



KCC & TSI Gas Pipeline Safety Seminar 2007

Lessons Learned and Other Safety Related Topics

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Associated **A**lectric **E**nergy **G**as **I**nsurance **S**ervices

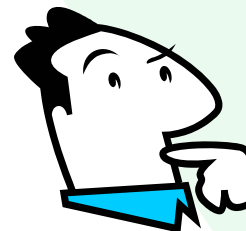
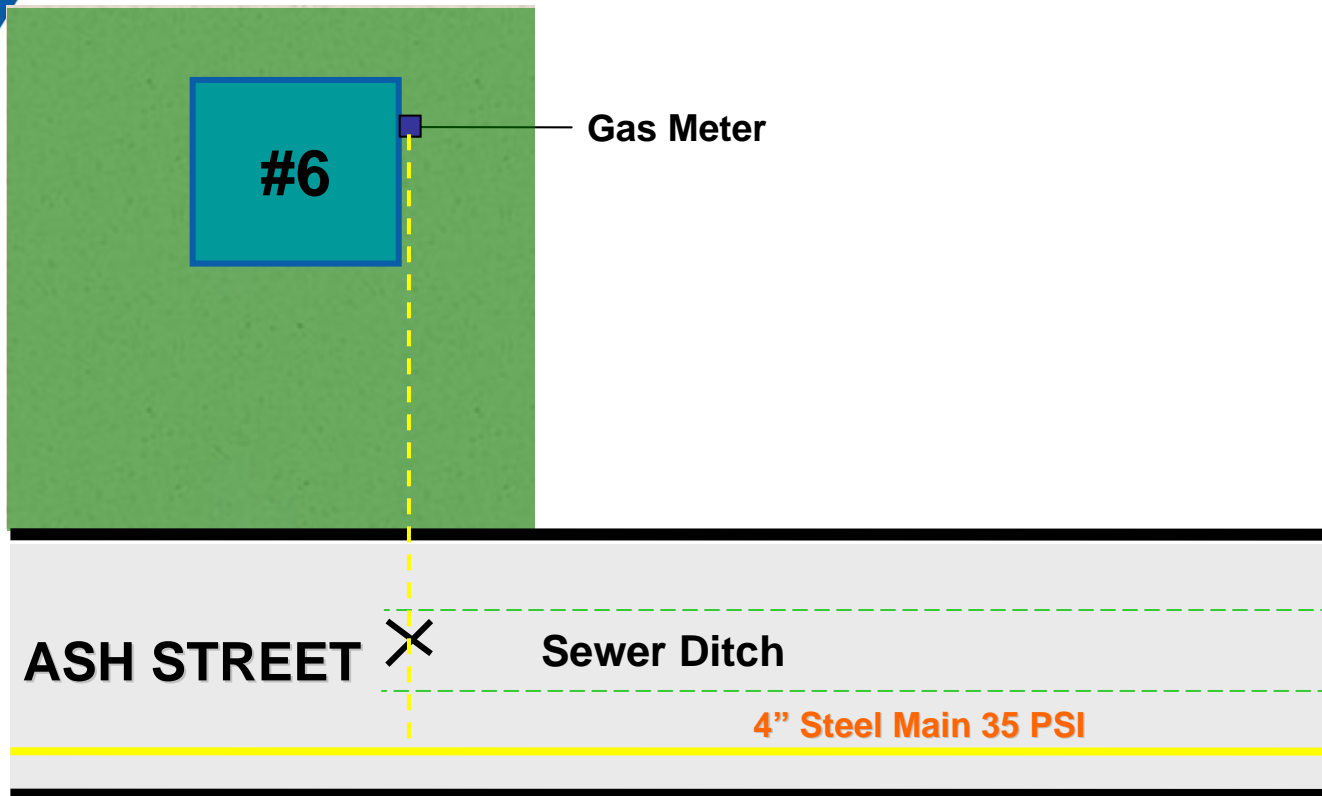
AEGIS

Background Information

- Utility Mutual Insurance Company (member owned)
- Formed in 1975 by 22 gas utilities
- Electric Utilities began joining in 1977
- 490 members – 95% utilities and related energy

Lessons Learned

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

AEGIS Webinar

November 8, 2007

Leak Response

More than “Find & Fix”

Registration now open at:

www.aegislink.com

Public Law 109-468
109th Congress

An Act

Dec. 29, 2006
[H.R. 5782]

Pipeline
Inspection,
Protection,
Enforcement,
and Safety Act
of 2006.
49 USC 60101
note.

To amend title 49, United States Code, to provide for enhanced safety and environmental protection in pipeline transportation, to provide for enhanced reliability in the transportation of the Nation's energy products by pipeline, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; AMENDMENT OF TITLE 49, UNITED STATES CODE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the “Pipeline Inspection, Protection, Enforcement, and Safety Act of 2006”.

(b) AMENDMENT OF TITLE 49, UNITED STATES CODE.—Except as otherwise expressly provided, whenever in this Act an amendment or repeal is expressed in terms of an amendment to, or a repeal of, a section or other provision, the reference shall be considered to be made to a section or other provision of title 49, United States Code.

(c) TABLE OF CONTENTS.—

- Sec. 1. Short title; amendment of title 49, United States Code; table of contents.
- Sec. 2. Pipeline safety and damage prevention.
- Sec. 3. Public education and awareness.
- Sec. 4. Low-stress pipelines.
- Sec. 5. Technical assistance grants.
- Sec. 6. Enforcement transparency.
- Sec. 7. Direct line sales.
- Sec. 8. Petroleum transportation capacity and regulatory adequacy study.
- Sec. 9. Distribution integrity management program rulemaking deadline.
- Sec. 10. Emergency waivers.
- Sec. 11. Restoration of operations.
- Sec. 12. Pipeline control room management.
- Sec. 13. Safety orders.
- Sec. 14. Integrity program enforcement.
- Sec. 15. Incident reporting.
- Sec. 16. Senior executive signature of integrity management program performance reports.
- Sec. 17. Cost recovery for design reviews.
- Sec. 18. Authorization of appropriations.
- Sec. 19. Standards to implement NTSB recommendations.
- Sec. 20. Accident reporting form.
- Sec. 21. Leak detection technology study.
- Sec. 22. Corrosion control regulations.
- Sec. 23. Inspector General report.
- Sec. 24. Technical assistance program.
- Sec. 25. Natural gas pipelines.
- Sec. 26. Corrosion technology.

SEC. 2. PIPELINE SAFETY AND DAMAGE PREVENTION.

(a) ONE CALL CIVIL ENFORCEMENT.—

(1) PROHIBITIONS.—Section 60114 is amended by adding at the end the following:

“(d) PROHIBITION APPLICABLE TO EXCAVATORS.—A person who engages in demolition, excavation, tunneling, or construction—

“(1) may not engage in a demolition, excavation, tunneling, or construction activity in a State that has adopted a one-call notification system without first using that system to establish the location of underground facilities in the demolition, excavation, tunneling, or construction area;

“(2) may not engage in such demolition, excavation, tunneling, or construction activity in disregard of location information or markings established by a pipeline facility operator pursuant to subsection (b); and

“(3) and who causes damage to a pipeline facility that may endanger life or cause serious bodily harm or damage to property—

“(A) may not fail to promptly report the damage to the owner or operator of the facility; and

“(B) if the damage results in the escape of any flammable, toxic, or corrosive gas or liquid, may not fail to promptly report to other appropriate authorities by calling the 911 emergency telephone number.

“(e) PROHIBITION APPLICABLE TO UNDERGROUND PIPELINE FACILITY OWNERS AND OPERATORS.—Any owner or operator of a pipeline facility who fails to respond to a location request in order to prevent damage to the pipeline facility or who fails to take reasonable steps, in response to such a request, to ensure accurate marking of the location of the pipeline facility in order to prevent damage to the pipeline facility shall be subject to a civil action under section 60120 or assessment of a civil penalty under section 60122.

“(f) LIMITATION.—The Secretary may not conduct an enforcement proceeding under subsection (d) for a violation within the boundaries of a State that has the authority to impose penalties described in section 60134(b)(7) against persons who violate that State’s damage prevention laws, unless the Secretary has determined that the State’s enforcement is inadequate to protect safety, consistent with this chapter, and until the Secretary issues, through a rulemaking proceeding, the procedures for determining inadequate State enforcement of penalties.”

(2) CIVIL PENALTY.—Section 60122(a)(1) is amended by striking “60114(b)” and inserting “60114(b), 60114(d).”

(b) STATE DAMAGE PREVENTION PROGRAMS.—

(1) CONTENTS OF CERTIFICATIONS.—Section 60105(b)(4) is amended to read as follows:

“(4) is encouraging and promoting the establishment of a program designed to prevent damage by demolition, excavation, tunneling, or construction activity to the pipeline facilities to which the certification applies that subjects persons who violate the applicable requirements of that program to civil penalties and other enforcement actions that are substantially the same as are provided under this chapter, and addresses the elements in section 60134(b).”

(2) IN GENERAL.—Chapter 601 is amended by adding at the end the following:

“§ 60134. State damage prevention programs

“(a) IN GENERAL.—The Secretary may make a grant to a State authority (including a municipality with respect to intrastate gas

HAZARD

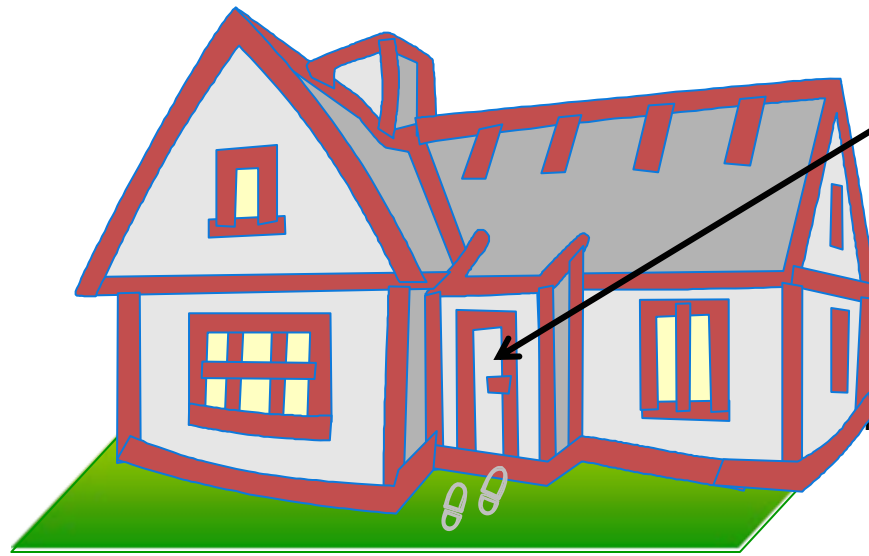
EXTENT

LIFE

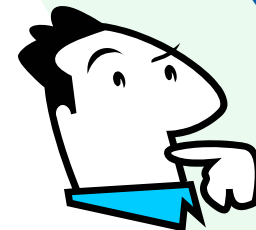
PROPERTY

The Combustible Gas Indicator

- **CGI should be used to:**
 - Classify an atmosphere
 - Inside a building or in a confined space
 - Classify underground leakage
 - Determine “Where is the gas?”
 - Pinpoint underground leakage
 - Determine “Where is the leak?”
- **You must know:**
 - How to properly use it
 - What readings might constitute a hazardous condition



1% Gas In Air

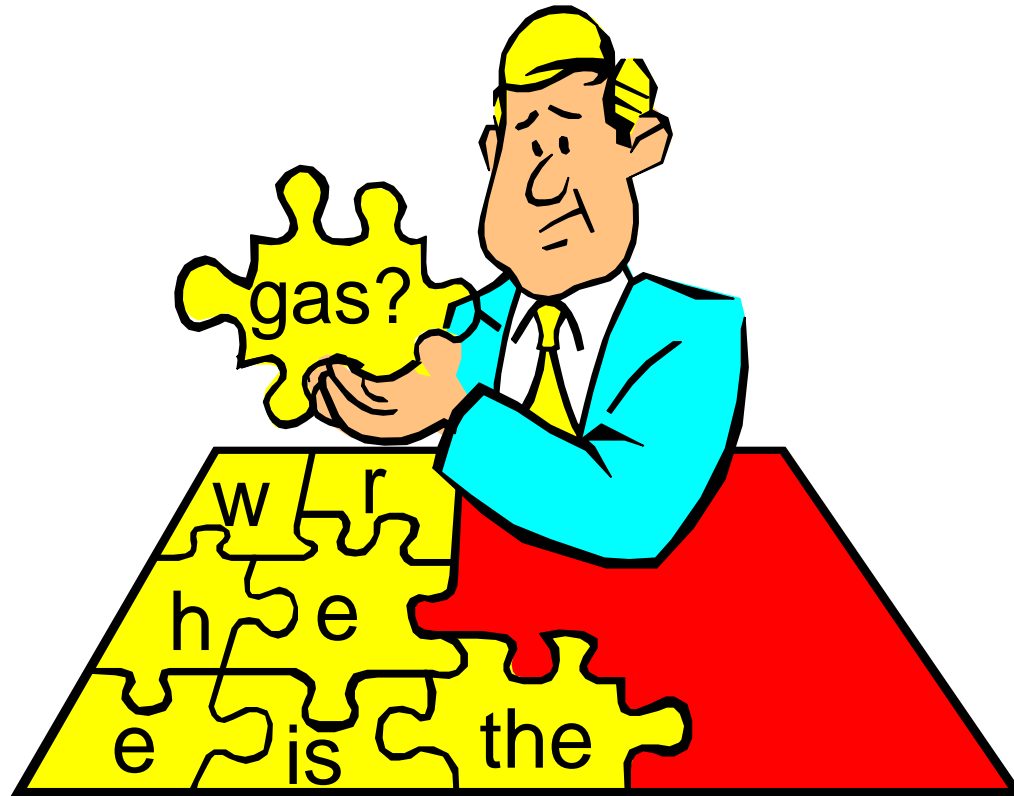


You arrive and get a 20%
LEL (1% Gas/Air reading)
in the atmosphere, just
as you enter the front
door.

What would you do?

Evaluating The Leak

Where is the gas?



Evaluating The Leak

- **W**here is the gas?
- **H**ow much is there?
- **E**xtent of hazard
- **R**elation to other structures
- **E**valuate/evacuate

“Centering” = Where is the Gas?

Centering The Leak

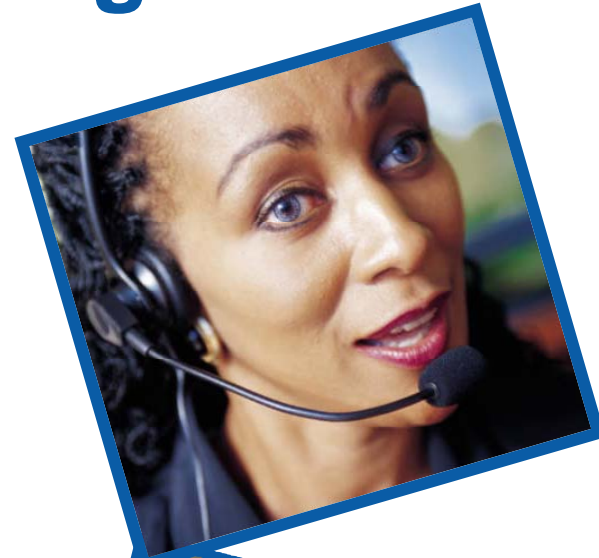
- Probe holes must be of sufficient depth
- Test all available openings
- “Zero out” N-S-E-W
- You must have sufficient information to make a good judgement



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

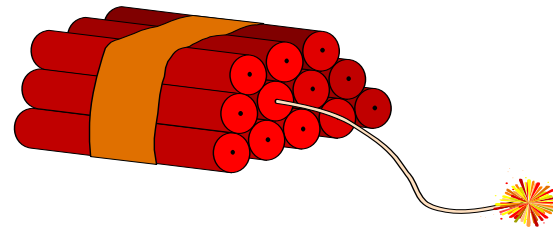
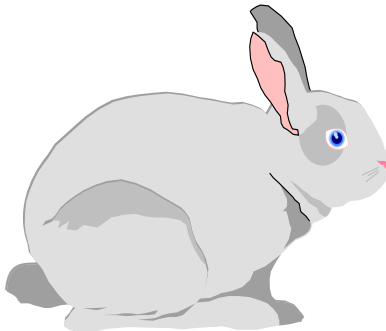
The Key Is Listening

- The Call Center is the “First Line of Defense”.
- All Odor Complaints should be considered priority calls and dispatched immediately.
- Listen to the customer and ask questions in order to gather the information needed is vital.



Is It Static Or Dynamic?

- Where is the odor? = At gas range vs. **throughout**
- How long smelled? = For a week vs. **just noticed it**
- How strong is the odor? = Barely smell vs. **making me sick**
- Can you hear anything? = No vs. **hissing sound**
- Anyone moved recently? = No vs. **apartment next door moved**
- Any plumbing done? = No vs. **husband just installed range**
- Any construction in area? = No vs. **backhoe digging out front**



Incident (2000)

Company Retention \$200K

- While parking the family car in his attached garage, a retired 83 year-old physician lost control of his automobile and struck the concrete block foundation that supported and elevated his home's heating and hot water equipment.
- The impact moved the boiler about one foot from its original position. The damage was severe enough to warrant an inspection, so the doctor called his regular plumbing and heating service provider who agreed to check the unit that afternoon.
- The doctor then called the local gas company and explained what had happened.

Incident (2000) Cont'd.

Company Retention \$200K

Cont'd.

- He was asked whether he smelled gas. He answered that he did not. The company's call center representative then explained that the company would not examine the damage unless he smelled gas, but if he did, he should please call back and they would gladly send someone out to his home.
- 90 minutes later the home exploded and the doctor and his wife were severely burned. Less than one month later, suffering from severe burns over most of his body, the doctor died.

AEGIS Incurred \$2.7 Million

What Happened?

- At times, customers and the general public seek assistance from gas utilities for situations that are not commonly encountered. Such was the case in this unusual incident. The call center representative did not recognize the potential severity of a situation involving an automobile striking the heating equipment.
- Listening to callers and their circumstances is critical to effectively achieve the ultimate goal of emergency response and the protection of life and property.
- The doctor, being 83 years old may have lost much of his sense of smell with age.

The call center is the “First Line of Defense”

#894

BRADY ST.

#8

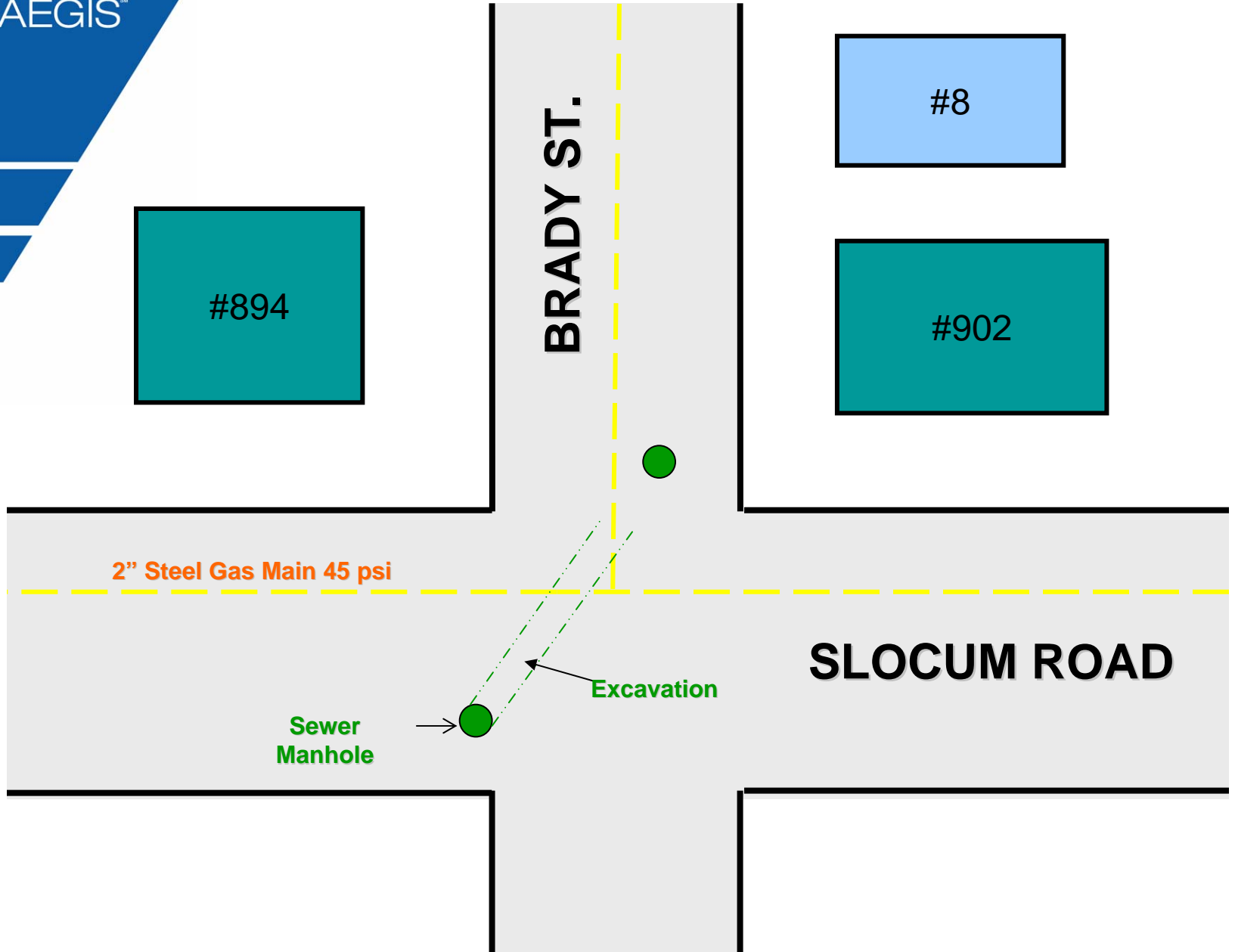
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2" Steel Gas Main 45 psi

SLOCUM ROAD

Sewer
Manhole

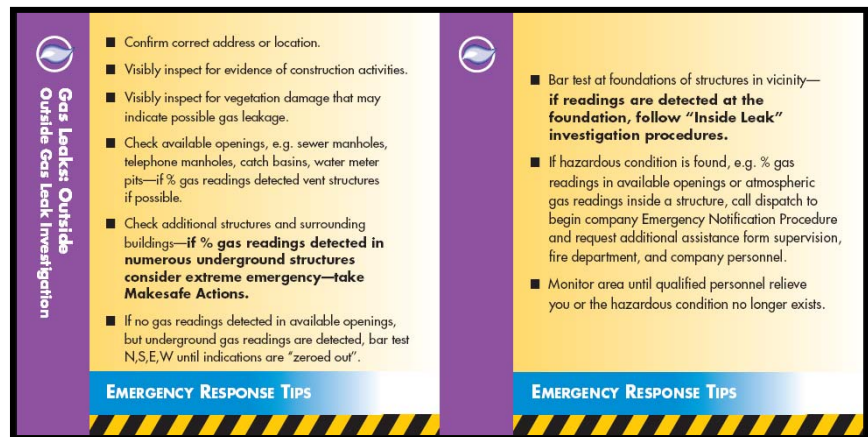
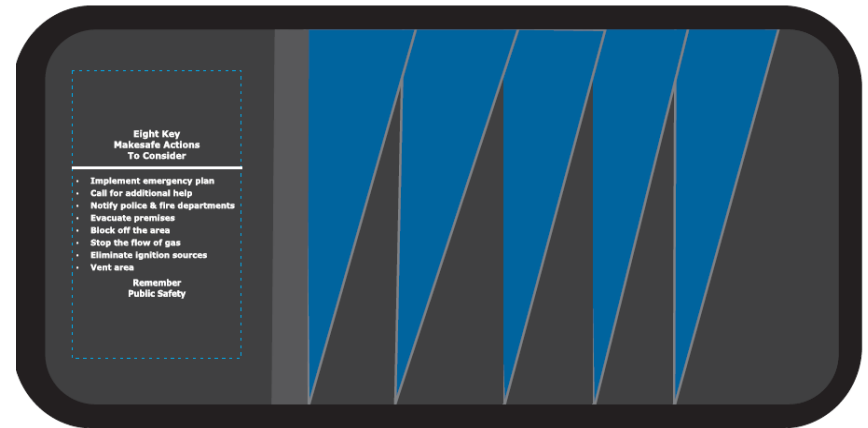
Excavation



Tip Cards


- Designed to assist First Responders in the steps necessary to evaluate a situation
- Focus is on assisting the First Responder in identifying a hazard and the steps necessary to make the area safe i.e.,

MAKESAFE



Tip Cards

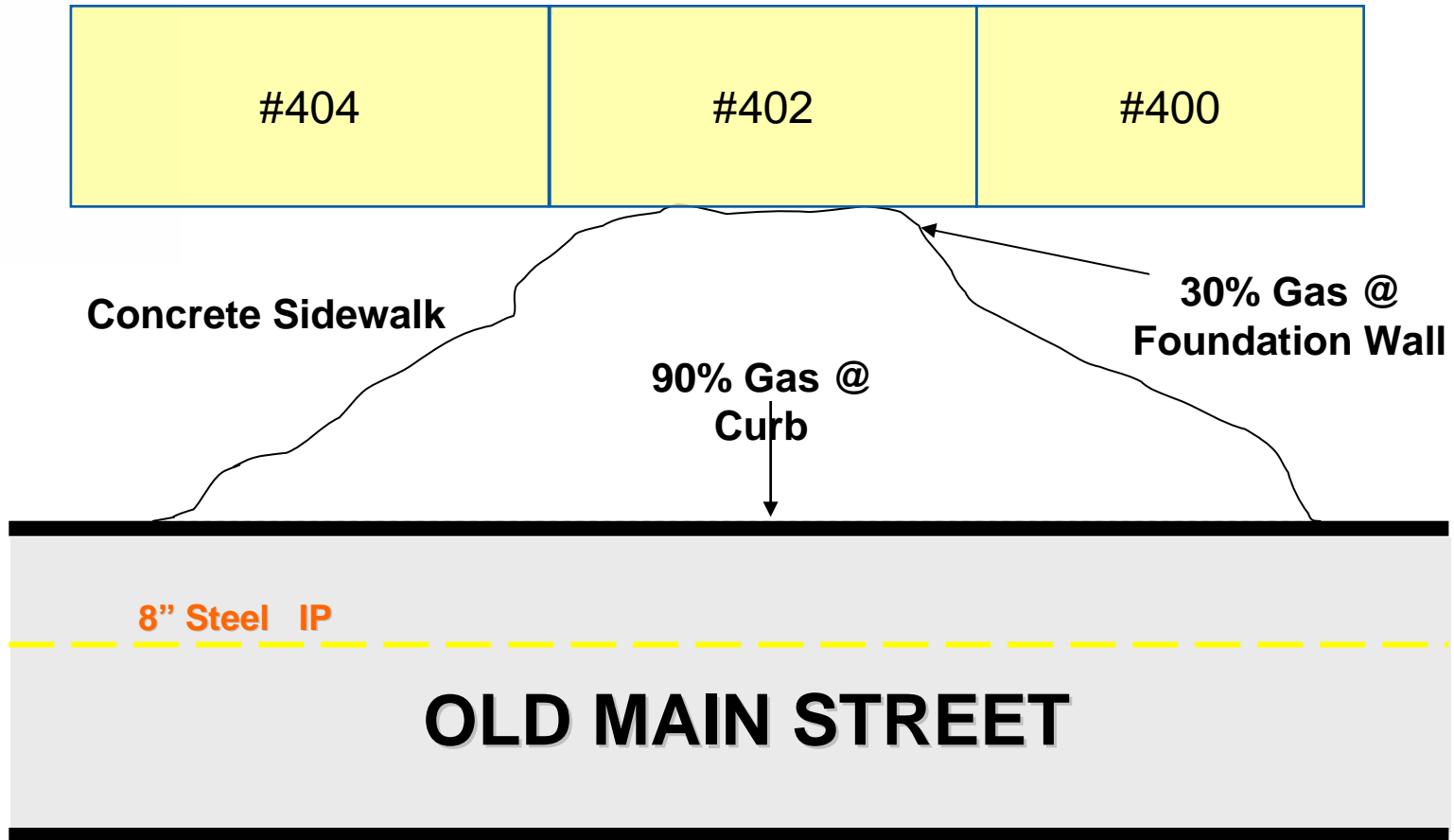
- There are 5 different “Tip Cards”:
 - Gas Explosion
 - Outside Damage or “Dig In”
 - Inside Gas Leak Investigation
 - Outside Gas Leak Investigation (shown)
 - Carbon Monoxide Investigation

 Gas Leaks: Outside Outside Gas Leak Investigation	<ul style="list-style-type: none"> ■ Confirm correct address or location. ■ Visibly inspect for evidence of construction activities. ■ Visibly inspect for vegetation damage that may indicate possible gas leakage. ■ Check available openings, e.g. sewer manholes, telephone manholes, catch basins, water meter pits—if % gas readings detected vent structures if possible. ■ Check additional structures and surrounding buildings—if % gas readings detected in numerous underground structures consider extreme emergency—take Makesafe Actions. ■ If no gas readings detected in available openings, but underground gas readings are detected, bar test N,S,E,W until indications are “zeroed out”. 	<ul style="list-style-type: none"> ■ Bar test at foundations of structures in vicinity—if readings are detected at the foundation, follow “Inside Leak” investigation procedures. ■ If hazardous condition is found, e.g. % gas readings in available openings or atmospheric gas readings inside a structure, call dispatch to begin company Emergency Notification Procedure and request additional assistance from supervision, fire department, and company personnel. ■ Monitor area until qualified personnel relieve you or the hazardous condition no longer exists.
EMERGENCY RESPONSE TIPS		EMERGENCY RESPONSE TIPS

Tip Cards

- To order go to: www.aegislink.com
- www.aegislink.com/portal/resources/publications_guides/loss_control/index.do
- or email RonaldSix@aegislimited.com for more information.

Table Top Emergency Exercises





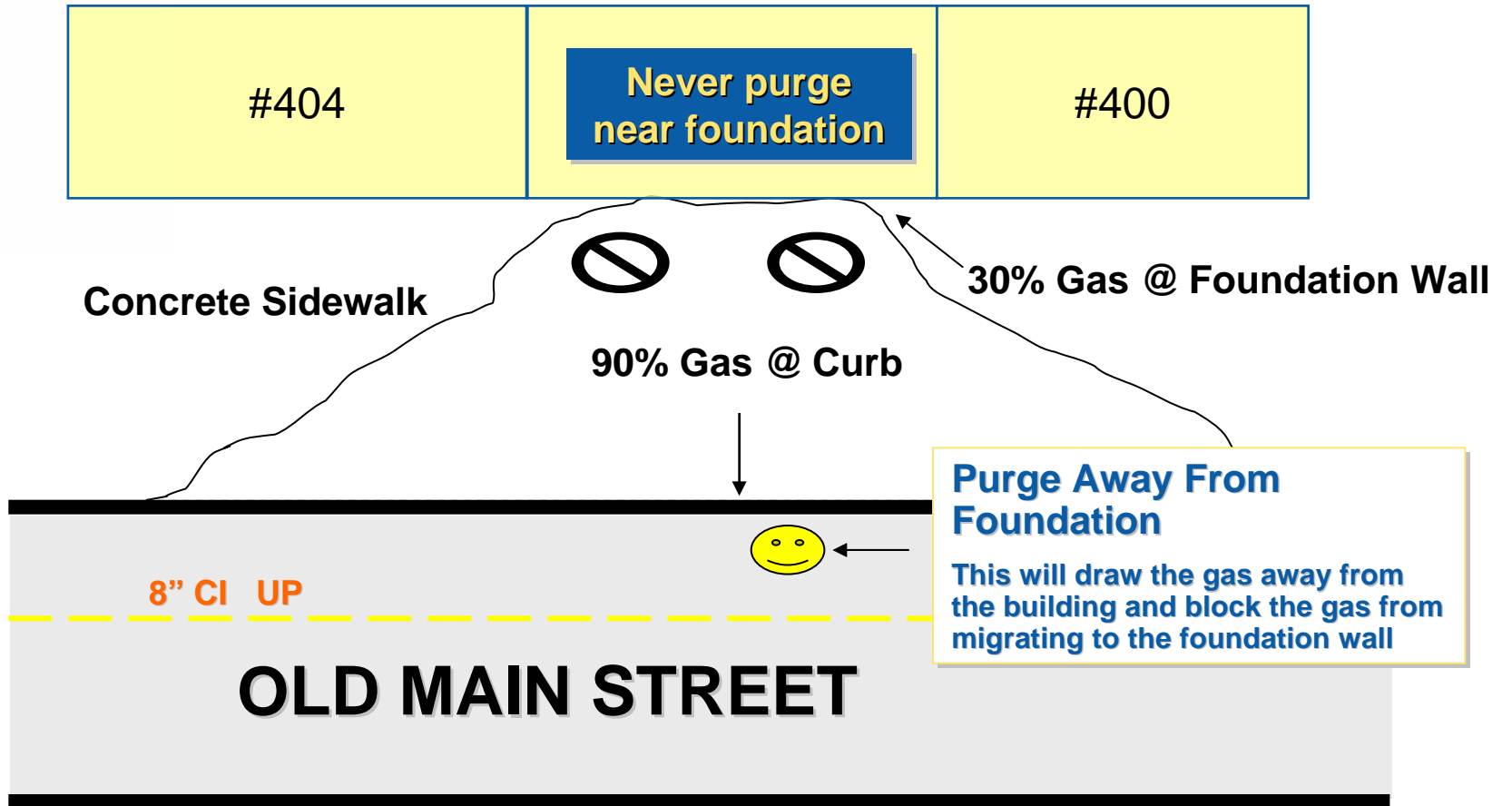
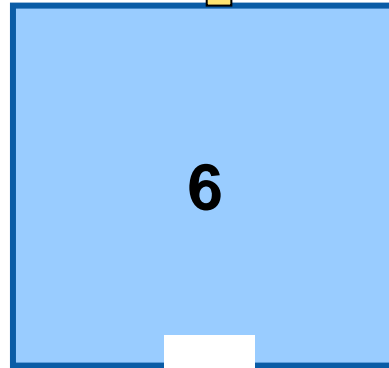
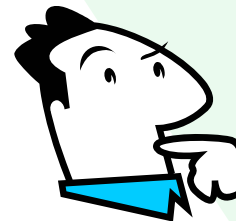


Figure # 2

Gas Meter



PINE STREET

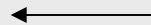


Dispatch reported to you that the homeowner has damaged a fuel line while moving the gas stove. You arrive and smell a very strong odor of gas as you approach the house.

What would be your actions?

CURB LINE

ASH STREET



20% Gas In Telephone Manhole

6" Steel UP

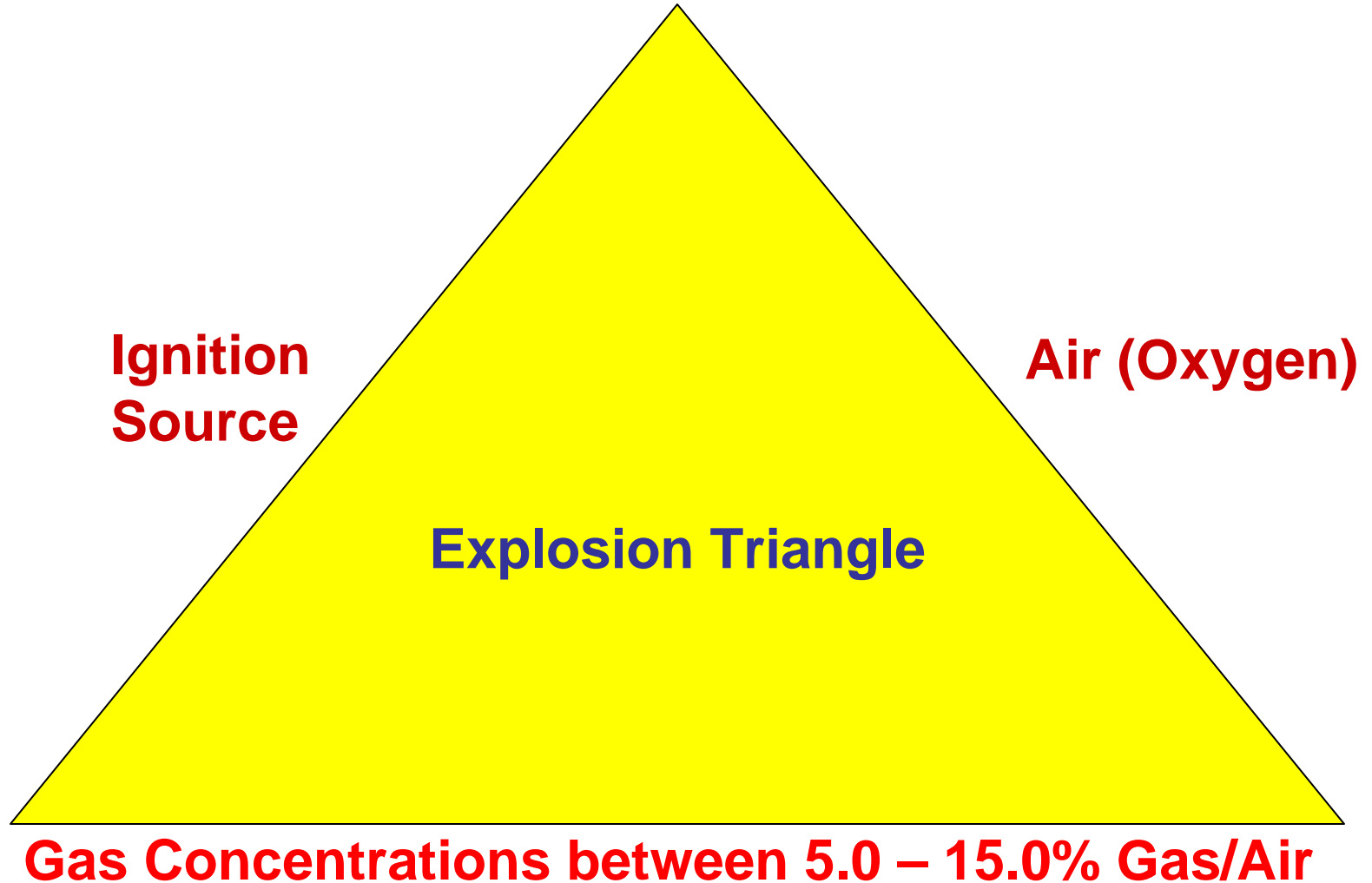
Makesafe

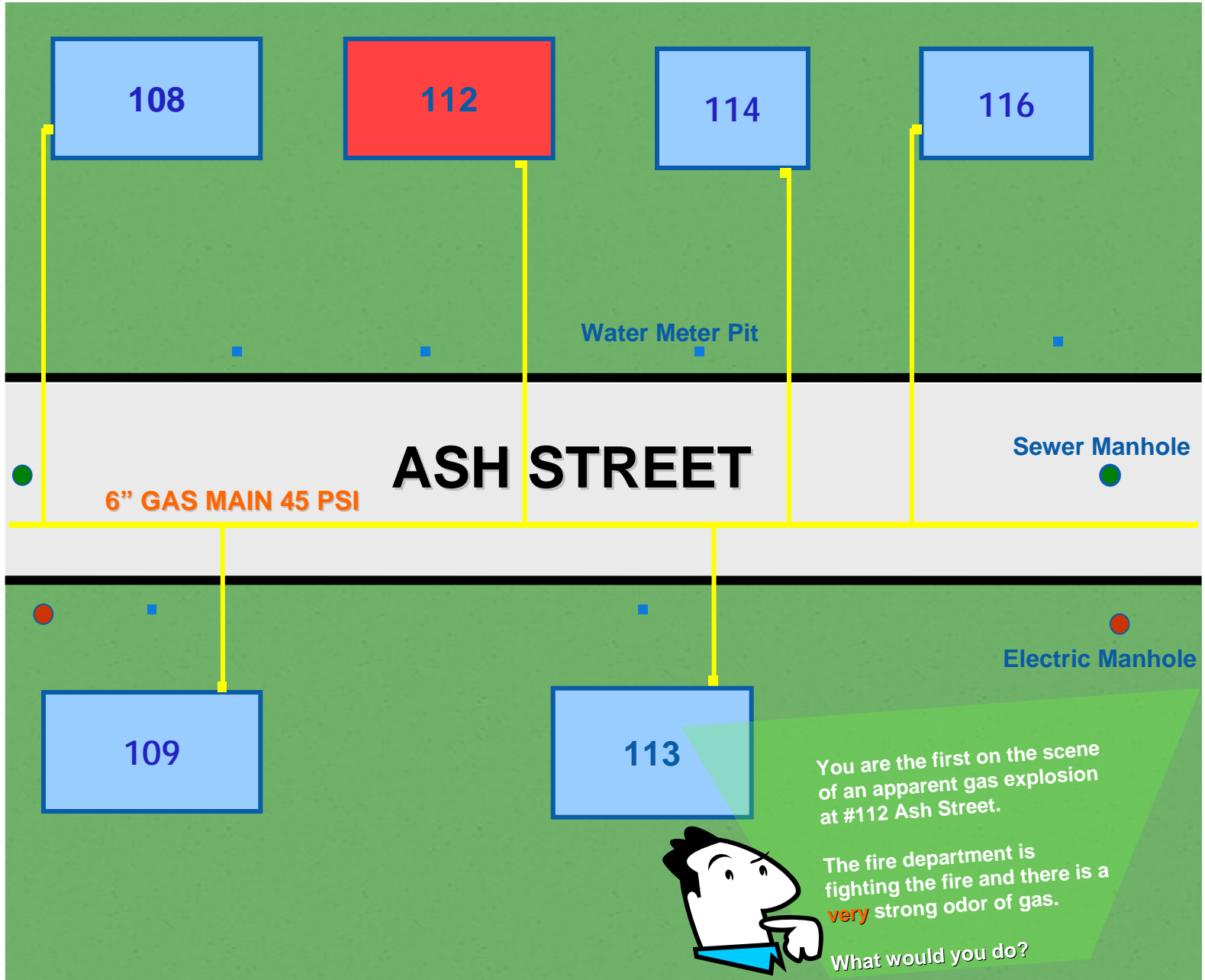
Actions to Consider

- Implement emergency plan
- Call for additional help
- Notify police/fire departments
- Evacuate premises
- Block off the area
- Stop the flow of gas
- Eliminate ignition sources
- Vent area



The Explosion Triangle





After An Incident

Actions to Consider

- Prevention of related incidents
- Calling for additional assistance
- Coordination of efforts with civil authorities
- Preliminary search for gas by testing adjacent structures, barhole testing available openings...use good judgement
- Record results of tests positive or negative
- Focus only on the immediate area of concern

“It is not over until it’s over...don’t be part of history”

After An Incident

Other Actions to Consider



**After the
area is
secured**

- Have a skilled photographer on the scene ASAP, photographic documentation
- Sniff tests, odorant tests, witness and document
- Names and addresses of witnesses
- Verify equipment calibration/document
- Pressure testing -- only when skilled employees and proper equipment are at the scene and only according to your standards
- Develop an event timeline

Incident (1996)

Company Retention \$1M

- An explosion and fire destroyed a mobile home severely burning its occupants a man and his wife. The husband spent 44 days in the hospital undergoing 6 surgical treatments and his wife spent 77 days and underwent 12 surgeries.

Incident (1996)

Company Retention \$1M

Cont'd.

- The cause of the leak was attributed to natural gas leaking from an open fuel line below the mobile home. The open fuel line was the work of a plumber hired to move the gas line. Not being “viable” – having sufficient assets or insurance coverage – he was not named as a defendant in the case.
- That left the local gas company as the sole defendant with the plaintiff only alleging that the gas was improperly odorized (no readily detectable odor).

Incident (1996) Cont'd.

Company Retention \$1M

Cont'd.

- Since the gas company performed and documented an odor-level test immediately after the incident, which indicated that the gas was readily detectable at levels 3 times the federal requirement, it was believed that the allegation would be difficult to prove.

Incident (1996) Cont'd.

Company Retention \$1M

Cont'd.

- During the trial, the odor meter used to conduct the test was introduced as evidence. When it was shown to the jury, its flexible tubing, which transports gas samples from the source into the instrument, had a distinct odor of gas; it should have borne no odor.
- The tubing, not being made of material intended for use with the instrument, retained odorant molecules – thus the smell.

Incident (1996) Cont'd.

Company Retention \$1M

Cont'd.

- The plaintiff argued this nullified the company's odor readings taken immediately after the incident.
- The jury originally found for the plaintiff and awarded \$6,500,000.00. Based on the improbability of a successful appeal, the utility accepted a negotiated settlement of \$4,100,000.00

AEGIS Incurred \$3.1 Million

What Happened?

- The concept of proper operation, calibration and normal maintenance of test instrumentation consistent with their manufacturers' recommendations cannot be over emphasized – not only for odor meters, but combustible gas indicators, flame ionization instruments, carbon monoxide detectors, oxygen level instruments and other safety and hazard detection instruments.
- Calibration and training in the proper operation and maintenance of these instruments is essential.
- The instrument is only as good as the operator who uses it.

Investigating Natural Gas Incidents Workshop

AEGIS Loss Control division will be presenting this workshop in West Palm Beach, FL on November 14, 2007. This workshop is free to AEGIS members, breakfast and lunch will be provided. To register go to:

www.aegislink.com

Reference Information

- **Pipeline Failure Investigative Report**
Located on the Pipeline and Hazardous Materials (PHMSA) website:
PHMSA www.phmsa.dot.gov in the search box type:
Pipeline Failure Investigation Report
- **“Root Cause Analysis For Beginners”**
(Free article)
American Society For Quality www.asq.org in the
search box type: Root Cause Analysis for Beginners
- **NFPA 921 Guide for Fire and Explosion Investigations** (\$50.00)
NFPA <http://catalog.nfpa.org> in the search box type:
NFPA 921

Our main job is *not*
finding & fixing leaks

Our main job is
public safety

To order the Hazard Awareness videos

<http://aegislimited.sawmac.com/form.php>



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Thank You

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