

## **Standard Operating Guidelines**

# **Gas Emergency Incidents - Natural and LP**

**Guideline # 310.13 (Supersedes all others)**

**Date: 6/20/11R**

### **PURPOSE**

Establishment of guidelines for the response, operations and safety of personnel encountering natural and Liquefied Petroleum Gas (LP) gas product emergencies.

### **POLICY**

It is the policy of the Jackson Fire District 3 to follow these guidelines in the response and operations in the handling of natural and LP gas emergencies for safety of fire personnel and the public.

### **BACKGROUND**

Fire Department units may encounter natural and LP gas in a variety of situations, each presenting a different set of hazards. The following guidelines present an approach which will be applicable in the majority of situations, but do not replace good judgement and experience in dealing with any particular incident. The guidelines should be used whenever these types of situations are encountered.

Natural gas is much lighter than air and will dissipate rapidly outside. Inside buildings, however, it tends to pocket, particularly in attics and dead air spaces. LP gas is heavier than air, and will tend to sink to lower areas of a structure like sump pumps, basements, or crawl spaces, to name just a few examples. The flammable limits are approximately 3% to 15% in air. Natural and LP gas itself is non-toxic. It does, however, displace oxygen and can result in asphyxiation if in a confined space. Flammable gas ranges and oxygen contents can only be determined by a intrinsically safe combustible gas instrument.

Natural and LP gas has an odorant added to help with detection of leaks. However, do not rely solely on the sense of smell to determine if a leak is occurring. Use a combustible gas leak detector to assess the source and also to determine the explosive range of the leaking product. Be aware that a high reading above the UEL limit means that as the area is ventilated, the product will be lowered into and through the explosive range until the reading below the LEL is achieved. This is a dangerous process and all precautions must be taken to avoid an explosion.

If the product is already burning, do not assume that all of the leak is being consumed in combustion and is contained to the fire area. Check all surrounding areas and structures for gas in the immediate vicinity, and evacuate all civilians from the interior of adjacent structures to safety.

### **RESPONSE**

The first-arriving officer should implement the Incident Command System, with a specific approach for Hazardous Materials.

Unless deemed to be a significant outside leak, one Engine company may enter the area of the reported leak, all others will stand by at least 500' from the suspected source of the incident. Keep all other vehicles including fire, EMS and police away up to 2,000 feet from the area if necessary to avoid accidental ignition of the gas product and exposure to potential ignition/explosion.

All cell phones, pagers or other small electronic devices should be kept out of the hot zone. No electrically switched gear should be operated in the vicinity of a leak. All leak detectors and radios used in the hot zone must be intrinsically safe. Only use non-sparking tools, bronze or plastic.

It is important to isolate the suspected source point of the leak, and then establish a safe perimeter to await arrival of gas representatives. If the source is a pipeline break, do not attempt to "crimp off" or otherwise clamp down on the gas line as a small spark could ignite the escaping gas product.

When the source of the gas emergency is determined to be natural gas, New Jersey Natural Gas should be notified immediately to respond at 1-800-GASLEAK. If the source is LP and the leak cannot be contained, either the service provider involved if known or the closest LP gas company should be requested to respond to the scene. Any LP gas provider will provide emergency response to a local scene, not just the service provider to a particular location or property involved. Be aware that LP gas tanks can be either above ground, partially or fully buried. Suburban Propane can be contacted at 732-462-1776 or MGS Jackson at 732-462-6111.

Burning natural or LP gas should not normally be extinguished, since this changes the hazard from visible to invisible and creates an explosion hazard. Fires should be controlled by stopping the flow of product.

### **If An Explosion Has Occurred**

Units arriving at the scene of a structure explosion must consider natural or LP gas as a significant possible cause. Explosions have occurred in structures which were not served by natural or LP gas. Underground leaks may permit gas to travel considerable distances before entering a structure through the foundation, around pipes, or through void spaces. In these circumstances the cause of the explosion may be difficult to determine. Until it can be determined that the area is safe from the danger of further explosions, evacuate all civilians and keep the number of Fire Department personnel in the area to minimum.

A. Look for signs of a gas leak, i.e., smell of gas, flames coming through cracks in ground or around foundations, bubbling through puddles. Do not extinguish flames coming up through the ground.

B. Do not rely on gas odor. Odorant may be filtered out by passage through ground. Use combustible gas indicators to check suspected areas.

C. Check systematically using combustible gas meters. Start outside the area of the explosion and move into the area until readings indicate detectable concentration. Map the readings in the affected area.

D. If a gas concentration is encountered inside, adjacent to, or underneath any building, secure all possible sources of ignition in the affected area. Cut electricity from outside the affected area to avoid arcing. Ventilate buildings where gas is found with explosion-proof equipment only.

E. The use of ground probes is essential to evaluate potential underground leaks. When gas company personnel are on the scene, ground probe readings and locations must be coordinated. Time, location, and concentration should be recorded for each probe - subsequent readings should be taken from same holes when possible.

F. Command shall provide for effective interaction between local law enforcement, EMS, fire, and gas company personnel. Gas company personnel are responsible for locating and eliminating leaks in the gas system. As industry specialists, they can provide Command with valuable assistance in the effective handling of these incidents. These personnel should be directed to Command to report their arrival, etc. In most cases, a company officer with a portable radio will be required to supervise during their on-site operations.

## **Reported Gas Leak - No Fire or Explosion**

Calls for "odor of gas," "gas leak," "broken gas line," and similar situations may range from minor to potentially major incidents. All of these should be approached as potentially dangerous situations. With gas company personnel on the scene of an incident, it shall be standard procedure for the first Fire Department unit to provide effective interaction between agencies. For natural gas leaks, Gas company personnel shall be responsible for locating and eliminating leak sources. For LP gas leaks, fire department personnel should attempt to locate the leaking component of the gas systems however LP gas servicers should be utilized as much as possible to assist in the mitigation process. Gas company personnel shall obtain a sufficient number of gas concentration readings, using their combustible gas indicators for Command to evaluate the hazard and take appropriate action.

In all cases, Fire Department units shall take whatever actions are necessary to provide for life and property safety. All personnel should approach the leak from the upwind side. Heavy fog streams should be used to dissipate the vapors if possible, directing the leaked product to a safe area. Particular attention should be paid to exposed structures.

The hazardous materials references should be used as a basic guide for these incidents. A minimum number of personnel should be allowed to enter the area to size-up the situation while any additional units stage in a location out of the potentially dangerous zone.

A. Evacuate any civilians in the area of escaping gas.

B. Attempt to locate the source of the gas and any shut-off devices available.

C. If the problem is an extinguished pilot light on an appliance, Fire Department personnel will not relight the pilot, but will advise occupant on possible dangers of lighting pilots, and will advise them to have the utility called as appropriate. In any other gas leak situation within a building, the gas supply shall be shut off and red-tagged until repairs are completed. This is most easily accomplished with the cooperation of the gas supplier at the scene.

D. If there is any indication of gas accumulating within a building, evacuate civilians from the structure and control ignition sources. Shut off electrical power from an outside breaker. Check for explosive concentrations with a combustible gas indicator if there is any suspicion of accumulation within a structure. Ventilate, using explosion-proof blowers to pressurize if necessary.

E. If gas company personnel must excavate to shut off a leak, provide stand-by protection with Minimum of two charged 1-3/4" lines (primary and back-up) with two firefighters each in full protective equipment (including SCBA).

F. Do not allow any liquid LP product to come in contact with PPE or human skin. It will burn skin due to extreme cold.

## **Fire Involving LPG/CNG Product**

Incidents involving a pressurized LP tank either stationary or that of truck-borne LP or Compressed Natural Gas (CNG) tank should be handled with extreme caution. Personnel should cool the tank from a safe distance and be especially vigilant to the possibility of a Boiling Liquid Expanding Vapor Explosion or "BLEVE".

A "whistling" sound emanating from a gas tank on fire is an indication of a pressure relief valve functioning -- be aware that failure of the tank may be imminent. A tank trunk roll-over may affect proper functioning of the relief valve.

Attempt to shut off the leaking product at the valve. Consult the driver or facility personnel as to the ability to shut off the flow. Apply heavy streams to all areas of the tank exposed to heat. Controlled burning of the product is an acceptable method to reduce the hazard. Dry chemical and CO2 extinguishers are effective on small leaks, however try to not extinguish any leaking product until the fuel supply can be shut off as well.

**Personnel Safety**

All personnel working in the vicinity of a known or suspected gas leak shall wear full protective clothing. Personnel working in a suspected ignitable atmosphere shall use SCBA and shall be covered by a charged protective hose line. The number of exposed personnel will be kept to an absolute minimum at all times.

A safety perimeter shall be established and maintained around any suspected gas leak.

**DOT GUIDEBOOK #115 in Orange Pages**

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Approved:

Date:                   Signature of Chief\_\_\_\_\_

Date:                   Signature of President, Board of Fire Commissioners\_\_\_\_\_