	West Fargo Fire & Rescue Standard Operating Guideline			Authorized by: D. Fuller Fire Chief
	Subject: FLAMMABLE GAS			
	Section: OPERATIONS	Date Authorized:	Date Reviewed:	
	Number: 219	8/5/2015	11/1/2017	

Intent

The intent of this SOG is to establish a procedure for responding to, operating at, and mitigating natural gas (LNG) and propane (LPG) incidents.

Definitions

Natural gas and propane -are much lighter than air and will usually dissipate rapidly in the outside environment. Inside buildings, however, they tend to pocket, particularly in attics and dead air spaces. These gasses are nontoxic; however, they displace oxygen and can result in asphyxiation if in a confined space. Flammable gas ranges can only be determined by a combustible gas instrument, such as the Sense-It four gas meter used by the department. The flammable range for natural gas is 5.3% to 15% in air, while propane is 2.5% to 9.5%.

The meter will only provide a percent of the lower explosive range of methane, the gas used to calibrate the meter. For natural gas, the LEL reading is accurate, but *for propane emergencies, the LEL reading is usually 2.5% lower than actual ranges* in the atmosphere. Refer to the correction chart below. A reading of 100% LEL on the meter means the atmosphere is at 5.3% total flammable range in air, ie: explosive limits have been reached and the atmosphere is neither too rich or too lean to burn.

Propane Correction Chart for Sense-It meter calibrated to methane

5% LEL = 12.5%	30% LEL = 75%
10% LEL = 25%	35% LEL = 87.5%
15% LEL = 37.5%	40% LEL = 100%
20% LEL = 50%	
25% LEL = 62.5%	


Guideline

Once members arrive on scene, they should first interview the occupants(s) or the reporting party to determine the following:

- If any anyone is or has been feeling ill. If so, request an ambulance
- The suspected location of the leak
- The location of the gas main, gas meter, or any combustion equipment or appliances.

INSIDE LNG or LPG LEAKS

Take the first LEL reading at the doorway. If any LEL readings on the meter are present, contact the gas company, the team shall back out, shut the gas off at the meter, and naturally ventilate the space. If the flow of gas can't be controlled, evacuate the area and take a defensive position in case of explosion.

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Burning natural gas and propane should not normally be extinguished, since this would change the situation from a visible to invisible hazard with explosive potential. Fires should be controlled by stopping the flow.

INCIDENTS AT WHICH AN EXPLOSION HAS OCCURRED

Units arriving at the scene of a structural explosion must consider natural gas as a possible cause. Explosions have occurred in structures which were not served by natural 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 and/or other emergency personnel (i.e., gas company personnel) in the area, to the minimum number necessary to stabilize the situation. Take a pessimistic point of view.

Do not rely on gas odor. Use combustible gas indicators to check all suspected areas. Both the fire department and gas company have combustible gas indicators for this purpose.

Check areas systematically using combustible gas indicators. Start outside of the area of the explosion, and move into the area until readings indicate detectable concentration. Map the readings for the affected area.


If a gas concentration is encountered inside, adjacent to, or underneath any building, secure all possible sources of ignition in the affected area. Use only natural ventilation.

Command shall provide for effective interaction between gas company personnel and the Fire Department. 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. In most cases, a company officer with a portable radio will be required to supervise during on-site operations.

Command must ensure the safety and stability of the structure. If further collapse is possible, the Fargo Trench Rescue Team/Heavy Rescue Team should be called to provide shoring, cribbing or other means of stabilizing the structure.

OUTSIDE INCIDENTS INVOLVING A REPORTED GAS LEAK - NO FIRE OR EXPLOSION

Calls for "odor of gas," "gas leak," "broken gas line" and similar situations may range from

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minor to potentially major incidents. All of these should be approached as potentially dangerous situations.

Gas company personnel shall be responsible for locating and eliminating leak sources. The department or gas company 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.

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.

Evacuate any civilians in the area of escaping gas.

Attempt to locate the source of the gas and any shutoff devices available.

If gas company personnel must excavate to shut off a leak, provide stand-by protection with a charged 1 ¾ inch line and two firefighters in full protective equipment and SCBA.

PERSONNEL SAFETY

All personnel working in the vicinity of a known or suspected gas leak shall wear full protective clothing with SCBA's. Personnel working in a suspected ignitable atmosphere (i.e., attempting to shut off a gas line) shall be breathing air from SCBA and shall be covered by a manned protective hoseline. The number of exposed personnel will be kept to an absolute minimum at all times.

A Limited Access Zone shall be established and maintained around any suspected gas leak and "fire line" tape should be used to identify the Limited Access Zone when necessary. A lobby sector shall be established for personnel control and accountability and where necessary, a hazard sector should be established