

## ***Responding to a Building with a Suspected Gas Indoors***

N.G.A. - 2022 Fall Operations Conference







**New Jersey Resources (NYSE: NJR) is a premier energy infrastructure company.**

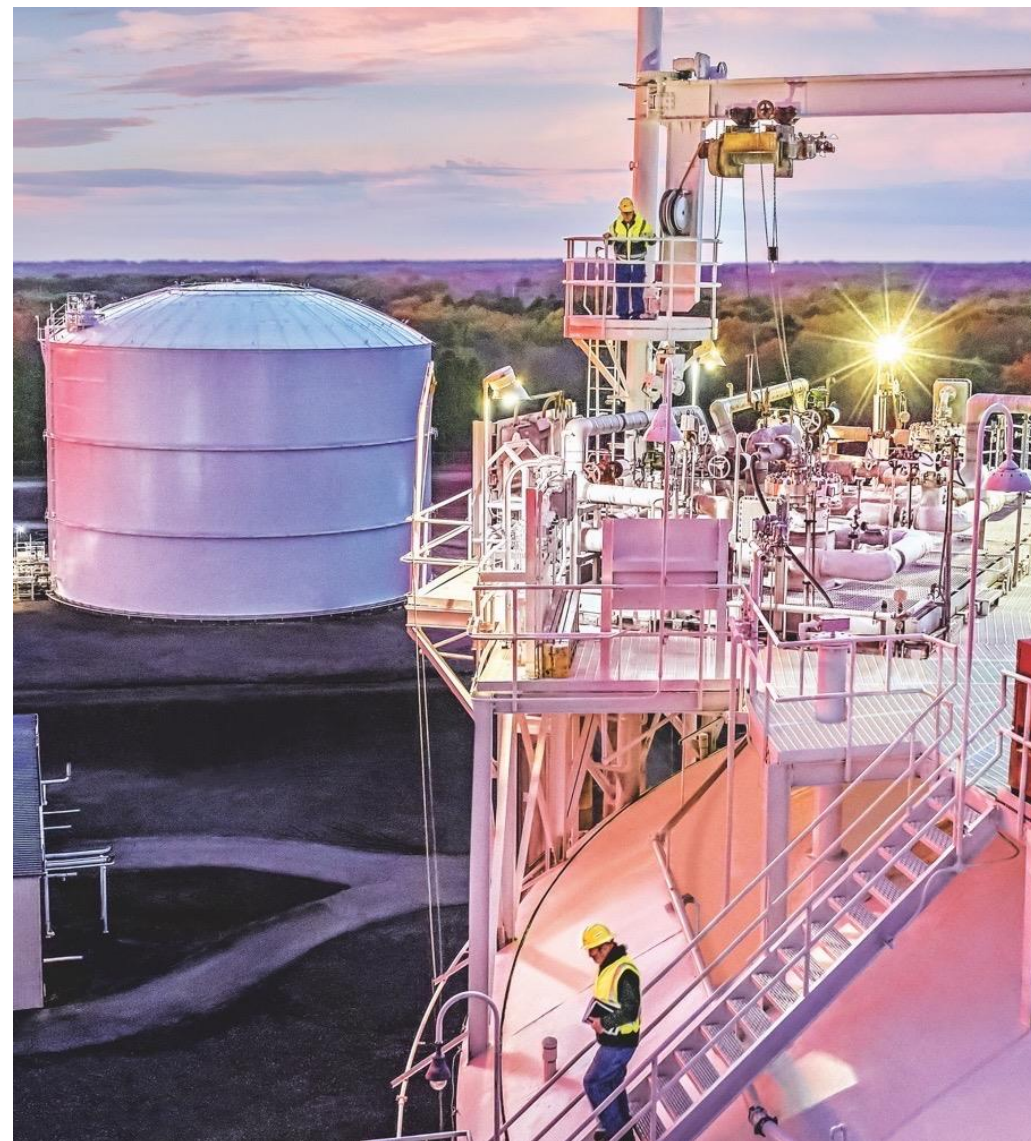
**New Jersey Natural Gas (NJNG)** provides safe, reliable service to over half a million customers throughout New Jersey.

**Clean Energy Ventures (CEV)** invests in residential and commercial solar projects to provide customers with clean, cost-effective energy.

**Storage and Transportation** invests in storage facilities and interstate pipeline projects that bring low-cost natural gas to constrained markets.

**Energy Services (NJRES)** provides physical natural gas storage and transportation capacity service to wholesale customers in North America.

**Home Services (NJRHS)** provides service contracts, as well as HVAC, water heaters, standby generators, solar and other products to residential homes throughout New Jersey.





- Principal subsidiary of NJR
- Founded in 1952
- Delivering safe, reliable natural gas service for 70 years
- Growing customer base with over 568,000 residential and commercial customers in Monmouth, Ocean, Morris, Middlesex and Burlington Counties
- Operates and maintains over 7,600 miles of distribution and transmission pipeline





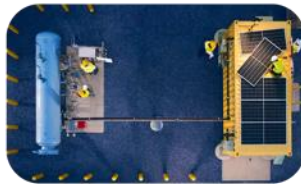
We use our expertise and embrace core environmental, social and good governance principles to meet our customers' expectations for safety, reliability and value and hold ourselves accountable through the following objectives:



**Safe, Reliable  
and Competitively  
Priced Service**



**Customer  
Satisfaction**



**Growth and  
Innovation**



**Quality**



**Valuing  
Employees**



**Corporate  
Citizenship**



**Superior  
Return**





### Our Journey to where we are today

- Started Feb 2015 – Stafford NJ
- Prior to this incident primary focus was working on live gas
- We had in place Leak Scene Safety Plan (LSSP) training, was dormant for several years
  - Resided only within the training group, Safety was not a part of this.
- Following our incident we worked with other NJ Gas companies on the response guidance, peer sharing.
  - Developed NJ Statewide Utility Safety Team. – Involved NJ Emergency Responders
- Started Distribution Live action drill in each Division
- ICS Training – Supervisors/ Management
- Expanded Outreach Training to FDs
- Set new Procedure and definition called “Hazardous Structure”
- Expanded LSSP – Revamped – 2 parts over 2 years
  - SME groups, committee, reviews, Is it plausible and palatable, Mind set that Employees are most important
- Post Incident Analysis of Hazardous Responses
- Areas to Enhance – Communications on-scene/ Return to hazardous structure after Evac., etc.



- NJNG E.D. Director of Ops – NJNG to work with other NJ gas companies on a solution
  - Assure we are all responding similarly and there is a united/ universal process for First Responders within NJ.
  - Additionally, NJBPU would question major differences between gas companies in NJ if our response protocols differed.
  - Some NJ towns are split and partially covered by different gas companies, very rare, but they do exist.
- Found Peer / SOS data from other NGA/ AGA members on their process for responding to gas related emergencies.
- Not much for Gas Filled Occupancies (GFO), more so only on outside blowing gas incidents.



## Engineering Technical Note

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Operating Section  
Telephone 703/841-8450

OSH 97-2-1

April 1997

**Guidelines for Respiratory Protection and Other  
Safety Measures  
for Gas Distribution Employees  
While Working in a Blowing Gas Situation**



- Involved NJ Div. of Fire and Safety, multiple other agencies, open invite.
  - Some participated more than others.
- Sent out messages via NJ Learn
- Share information through NJ Div Fire and Safety to all NJ FDs.
- NJ Gas Companies have participated in each other's live action drills, invite Div Fire and Safety and other agencies, NJBPU, PHMSA, etc.



- Found reference to LSSP in our standards manual. Old videos of a training session, 1990s?
  - Mainly focused on Outside Blowing gas responses
    - Not a GFO
- Initial focus, part 1 was on Inside Leak Response, or Gas Filled Occupancy or what we at NJNG call a “Hazardous Structure”
- Some procedures at that time tended to direct us to get in the building and kept us close to the building during an inside leak investigation and response.





- Hardest sell was to stand back and let it go.
  - Mentality, we need to fix it
  - Surprisingly hard sell that their lives are more important to us than a customer's house
- Culture shift of FD has control and will deem it safe to re-enter.
  - We are SME's under a unified command.
- Our lives or more important than customer's property
  - Old school of never shut off customers.
- Needed Senior Management to reassure them we are willing to shut off many customers for our employee's safety, if we need to.





- Internally, the Training and Safety Departments developed this based on information we found from multiple resources.
  - ERG guidebook
  - HLS – Bomb Stand off guides
  - Think of it as a bomb vs. Haz Mat issue or leak
  - <https://vimeo.com/81510804>
- Action level – when do we evacuate and when can we stay and work the leak?
  - Meters, CGI, concerns
  - Struggle with employees hesitant or concerned of making something out of nothing. Both from peers and management, either real or self imposed?

**GUIDE 115 GASES - FLAMMABLE (INCLUDING REFRIGERATED LIQUIDS)**

**POTENTIAL HAZARDS**

**FIRE OR EXPLOSION**

- EXTREMELY FLAMMABLE.
- Will be easily ignited by heat, sparks or flames.
- Will form explosive mixtures with air.
- Vapors from liquefied gas are initially heavier than air and spread along ground.

**CAUTION:** Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966), Methane (UN1971) and Hydrogen and Methane mixture, compressed (UN2034) are lighter than air and will rise. Hydrogen and Deuterium fires are difficult to detect since they burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.)

- Vapors may travel to source of ignition and flash back.
- Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

**HEALTH**

- Vapors may cause dizziness or asphyxiation without warning.
- Some may be irritating if inhaled at high concentrations.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire may produce irritating and/or toxic gases.

**PUBLIC SAFETY**

- CALL 911. Then call emergency response telephone number on shipping paper. If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.
- Keep unauthorized personnel away.
- Stay upwind, uphill and/or upstream.
- Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).

**PROTECTIVE CLOTHING**

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing provides thermal protection but only limited chemical protection.
- Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

**EVACUATION**

**Immediate precautionary measure**

- Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

**Large Spill**

- Consider initial downwind evacuation for at least 800 meters (1/2 mile).

**Fire**

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.
- In fires involving Liquefied Petroleum Gases (LPG) (UN1075), Butane (UN1011), Butylene (UN1012), Isobutylene (UN1055), Propylene (UN1077), Isobutane (UN1969), and Propane (UN1978), also refer to BLEVE – SAFETY PRECAUTIONS (Page 366).

**BOMB THREAT STAND-OFF CARE**  
OFFICE FOR BOMBING PREVENTION

Threat Description	Explosives Capacity	Max Evacuation Distance	Place Zone	Evacuation Distance
Pipe Bomb	5 lbs	70 ft	71-1199 ft	+1200 ft
Suicide Bomber	20 lbs	110 ft	111-1699 ft	+1700 ft
Briefcase/Suitcase	50 lbs	150 ft	151-1849 ft	+1850 ft
Car	500 lbs	320 ft	321-1899 ft	+1900 ft
SUV/Van	1,000 lbs	400 ft	401-2399 ft	+2400 ft
Small Delivery Truck	4,000 lbs	640 ft	641-3799 ft	+3800 ft
Container/Water Truck	10,000 lbs	860 ft	861-5099 ft	+5100 ft
Semi-Trailer	60,000 lbs	1570 ft	1571-9299 ft	+9300 ft

- Evacuation distances – in all direction, 330 ft, ERG guidance?
  - Looking at Aerial photos of incidents
  - Don't forget the back neighbors, often overlooked
  - Hot/ Warm/ Cold zones
  - Use FD and PD to help
  - 2 similar structures away vs. 330 ft.
  - Concussion and hearing loss, not just getting hit by debris
- Performed the initial Post Incident Analysis (PIA) as we were developing this.
  - Disconnecting the electric on pole directly in front of the home
  - Standing directly in front of the building and entering to ventilate



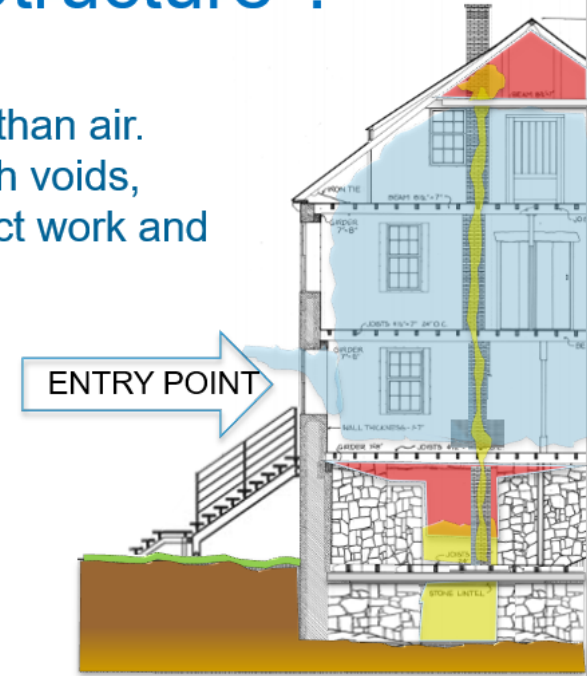




- Working with First Responders – ICS – teaming up, reporting to the command post, acting as SME in unified command
- Accountability – Supervisors internal point of communications, everything filters through just one person
  - No freelancing
- Dispatch response – Auto call for FD/ PD/ EMS
  - Responder needs to call for anything additional, often nothing else is required
  - EMS on scene is important due to Stafford, not automatic in all towns for FD response.
- Hazardous Structure -
  - Gas levels are measured at or above 1% gas in open air or 20% LEL
  - Smell, sound or visual signs that there is a probability of natural gas in concentrations of 1% gas in air or 20% LEL
  - Damage caused by accidents, acts of theft, vandalism, suicide, terrorism etc. that caused unsafe conditions
  - Inaccessible structures that gas readings have been measured with leak detection equipment at any opening – pushing out from the inside

## Hazardous Structure ?

- Natural gas is much lighter than air. It will travel upwards through voids, pipe chases, staircases, duct work and other voids.
- Gas may collect in attics, lofts or other voids.
- Gas can accumulate in cabinets, vanities, drawers, etc.





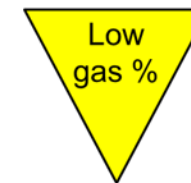


- Gas Clips – personal gas detection devices – 4 gas open air readings. Not a leak detection device, life safety indicator. Low O<sub>2</sub>, H<sub>2</sub>S, CO, etc.
  - Had Acetylene miss reads and swamp gas odors.
- Push Employees to only use radio for declaring a hazardous structure
  - So anyone on air and nearby can respond if needed. Too much cell phone use.
- Set up our own IC staging and safety zones if we are the only ones on scene initially.
- Inaccessible structure – Curb valve, shut off at meter set, use FD or PD if access is required.

## Inside Investigations

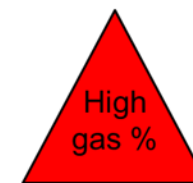
Ambient gas levels inside structure are:

Low



Low  
gas %

High



High  
gas %

Note: for this presentation

**Low gas readings are below 20% LEL**

**High readings are above 20% LEL**

**1 % Gas in Air = 20 % LEL = 10,000 PPM**





- Brought in Supervision and SMEs during development.
- Was this acceptable and feasible? Not what we did before.
- Developed a part 2 second year, focused on Outside blowing gas response.
- Will do an annual refresher
- A living program, always expanding and enhancing from PIAs, new incidents, findings, etc.
  - Surprised that several times we had reads coming from closed doors, CGI, but inside levels were below 20 % LEL when we did get in.
- Review and track number of Hazardous Structure incidents per month/ year – where, what, who.

## Leak Scene Safety Plan

### Definition:

It is the process that NJNG follows to coordinate and implement our response plan for all emergency incidents.

*Focus on where we are going, not where we were*



- Call in all employees, Supervision, Dispatch, etc. to review the incident to learn from it.
  - Needed to assure employees that we are not on a witch hunt, merely looking to improve ourselves as an organization, not to find fault with individuals.
- Review radio and phone calls, recorded, timeline from initial call to when we left the scene, stages, when, who, etc.
- Actual incident on the right.
  - We try to come up with unique situations for our drills, this one we didn't think of and would have sounded outlandish if we did. Used in our training.
- Develop Lessons Learned reports and share globally.
  - Identified some miss understandings, old school ways show up from time to time, new concerns that we didn't identify.





- Goal of - 1 per Division a year
- Invite local FDs/ PDs/ Other Gas Companies
- Use of our new training facility
- ICC vehicle – long duration events, overnight relights
- Emergency Response Supervisor Position
- Share responses and summary globally, developed posters
- All Supervisors and above required to take ICS 100/200.
- ID tags, Accountability, Team up with FD
- Help I.D. the hot zone, or responding vehicles and people, use caution tape, etc.



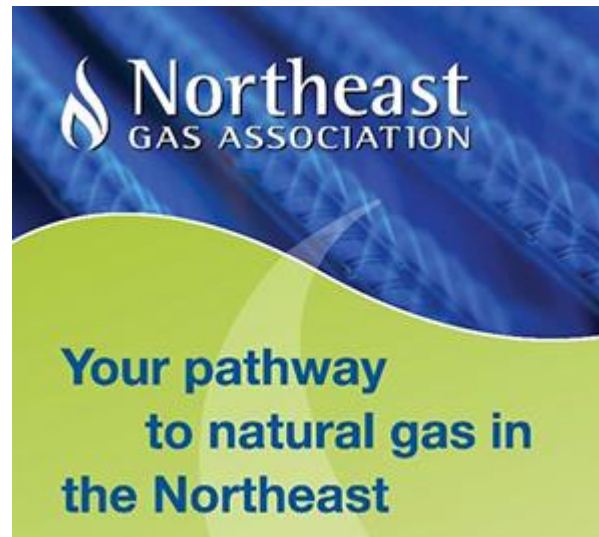


- AGA G.F.O. Task Force – white paper
  - Industry guidance's
- Reapproaching a structure, is it safe yet?
- Overall site communications - On scene with each other
- Integrating with FD's ICS, do they consider us?
  - We created a sample S.O.G for FDs on GFOs
- How can we know it's a hazardous structure before we walk up to the front door?
- Best way to ventilate?
- High rise buildings and apartments.
  - How can you quickly evacuate everyone?
    - ❖ Don't pull the non-intrinsically safe fire alarm.
  - How much do you need to evacuate?
  - Hospitals, non-mobile patients





- Thank you for allowing New Jersey Natural Gas to speak and share our experiences on this subject today.
- Thank you, NGA for inviting us and allowing us to present.



- Any Questions or Comments?