



Columbia Fire Department

Standard Operating Guideline OPS-034

Response to Natural Gas Emergencies

Effective: January 11, 2010

Issued by Wm. Bradley Anderson, Fire Chief

Rescinds: No previous

Purpose: To establish a guideline for responding to a Natural Gas emergency.

Scope: This guideline applies to all suppression personnel.

Guideline: Natural gas is much lighter than air and will usually dissipate rapidly in the outside environment. Inside buildings, however, it tends to pocket, particularly in attics and dead air spaces. The flammable limits are approximately 4% to 15% in air. Natural gas itself is non-toxic; however, it displaces oxygen and can result in asphyxiation if in a confined space. Carbon Monoxide will not be found during a natural gas leak unless it is being burned. Flammable gas ranges can only be determined by a combustible gas instrument.

It is important to determine if the gas leak is natural gas or propane. These two gases have completely different characteristics, which could change the Incident Action Plan.

I. Safety

A. Safety of responders and the public is the first priority when responding to a natural gas emergency. The following safety precautions should take place on every scene:

1. Personnel responding to a natural gas emergency should be dressed in full protective clothing and SCBA at all times.
2. Evacuate the affected area at least 150 feet.
3. Deny access to the area.
4. Operate upwind whenever possible.
5. Locate a water supply.
6. Remove any possible sources of ignition.
7. If a gas meter is isolated (Shut-off) it should **NEVER** be turned back on by anyone except the gas company

B. Plastic (polyethylene) pipe is a common material used for natural gas. The flow of gas through the pipe alone generates a static charge. Any additional bending or restriction in flow only increases the static build up. For this reason first arriving units should not attempt to isolate a leak by bending or crimping a gas line.

II. Initial Actions

A. The following actions should be initiated on all natural gas emergencies:

1. Ensure Haz-Mat 1 or a support company is en route.
2. The first arriving unit will position the apparatus at least 150 feet upwind if possible.
3. All additional units should stage at least 300 feet away.
4. Evacuate the immediate area and deny any further entry.
 - Law enforcement should be called to assist with traffic control if the roadway is affected
5. Interview the occupant or caller to determine the problem before entering any structures or accessing any areas.
6. If a leak is confirmed ensure that the gas company has been notified.

III. Gas Leak Outside of a Structure

A. Gas leaks outside of a structure are a common call, and are the least likely type of gas leak to present a hazard. Natural gas is lighter than air so it has a tendency to rise immediately into the atmosphere. Weather is a determining factor into how fast it rises. If the leak is close to a structure it is quite possible for the gas to become trapped inside the structure. Companies should follow these guidelines when handling a gas leak outside of a structure.

1. A safety line should be pulled in case of ignition.
2. Ensure any structures within 150 feet are evacuated.
 - Large leaks may require a larger evacuation distance. i.e. a six inch line.
3. Do not attempt to shut off or start up any gas powered equipment or vehicles.
4. Ensure all structures in close proximity are free of gas once leak is isolated.
5. Standby for Haz-Mat and the gas company to arrive.

IV. Gas Leak Outside of a Structure with Fire

A. Do not attempt to extinguish the fire. If fire is accidentally extinguished revert to section III. Make sure to pay close attention to possible re-ignition sources as surrounding surfaces will retain heat from the fire.

1. Hose lines should be placed on exposures, not the flames from the gas.
2. If fire can be controlled by isolating the meter, then secure the meter.

V. Gas Leak Inside of a Structure

A. Gas leaks inside of a structure can pose a severe risk of explosion. Gas becomes trapped inside the structure, and can quickly reach its explosive range.

1. If an odor is detected it is important that all occupants evacuate the structure along with all responding personnel.
2. Do not operate any light switches or perform any actions that may produce an

ignition source

3. For slight odors do not isolate the gas meter. Doing so will prevent Haz-Mat personnel from locating the source of the leak.
 - If the leak is large and if causing a safety issue then the meter should be isolated immediately.
4. Do not attempt to ventilate the structure until the atmosphere can be monitored.
 - a. Changing the atmosphere without knowing the concentration may bring the gas into its flammable range.
 - b. Ventilating the structure also prevents locating the source.
5. Evacuate the adjacent structures.
6. Standby for Haz-Mat and the gas company to arrive.

VI. Gas Leak Inside of a Structure with Fire

- A. Gas leaks inside of a structure with fire produces a large amount of heat and will increase the chance of fire spread and decrease structure integrity.
 1. Ensure all occupants are out of the structure.
 2. Perform defensive fire attack operations until the gas can be isolated that is fueling the fire.
 3. Once gas is secure the fire can be treated as a normal structure fire. Remember the amount of damage that has taken place during the gas fueled fire. This should be a determining factor as to committing fire crews inside the structure.

VII. Gas Leak Underground

- A. Gas leaks underground are difficult to locate, especially if there is not visible underground work being performed. It is important to not clear in coming units as they may be needed to search a large area. Natural gas can travel great distances underground through pipes, conduit and natural crevasses in the earth.
 1. Attempt to find the source by seeking the area of highest concentration.
 2. Have units check adjacent streets for underground work.
 3. Accurate detection may be limited since the gas company is in possession of the ground probes to detect gas in the soil.
 4. Standby for Haz-Mat and the gas company to arrive.

VIII. Gas Company

- A. It is important that the gas company be notified as soon as possible when there is a gas leak. This will ensure a more timely response. Most often Columbia Central will notify them automatically when dispatching the initial fire units. The appropriate gas company, most commonly South Carolina Electric and Gas (SCE&G) should be

called under the following conditions.

1. Anytime a gas line has been cut.
2. Anytime a gas meter has been isolated.
3. Anytime a suspected or confirmed gas related injury or death has occurred.
This also includes Carbon Monoxide emergencies.

IX. Haz-Mat and Support Company Actions

A. The following is the normal process that will occur once Haz-Mat 1 or a Haz-mat Support Company arrives on scene. It is important that one of these companies arrive on scene in order to properly confirm the leak and possibly identify the source. The following actions should take place.

1. The Haz-Mat officer will report to the Incident Commander and formulate a plan of action based on past and current situations.
2. Haz-Mat personnel will monitor the atmosphere.
3. Meet with the gas representative once on scene.
4. Isolate gas if needed based on readings
 - An attempt to isolate the leaking appliance will be made prior to isolating the meter if possible.
5. Ventilate the structure accordingly.
6. Monitor to confirm structure is safe.

X. Gas Clamp Procedures

A. The following is a guideline for clamping a leaking natural gas line. These actions should be completed by Haz-mat personnel only. At no time should personal safety be superseded by an attempt to control a leaking line. Static charge is likely during the active flow of gas and clamping operation. Strict safety guidelines should be followed.

1. A charged safety line will always be deployed for personnel operating in the area of the leak.
2. Residential lines no larger than 1 ½" will be clamped.
3. Atmospheric monitoring will take place at the location of the clamping operation.
4. Use non sparking tools if possible.
5. When using the clamp ensure the unit is grounded properly.
6. Use a wet soapy rag to minimize the chance of a static charge, both laid over the exposed pipe and on the wall of the trench.
7. Dampen area if needed, especially during a dry day with low humidity.
8. Once clamp is used fire department personnel should remain on scene until the gas company arrives.

