Leak Survey/ Investigation

Case Study

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POINTS TO CONSIDER

When it comes to processes, procedures, proper instrumentation; - - -

How would you rate your program? 1 - 10

Will your current process satisfy the KCC

POINTS TO CONSIDER

Will your current process stand up in court?

Do you need to upgrade your procedures.

This Case Study was meant to give you things to think about!

Behaviors of Natural gas

- Escaping Natural gas reacts to the conditions of the environment which it is in.
- It will always follow the path of least resistance.
- Examples: Drains, sewers, tunnels, conduits
- If under concrete or asphalt it may travel great distances from it's source.
- If confined, may build to levels of combustion

Flammability Range for Natural Gas

- Natural Gas Has a Flammability Range from 5% = (LEL) to 15%= (UEL).
- Ignition temperature of 1100 to 1200 degrees
- Any source of ignition that can generate a spark within this range is likely to ignite gas within the Flammability Range.

Ignition Examples

- Light Switches
- Radios
- Cell Phones?
- Motors
- Electrical devices
- Static Electricity
- Anything that causes a spark

How to Handle Calls

- Employees taking the calls need to know how to instruct the customer.
- Do not use light switches, lay the phone down, do not hang up, Be aware of static as you exit the house. Do not light cigerette.
- Then, responding to the house as a service tech, do not: Ring the doorbell !!!

One of the most important things to remember when surveying for gas is,

* Locate the gas
* Make the area safe
* Locate the source
* Therefore knowing what can affect the spread of gas can help the surveyor to determine where to look for the gas

Leak Survey , Good Practices

- Check all cracks in pavement and soil
- Use vegetation as a supplemental source for finding leaks
- A slow pace of walking is recommended to assure a good sample of the area has been taken.
- If using a mobile survey, wind speed and direction have a great effect on the integrity of the survey.

Leak Survey, Good Practices

- All Manholes, Vaults, Water meter boxes, conduit, any other item that will cause natural gas to migrate needs to be checked while surveying
- If it's in the area , Check it !

CASE STUDY


WARNING
GAS
Gas
Pipeline


Class -1 Leak
5000 ppm
Equals 1% gas


Could it have been sewage gas?
How would you know?
RESTMONT DR

Natural gas Consists of:

- Approximately 85% Methane Gas
- 12% Ethane
- 3% Other gases
- But this will vary depending upon its origin

Sewer Gas Consist of

- 50% Methane
- 40% Carbon Dioxide
- and 10% other gases

Natural gas will Always have a percentage of Ethane gas in its composition or else it is not Natural gas


Class -1 Leak
5000 ppm
Equals 1% gas


This house blew up first

Where was the leak?
Why did the Maintenance Crew not find it?
Was the right equipment used?
Was the correct procedures/standards used or followed?

pause

Instrumentation for investigation

FI units cont….

- What does a Flame Pack or FI unit do ?
  - It finds the general location of a gas leak.
  - Generally the FI unit is used in a walking survey sweeping the wand 2 to 6” above the ground an checking all suspect areas for leakage.
  - It is capable of detecting a hydrocarbon gas as little as 1/2 Part Per Million.

FI Unit

- Most FI units measure from 1/2 PPM to 5000 PPM.
- 5000 PPM equals approximately .5% Gas
- 10000 PPM equals 1% Gas in air
- Most units have a Flame out indicator, Which can cause a unit to Flame Out?
- Can you use this instrument inside a structure?


LEL
GAS-RANGER
OFF
Bascom-Turner
NATURAL GAS DETECTOR

Combustible gas Indicator CGI

- What is the purpose for a CGI ?
  - To determine the **percent of gas in air mixture.**
  - To **classify the severity** of the gas leak.
  - To **pinpoint** a Gas leak.

CGI

- The CGI is one of many instrument approved to use inside a structure.
- However, Some Hydrogen Flame Ionization units(HFI) are intrinsically safe but are not recommended for checking leaks inside a structure !!

Processes and/or Procedure's Industry Standards

Barhole testing

- Barhole testing is a procedure used to:
  - Isolate and Pinpoint
  - Determine if the leak is hazardous or not
  - Classify leaks to the severity of the situation

Bar Hole Testing

- Bar holes should be the same uniform depth and size
- When bar hole testing, holes should be at least 2 to 3 feet apart to perform an adequate test.

Classification Guidelines/Procedure

- **D.O.T. Class 1:**

  Leaks that represent an existing or probable hazard to persons or property and requires immediate repair or continuous action until the hazard no longer exists.

  - Gas found inside a building
  - Gas migrating into or under a building.
  - Odor of gas from an unknown source.
  - Existing or probable hazard to person or property.

- A **sustained gas** reading of 50% LEL (2.5% gas) or greater at available street openings, manholes, catch basins, telephone conduit, or any structure which will act as a substitute conduit.

- **Bar testing** that results in a **sustained*** CGI reading of:
- 1 % to 100% Gas, located from **0ft. - 10ft**. from any building
- 25% to 100% Gas, located from **10ft. - 20ft**. from any building
- 50% to 100% Gas, located from **20ft. - 30ft**. from any building

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0%
0%
0%
0%
0%
0%
5%
10%
20%
0%

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Case Study


20%
30%
40%
50%
LEL
GAS-RANGER
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The Leak was found
Under the road.
0%
0%
60%
60%
80%

EMERGENCY RESPONSE

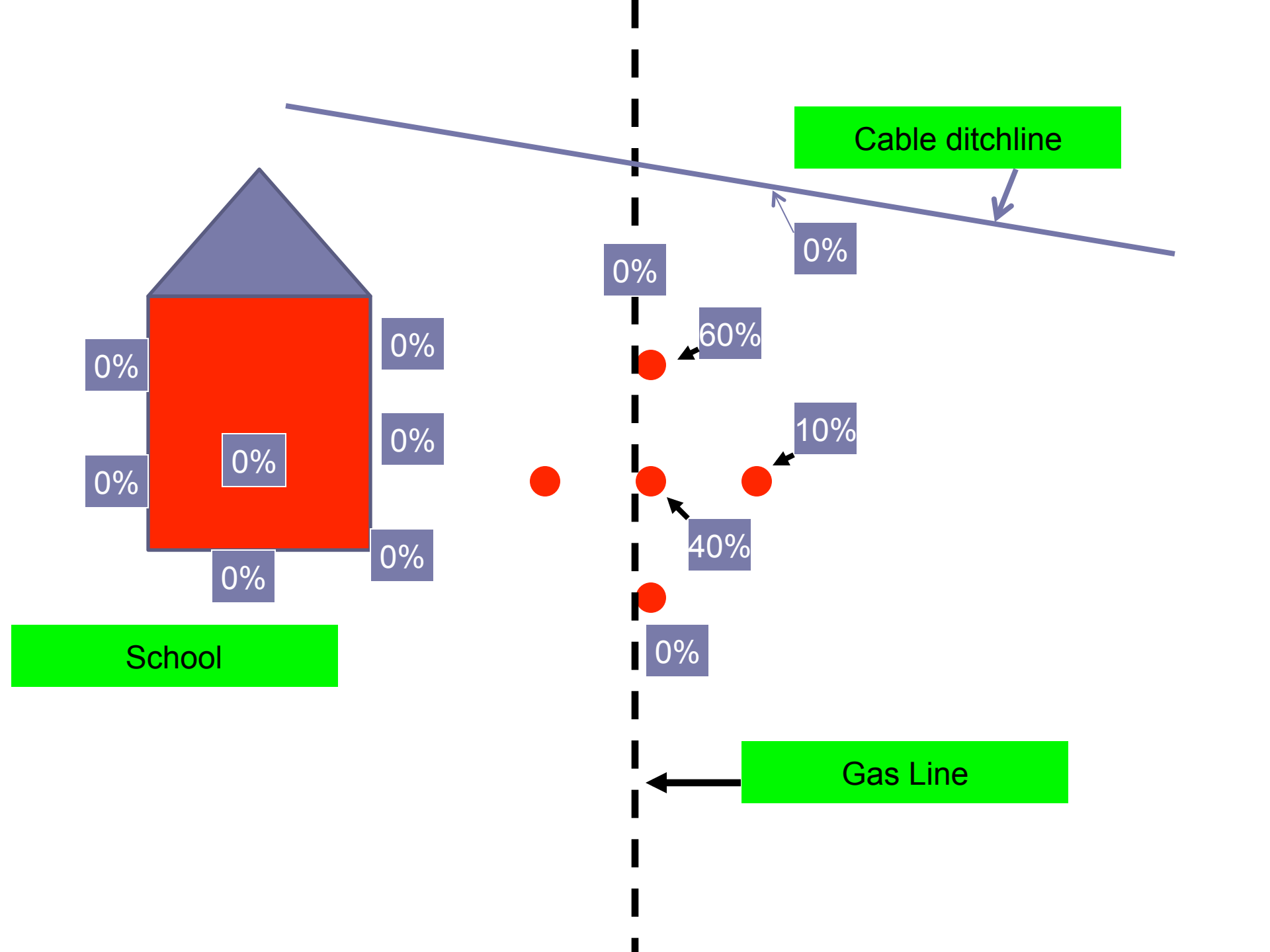
Emergency Response

- Are all of your staff properly trained?
- Who takes the call of a gas leak report?
- Even if you have contractors that may assist, will you be on hand ASAP to oversee the project?
- If evacuation is involved, would you be ready to make that happen?

Emergency Response

- What about your relationship with first responders?
- Will your Liaison efforts that you have conducted benefit you if an incident should occur?
- Do the responders know what to expect from you if an incident should occur?

Documentation when conducting Leak Investigation


Cable ditchline
0%
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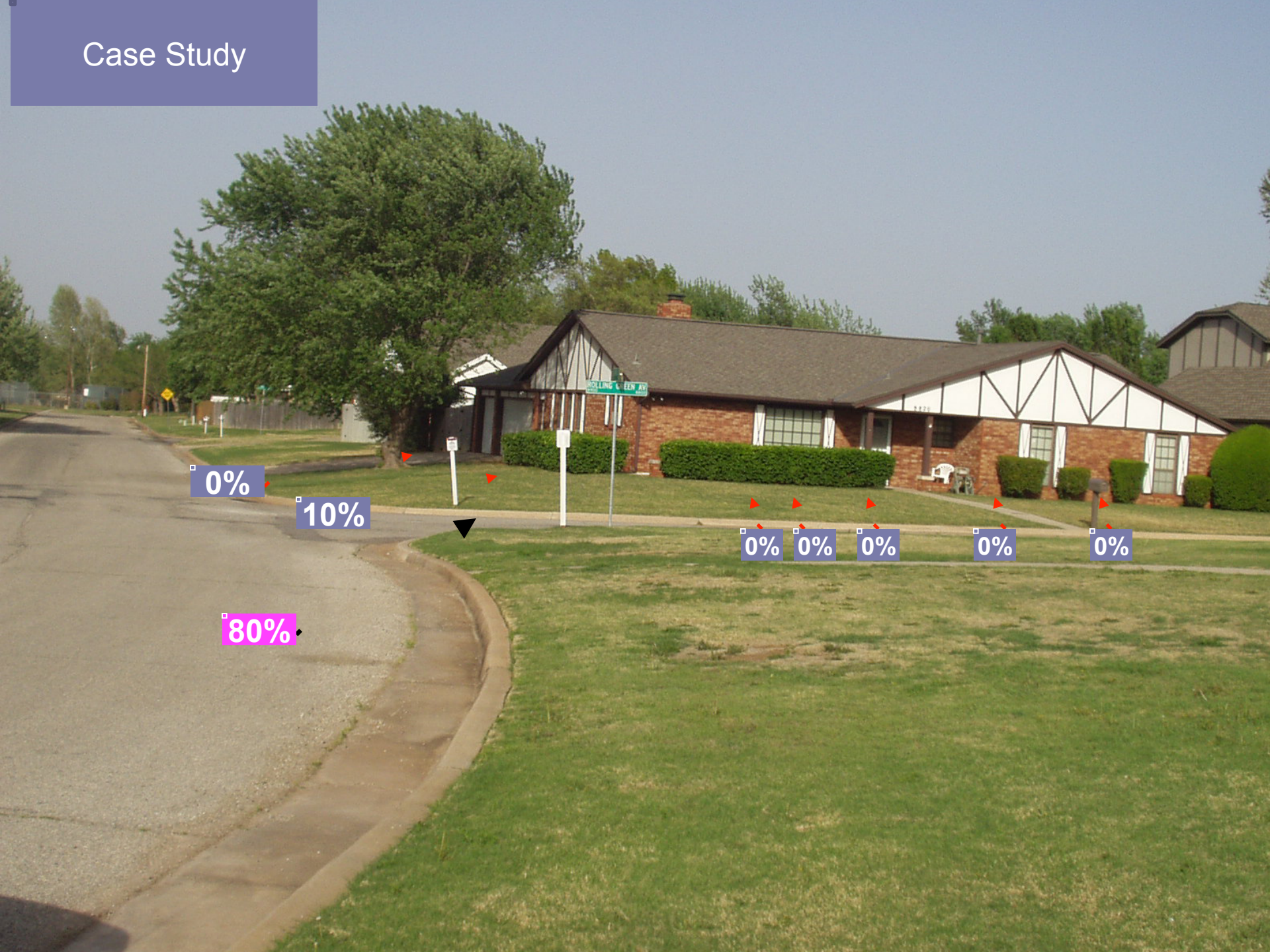
School
Gas Line

Case Study



Case Study

GOOD COMMUNICATION IS A MUST

50’ ft of Poly was Installed in the existing steel gathering line.

`KEY THINGS TO REMEMBER

Know your instruments.

Use the right instrument for the job.

Process’ es and/or Procedures are at least industry standard.

`KEY THINGS TO REMEMBER

- Utilize bar hole testing

Document

Document

Document


FOTOSEARCH