## BW Final

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| **Operations at Gas Emergencies** | Related Policies: Accountability Procedures; SCBA; Rapid Intervention Teams; ICS |
| *This policy is for internal use only and does not enlarge an employee’s civil liability in any way. The policy should not be construed as creating a higher duty of care, in an evidentiary sense, with respect to third party civil claims against employees. A violation of this policy, if proven, can only form the basis of a complaint by this department for non-judicial administrative action in accordance with the laws governing employee discipline.* |
| Applicable KY Statutes: |
| NFPA Standard: 1500, 1561 |
| Date Implemented: | Review Date: |

1. **Purpose:** To establish guidelines for the safe response to, and mitigation of, emergency incidents involving natural gas, propane and similar flammable gasses.
2. **Policy:** All personnel responding to or operating at emergency incidents involving natural gas, propane and similar gasses shall comply with the following procedure.
3. **Introduction**

Firefighters are routinely dispatched to “gas leaks” or reports of a “smell of gas”. Protective clothing used for structural firefighting may not provide adequate flash protection in the event of a flammable vapor explosion, and is totally inadequate to protect against the concussion of an explosion.

Without appropriate gas detection equipment to determine if an area is in danger of exploding, firefighters must operate with extreme caution.

1. **Definitions**

**Hazardous area**: An area where personnel may be exposed to an IDLH, potentially IDLH, or unknown atmosphere

**IDLH:** Immediately Dangerous to Life and Health – Any condition that would pose an immediate or delayed threat to life, cause irreversible adverse health effects, or interfere with an individual’s ability to escape unaided from a hazardous environment

1. **Operations at Gas Emergencies**
2. Full protective clothing including self contained breathing apparatus shall be worn by all personnel operating at a gas leak, reported gas leak, or a reported smell of gas.
3. Arriving apparatus should be positioned on scene so as to minimize the risk of being damaged in the event of an explosion. This includes avoiding the area directly in front of a building in which there is a reported gas leak. It also includes consideration of the areas around man hole covers, storm drains, sewers, under ground vaults, etc. if an underground gas leak is suspected.
4. Apparatus should also be positioned so as to offer personnel who remain outside the building some degree of blast protection.
5. The initial objective of the first arriving company is to determine if there is a gas leak, and if so, what area or areas of the building are involved. Also the first arriving company should determine what type of gas is involved (natural gas or propane), and whether there are people in danger.
6. In accordance with the SOP on SCBA and Accountability, a minimum of four personnel shall be assembled on scene before any personnel enter a hazardous area. The number of personnel entering the building or area shall be kept to a minimum throughout the incident, provided members entering the building or area work in teams of two or more.
7. At least two members shall remain outside of the building to maintain an awareness of the number and identity of personnel in the building, and serve as an initial rapid intervention team. The apparatus should be used to provide shielding for the initial rapid intervention team.
8. Additional arriving companies and personnel shall stage and await specific instructions. Strict accountability shall be maintained.
9. Firefighters should not attempt to enter any area or part of a building where there is a probable gas leak without a properly functioning combustible gas indicator (CGI). The presence of an odorant in the gas may be used initially to aid in identifying a possible leak, but it should be relied upon.
10. Upon confirmation of a gas leak, the incident commander shall immediately request the dispatch office to request the appropriate gas company, and/or the propane supplier, to respond. A safety officer shall also be requested to respond or assigned from among available on scene personnel.
11. Personnel should eliminate all sources of ignition in the area including motor vehicles, open flames, electrical and heating devices, and any other potential points of ignition. Personal pagers, cellphones and other non-intrinsically safe devices should be turned off outside of the potentially hazardous area.
12. Personnel should evacuate civilians from the structure(s) or area, being careful to minimize the risk of causing a spark (i.e. do not permit electrical switches to be turned on or off, do not transmit over portable radios, extinguish open flames, be alert for static sparks, etc.). If possible, the evacuation should be conducted from outside the building or area affected so as to minimize the risk to members. Otherwise the evacuation should be conducted so as to minimize the risk to members and the occupants.
13. If gas to the building can be terminated at an exterior meter shut off, tank, or other remote shut off, without firefighters having to enter a vapor rich atmosphere, this should be done immediately.
14. Non-destructive ventilation should be employed as appropriate given the circumstances.
15. Upon the arrival of appropriate gas detection equipment, a determination can be made as to whether or not it is safe to enter the structure, or enter that part of the structure which is vapor rich.
16. Should the Incident Commander determine that the structure cannot safely be entered by firefighters, fire department objectives shall be limited to:
17. notifying the gas company/supplier
18. evacuation of residents
19. establish a perimeter control to prevent anyone from entering
20. turning off gas where the shut off is outside the building, and can be safely accomplished
21. performing whatever ventilation can be performed from a safe location outside the structure
22. if appropriate, withdrawing to a safe location and
23. preparing for fire and/or explosion
24. Deployment of backup handline(s) and/or feeders should be given due consideration by the Incident Commander, based upon circumstances and conditions present.
25. When an underground gas leak is suspected, the Incident Commander shall ensure that the basements of adjacent structures are checked with combustible gas indicators. All members should be mindful of the fact that the odorant added to gas (ethylmercaptain) may leech out as the gas travels through soil. This creates the possibility that an explosive atmosphere may exist without the warning sign normally provided by the odorant.
26. **Use of Combustible Gas Indicators**
27. Combustible gas indicators (CGI) assigned to units of the fire department shall be used, maintained and calibrated in accordance with the manufacturer’s instructions.
28. Each company with a CGI shall be responsible for maintaining records of all maintenance and calibrations.
29. Only personnel who are trained in the use of a CGI shall use it at an incident.
30. Only personnel who have read the instruction materials accompanying a CGI shall use it.
31. Only personnel who are familiar with the properties of natural gas, propane and similar gasses shall use a CGI.
32. CGI readings should be taken initially outside the building or area in question, and retaken every few feet thereafter as firefighters move into the building. At doors, readings should be taken at the tops and bottoms before opening. This is particularly important before descending stairs leading to a basement or cellar. No member should proceed in front of the member operating the CGI.
33. Provided the CGI readings remain below 10% of the lower explosive limit (LEL) (10% of LEL), members may operate using extreme caution, mindful that the closer one gets to the source of a leak, the higher the concentration of gas that can be anticipated. Members should also remain mindful that natural gas rises, and may accumulate at the tops of shafts or stairways. Propane will usually sink, accumulating at floor level or in basements.
34. If at any time, members feel there is a threat to their safety, they should not proceed further regardless of any reading on any meter.
35. If at any time a CGI indicates that an area or buildings is at 10% of LEL or higher, the area or building shall be evacuated immediately. Under no circumstances shall any member enter or operate in an area where the concentration of gas is 10% of LEL or higher, UNLESS A SAVABLE HUMAN LIFE IS IN DANGER, AND THERE IS NO OTHER WAY OF MAKING THE RESCUE. In such a case the Incident Commander shall deploy defensive handlines to cover the rescue and take whatever other measures are feasible to minimize the risk to personnel.
36. Where a CGI indicates that the concentration of gas is less than 10% of LEL in one location, but in the judgment of the Incident Commander or members of scene that the concentration exceeds 10% of LEL in areas closer to the leak, members shall withdraw and assume a defensive position until the arrive of gas company personnel.
37. Where CGI readings exceed 10% of the LEL, the Incident Command should consider utilizing positive pressure ventilation to help reduce the concentration of gas. If a mechanical blower is to be used, personnel must ensure that the area where the blower will be positioned is free of vapors within the explosive limits, by monitoring that area with the combustible gas indicator before starting the blower.
38. A water fog stream can also be used to rapidly disperse or divert flammable vapors in most cases, particularly for outside leaks.
39. In the event that PPV is used, CGI readings should be taken on a regular basis. Once the level of flammable gas has dropped below 10% of the LEL, the entry team can move cautiously inside the structure to control sources of ignition and work to locate and/or isolate the source of the gas leak if the flow of gas was not able to be stopped from the exterior.