

Ohio Gas Association 2011 Technical Seminar

Lessons Learned From Liability Insurance Claims Paid

Ron Six, Instructor
Senior Utility Consultant
AEGIS Insurance Services, Inc.

201/417-2487

RonaldSix@aegislimited.com

Incident (2007)

Company Retention \$1 Million

- An explosion and fire at a residence killed two people and severely burned three others. The home was all electric and had no gas service. On the day of the incident the homeowner's daughter, son-in-law and two grandchildren were visiting. That day, the homeowner noticed that a blue flame "shot to the ceiling" when his wife lit a cigarette. He called the fire department and was told not to light any more cigarettes and they would send someone over to check out the situation. The homeowner was not instructed to evacuate the home.
- While waiting for the fire department to arrive the homeowner's wife wanted to have a quick cigarette, but was stopped by the husband. She persisted in her request and the husband unfortunately relented.

Incident (2007)

Company Retention \$1M

Cont'd.

- When he struck a match to light her cigarette there was a blue flash that extinguished the match. He lit a second match and the explosion occurred. Between 15-20 seconds after the initial explosion and fire a second explosion occurred ripping the roof off of the home.
- The gas company, which was never called prior to the incident, responded and completed a thorough leak investigation of the area. A compression coupling was found to be leaking 100 feet from the home. The homeowner claimed he did not smell gas prior to the incident. The company performed an odorant test in the area and found the gas was properly odorized.

Incident (2007)

Company Retention \$1 Million

Cont'd.

- A laboratory examination of the components that made up the compression coupling revealed that the coupling body was mismatched at the time of manufacture resulting in an area comprising approximately twenty (20) percent of one sealing surface being left with an as-cast surface. In addition, both seals had experienced some hardening with age indicative of shrinkage.
- The combination a poor sealing surface and seal aging caused the coupling to leak.

AEGIS Incurred \$15 Million

Lessons To Be Learned

- If the homeowner had known of the physical indications of a natural gas release, or the fire department dispatcher advised the family to leave the home, this incident may have been prevented.
- Federal Code 49 CFR 192.615 paragraph (c) states that the operator shall establish and maintain liaison with appropriate fire, police and other public officials to acquaint the officials with the operator's ability to respond to gas pipeline emergencies and plan how the operator and officials can engage in mutual assistance to minimize hazards to life & property.
- In the operator's Recommended Practices (RP) 1162 the program must include provisions to educate the public, including non-customers, concerning the possible hazards associated with the unintended release of natural gas i.e odor.

CURB LINE

ASH STREET



20% Gas In Sewer Manhole

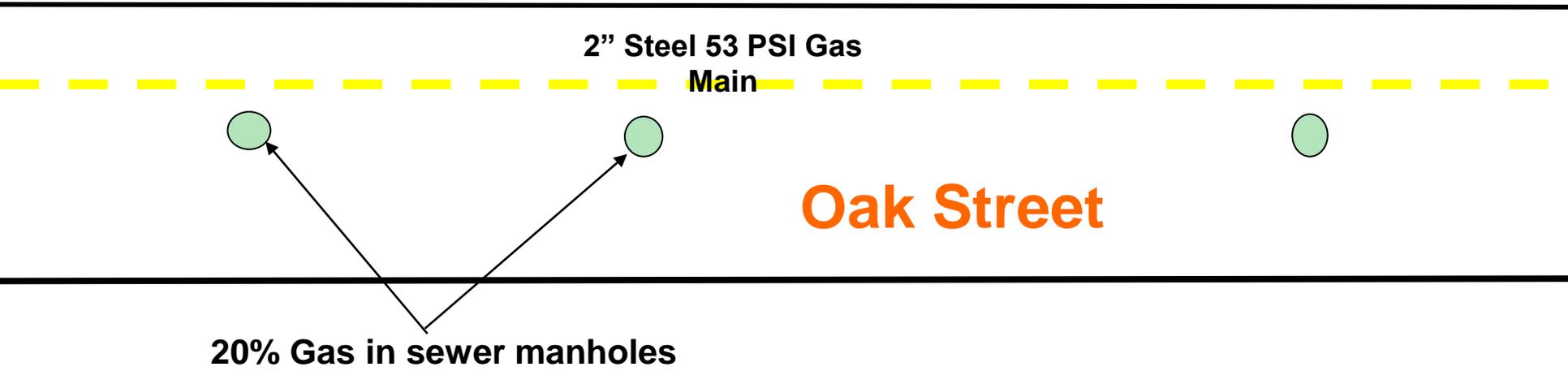
6" Steel UP

Resident calls
@ 3:34 pm Gas
odor
46

50

54

First Responder smells a very strong odor of gas in the area as he arrives (4:05 pm). Checks sewer manholes in the street and finds 20% gas in each manhole. Calls for a crew.

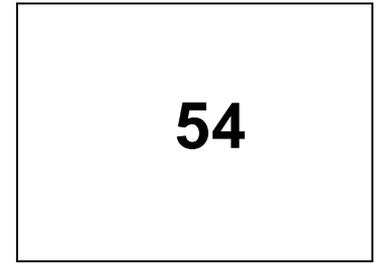
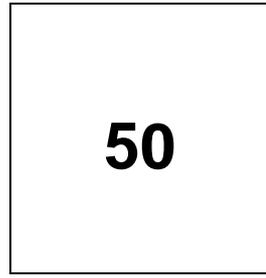
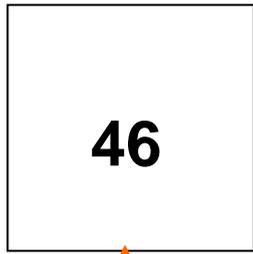


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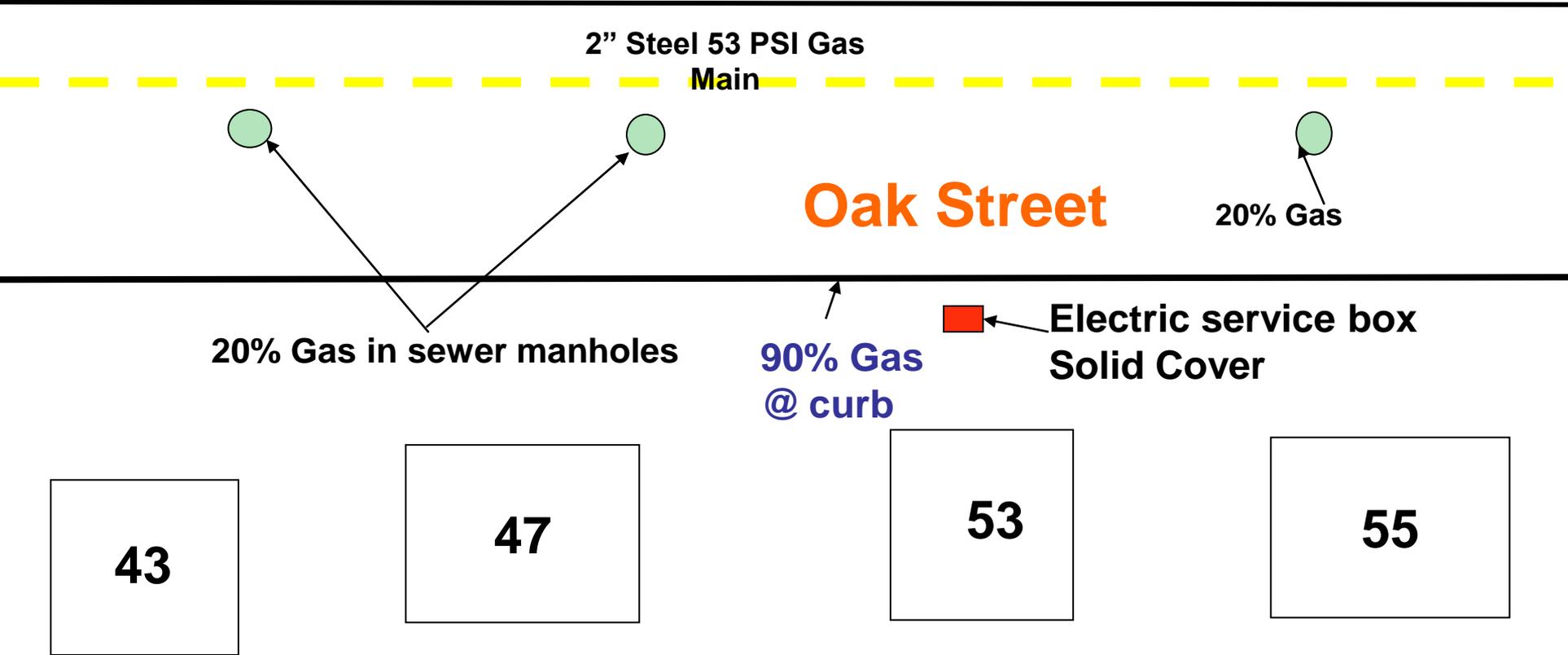
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Checks inside #46 and finds 0% gas in atmosphere, but gets a 10% gas reading at electric service entrance to building in the basement. Starts taking additional readings outside.

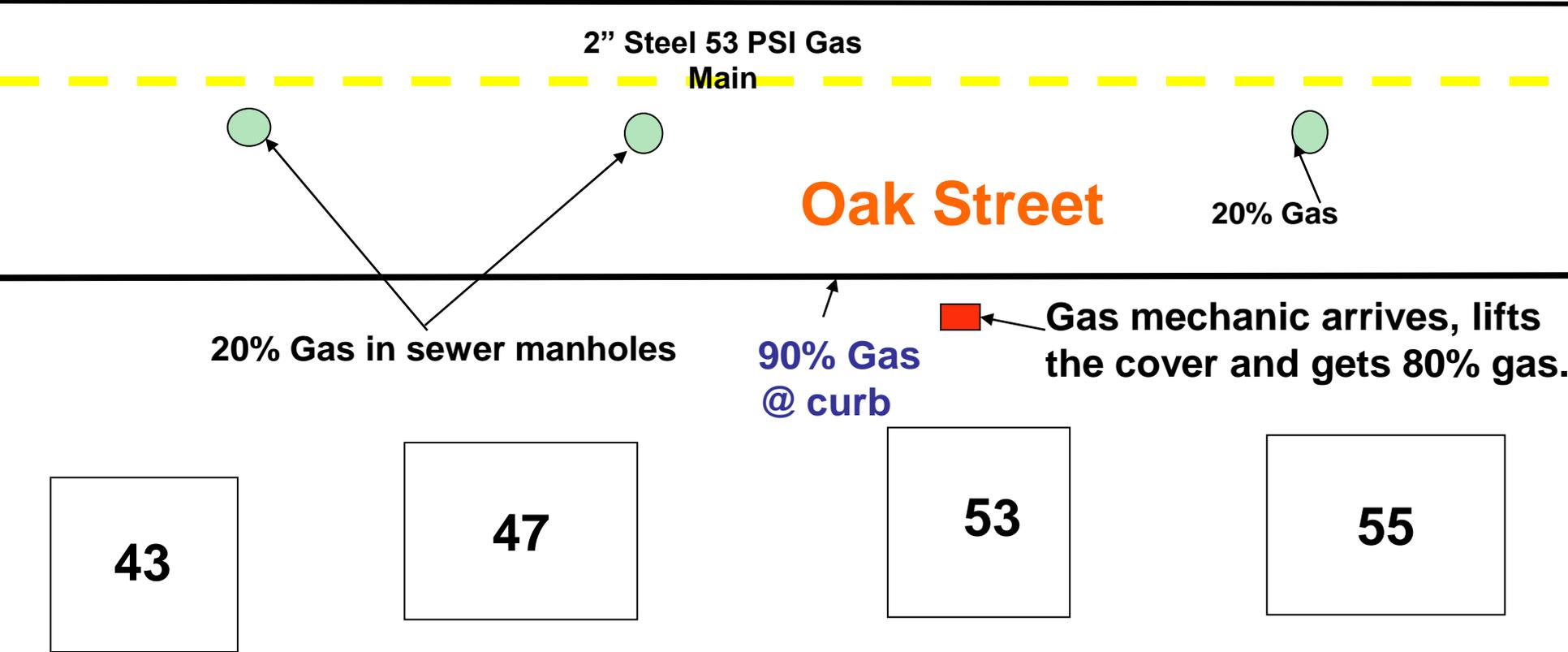


46

50

54

Gas mechanics arrive and they lift the cover on the electric service box and They get a 80% gas in air reading.



2" Steel 53 PSI Gas Main

Oak Street

20% Gas in sewer manholes

90% Gas @ curb

Gas mechanic arrives, lifts the cover and gets 80% gas.

20% Gas

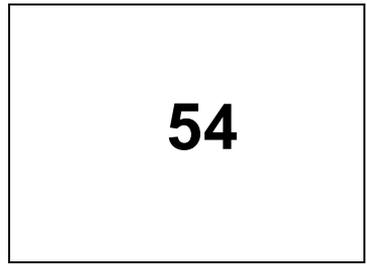
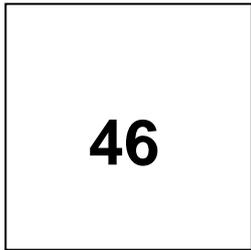
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Odor complaint call **3:34pm**
Dispatched at **3:55**
Arrived at location **4:05**
Called for crew **4:10**
Checks inside of #46 **4:15**
Checks outside next **26 min**
Gas mechanics arrive and find 80%
gas in electric service box. **4:42**



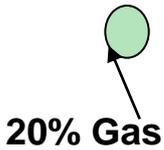
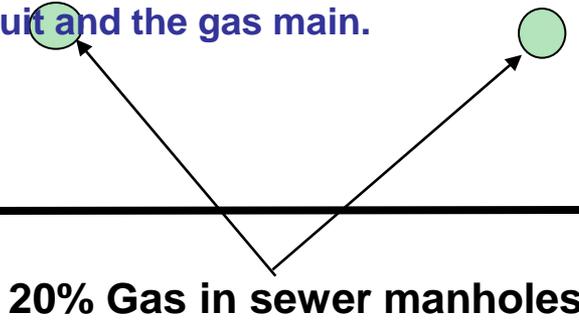
Explosion at #50 occurs at 4:50pm

Explosion occurs at 4:50pm, a forty year old woman was killed others injured.

Cause of the leak attributed to a short in electric service cables caused current to flow onto the steel gas main where they crossed. Arcing created holes in both the electric conduit and the gas main.

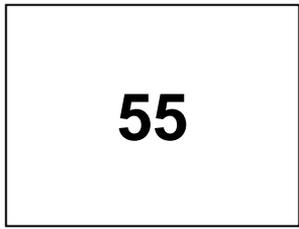
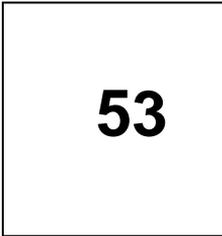
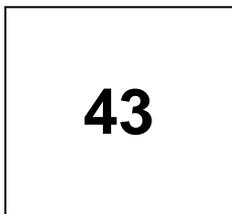
2" Steel 53 PSI Gas Main

Oak Street



90% Gas @ curb

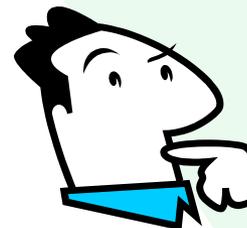
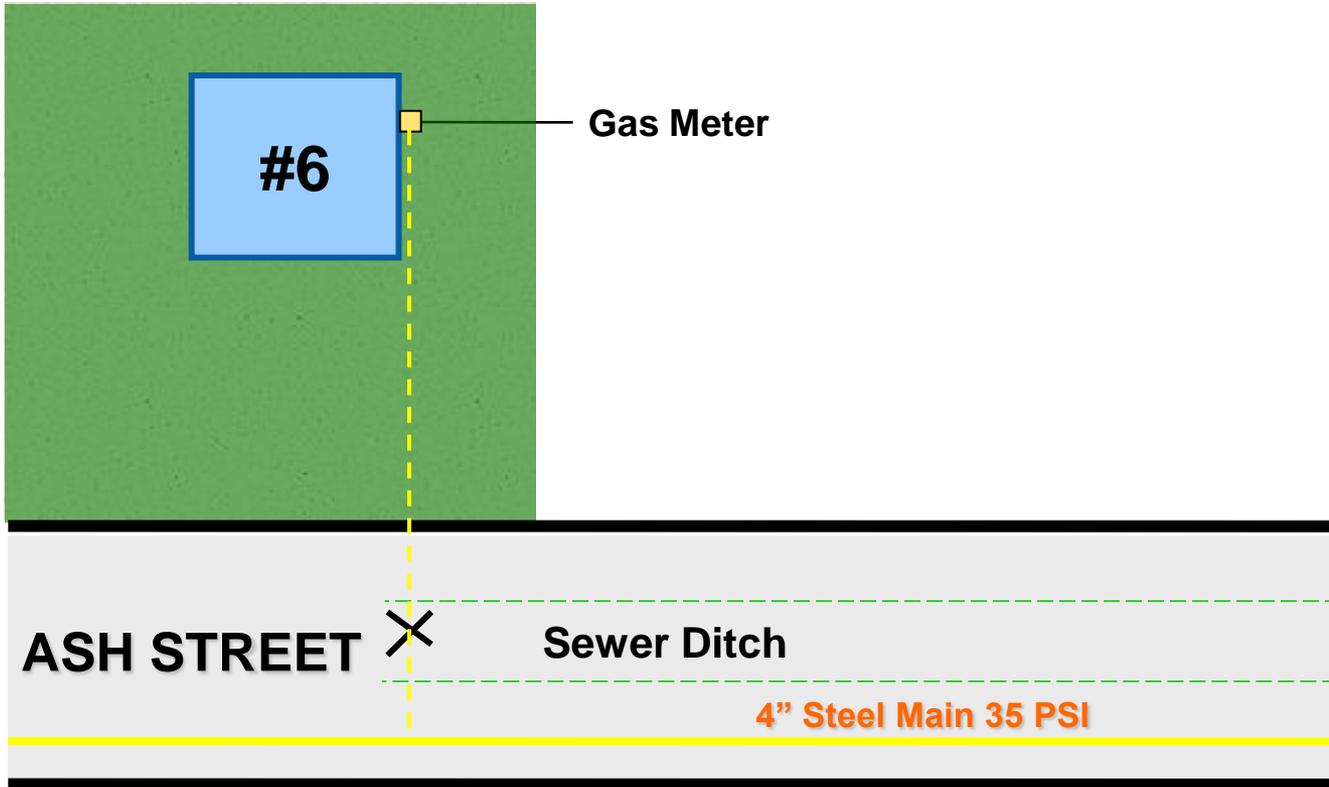
Electric service box
80% Gas



Hole Made When Shorted Electric Cable Arced Over To Gas Main



Figure # 1



A contractor has snagged the 1" steel service and bowed it in the ditch. A small hole was made in the line and gas is blowing in the ditch.

What would be your actions?

Incident (1998)

Company Retention \$5M

- A contractor working on a highway reconstruction project struck the service line to a house, causing the service line to separate from a compression coupling near the gas main.
- The gas company was called at 11:15 am; a serviceman arrived on the scene at 11:45 and immediately called for a crew. Thinking the gas was venting out into the street, he sat in his truck for 20 minutes until the crew arrived. Although the damage location was only 32 feet from the incident site, no attempt was made to check nearby buildings with a combustible gas indicator for the presence of migrating gas.

Incident (1998)

Company Retention \$5M

Cont'd.

- The leaking gas migrated to the house where an explosion occurred killing an elderly woman and severely burning 3 children, the explosion occurred at 1:00 pm. The children received burns to over 45% of their bodies with most of the burns occurring in the facial areas.
- In the settlement the contractor also paid more than \$15,000,000.00 in claims.

AEGIS Incurred \$15 Million

What Happened?

- First Responder failed to recognize the gravity of the situation and made the assumption that the pulled line was leaking in only one place.
 - The First Responder’s main job on a reported gas leak is to determine “Where is the gas?” and “Is it affecting people or property?” The appropriate way of determining this is with a combustible gas indicator (CGI) – Test Don’t Guess!
- Our first priority must always be focused on
Public Safety

Incident (2005)

Company Retention \$1,000,000

- A gas explosion and fire destroyed a single family residential home causing three fatalities. An investigation subsequent to the incident revealed localized atmospheric corrosion had progressively thinned meter set piping eventually creating a hole. The meter set was located under the front porch of the home and it is believed that leaking gas accumulated in the crawl space and basement.
- Company records indicated that the bare steel service line and meter set piping were installed in 1937. Similarly aged gas services and meter sets in the immediate area were replaced due to their poor condition. Records revealed that this bare steel service line and meter set had not been inspected by the gas company since 1996.

Lessons Learned

Company Retention 1 Million

Part 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards requires piping exposed to the atmosphere to be inspected for evidence of atmospheric corrosion at least once every 3 calendar years, but at intervals not exceeding 39 months.

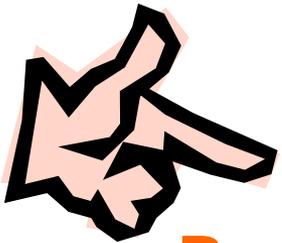
- This code mandates the inspection of all above ground natural gas piping including residential meter sets. In addition, Part 192 requires cathodically unprotected distribution lines, where electrical surveys are impractical, to be leak surveyed at least once every 3 calendar years at intervals not exceeding 39 months.
- If the operator had completed either of these code mandated inspections, this incident may have been prevented.

AEGIS Incurred \$4,594,000

“Centering” = Where is the Gas?

Centering The Leak

- Probe holes must be of sufficient depth
- Test all available openings
- “Zero out” N-S-E-W
- You must have sufficient information to make a good judgement



Be Careful – “Don’t make a leak, looking for a leak.”

Incident (2005)

- A homeowner contacted the gas company stating that “she smelled a very strong odor of gas in the vicinity of her gas meter”.
- The gas company sent a service technician to investigate the odor complaint. Upon arrival, the technician noticed the smell of gas as soon as he got out of his truck.
- He decided to put a bar hole down near the riser to check the soil atmosphere. The temperature was around 5 degrees and there was frost in the ground making it difficult to make the test hole.

Incident (2005)

Cont'd.

- After a lot of effort, he was able to get a test hole in the ground below the frost layer. When he pulled his probe bar out of the ground, gas started blowing up through the test hole. The escaping gas was making considerable noise so he put the probe bar back in the hole. He ran back to the truck to get a shovel to dig the plastic service up in order to squeeze it off and stop the leak.
- As he was attempting to expose the service, approximately 30 minutes after the line was hit, there was an ignition and two people inside of the home were injured.

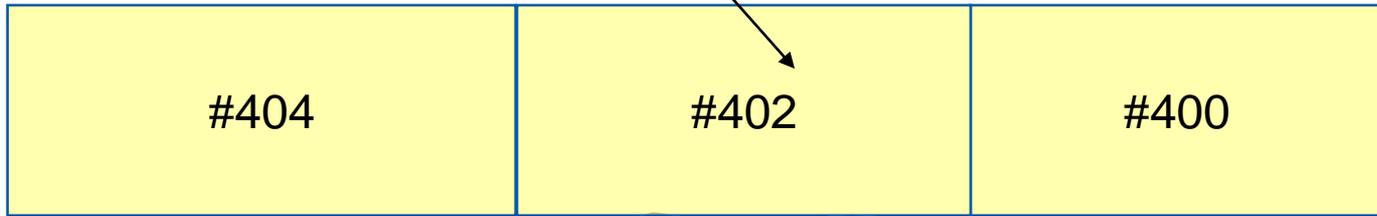
Lessons Learned

Company Retention 2 Million

- Bar testing and checking the soil atmosphere for gas is a crucial part of the overall odor complaint investigation. It is necessary to make the test hole a sufficient depth in order to obtain an accurate reading, thus getting below the frost layer is essential.
- In this case, the bar should have been left out of the bar hole to allow the gas to “vent” and notifying the occupants to leave the house until the line could be shut off.
- The main priority is **Public Safety!**

AEGIS Incurred 2.3 Million

**70% Gas in the atmosphere
Inside of the building.**



Concrete Sidewalk

**90% Gas @
Foundation Wall**

**100% Gas @
Curb**

8" CI 12 PSI

OLD MAIN STREET



What Would You Do?

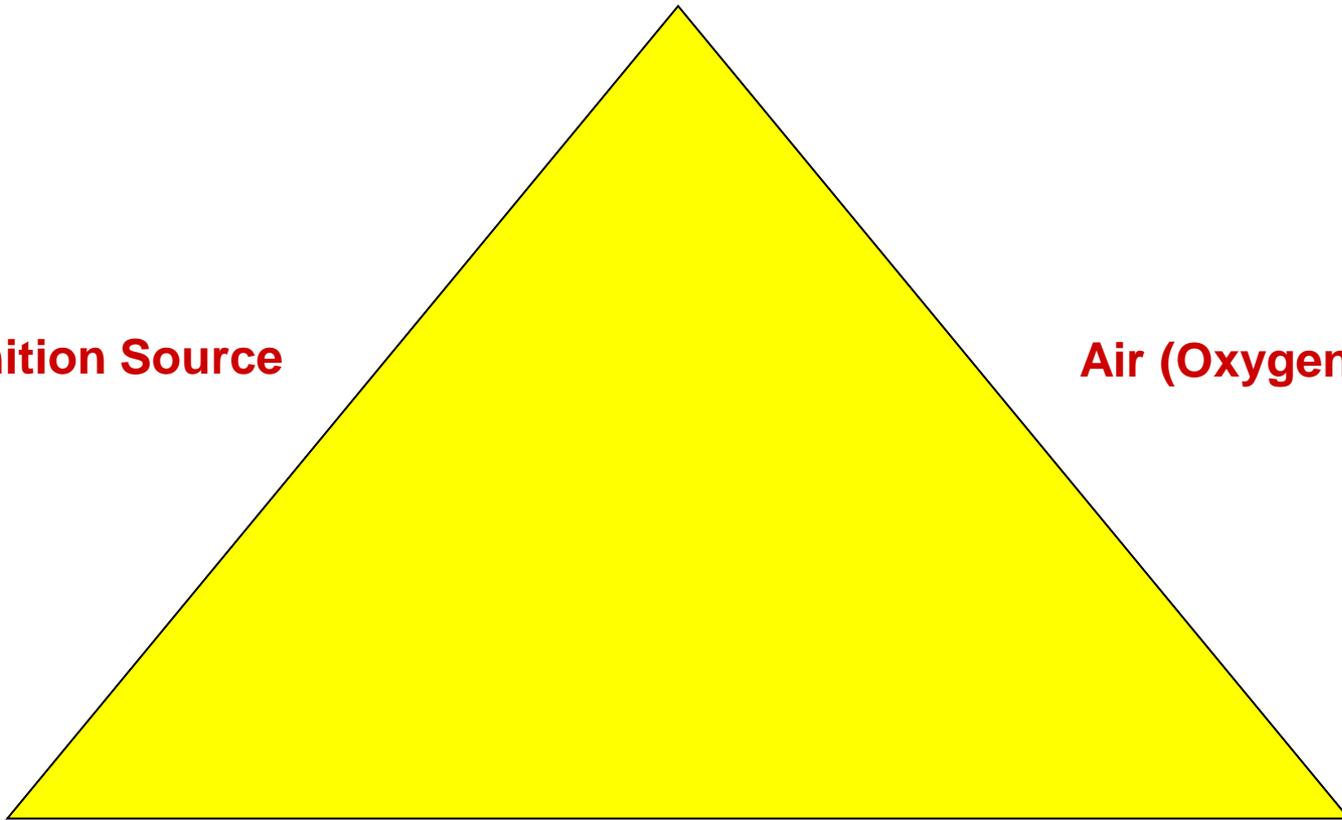
- Fire department and gas company are on the scene.
- Buildings have been evacuated.
- 70% gas/air in atmosphere in 402.
 - a. **Pinpoint the leak**
 - b. **Eliminate Ignition Sources**
 - c. **Ventilate the Building**
 - d. **All of the Above**

The Explosion Triangle

Ignition Source

Air (Oxygen)

Gas Concentrations between 5.0% – 15.0% Gas/Air



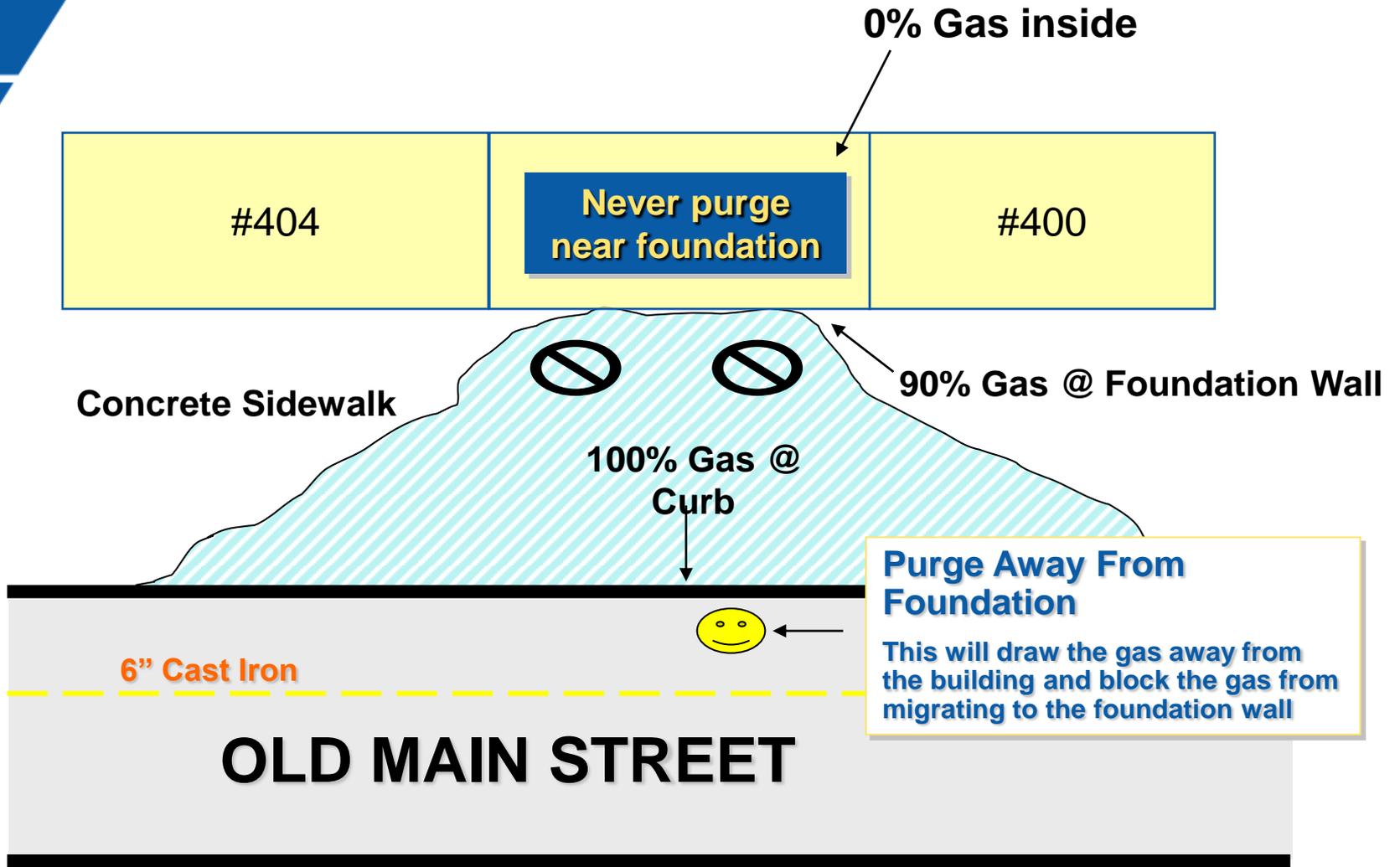
In order to have an ignition you need 3 things:

- **Gas concentrations between 5-15%**
- **A competent ignition source**
- **Air**

If we can eliminate one of the above we can prevent the ignition. Eliminating the ignition sources and passive ventilation may be the safest way of handling an emergency of this type. If the ignition occurs, so be it, you have performed your most important job which is **PUBLIC & PERSONAL SAFETY.**

Types of Soil Purgers/Aerators





0% Gas inside

#404

**Never purge
near foundation**

#400

Concrete Sidewalk

90% Gas @ Foundation Wall

100% Gas @
Curb

**Purge Away From
Foundation**
This will draw the gas away from
the building and block the gas from
migrating to the foundation wall

6" Cast Iron

OLD MAIN STREET



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October 12 Nisource Columbus, OH

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