can access them via the National Pipeline Mapping System website: <https://www.npms.phmsa.dot.gov>.
- The markers should never be used as a substitute for calling 811. Nor should you rely on the pipeline maps. 811 is your best resource for natural gas pipeline locates.
- Call the number on the marker if you notice any type of suspicious activity or construction occurring nearby without gas utility personnel present.

Recognizing a natural gas pipeline leak: Look, listen and smell

- BGE puts the safety additive mercaptan in natural gas, giving it a rotten-egg odor and making it easier to detect. **Some gas leaks are also detectable by sight or sound.** Signs of a gas leak include:
 - **Dirt** being blown into the air
 - **Dead vegetation** in an otherwise green area
 - **A dry spot** in an otherwise moist area
 - **Fire** coming from the ground or appearing to burn above the ground
 - **Water** bubbling or being blown into the air
 - **Roaring**, blowing or hissing sounds
 - **Exposed pipeline** after an earthquake, fire, flood or other disaster
 - **A damaged connection** to a gas appliance



When it comes to detecting natural gas leaks, you must use all your senses.

BGE puts the safety additive mercaptan in natural gas, giving it a rotten-egg odor and making it easier to detect. Some gas leaks are also detectable by sight or sound. Signs of a gas leak include:

- Dirt being blown into the air
- Dead vegetation in an otherwise green area
- A dry spot in an otherwise moist area
- Fire coming from the ground or appearing to burn above the ground
- Water bubbling or being blown into the air
- Roaring, blowing or hissing sounds
- Exposed pipeline after an earthquake, fire, flood or other disaster
- A damaged connection to a gas appliance

Responding to a natural gas pipeline leak

- **If you suspect a gas leak or if you contact a gas pipeline, take these steps:**
 - **Warn others and leave the area immediately.** Go to a safe place, then call BGE at 877.778.7798.
 - **Extinguish open flames.** Do not use matches or lighters. Do not attempt to light an appliance.
 - **Do not use any phones, electric switches, thermostats or appliance controls.** All of these devices, including battery-operated equipment, can cause sparks and ignite natural gas.
 - **Do not start or turn off vehicles or motorized equipment.** Abandon any motorized equipment.
 - **Do not attempt to find the source of the leak** or to repair a leak.
 - **Call 911 if you are concerned about your safety.** If gas is escaping, federal code requires you to call 911.
 - **Emergency gas service calls are answered 24/7.** BGE will respond promptly to survey the area, perform safety measures and repair BGE's equipment. There is no charge to investigate a gas leak.
- **Review your emergency plan** before work begins so that everyone knows what to do in case of natural gas pipeline contact.



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Responding to a natural gas pipeline leak requires great caution. 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.

- If you suspect a leak or if you contact a gas pipeline—even if a leak is not obvious—assume there's a danger:
 - Warn others and leave the area immediately. Go to a safe place, then call BGE at 877.778.7798.
 - Extinguish open flames. Do not use matches or lighters. Do not attempt to light an appliance.
 - Do not use any phones, electric switches, thermostats or appliance controls. All of these devices, including battery-operated equipment, can cause sparks and ignite natural gas.
 - Do not start or turn off vehicles or motorized equipment. Abandon any motorized equipment.
 - Do not attempt to find the source of the leak or to repair a leak.
 - Call 911 if you are concerned about your safety. If gas is escaping, federal code requires you to call 911.
 - Emergency gas service calls are answered 24/7. BGE will respond promptly to survey the area, perform safety measures and repair BGE's equipment. There is no charge to investigate a gas leak.
- Review your emergency plan before work begins so that everyone knows what to do in case of a natural gas pipeline contact.

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 *at least 10 feet away* from all overhead power lines carrying up to 50 kV. Higher voltages require greater clearances.
- Cranes and derricks used in construction may require clearances greater than 10 feet and encroachment prevention precautions.
- Always use a dedicated spotter.
- If a power line contact occurs, follow proper safety procedures and immediately call **911** and BGE.
- Call Miss Utility at **811** and wait the required time before you dig.
- Know the warning signs of a natural gas leak.
- If you suspect a gas leak or if you contact a gas pipeline, warn others, leave the area immediately, go to a safe place and call BGE. If gas is escaping, you must call **911**.

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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. 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. Higher voltages require greater clearances. Always assume that lines are energized.
- Cranes and derricks used in construction may require clearances greater than 10 feet and encroachment prevention precautions. Visit [osha.gov](https://www.osha.gov) for specific clearance requirements.
- 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 BGE.
- Call Miss Utility at 811 and wait the required time before you dig. Be sure to call at least two full business days but not more than 10 days before any digging or other earth-moving operations. Respect the marks. Hand-dig within 18 inches on each side of marked utilities.
- Know the warning signs of a natural gas leak.
- If you suspect a gas leak or if you contact a gas pipeline, warn others, leave the area immediately, go to a safe place and call BGE. If gas is escaping, you must call 911 as well.

Underground utility locator contact information

- Call Miss Utility at **811** or these local numbers:
 - Delaware: 800.282.8555
 - Washington, DC: 202.265.7177
 - MD (Western Shore): 800.257.7777
 - MD (Eastern Shore): 800.441.8355
- Visit **missutility.net**.



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

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There are a few ways to reach Miss Utility to request a locate.

Call Miss Utility at 811 or these local numbers:

- Delaware: 800.282.8555
- Washington, DC: 202.265.7177
- MD (Western Shore): 800.257.7777
- MD (Eastern Shore): 800.441.8355

Alternatively, you may enter a locate request online at missutility.net.

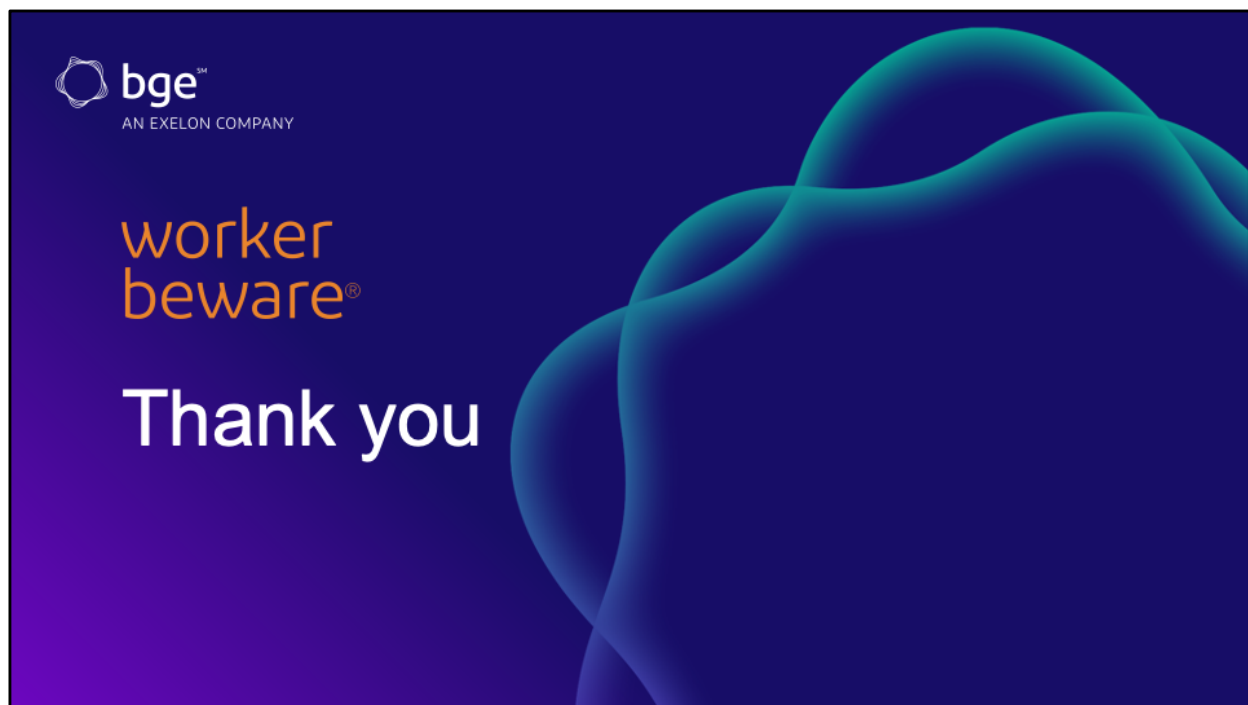
Contact information

- In case of a natural gas or electrical emergency, call 911 and BGE at **800.685.0123**.
- For additional information, visit our website at **BGE.COM/ContractorSafety**.

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- In case of a natural gas or electrical emergency, call 911 and BGE at 800.685.0123.
- For additional information, visit our website at BGE.COM/ContractorSafety.



Thank you for your attention.

Take questions and begin discussion. If you are using the safety education guide, in it you will find more detail about the properties of natural gas and electricity, when to contact BGE and other information.

Discuss how this information conflicts with what your audience believed about natural gas and electricity 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 education before.

BGE thanks you for helping to keep workers safe.