To: Ms. Kathleen H. Burgess
Secretary
NYS Public Service Commission
3 Empire State Plaza
Albany, NY 12223-1350

8 Jan 2014

From: Mr. Gerald L. Knapp
9 Mackey Rd
Garnerville, NY 10923

Subject: Case # 13-G-0484 Recommendations to Improve Responder Safety at Natural Gas Emergencies

2014 JAN 16 AM 10: 03

Dear Ms Burgess,

Thank you for your time to consider the attached information.

These documents contain practical, experience based, cost effective and easily attainable recommendations to vastly improve the safety of Firefighters, Police Officers, Emergency Medical Service personnel and residents during natural gas emergencies.

The critical issue is that currently, a standardized response protocol blending both fire and utility industry best (safety) practices is not available. This procedural gap is a huge safety deficiency. The Public Service Commission can lead the effort to close this gap. Success will require cooperation and only minor adjustments by both the utility and emergency responders.

I would like to thank your staff members, Mr. Steven Blaney and Ms Donna Giliberto who have been extremely helpful to me by providing research and guidance in preparation of my recommendations. Their professionalism and service oriented approach reflect great credit upon, you, the PSC and of course, themselves. Please pass my thanks on to them.

Please review the attached information and consider appropriate actions.

I am available to assist, discuss or simply answer your questions via phone at: 845-429-2432, cell 845-558-0489 or by email at jknapp23@aol.com.

Very Respectfully,

GERALD L. KNAPP

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Secretary
NYS Public Service Commission
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Albany, NY 12223-1350

From: Mr. Gerald L. Knapp
9 Mackey Rd
Garnerville, NY 10923
845-558-0489

Subject: Case # 13-G-0484 Recommendations to Improve Responder Safety at Natural Gas Emergencies

1. The purpose of this document is to provide my recommendations toward improving the safety of residents, Firefighters, Police Officers and Emergency Medical Service personnel during releases of natural gas. Clearly, to improve the on-scene result at these unfortunate incidents, both the utility and the fire departments must both consider minor changes to current practices.

2. There is a significant opportunity before us to improve the safety of all utility and emergency responders if we seize it. Resolving the issues listed below will be a major contribution to the safety of firefighters and police officers in New York State.

3. The critical and underlying weakness on the scene of a gas emergency is that there are personnel from both the utility and responder communities (FD,PD), both attempting to resolve the same emergency without: a common plan, functional communications, common training, standard gas detection instruments and without a mutually agreeable command system.

4. Currently, a standardized response protocol blending both fire and utility industry best (safety) practices is not available. This gap is a huge safety deficiency for all responders to natural gas emergencies. Protocols/procedures should be developed similar to those New York State Paramedics use for medical emergencies. These protocols are based on industry best practices and analysis of outcomes of similar emergencies nationwide. Additionally, utilizing a concept similar to the "Red Flag" warning situations used by our wildland firefighters, will further enhance responder safety at natural gas emergencies.

5. Although I can only speak from my experiences in Rockland County NY, it is safe to assume, the issues and recommendations that follow can in whole or in part

be applied across the state and possibly our country. Most of these recommendations cost little or no money to execute and simply require good responsible leadership and management from utility, fire, police and EMS responders.

6. The following plans and recommendations are based on my experiences: Plans Officer at the US Military Academy, West Point, Rockland County HazMat Team Battalion Chief, 39 year veteran Firefighter/ Paramedic, training officer, published author (national and international) and natural gas explosion survivor.

7. Fire Department responses to natural gas explosions are actually responses to– Improvised Explosive Buildings—and are more common than one may realize. If you are reading this there is no need to remind you of their unpredictability, frequency and devastating consequences. Additionally, gas emergencies are very high risk operations with deadly consequences for all responders and civilians even under the best management, oversight, training and prior planning.

8. Please consider the following:

   a. **ISSUE: Fire Departments and utility responders to natural gas emergencies *do not use the same procedures* and have different protocols, perspectives and most important, priorities.**

      DISCUSSION: Here is just one example. On Jan 16, 2012 while operating at a gas main leak, an Orange and Rockland Utility (O&R) gas technician reported to the FD that there was a significant amount of gas coming from inside the house causing a high reading on his meter (outside). A contractor allegedly struck the main with a torpedo (excavation device) and gas apparently migrated underground into the nearby unoccupied home. According to utility company procedures, this is an immediate red flag that should have caused all responders to evacuate the area per Work procedure 7000A/70002A-5 paragraph B (Attached at Tab A). Instead the gas technician requested the FD to force open the door so he could get inside. Seconds after his request, the house exploded severely injuring 2 firefighters. Only good luck prevented their deaths and deaths of 3 firefighters that were approaching with the tools necessary to force entry.

      FD leaders are often not aware of this utility procedure. Utility companies and procedures are recognized (appropriately) as the subject

matter experts but effectively, for one reason or another, their safety/work procedures are a well kept secret from FD, PD and EMS responders. Further, sharing of these procedures is NOT part of the awareness training provided to FDs by utilities. Attached at Tab B is an example of dangerously weak procedures currently used by fire departments in my area. Often department members have not even been trained using these specific procedures.

Note that these FD procedures do not align even remotely with the utility procedure. FD procedures often do not contain: action levels or methods for air monitoring, required training for officers and members, clear mission statements (is the FD mission, Life safety?), how to interface (use the Incident Command System) with utility responders on the scene, clear lines of authority, clear direction on what actions to take and those that are prohibited under certain dangerous circumstances (similar to gas industry procedures), methods to minimize the explosion hazard, (removing man hole covers, eliminate ignition sources) etc.

Additionally, the Utility has a Code Mrre (Multiple Resource Response Event) which in actuality has similarities to a pilot declaring an in flight emergency. This rapidly summons the FD to the scene....with no joint plan or training before the emergency except for some weak and limited awareness (basic) level power point presentations presented by the utility.

Utility and fire personnel do not train together, share a common plan or radio frequency, but leaders on both sides expect subordinates to figure it out during the emergency. We respond together to the same emergency, why do we not train together to prepare for these deadly calls?

RECOMMENDATION: PSC lead and chair a working group to include the NYS Office of Fire Prevention and Control, SEMO, PESH, Local FD representatives and utility experts to develop a detailed *model emergency response procedure for natural gas emergencies* that can be modified for use at the local level. This procedure should be based on gas industry standard best practices and FD best practices. Similar to the wildfire community response (overhaul of their plans/procedures/protocols) to several multi-fatality firefighter deaths, a RED FLAG system of warning scenarios should be developed for natural gas emergencies so responders can be trained to recognize developing

dangerous situations. Maybe it is time to ***require FD training*** like we do for: Bloodborne Pathogens, OSHA safety, Hazmat refresher and Bail-out?

ADDITIONAL INFORMATION: Attached at Tab C is a draft procedure that was prepared jointly by the undersigned and O&R gas experts. It could be used as a starting point for model procedure recommended above. It represents a simple but effective standard operating guideline for use by FDs, PDs and EMS to improve safety during gas emergencies. Essentially, this document is a melding of industry best practices into a model SOP for firefighter use. This of course is the flow chart which is a summary and part of the full 5 page detailed procedure.

b. **ISSUE**: **Currently there is a huge training gap between utilities gas technicians and FD, PD and EMS units that respond to natural gas leaks, fires and explosions.** Because of this training gap, all responders are unnecessarily vulnerable at gas leaks.

DISCUSSION: Utilities currently offer only awareness (very basic) level training to firefighters and fire officers. Firefighters respond at the technician level (actively enter hot zones, mitigate leak) at these dangerous alarms. Awareness training does not cover specific procedures and specific dangers of various leak scenarios. There are common leak scenarios: odor of gas inside, odor of gas outside. Firefighters get a weak basic knowledge and leave the training thinking they are fully prepared to safely respond to natural gas leaks. The utility meets their obligation (minimally) for providing training which provides FDs, PD and EMS responders a false sense of security. There is a moral, ethical and professional obligation to provide adequate training for firefighters for the most common and dangerous hazmat emergency, natural gas or propane leaks.

RECOMMENDATION: The work group recommended above, lead by PSC should work cooperatively with NYS OFPC to take the lead in developing a training program to provide the technician level training specific for natural gas emergencies state wide for firefighters. This program should be delivered state wide as a pre-requisite for response to natural gas emergencies by all responders. See proposed phased training plan at Tab D.

c. **ISSUE:** Currently, it is impossible for first due responders (Fire, Police, Utility) to follow the NIMS/ICS procedures during gas emergencies and there is no joint training or common ICS policy or plan to link the utility technician to FD command.

DISCUSSION: To minimize cost, utilities send just one gas technician to natural gas emergencies. Typically, s/he goes about his business following gas company procedures. Often there is no communication between the gas technician and the FD Incident Commander. This obvious NIMS/ICS violation and communication gap must be repaired with a common, functional plan agreed upon by all responding agencies.

RECOMMENDATION: Possible solutions: a firefighter can accompany the gas tech and radio back to FD Command gas tech meter readings or status reports; or the gas tech can be provided a FD radio for direct coms with the command post or the gas company can send 2 employees, one to remain at the command post and one down range to investigate the leak. The second employee does not need to be a gas tech he can be a lower paid/skilled employee.

d. **ISSUE:** Which agency is legally responsible at a natural gas leak when the FD is called to the scene?

DISCUSSION: The answer to this question is critically important to implementation of the NIMS/ICS process and resolving the on scene communication gap. Many agencies have many different answers/opinions and at an emergency, nebulous situations get people hurt or killed. Naturally, there needs to be a cooperative partnership between the gas tech and the fire commander. However, the devil is in the details. If the FD is in-charge then according to NIMS/ICS the gas tech is a subject matter expert and works subordinate for/to the IC. Thus the FD can direct the gas techs actions. These actions maybe as simple as requiring him to maintain contact with the commander or command post. However, some gas techs do not report or communicate clearly with the commander. This is free lancing and diametrically opposed to all the principles of ICS. Essentially there are two teams playing the same game with different strategies with unsafe results at best, disastrous results at worst. Why are responders using different stratagies/tactics and instruments?

RECOMMENDATION: PSC must determine who, ie what agency—PD, FD, Utility... is responsible for mitigation of a gas leak when the FD is called to the scene. The model SOG recommended above must contain clear language (policy and procedures) about on scene interactions and how the gas tech must interface with the FD incident commander. There must be one coordinated plan for gas leak emergencies that all agencies can train responders to operate in. Alternatively, the Unified Command principal could be applied assigning a utility representative and a fire representative to fill the command position responsibilities.

e. **ISSUE:** Countless times in Rockland County, Volunteer Firefighters are requested by Orange and Rockland Utilities to "assist" at a gas leak without critical safety information.

DISCUSSION: Fire dispatch frequently only has the following information for the responding firefighters: *"O&R requests assistance at a gas leak at a certain address"*. For the safety of volunteer firefighters the following information is required:

a. Is the utility on the scene?
b. Is it an underground leak or an odor in a building?
c. Where is the hot zone so responding firefighters don't drive into it?
d. Where is the O&R command post
e. Who is the current Incident Commander from the utility?
f. Are there dangerous levels of gas being detected?
g. What actions have been taken?
h. What actions are necessary?

This cost free information flow is critical to the safety of incoming fire and police units.

RECOMMENDATION: PSC update the regulations to require the utility to provide specific information as recommended by the combined PSC-FD-Utility work group recommended above.

f. **ISSUE:** Known leaks, information relay from utility to FD.

DISCUSSION: FDs are frequently, repeatedly, dispatched to the same class 2 or 3 gas leak. Last Christmas (2012) my Volunteer FD spent a full hour searching for a gas leak reported to be outside a specific address.

While we waited a full hour for the gas tech we inconvenienced numerous home owners in the area to enter their home and air monitor, stopped both pedestrian and vehicular traffic and wasted our volunteer's time when they should have been with their families. Upon arrival of the gas tech, he stated that they were aware of the leak, had been there several times and correctly pointed out in the street where the gas odor/leak was emanating from—all without leaving the seat of his truck. Orange and Rockland Utility obviously had known about the leak but willfully chose NOT to share this information with the FD on scene. Interesting, when the FD requests O&R to the scene, O&R's dispatch often asks numerous specific details from the FD.

RECOMMENDATION: PSC require the utility to provide necessary critical information upon requesting FD response.

g. **ISSUE**: Orange and Rockland Work Procedure 7000A/7002A-5 is an example of the disconnect between utility procedures and FD capabilities and understanding. This procedure is for a locked building that apparently, based on gas company atmospheric readings has *any* detectable gas concentrations at the outside of doors or windows.

DISCUSSION: This procedure states...."Note: under no circumstances is anyone, including Company personnel to enter the building until the source of the leak has been corrected from the outside, sources of ignition eliminated, the building has had ample time to ventilate, *AND the fire department provides clearance that the building is safe to enter."*

All FDs recognize the utility as the subject matter expert. This utility work procedure appears to transfer the responsibility and liability to the FD. There is no clear procedure for minimizing this hazard of this building which is nothing more than a huge bomb—an Improvised Explosive Building. It contains the fuel, oxygen and ignition sources. FDs have not been trained on how to deal with these type incidents, especially if there is no life hazard. Most NY Fire Departments are not trained to respond to improvised explosive buildings. FD personal protective equipment is not adequate for improvised explosive buildings and most FDs are not proficient in air monitoring at improvised explosive buildings. The utility is the subject matter expert, why have they not shared their work procedures and more importantly, Red Flags, with local Fire Departments? Why does this work procedure hand off a very dangerous situation to the FD?

There is not clear procedure on how to vent the gas loaded building safely except thru the use of bomb squad robots to break windows, release the natural gas and take subsequent readings.

RECOMMENDATION: Resolution of this huge gap in responder training be filled with a recommended procedure by the PSC work group as noted above.

END RECOMMENDATIONS

WORK PROCEDURE:	INTERIM ADDENDUM TO GAS LEAK PROCEDURES 7000 AND 7002

Additional Attempts to Gain Access to Buildings: Additional, immediate, and continuous actions shall be taken to gain access to inaccessible buildings under the circumstances listed below. This is required regardless of whether or not a Gas Construction crew has initiated repairs onsite. Additional attempts shall include but not be limited to: seeking contact information from neighbors, determining from Customer Service if the customer's account contains alternate contact information, or contacting emergency services for assistance (See section II). Exception: These requirements DO NOT apply if it can be determined through the GDCC or other means that NO pipes or conduits emanate from an identified SSS (ex: water valve manhole or a telephone man hole and the GDCC makes contact with and determines from the telephone company that no ducts or conduits emanate from the telephone SSS into any buildings):

a. Discovery of a sustained reading of 4% gas-in-air or greater at the foundation wall of an inaccessible building and the reading cannot be reduced below 4% by taking actions that may include shutting off the curb valve or digging a vent hole.

b. Discovery of atmospheric readings around a door or window frame at an inaccessible building. NOTE: Immediately shut off gas to the building from the outside, if possible, and notify the GDCC to call the fire department. THEN, cut the electric to the building, if possible. This can be accomplished by pulling the electric meter ONLY under the following circumstances: the electric meter is located outside the building AND a check has been performed to verify that NO gas readings are found where the electric meter meets the panel socket. An alternative is to call the GDCC to request Electric Operations to cut the power to the building. NOTE: UNDER NO CIRCUMSTANCES is anyone, including Company personnel to enter the building until the source of the leak has been corrected from the outside, sources of ignition eliminated, the building has had ample time to ventilate, AND the fire department provides clearance that the building is safe to enter.

ORANGE AND ROCKLAND UTILITIES,INC.		
DATE: 11/4/09	REVISION:	DEPT. Gas Operations
APPROVED BY	Reference:	PROCEDURE NUMBER: 7000A/7002A-5

Natural Gas Main Break/Leak With NO Fire

1. Purpose

To establish a procedure for incidents involving a gas main break/leak either inside or outside a structure where there is no fire.

2. Scope

The SOG applies to all officers and members of the West Haverstraw Fire Department.

3. Responsibility

It is the responsibility of all officers and members to explain and enforce this SOG so that all members comply

4. Procedures

4.1 Contact 44-Control and verify O&R Gas has been notified.
Ask for an ETA (estimated time of arrival) for O&R Gas

4.2 Stage apparatus safely upwind from break/leak.
"ESTABLISH HOT ZONE"

4.3 The First Due apparatus may enter the general area of the break/leak for investigative purposes or where the IC designates. Whenever possible, the apparatus should be facing away from the incident location; should the gas vapors ignite and an explosion or fireball occur. The rear of the apparatus will be exposed thus adding more protection to the members in the cab or pump panel.

4.4 Assign a Safety Officer & Monitoring Team.

4.5 Traffic control should also be considered with the use of Fire Police and or the local police having jurisdiction. Road flares will not be used as they are an ignition source.

4.6 All other responding apparatus should stage at least one block away or where the IC designates.

WEST B3

Natural Gas Main Break/Leak With Fire

1. Purpose

To establish a procedure for incidents involving a gas main break/leak in which it involves a fire outside a structure.

2. Scope

The SOG applies to all officers and members of the West Haverstraw Fire Department.

3. Responsibility

It is the responsibility of all officers and members to explain and enforce this SOG so that all members comply

4. Procedures

4.1 Contact 44-Control and verify O&R Gas has been notified.
Ask for an ETA (estimated time of arrival) for O&R Gas

4.2 Assign Safety Officer

4.3 Request additional unit if necessary. Extend operation? Consider an alternate frequency.

4.4 Assign Monitoring Team.

4.5 Traffic control should also be considered with the use of Fire Police and or the local police having jurisdiction.

4.6 Stage/set-up apparatus safely from leak/break/fire.
ESTABLISH HOT ZONE

Consideration should be given to backing into scene so apparatus can hastily exit in the event that The incident takes a turn for the worse. This will also only expose the rear of the apparatus to the fire, not the cab or even possibly the pump panel.

C1

FD POLICIES
1-FD TASK= LIFE SAFETY
2—SHUT OFF OF GAS ALWAYS AN IC OPTION
3-ASSIGN OFFICER TO GAS CO REP
4-TASK PD FOR PERIMETER
5—*ANY GAS READING OUTSIDE FROM INSIDE=IMMEDIATE WITHDRAWL*

OUTSIDE GAS ODOR OR CLOSED PIT DAMAGE

V 21 June 12 TAB C2

Establish Command
Verify gas co Response & Leak History

Establish hot zone 100' all directions

Assign Safety Officer

Safety Officer Assist IC

If gas co on scene... Assign Officer/member for communications link to IC

[redacted]

Assign Monitoring Team(s)

Confirm Danger Zone

Check Rig Positions

Use SOG as Checklist

Limit Rescuer Overload

Task PD to assist with set up of perimeter/traffic control

[redacted]

[redacted]

[redacted]

[redacted]

0 % LEL

[redacted]

0% LEL

Operation Complete

>0% LEL in SSS

Expand SSS Monitoring & danger zone Until 0% in SSS

>50% LEL in SSS

Remove Covers Place Cones around Hole

[redacted]

Evac occupants and members if >10% LEL inside buildings or >0% Outside

Continuously monitor nearby buildings if leak remains active

Call MA/HAZMAT for additional air monitors

C2

FD POLICIES

1–FD TASK—LIFE SAFETY
2–SHUT OFF GAS—ALWAYS AN OPTION
3– ASSIGN OFFICER TO UTILITY REP
4– TASK PD FOR PERIMETER
5– **ANY GAS READING OUTSIDE FROM INSIDE= IMMEDIATE WITHDRAWL**

INSIDE GAS ODOR SINGLE BUILDINGS FIND SOURCE

10% LEL=ACTION LEVEL
V12 FEB 13 TAB C1

Establish Command Post

Verify GAS CO Response

Assign Safety Officer

If GAS CO on scene Assign Officer/member for communications link to IC

Establish Hot Zone One house all sides of callers house

Assign Monitoring Team(s)

[redacted]

Assist IC at CP

Confirm Danger Zone

Check Rig Positions

Use SOP as Checklist

Limit Rescuer Overload

Shut Off Gas Meter IC Option

[redacted]

Withdraw everyone Inform IC

Shut Off Meter IC Option

FOLLOW OUTSIDE SOG

[redacted]

Gas Reading >10%

Withdraw Inform IC

Shut Off Gas Meter IC Option

[redacted]

Gas Reading <10%

Complete Monitoring

D

NATURAL GAS TRAINING PROPOSAL

PHASE 1—AWARENESS—3 hrs—presented by utility

PURPOSE: Provide to all firefighters, fire officers and police officers on the general hazards of gas, several case histories, flammable limits, limiting ignition sources, scene safety, safe parking of vehicles, limiting pedestrian and vehicle traffic in the hot zone, use of selected Aegis, Lessons Learned videos.

NOTES:

1. This is essentially, with some minor improvements, what the utility currently presents
2. Program needs to be modified to be more FD oriented to discuss specific procedures for leak detection, mitigation, etc
3. Use of case histories must be added and focus on best practices of both FD and gas industry
4. PSC-OFPC work group could help improve this program

PHASE 2—AIR MONITORING TECHNICIAN—2 hr—presented by OFPC or local fire training center staff, jointly with utility assistance

PURPOSE: Provide knowledge, skills and abilities to insure firefighters and fire officers can effectively use their 4 gas monitors to safely monitor for flammable gases.

NOTES:

1. This program focus is strictly on air monitoring
2. Use of monitors with real gases in table top explosion chamber
3. Provide a thorough understanding of explosive/flammable gases
4. Show actual reading using explosion chamber with instruments brought by trainees (same ones they will use at real emergencies)
5. Show limitations of air monitors(cross sensitivities, UEL is top end of scale, calibration an bump test requirements,etc)

PHASE 3—JOINT FIRE OFFICER AND UTILITY TECHNICIAN NIMS/ICS/ POLICY PROCEDURES TRAINING –presented by utility and OFPC or local fire training center staff

PURPOSE: Provide hands on practice with meters and policy and procedures

NOTES: Practice using the model SOP by way of gas leak scenario based program

1. Practice use of ICS policy and procedures by both utility ad FD leaders
2. Use of SOP as checklist for FD Safety Officers to assist IC
3. Use of various notional leak scenarios to have trainees walk thru until they understand and can execute the model SOP