nationalgrid

First responder beware®

Natural gas safety slide show presenter's notes

Slide 1

Before darkening the room, offer a welcome and an overview.

Begin by introducing the program and its topic:

- *Welcome to First Responder Beware: Staying Safe while Saving Others, Natural Gas Safety for First Responders. Today's session will share strategies for working safely around and handling certain emergencies involving natural gas. By following the procedures we'll cover here today, you can keep yourself, your fellow first responders and the public safe. Now I know that some of you will have heard this information before, and so for you, this program will be a refresher. For others, this may be the first time you're hearing about this topic, but I hope everyone will find the program valuable.*

Darken the room.

Click for the next slide. (Throughout this presentation, you will need to click for text and graphics on each slide and to bring up new slides.)

Slide 2

- *Firefighters, police and EMTs are typically first on the scene in an emergency and face the greatest risk from natural gas leaks and fires. Understanding the potential dangers and dealing with them correctly makes everyone safer. This program is designed to supplement, not replace, your department's standard operating procedures (SOPs).*

This is a good time to reiterate the importance of this information: that it can protect first responders, incident victims and bystanders from natural gas-related injury or death.

Please note: Each local department will have its own standard operating procedures or SOPs about natural gas safety. Emphasize to participants that this program is not designed to replace these procedures, only to supplement them.

Click for next slide.

Slide 3

Begin when the title appears.

- *Natural gas safety basics. This presentation will cover key practices you need to know to keep yourself safe around natural gas lines and on the scene of emergencies involving natural gas. The topics we are going to focus on are:*

Click for each of the seven bullets and read them off as they appear.

- *Properties of Natural Gas*
- *The Natural Gas Delivery System*
- *Preventing Natural Gas Ignition*
- *Responding to Natural Gas Emergencies*
- *Indoor Natural Gas Leaks*
- *Carbon Monoxide Poisoning*
- *Outdoor Natural Gas Leaks*
- *Natural Gas Fires*

Click for next slide.

Slide 4

Begin when the title appears.

- *Properties of natural gas. You will someday have to deal with natural gas at an incident scene. So, it's important to know a few basic facts about natural gas, its properties and how it behaves.*

Click for first bullet.

- *Natural gas is lighter than air.This means it will naturally tend to rise.*

Click for first sub-bullet.

- *It will follow the path of least resistance and will travel upward through any available space. Be alert. This can include stairwells, ducts or cracks in the road. It can even seep up through soft ground. Leaking gas will flow out of open windows and doors naturally, making this an effective method of venting a room or building.*

Click for second sub-bullet.

- *When underground or in enclosed spaces, natural gas will move laterally, or"migrate." It will travel as far as it can under roads, along utility lines and trenches or along a ceiling, until it finds a way up. This explains how gas can accumulate in buildings at some distance from the site of a leak.*

Click for second bullet.

- *Natural gas is odorless. The addition of mercaptan produces the familiar, sulfur-like smell.*

Click for sub-bullet.

- *You may not always be able to smell mercaptan, so never rely on your nose alone to detect a gas leak. Use a combustible gas indicator (CGI) to monitor the atmosphere.*

Click for next slide.

Slide 5

Click for first bullet.

- *Natural gas is highly flammable.This means that first responders must exercise extreme caution to prevent ignition hazards in the vicinity of any natural gas leak.*

Click for second bullet.

- *Natural gas will burn when the gas-to-air ratio is between about 5% and 15%.*

Click for sub-bullet.

- *At concentrations below 5% or above 15%, natural gas will not burn.*

Click for third bullet.

- *Liquefied gases such as propane have different properties than natural gas. Propane is heavier than air and may accumulate in trenches, drains, and other low areas. Propane is used in most gas grills, so if an incident involves a gas grill leak or fire, keep this behavior in mind.*

Slide 6

Begin when the title appears.

- *The natural gas delivery system. It's useful to know a bit about the how gas is delivered to structures.*

Click for first bullet.

- *Natural gas travels through three types of pipelines on its way from the wellhead to individual service laterals:*

Click for first sub-bullet.

- *Gathering pipelines,*

Click for second sub-bullet.

- *Transmission lines, and*

Click for third sub-bullet.

- *Distribution mains*

Click for second bullet.

- *Service laterals carry natural gas from distribution mains to customers' gas meters.*

Click for third bullet.

- *In general, the closer natural gas gets to the end user, the smaller the pipeline and the lower the pressure.*

Click for next slide.

Slide 7

Begin when the title appears.

- *Transmission pipeline markers. It's important to know how to recognize pipeline markers.*

Click for first bullet.

- *High-visibility markers indicate the approximate location of transmission pipelines in rights-of-way. For security purposes, these markers do not show the exact location, path, depth or number of gas pipelines in the area. But they will give you a general sense of the location of National Grid's high-pressure lines. They are usually found where a pipeline crosses a highway, railway, waterway or natural boundary.*

Click for second bullet.

- *These markers include the pipeline company's name, the type of product carried and an emergency phone number.*

Click for third bullet.

- *National Grid's transmission pipeline markers look like this. If a natural gas leak is detected or even just suspected in the vicinity of one of these markers, or if you see suspicious activity near a marker, notify National Grid immediately at the number shown.*

Click for next slide.

Slide 8

Begin when the title appears.

- *Preventing natural gas ignition. It's vital to know the correct precautions for preventing gas ignition when a natural gas leak is detected.*

Click for first bullet.

- *Even the smallest flame or spark can ignite leaking natural gas. Avoid turning electrical equipment or devices on or off in the vicinity of a known or suspected gas leak.*

Click for first sub-bullet.

- *Do not use spark-producing equipment. Intrinsically safe radios and flashlights should be used for the duration of any incident response.*

Click for second sub-bullet.

- *Avoid using doorbells, wall switches, flashlights and cell phones, and prevent their use by others.*

Click for third sub-bullet.

- *Do not step on doormats. Friction from your boots could create a spark of static electricity.*

Slide 9

Begin when the title appears.

- *Responding to natural gas emergencies. In addition to preventing gas ignition, there are certain procedures you should follow when responding to any natural gas emergency. Here are a list of steps to take when you approach any natural gas incident.*

Click for first bullet.

- *Notify National Grid through your dispatcher as soon as practicable for all gas emergencies.*

Click for first sub-bullet.

- *Approach cautiously and stay upwind. Stage apparatus out of the path of the leak and a safe distance away—typically 50 to 200 feet, depending on the situation.*

Click for second sub-bullet.

- *Park safely away from collapse zones and manholes. Stay clear of storm sewer grates as well.*

Click for third sub-bullet.

- *Secure the perimeter. Reroute traffic if necessary.*

Click for fourth sub-bullet.

- *Evacuate at least 330 feet in all directions. For larger leaks, consider initial downwind evacuation for at least ½ mile. (The incident commander will consult with a national grid emergency representative to determine the final extent of the evacuation)*

Click for fifth sub-bullet.

- *Stay out of manholes, sewers at any type of underground vault. Natural gas can accumulate in these underground spaces.*

Click for sixth sub-bullet.

- *Eliminate ignition sources, such as vehicle engines, flame-producing devices, and anything that could produce sparks.*

Click for seventh sub-bullet.

- *Use full self-contained breathing apparatus (SCBA) and personal protective equipment (PPE).*

Click for last sub-bullet.

- *And last but not least, monitor the atmosphere, using multiple monitors.*

Click for next slide.

Slide 10

Begin when the title appears.

- *When you respond to an incident involving a structure that is fed by natural gas, you must follow very specific procedures regarding gas pipeline valves.*

Click for first bullet.

- *NEVER attempt to open or close underground pipeline valves. Doing so could cause dangerous pressure changes in the system.*

Click for second bullet.

- *First responders may only close gas service valves at meters or appliances. If you can identify a specific appliance causing the leak, shut off the gas at the appliance's supply line. If you cannot identify a specific appliance or when in doubt, use the meter to shut off the gas.*

Click for first sub-bullet.

- *A quarter turn to the right will turn off a meter. Use the same procedure at an appliance supply line.*

Click for second sub-bullet.

- *Inform National Grid of any valve you have closed and its precise location. This information is critical for system safety and service restoration.*

Click for third bullet.

- *After the service valve has been closed, DO NOT open it under any circumstances. Only National Grid employees are permitted to turn gas service back on. Pack*

Click for next slide.

Slide 11

Begin when the title appears.

- *Indoor natural gas leaks.*

Click for first bullet.

- *Natural gas leaks inside buildings present significant hazards. Take these precautions:*

Click for first sub-bullet.

- *Have a charged hand line with fog nozzle ready The general rule is you should not put out a gas fire, but you may use a fog spray to cool combustible exposures and assist with rescue operations.*

Click for second sub-bullet.

- *Do not use spark-producing equipment. Only intrinsically safe radios and flashlights should be used.*

Click for third sub-bullet.

- *Evacuate at least 330 feet in all directions.*

Click for second bullet.

- *Coordinate with National Grid before ventilating.*

Click for first sub-bullet.

- *Remove all ignition sources. Ventilate structures from the top down.*

Click for second sub-bullet.

- *Use extreme caution when ventilating a building with a gas concentration above 15%. As gas disperses, concentrations will pass through the flammable range. Be aware that what appears to be an indoor leak may be the result of gas migrating into the structure. Once service to the structure is off and ventilation has occurred, verify that the leak has been eliminated.*

Click for next slide.

Slide 12

Begin when the title appears.

- *Carbon monoxide poisoning. Every year approximately 1,500 people in the U.S. die from being poisoned by carbon monoxide. This deadly gas is not a component of natural gas, but natural gas-burning appliances can be a source of carbon monoxide.*

Click for first bullet.

- *Understanding the dangers of leaking carbon monoxide, commonly known as CO, requires knowledge of some basic properties and causes.*

Click for first sub-bullet.

- *CO is a colorless, odorless, poisonous gas. Because it cannot be detected through the senses, it is important to exercise extreme caution if there is the possiblity of carbon monoxide in a room or building.*

Click for second sub-bullet.

- *CO leaks are frequently caused when fuel-burning appliances malfunction or are used without adequate ventilation. Warning signs of CO presence may include a sooty build-up around appliances and unusually high humidity indoors.*

Click for second bullet.

- *CO poisoning can look like a common illness, but it is deadly if untreated.*

Click for first sub-bullet.

- *Flu-like symptoms such as headache, tiredness and dizziness are signs of early exposure at low concentrations.*

Click for second sub-bullet.

- *With continued exposure or higher concentrations, these may progress to nausea, confusion, and slow breathing….*

Click for third sub-bullet.

- *Or even loss of consciousness and death. It is important to be aware of all of these symptoms.*

Click for last bullet.

- *Make sure CO poisoning victims get fresh air and seek medical attention immediately. If the building uses natural gas, notify National Grid as soon as practicable through your dispatcher.*

Click for next slide.

Slide 13

Begin when the title appears.

- *Outdoor natural gas leaks. Gas leaks outdoors pose some different challenges than those indoors.*

Click for first bullet.

- *Outdoor natural gas leaks can be caused by construction-related damage, cracks due to extreme weather, or pipe corrosion. Be on the lookout for evidence of construction activity and severe weather as indicators of a possible leak.*

Click for second bullet.

- *Contact National Grid immediately to shut off the gas. Do this whenever you suspect a leak. They will respond, turn off the gas, and repair the damaged pipeline.*

Click for third bullet.

- *Evacuate the area.*

Click for last bullet.

- *Be alert for migrating gas. Gas can accumulate in storm drains, construction trenches, buildings, and other utility lines, particularly as it moves laterally and seeks a path upward. As gas migrates, localized concentrations will change. Remember that natural gas can burn or explode as concentrations move through the flammable range.*

Click for next slide.

Slide 14

Begin when the title appears.

- *When on the scene of an outdoor emergency, always be alert for the telltale indicators of a natural gas leak. Depending on the pressure of the gas line, these indicators will vary.*

Click for first bullet.

- *In addition to the familiar sulfur-like smell, indicators may include:*

Click for first sub-bullet.

- *A hissing, whistling or roaring sound*

Click for second sub-bullet.

- *Dirt being blown into the air from a hole in the ground*

Click for third sub-bullet.

- *Continual bubbling in water.*

Click for fourth sub-bullet.

- *Dead or dying vegetation*

Click for fifth sub-bullet.

- *A fire or explosion nearby*

Click for last sub-bullet.

- *An exposed pipeline after a disaster. In any gas leak incident use a combustible gas leak indicator to be certain a flammable atmosphere does not exist.*

Click for next slide.

Slide 15

Begin when the title appears.

- *Outdoor gas leak response. There are certain procedures you should follow when a natural gas leak is detected or suspected in an outdoor area.*

Click for first bullet.

- *Have a charged hand line with fog nozzle ready for use.*

Click for sub-bullet.

- *In the event of a fire, a fog spray may be used to cool combustible exposures, assist with rescue and extinguish flames not originating from a gas pipe.*

Click for second bullet.

- *Use a CGI to identify the general area of the leak. Un-ignited gas can migrate to the surface from an underground leak or from a damaged gas line in an open excavation.*

Click for sub-bullet.

- *Check for gas migrating into nearby buildings (especially basements), storm drains and construction trenches.*

Click for third bullet.

- *Evacute at least 330 feet in all directions. Larger leaks may require downwind evacuation for at least ½ mile.*

Click for next slide.

Slide 16

Begin when the title appears.

- *Natural gas fire response. Burning natural gas poses special risks and requires extra precautions.*

Click for first bullet.

- *When responding to a fire involving natural gas, your best and safest course of action is to let it burn. Your first priority, as always, is to protect life and property.*

Click for sub-bullet.

- *Burning natural gas will not cause an explosion.*

Click for second bullet.

- *Allow the gas to burn until the source can be turned off. When the gas supply is depleted, the fire will extinguish itself.*

Click for third bullet.

- *Evacuate the area and protect exposures.*

Click for next slide.

Slide 17

Begin when the title appears.

Click for first bullet.

- *Do NOT use water to suppress a natural gas fire.*

Click for first sub-bullet.

- *Use a hand line with fog nozzle to cool exposures and to extinguish open flames not originating from a gas pipe.*

Click for second sub-bullet.

- *Avoid spraying water at the point where natural gas is being released. If you introduce water into a gas line, you could flood the line and cause serious problems in the distribution system.*

Click for second bullet.

- *Shut off gas ONLY at the service valve before the meter, or the appliance supply line. Do NOT shut off gas pipeline main valves. Do not shut curb valves unless you have been properly trained in curb valve operation.*

Click for third bullet.

- *Once gas is off, remain alert for gas migration and possible reignition.*

Click for next slide.

Slide 18

Begin when the title appears.

- *Natural gas safety review. So let's review the key points of this presentation.*

Click for first bullet.

- *Prevent ignition of natural gas. Eliminate spark hazards at the scene of a gas leak, and use intrinsically safe equipment.*

Click for second bullet.

- *When natural gas is involved in an emergency, notify National Grid through your dispatcher as soon as practicable.*

Click for third bullet.

- *Park emergency vehicles upwind and away from collapse zones and manholes.*

Click for fourth bullet.

- *Evacuate the area and be alert for migrating or accumulating gas.*

Click for fifth bullet.

- *Coordinate with National Grid before ventilating. Remove all ignition sources and ventilate from the top down.*

•Click for sixth bullet.

- *Turn off natural gas service at meters or appliance supply lines only.*

Click for last bullet.

- *When natural gas is burning, let it burn and protect area exposures. Remember, water is not effective for extinguishing gas fires.*

Click for next slide.

Slide 19

Begin when the title appears.

- *Contact Information. In case of a natural gas emergency, notify National Grid at the following numbers:*

  •*Massachusetts: 800-233-5325*

  •*New York: 800-892-2345*

  •*Rhode Island: 800-640-1595*

Click for the final slide.

Slide 20

- *Thank you for your attention.*

Take questions and begin discussion.

The trainer's guide includes more detail about how natural gas works, when to contact National Grid, what sort of devices and behaviors can cause explosion hazards, and other information about safety procedures.

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

Consider some of the suggested simulations or use your own.

National Grid thanks you for helping to keep first responders safe.

Click to clear screen.

Bring up the lights.