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|  | **Guidance for Standard Operating Guidance (SOG) Considerations for** **Natural Gas Incidents** |
| Effective Date:  | By the Authority of:  |
| Created Date: | Author Name: |
| Revised Date: |  |

**Purpose**

## To provide a model standard operating guide (SOG) to aid New Jersey (NJ) fire departments respond to natural gas incidents. Serve as an SOP/SOG Development / Enhancement Aid. This material was developed to aid emergency response organizations in developing or enhancing standard operating procedures (“SOPs”) or standard operating guidance (“SOGs”) relative to emergencies involving natural gas facilities.

This material is only focusing on a few aspects of SOPs/SOGs. SOPs can provide a valuable resource for emergency organizations / agencies in protecting themselves and others from harm. SOPs are not one fits all – they must be customized to the unique aspects, requirements, capabilities and resources of the emergency agency.

SOPs clearly outline what is expected and required of personnel during an emergency. They establish a standard course of action generic in nature that includes equipment placement, tactical operations, safety, command structure, responder expectations, and coordination with other organizations including utility companies, hazard assessment, and related considerations. SOPs are the procedural guidance for responding not the technical skills. This material provides considerations first responder organizations should evaluate when responding to emergencies that involve and / or natural gas facilities. While the material was prepared relative to natural gas hazards and utility facility considerations, not all hazards or aspects of natural gas utilities may have been considered.

It is strongly recommended that multiple resources and subject matter experts be used to develop your agencies SOPs. Some resources have been referenced in this document. It does not represent all of what is available. You should consult with your local utility and other operators of facilities in your jurisdiction for additional information and with other governmental, standard setting groups and other experts including the Gas Utility. SOPs are living documents that need to be reviewed and updated periodically. Training should be conducted periodically to your agencies SOGs.

Communication and coordination are key elements of any SOP. Always notify gas utilities immediately whenever their facilities are involved in an incident - utilize their expertise. Best by forming a Unified Command that includes the utility. Some incidents will require that the electric and / or gas be shut off and for the first responders to wait for the utility to de-energize or shut off the gas. Never attempt to repair gas facilities. You could jeopardize people and your own safety.

**Scope**

All NJ fire departments

**Definitions and Properties of Natural Gas**

* Natural gas in its natural state is colorless, tasteless, and odorless.
* Mercaptan is added to give NATURAL GAS AND PROPANE THEIR unique odor
* Mercaptan may be scrubbed out which is a condition known as “odor fade”.
* Natural gas is predominately composed of approximately 85-95 percent methane gas.
* Natural gas is non-toxic, but it may displace oxygen that can result in asphyxiation if a person is in a confined space
* Air has a specific gravity of 1 and natural gas has a specific gravity of 0.6.
* Therefore, natural gas is lighter than air causing it to rise and having higher readings at ceiling level.
* Venting manholes, homes, businesses, and other structures will allow natural gas to rise and dissipate into the outside environment, if it is not contained.
* Propane is heavier than air, where you will find elevated readings at floor level; as compared with natural gas (elevated readings can be found at ceiling level).
	+ The odorant Mercaptan is also added to propane gas.
	+ Propane: LEL is 2.1 with UEL of 10 percent.

**Lower Explosive Limit and Upper Explosive Limit**

* LEL (lower explosive limit) is the leanest possible mixture that will support combustion and is approximately 5% air gas mixture on a percent gas scale.
* UEL (upper explosive limit) is the richest possible mixture that will support combustion and is approximately 15% air gas mixture on the percent gas scale.



**Action Level for the Protection of the Public and Responders based on Open Air Readings**

* ANY “open air” gas readings obtained inside a structure, evacuate all occupants from the structure
* Any “open air” gas readings obtained inside a structures at 10% LEL (0.5% Gas), evacuate emergency responders
	1. Gas Responders evacuate at 20% LEL (1% Gas).

Note: While evacuation is at a lower percent of the LEL there may be areas in the structure at or above the explosive limit.

Note: Open Air readings inside a building are obtained for room air in the open area.

Note: Gas detection equipment (METER) is typically calibrated to a specific reference combustible gas, reading different gas than the specific gas the CGI will provide a reading that is under or over the actual level. The best action is to establish a low (10% LEL) action level to evacuate responders. Life Safety concerns may require actions above the action level for these situations use risk to gain, control ignition sources and coordinate actions using Unified Command.

**Gas Migration Considerations (e.g. other utility lines, concrete, asphalt, winter conditions, rain / water)**

* Natural gas lighter than air can migrate underground and along other pathways including sewer systems and utility trenches. Asphalt / concrete / frost can prevent natural gas from rising into the atmosphere. Natural gas can migrate underground into structures.
* Do not rely on gas odor. The odorant added can be scrubbed from the gas or a person can be desensitized to the odorant. Always use calibrated gas detection equipment (METER) such as a Combustible Gas Indicator (CGI).
* Propane being heavier than air will pool in low areas, basements and can collect in pockets underground.

**There are three general natural pressures systems:**

* Low pressure or utilization pressure typically ¼ psi generally the pressure used to feed appliances. This pressure is used in some gas distribution systems.
* High pressure greater than ¼ psi and less than 125 typically used gas distribution system to deliver gas with regulator to lower the pressure at the point the gas is provided to the customer. A regulator lowers the high pressure to the ¼ that the customer is supplied. A pressure relief is part of the regulator and can release gas as a safety to prevent high pressure gas from entering the customer piping / structure.
* Transmission pressure greater than 125 psi and can be hundreds of psi up to 1200 psi. This pressure is used in the gas transmission system to supply gas to gas companies and provide transmission feeds to gas distribution systems. Gas Transmission systems have 24/7 monitoring by a Control Center. The location of transmission facilities and Control Center contact information can be obtained from the National Pipeline Mapping System: <https://www.npms.phmsa.dot.gov/>
	+ Larger stand-off distance will typically be required for transmission gas leaks. See USDOT Emergency Response Guide - Guide 115 (800 meters / ½ mile or greater).
		- Link: <https://www.phmsa.dot.gov/hazmat/outreach-training/erg>

**Identifying natural gas**

For all pressure systems:

* Smell (rotten eggs) based on an odorant added (note: same odorant as use for propane)
* Sound the high pressure and transmission pressure systems can create loud blowing noise with the transmission pressure create a much louder blowing noise
* See - blowing dirt or vapor - transmission would create a potential of a much greater amount dirt / vapor being released
* For transmission only: 24-7 Control Center may see a loss of pressure and can provide support and may be able to verify a system loss of pressure along with operating emergency valves

**Personnel Responsibilities**

Upon arrival at the scene it is the responsibility of a fire department officer to establish a command post.

The fire department officer should determine the following:

* Threat to life safety including the responders.
* Gas company notified and requested to respond, if needed.
* Possible damage to property that is posed by any fire caused by the gas equipment.
* If additional companies and/or agencies are needed.
* A course of action to protect life and stabilize the incident.
* Form a unified incident command with other responders and gas company representatives
	1. Scribe to capture information
		1. Map readings and change over time
		2. Evacuee information
		3. Assignments and status
			1. When tasked completed
			2. When operations are terminated or turn over to another agency

**Considerations**

* Establish command post
* Appoint Safety Officer
* Track responders when checked-in and track evacuees.
* Use **distance** (330 feet) and **shielding** to **protect** command post and responders.
* Notify the gas company.
* Work with gas company representatives to secure gas to the affected area or the entire structure.
* Do not open or close underground valves.
* If you turn off a valve, leave it off. **DO NOT** turn gas valves back on.
* Apparatus should be parked away from manholes, valve boxes, catch basins, vent holes, etc.
* Do not walk or stand on or near manholes, valve boxes, catch basins, vent holes, etc. with gas readings
* Park upwind, if possible, and out of the Hot Zone to avoid collapse and blast hazards.
* Eliminate all possible ignitions sources, including electronic devices (i.e. cell phones)
* When gaining access to the structure, **DO NOT** uses the doorbell, intercom etc., or other devices that may act as sources of ignition.
* Do not linger inside or in front of any structure with a strong gas odor, sound of releasing gas or see gas being released, unless the condition is below the action level as determined by a calibrated Combustible Gas Indicator (CGI).
* When possible and safe (below the action level), have a firefighter (FF) locate and check the gas meter for excessive flow.
* The FF should be equipped with full personal protection equipment (PPE) including: SCBA, intrinsically safe radio, and adjustable wrench, and calibrated gas detection equipment (METER).
* Ensure that detection equipment is turned on in clean air prior to entering areas that may be contaminated for a zero calibration reading.
* Turn flashlights, radios, and thermal imaging cameras etc. on prior to approaching scene. Do not change batteries in gaseous atmosphere
* Cell phones are generally not rated as intrinsically safe and should not be brought into a possible ignitable/explosive atmosphere. If you must carry a cell phone, turn it off prior to entry in the contaminated area.
* If electrical switches are on, **LEAVE ON**. If they are off, **LEAVE OFF**. Notify occupants of same as they evacuate.
* Before closing above ground meter / service/ feeding the structure ¼ turn valves, check for corrosion at the pipe / ground interface which may cause the pipe to break when trying to close the valve. Do not use excessive force to close the valve or remove the valve core retaining nut.
* Keep personnel, occupants, and apparatus 330 feet from structures, shield the command post, and staging areas.
* Develop an action plan for eliminating sources of ignition with the Unified Command.
	+ (Don’t assume you can always eliminate all ignition sources)
* Use public address (PA) equipment / system to aid in evacuations.
	+ Be aware when using reverse 911 systems (potential ignition source).
		- Risk-to-gain consideration.
* Develop an action plan for venting the structure with the Unified Command.
* Do not operate above ground valve in Gas Meter and Regulation Stations. These fenced in areas are securing the gas supply.
* Venting Considerations and Precautions:
	+ Ignition sources should be eliminated before venting as the gas level may be above the upper explosive limit and will enter the explosive range when being venting
	+ Venting equipment can be a source of ignition
		- Use intrinsically safety equipment if available
		- Do not use smoke ejectors that are not intrinsically safe as these will pull the gas through a possible ignition source
	+ Consider the direction of venting and avoid venting into other structures / intake vents
	+ Consider natural venting by opening lower and upper windows air flow can naturally occur - if below the LEL
	+ Consider positive venting including preventing back flow that might permit gas to be pushed back around the venting equipment. PPV could force gas into voids and into unaffected spaces
	+ Consider negative venting only with intrinsically safety venting equipment
	+ If the atmosphere inside the structures is in the explosive range, develop a plan to ventilate that will not expose responders to a possible explosion. This may include using a long pike pole from behind another structure etc.
	+ Keep personnel to a minimum and protect with heavy shielding and PPE
* Consider / coordinate with Gas Company in Unified Command if a Rapid Intervention Crew / Team (RIC / RIT) is needed to support the Gas Company.

**Natural Gas Escaping From Outside Of a Building**

* Notify dispatch to have the gas company respond to the scene.
* Approach the scene from an up-wind direction.
* Do not park in front of the structure
* Apparatus should be parked away from manholes, valve boxes, catch basins, and vent holes.
* Park upwind if possible and out of the Hot Zone to avoid collapse and blast hazards.
* Do not carry cell phones or other electronic devices that are not intrinsically safe
* Approach walking toward the structure corners with calibrated gas detection equipment (METER)
* Check surrounding buildings, particularly cellars, for any gas present by using calibrated gas detection equipment (METER). Team up with gas company personnel to perform these checks.
* The Hot Zone should be cleared and taped-off or barricaded.
* The Cold Zone should be tape-offed or barricaded and perimeter secured.
* Prohibit smoking, starting power equipment or any device that may cause a spark.
* Extinguish all open flames **unless it is fed by the leaking gas.**
* Keep a list of structures that have been checked and the status of occupants.
* Restrict or re-route traffic until Gas Company personnel can identify or locate the source of the gas and bring it under control.
* Restrict all non-gas company individuals from entering the Hot Zone.
* Consider handline(s) for protection, when needed.
	+ Safety Considerations: distance and shielding and being mindful of freezing and ice accretion
* **DO NOT** rely on sense of smell. Use calibrated gas detection equipment (METER). Mercaptan may have been scrubbed from the gas and/or you may temporarily lose sensitivity to the odor**.**
* Consider near-by structures and intake vents. May need to close intake vents / doors / windows to prevent gas from entering a near-by building.

**Natural Gas Escaping From Inside a Building**

* Notify dispatch to have Gas Company respond to the scene.
* Approach the scene from an up-wind direction.
* Apparatus should be parked away from manholes, valve boxes, catch basins, and vent holes.
* Park upwind if possible and out of the Hot Zone to avoid collapse and blast hazards.
* Do not carry cell phones or other electronic devices that are not intrinsically safe
* Approach walking toward the structure corners
* Ensure that gas detection equipment is turned on in clean air prior to entering areas that may be contaminated for a zero calibration reading.
* Perform checks with calibrated gas detection equipment (METER) prior to entering the building and inside the building.
	+ If gas readings are found and no occupants are determined to be inside withdraw to a safe distance (330 feet or 2 similar structures away) and await the arrival of a gas company representative. Check and evacuate surrounding structures.
	+ If gas readings are found and building occupants are present, clear the building of occupants and leave doors and windows open. Keep in mind this may bring the structure back into the explosive/flammable range if the gas/air mixture was above the explosive/flammable range.
	+ If gas readings are obtained at 10% LEL (0.5% Gas), evacuate emergency responders
		- NOTE: Gas Responders evacuate at 20% LEL (1% Gas).
* When possible and safe (below the action level), have a firefighter (FF) locate and check the gas meter for excessive flow. This FF should be equipped with full PPE, intrinsically safe radio, and adjustable wrench.
* Turn off gas at the above ground ¼ turn valve if it is an outside meter. Before closing above ground valve, check for corrosion at the pipe / ground interface which may cause the pipe to break when trying to close the valve. Do not use excessive force.
* If it is an inside meter **DO NOT** attempt to turn it off. **EXIT** the building and wait for a gas company representative to turn off the gas.
* **DO NOT** turn electrical switches inside the building **ON** or **OFF** as they may provide a source of ignition. If electrical switches are on, **LEAVE ON**. If they are off, **LEAVE OFF**. Notify occupants of same as they evacuate.
* **Do not operate the main breaker** as this could be an ignition source if gas is in the enclosure / panel.
	+ **If you are going to operate the main breaker, check with calibrated gas detection equipment (METER) to verify that there are no gas readings in the breaker enclosure / panel and that there is not an emergency generator or other power source as part of the electric system before operating the breaker.**
* At no time should anyone but a gas company representative operate underground gas valves.
	+ In certain instances, you may be turning a gas valve on or turning off the gas might seriously interrupt important processes or create further hazards. Coordinate with the Gas Company.
* Never turn a valve to the on position after being turned off (**ONCE OFF** **LEAVE OFF**). Leave this process to the gas company representative. **(Notify the gas company if a valve is shut off).**
* **DO NOT** rely on sense of smell. Use calibrated gas detection equipment (METER). Mercaptan may have been scrubbed from the gas and/or you may temporarily lose sensitivity to the odor.

**Natural Gas Burning Outside**

* Notify dispatch to have Gas Company respond to the scene.
* Approach the scene from an up-wind direction.
* Apparatus should be parked away from manholes, valve boxes, catch basins, and vent holes.
* Park upwind if possible and out of the Hot Zone to avoid collapse and blast hazards.
* Do not carry cell phones or other electronic devices that are not intrinsically safe
* Approach walking toward the structure corners
* Allow gas-fed fire to burn if there is no threat to life or property. If extinguished, it is possible for gas fires to re-ignite at other locations or for gas to build up to dangerous levels.
* Protect nearby combustibles in the vicinity of the fire by wetting down or isolating.
* Consider use of fog spray to control the burning gas away from other structures.
* Anticipate multiple gas leaks. Check surrounding structures.
* Evaluate if gas is migrating into nearby structures with calibrated gas detection equipment (METER).
* Stay at a safe distance and clear the Hot Zone by taping it off or barricading if possible.
* **DO NOT** turn **ON or OFF** any underground gas valves.
* Consider whether people should be evacuated.
* Share all information with Unified Command
* Consider general fire tactics for gas emergencies.
* Coordinate with Gas Company

**Natural Gas Burning Inside**

* Notify dispatch to have Gas Company respond to the scene.
* Approach the scene from an up-wind direction.
* Apparatus should be parked away from manholes, valve boxes, catch basins, and vent holes.
* Park upwind if possible and out of the Hot Zone to avoid collapse and blast hazards.
* Account for all occupants and evacuate.
* Protect nearby combustibles in the vicinity of the fire by wetting down or isolating.
* Anticipate multiple gas leaks. Check surrounding structures with calibrated gas detection equipment (METER).
* Do not carry cell phones or other electronic devices that are not intrinsically safe
* Approach walking toward the structure corners.
* Evaluate if gas is migrating into nearby structures with calibrated gas detection equipment (METER).
* Shut off the gas if possible prior to extinguishing the flame.
* Consider the impact of a quick-spreading gas-fueled fire on adjoining structures.
* Consider whether other structures should be evacuated.
* Gas company personnel are not equipped for entry into hazardous areas. Consult with gas company representative for best method to isolate gas service.
* If the gas supply cannot be safely shut- off have a hose line available to extinguish any possible fire in adjacent combustible material.
* **DO NOT** use water on the burning gas if possible.
* Consider use of fog spray to control the burning gas away from other structures.
* Consider growth of fire and additional water sources and hand-lines, if needed.
	+ Consider general fire tactics for gas emergencies.
* Remember CO can also create an explosive atmosphere
* Coordinate with the Gas Company

**Natural Gas in Manholes, Vaults, or Sewers**

* Notify dispatch to have Gas Company respond to the scene.
* Approach the scene from an up-wind direction.
* Apparatus should be parked away from manholes, valve boxes, catch basins, and vent holes.
* Park upwind if possible and out of the Hot Zone to avoid collapse and blast hazards.
* Do not carry cell phones or other electronic devices that are not intrinsically safe
* Approach walking toward the structure corners
* Check surrounding structures.Evaluate if gas is migrating into structures via the sewer.
* If the gas is ignited, allow it to burn to help limit the threat to life or property.
* Stay at a safe distance and clear the Hot Zone by taping it off or barricading if possible.
* Never enter manholes, vaults or sewers. ( if life hazard is present refer to confined space SOPs)
* Check the surrounding manholes, vaults or sewers with calibrated gas detection equipment (METER)
* Develop an action plan for venting manholes with the Gas Company in Unified Command.
* Keep head, hands and body parts away from manhole openings at all times.
* DO NOT pull manhole covers to vent gas from sewer systems
	+ Leave this to the Gas Company
	+ Danger of metal on metal, causing a spark.
* Verify that barricades are erected around open manholes.
* Coordinate with the Gas Company in Unified Command.

**Damaged Gas Facility in Exposed Excavation**

* Notify dispatch to have Gas Company respond to the scene.
* Approach the scene from an up-wind direction.
* Apparatus should be parked away from manholes, valve boxes, catch basins, and vent holes.
* Park upwind if possible and out of the Hot Zone to avoid collapse and blast hazards.
* Stay at a safe distance and clear the Hot Zone by taping it off or barricading it if possible.
* Never enter a trench/excavation unless life safety concerns exists
	+ Use properly trained personnel equipped to enter if necessary
* Never perform gas repair work.
	+ Never bend or have contact with plastic natural gas line due to possible electrical charge associated with improper grounding resulting in static electricity.
* Evacuate a trench/excavation site until the gas company can make repairs.
* Do not carry cell phones or other electronic devices that are not intrinsically safe
* Approach walking toward the structure corners
* Anticipate multiple gas leaks. Check surrounding structures with calibrated gas detection equipment.
* Evaluate if gas is migrating into nearby structures.
* **DO NOT** attempt to turn off machinery unless safe to do so.
* **DO NOT** apply water to trench/excavation unless absolutely necessary. Water could enter a gas main and create safety problems in other areas.
* Use water when needed to keep combustibles from burning without putting out gas-fed fire.
* Coordinate with the Gas Company

**Cross-bore**

* Directional Drilling may inadvertently bore a gas facility through a sewer line “cross-bore”.
* A cross-bore can go undetected for months or even years.
* If a sewer backup develops, a plumber may use a mechanical rotary device that may damage a gas facility, causing gas to migrate into the sewer system and into homes and buildings fed by the sewer system.
* Beyond the normal considerations of blowing gas, be alert for any unusual conditions including:
	+ Bubbling water in a sink, toilet or drains inside the house.
* Evacuate and follow **Inside &** **Outside Gas Leak** procedures.
* Gas migration in the sewer may extend to a larger area fed by the sewer system.
* Check the surrounding manholes, vaults or sewers with calibrated gas detection equipment (METER)
* Develop an action plan for venting manholes with the Gas Company in Unified Command.
* Keep head, hands and body parts away from manhole openings at all times.
* DO NOT pull manhole covers to vent gas from sewer systems
	+ Leave this to the Gas Company
	+ Danger of metal on metal, causing a spark.
* Verify that barricades are erected around open manholes.
* Coordinate with the Gas Company in Unified Command.

**Damaged Gas Facility by Directional Drilling**

* Notify dispatch to have Gas Company respond to the scene.
* Approach the scene from an up-wind direction.
* Apparatus should be parked away from manholes, valve boxes, catch basins, and vent holes.
* Park upwind if possible and out of the Hot Zone to avoid collapse and blast hazards.
* Stay at a safe distance and clear the Hot Zone by taping it off or barricading it if possible.
* Never enter a trench/excavation unless life safety concerns exists
* Use properly trained personnel equipped to enter if necessary
* Never perform gas repair work.
	+ Never bend or have contact with plastic natural gas line due to possible electrical charge associated with improper grounding resulting in static electricity.
* Evacuate a trench/excavation site until the gas company can make repairs.
* Determine the extent of directional drill length to aid in knowing where potential facilities may have been damaged and the area to evaluate.
	+ Key questions to ask / consider-
		- How far and direction the drill or piercing tool went?
		- Was the HDD pulled back? If yes, how far back?
	+ Do not have the directional drill pulled back - have it left in place.
* Do not carry cell phones or other electronic devices that are not intrinsically safe
* Approach walking toward the structure corners
* Anticipate multiple gas leaks along the length of the directional drill.
* Check surrounding structures fed by sewer system and consider elevation as natural gas rises.
* Evaluate if gas is migrating into nearby structures using calibrated gas detection equipment (METER)
* Be alert for multiple gas leaks.
* **DO NOT** attempt to turn off machinery unless safe to do so.
* **DO NOT** apply water to trench/excavation unless absolutely necessary. Water could enter a gas main and create safety problems in other areas.
* Use water when needed to keep combustibles from burning without putting out gas-fed fire.
* Coordinate with the Gas Company.

**Explosion:**

See response to Inside / Outside / Damage Gas Leak / Cross-Bore Response, as appropriate:

* Signal evacuation alert
* Conduct PAR / check with other responders for accountability of their personnel
* Verify evacuees are safe and accounted for
* Plan & conduct rescue if needed Refer to technical rescue SOPs
* Re-evaluate the scene , size-up
	+ Is gas secure
	+ Structure stability / near-by structure stability
	+ Hazardous conditions
		- Fire / Gas Leaks / Additional Explosions
		- Asbestos and/or other harmful containments maybe in the dust / debris
		- Damage to other utilities
* Check near-by structures: gas leaks (assume multiple gas leaks) / potential for additional building explosions
* Re-assess staging, zones, CP location and resources needs
	+ Additional EMS - establish triage area as needed
* Conduct appropriate notifications and resource requests
	+ Notify where to stage and best approach
	+ Ensure egress and ingress
* Request Special Units
	+ Collapse Unit / Hazmat / SMEs - Structural assessment
* Establish perimeter and press area
	+ Consider drones / other scene intrusions

**Personnel Safety**

**Identifying a gas leak**

* Smell – Strong odor similar to rotten eggs
* See – exposed pipe, bubbling water, blowing dirt, dead plants or sinkhole.
* Hear – Roaring, hissing or whistling sound.
* Detection with calibrated gas detection equipment (METER).
	+ NOTE: the odorant may be stripped and/or one may become desensitized to the odorant.

All personnel working in the vicinity of a known or suspected gas leak shall wear the agency’s required PPE.

* Turn flashlights, radios, and thermal imaging cameras etc. **ON** prior to approaching scene.
* No smoking or vaping or use
* Cell phones or personal electronic devices are generally not rated as intrinsically safe and **SHOULD NOT** be brought into a possible ignitable/explosive atmosphere. If you must carry a cell phone, turn it off prior to entry in the contaminated area.
* Personnel should limit exposure to the hazardous structure(s) and use distance and shielding.

Personnel working in a suspected ignitable/explosive atmosphere (eg: attempting to shut off a gas line, evacuating a building) shall be breathing air from their SCBA and shall be covered by a staffed charged hose line. The number of exposed personnel will be kept to an absolute minimum at all times. Emergency Medical Services (EMS) should be requested to the scene and staged at a safe distance.

**Establish an Action Level for the Protection of the Public and Responders**

* All personnel should know the agency’s action levels and evacuation requirements.
* ANY open air gas readings obtained inside a structure, evacuate all occupants from the structure
* Any gas readings obtained inside a structures at 10% LEL (0.5% Gas), evacuate emergency responders unless different action level has been set - action level should be well below the LEL
* Note: Gas Responders evacuate at 20% LEL (1% Gas).
* Note: Fire Department typically uses the LEL scale whereas Gas Companies use the % gas scale. Make sure the reading scale is stated when sharing and recording readings

Shielding typically uses apparatus to protect responders

All firefighters should have required training and working knowledge of gas emergencies. All firefighters should understand how their gas detection equipment (CGI) functions and what the alert levels are.

Periodic review and updates to SOGs should be done along with associated training.

**Conduct a HOTWASH / AFTER ACTION REVIEW**

Share key learnings internally and externally with other responders

Learnings with a wider implications share with New Jersey Division of Fire Safety (NJDFS)

**Media Response**

* Follow your department’s media and social media policies.
	+ Be respectful of people’s privacy.
* Avoid any speculative remarks regarding the incident.
* A representative from the gas company should be requested for accurate information relating to the incident prior to any public statements. Only the Public Information Officer (PIO), Incident Commander or their designee is authorized to issue a statement.
* Please see the **CDC Crisis and Risk Communication (CERC)** website additional tools and resources: <https://emergency.cdc.gov/cerc/index.asp>

**DO NOT:**

* Allow open flames, smoking, or spark-producing devices in either open or closed areas if the presence of unignited combustible gas is suspected.
* Ring doorbells, operate switches or use the telephone/cellphone in areas where the presence of unignited combustible gas is suspected.
* Open or close underground gas valves in the street at any time.
* Turn on a gas valve if you have already shut it off (**ONCE OFF LEAVE OFF**).
* Extinguish flames of ignited escaping gas inside or outside where there is no danger to life or property.
* Issue public statements at the scene unless authorized by the IC.
* Linger around or near any structure with a strong gas odor present, unless the condition is being monitored by calibrated gas detection equipment (METER).
* Park emergency vehicles over or around manholes, valve boxes, catch basins and vent holes collapse or explosion zones.
* Pull electric meters
* Operate the main breakeras this could be an ignition source if gas is in the enclosure / panel.
	+ **If you are going to operate the main breaker, check with calibrated gas detection equipment (METER) to verify that there are no gas readings in the breaker enclosure / panel and that there is not an emergency generator or other power source as part of the electric system before operating the breaker.**

**DO:**

* Notify dispatch when the gas company is needed on scene.
* Evacuate structures when hazardous conditions exist.
* Account of all occupants evacuated (may need their keys to check apartments etc. later).
* Stay away from hazardous structures at least 330 feet or two similar type & size structures.
* Shield responders and command post from hazard.
* Consider multiple gas leaks, gas migration and potential for explosions
* Shut off gas at the meter (typically-¼ turn) valve or the gas service riser valve if possible.
* Instruct all occupants **NOT** to turn off or permit anyone to turn off electric light switches, motors, circuit breakers or any other electrical equipment.
* Notify dispatch if the electric service has to be disconnected to an area or single building.
* Check the buildings in the immediate area for the presence of gas with calibrated gas detection equipment (METER). Evacuate when necessary.
* Immediately tape-off or barricade the suspected area at the scene of any gas emergency.
* Restrict pedestrian or non-emergency vehicular traffic from entering the area.
* Eliminate as many sources of ignition as possible such as flares, torches, cigarettes, cell phones, etc.
* Always try to stay on the upwind side of a gas leak.
* Use self-contained breathing apparatus.
* Refer to the department’s standard operating procedures (SOPs) regarding trench/excavation and confined space procedures.
* Use water when needed to keep combustibles from burning without putting out gas-fed fire.

Note: Gas detection equipment (METER) is typically calibrated to a specific reference combustible gas, reading different gas than the specific gas the CGI will provide a reading that is under or over the actual level. The best action is to establish a low (10% LEL) action level to evacuate responders. Life Safety concerns may require actions above the action level for these situations use risk to gain, control ignition sources and coordinate actions using Unified Command.

**Job Aids:**

**Job Aid # 1: Gas Coordinated Emergency Response Checklist**



**Job Aid # 2: Natural Gas SOP/SOG Checklist**

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**Job Aid #3: Natural Gas vs. Propane Aspects**



**Job Aid # 4: Google Translate Instructions**



**Resource Links:**

PHMSA National Pipeline Mapping System (Transmission /Hazardous Liquid): <https://www.npms.phmsa.dot.gov/>

Pipeline Association for Public Awareness: <http://www.pipelineawareness.org/welcome-government-and-emergency-officials/>

US-DOT Emergency Response Guide: <https://www.phmsa.dot.gov/hazmat/outreach-training/erg>

New Jersey Division of Fire Safety (NJDFS):

NJDFS Awareness Gas Response Alert: <http://www.nj.gov/dca/divisions/dfs/alerts/safety_alerts/awareness_alert_17_1_natural_gas_leak_response.pdf>

NJ Learn:

Online Gas Training: <https://ngafirstresponder.com/>

Lafayette Indiana Case Study: Natural Gas Pipeline Explosions: <https://www.youtube.com/watch?v=uFeBlAYRJTo>

AEGIS Loss Control Training & Awareness Videos: <https://www.aegislink.com/aegislink/resources/education/loss_control.html>