



GALENA FIRE DEPARTMENT  
Standard Operating Guideline  
**LP GAS FIRES**

*Randy A. Beadle*  
Fire Chief Signature

January 1 2021

**SOG: 042**

Effective: 01Apr13  
Revised: 01Jan2021  
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Purpose: To establish standards for GFD operations for Liquid Petroleum Gas Fires incidents,, including safety considerations, responsibility, precautions, notification, and resources.

### LP Gas Properties

Liquid Petroleum Gas (LPG) is composed primarily of Propane with some Butane and other trace gases. It has no natural odor and has an odor added. LPG is nontoxic but will displace air in an enclosed area. It is about 1.5 times heavier than air and will seek low points on the ground and within structures.

LP is explosive in concentrations between 2.15% (LEL) and 9.6% (UEL). As a rule -of-thumb the explosive limits are 2%-10%.

All pressurized LP gas containers are subject to Boiling Liquid Expanding Vapor Explosions (BLEVE) when exposed to intense heat or open flames.

### Characteristics

One (1) cubic foot of Liquid Propane will boil off producing 270 cu. ft. of Propane vapor.

Liquid state: Gaseous state ratio = 1:270 in volume.

LPG weighs 4.2 lbs. per gallon.

LPG Boiling Point is minus 44 degrees F.

LPG Ignition Temperature = 920 to 1120 degrees F.

### Caution

- Never permit personnel to attempt leak control in areas where unignited LP gas has accumulated.
- Verify LP gas concentrations in lowest areas with gas measurement instrument.
- Large Propane vapor release travels great distances and may "Flash Back" to leak source (BLEVE).
- A burning 80-100 gallon Propane tank may BLEVE.
- Minimum safe distance to avoid projectiles is 300-ft. front and back and 150 ft. from sides of tank.
- Projectiles may travel further than these "safe" distances.
- Projectiles from 80-100 gallon tanks can reach 30 times the fireball radius.
- Master streams on large tanks should be fixed in place and unattended.
- Bulk container failures (18,000-30,000 gallons) can yield severe fire and fragmentation over 3,000 ft. (equivalent to 10 football fields).

### Reference: Emergency Response Guidebook

I.D. #1075 in Yellow Section of book.

Guide #115 in Orange Section of book.

LP Gas is a Hazard Classification System—Class 2—"Flammable Gas".



## LP GAS FIRES

### In the event of an LPG emergency the Incident Commander will:

- Identify unit and number of personnel while enroute to the scene.
- Request County HazMat Team for large tanks, LP gas trucks and railroad car incidents or imminent exposures.
- Establish Incident Command.
- Look for other hazardous materials such as corrosives, flammable liquids, poisons, etc.
- Contact utility company or LPG carrier.
- Call for EMS crew for stand-by at a safe area with access to the scene.
- Determine the extent of the hazard area.
- Establish a security perimeter.
- Describe the situation, as well as location of the IC, and staging area if applicable, to all incoming units, including EMS and Law Enforcement.
- Initiate appropriate evacuation of threatened areas.
- Establish hot, warm, cold hazard zones.
- Designate Safety, Staging, and other appropriate sectors, as well as designate a Water Officer.

### All responding personnel shall be aware of the following:

- Life safety considerations.
- Type of gas.
- Type of leak (Tank, truck, railroad car, pipeline, other).
- Liquid and/or vapor leak.
- Fire or no fire.
- Structure(s), equipment and/or gas vessels involved or threatened.

### If victim Rescue is necessary

- Restrict number of authorized personnel in hazard area.
- All rescue personnel in full turnout gear & SCBAs.
- Identify escape route out of hazard area.
- Perform from upwind side.
- With water fog, keep area LP gas concentration < 10% of LEL.

### Tactical Considerations

- Control and/or eliminate all potential ignition sources.
- Shut off feed valves immediately-if accessible.
- Position arriving emergency vehicles upwind away from hazard zone
- Avoid introducing ignition sources into the hazard area.
- Watch for wind shifts.
- Continue to check surrounding ground depressions and lower parts of structures for gas buildup.



**LP GAS FIRES**

**PPE**

- Use personnel accounting PAT for those entering and leaving hazard area.
- All personnel in hazard area will deploy with full turnout gear including bunker coat and pants, boots, PASS, Nomex® hood, helmet with face shield or goggles and fire gloves.
- SCBA is required in Haz-Mat-designated hot area for LP vapor/fire control and victim rescue.

**Method of Attack**

- If gas is burning **DO NOT EXTINGUISH THE FIRE**. Keep the flame burning as opposed to a confined vapor cloud.
- Have enough continuous supply of water to handle the task.
- For cooling, you will need water at 500GPM at the point of each flame impingement.
- For fire suppression/protection of exposed structures and/or equipment use a direct hose stream.
- For gas vapor dissipation, you will need at least a 100GPM fog stream from 1 ¾" hose line.
- Isolate the propane source feeding fire.
- Identify and remote valves.
- Pinch off copper line of vessel feeding fire.
- Reduce pressure of line or vessel feeding fire.

**Decontamination Considerations**

- Liquid Propane can saturate turnout gear.
- Avoid direct contact with LP liquid that will cause frostbite.
- Decontaminate clothing by flushing with water.
- Keep SCBA active until turnout gear is decontaminated.