811 SAFETY IS IN YOUR HANDS.
EVERY DIG. EVERY TIME.

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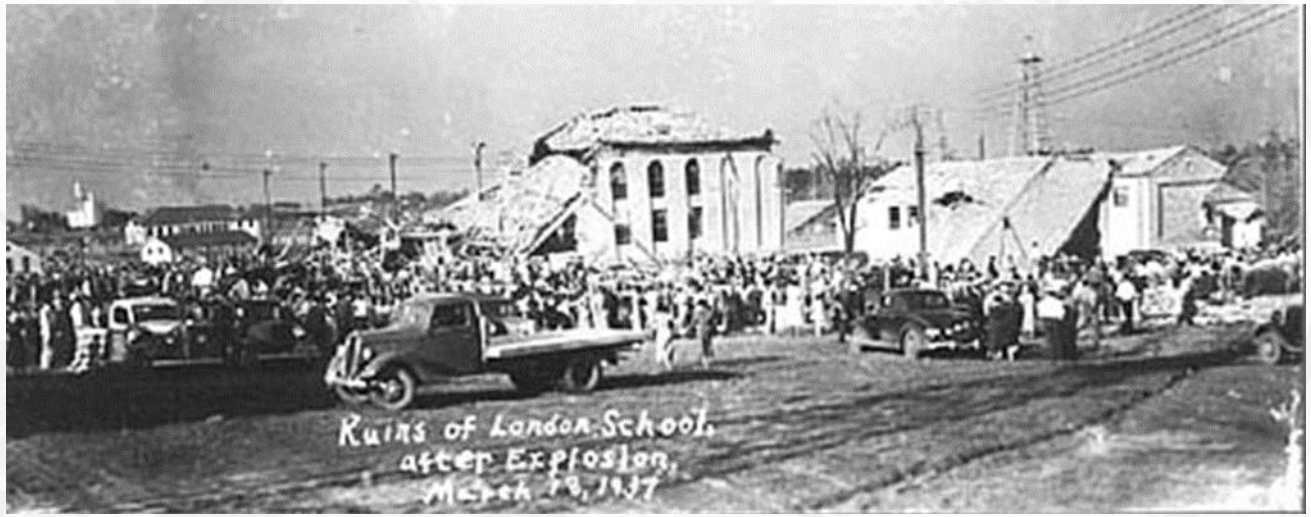
Odorization Issues

88 Years Ago…

New London, Texas School Explosion

New London, Texas School Explosion



Pipeline Safety Regulation Begins…

Gas Reports

§192.605

Respond promptly to a report of gas odor in or near a building, unless covered by emergency plan

Why Odorize?

Liability

- Odorization of a gas system is done with a single purpose in mind: Provide the public with an effective warning device to alert them when there is a possible problem
- It’s also the law

Why Odorize?

Regulations – 49 CFR §192.625(a)

- A combustible gas in a distribution line must contain a natural odorant or be odorized so that at a concentration in air of one-fifth of the lower explosive limit, the gas is readily detectable by a person with a normal sense of smell
- After December 31, 1976, a combustible gas in a transmission line in a Class 3 or Class 4 location must comply with the requirements of paragraph (a) of this section unless exempted under §192.625(b)

Question

Which pipelines must always be odorized?

- Distribution lines and non-exempted transmission lines
  - OPS Interpretation, Sept. 10, 1980
    - Section 192.625(a) requires that gas in distribution lines have a natural odor or be odorized to the limit prescribed
    - Since service lines are distribution lines, they are subject to the odorization requirements of §192.625(a)
    - The exception from odorization provided by §192.625(b) for some transmission lines does not affect the requirement to odorize gas in distribution lines connected to an unodorized transmission line

Complying with 49 CFR 192.625

- Readily detectable
- 1/5 LEL
- Class location
- Odorant selection
- Odorizers and injection rates
- Periodic sampling

What is Readily Detectable?

- Ready – “in a ready manner as a) without hesitating; willingly b) without much difficulty…”
  - Merriam-Webster Dictionary, on-line edition
- Detectable - “a) to discover the true character of; b) to discover or determine the existence, presence, or fact of…”
  - Merriam-Webster Dictionary, on-line edition
- Readily detectable odor – an odor that can be discovered, determined or whose existence can be identified in a ready manner, without hesitating or much difficulty

What is Readily Detectable?

The odor of gas should be one that a spouse, family, or member of the general public would quickly recognize, prompting them to take appropriate action

Odor Intensity or Perception Factors

- Anosmia - odor blindness
- Smoking
- Colds and Allergies
- Physical condition – age, gender, exposure
- Psychological effects

Normal Sense of Smell?

- Use a wide variety of testing personnel
- Testing or “qualifying” a sense of smell
- Sensonics “Smell Identification Test”
  - http://www.sensonics.com

Normal Sense of Smell?

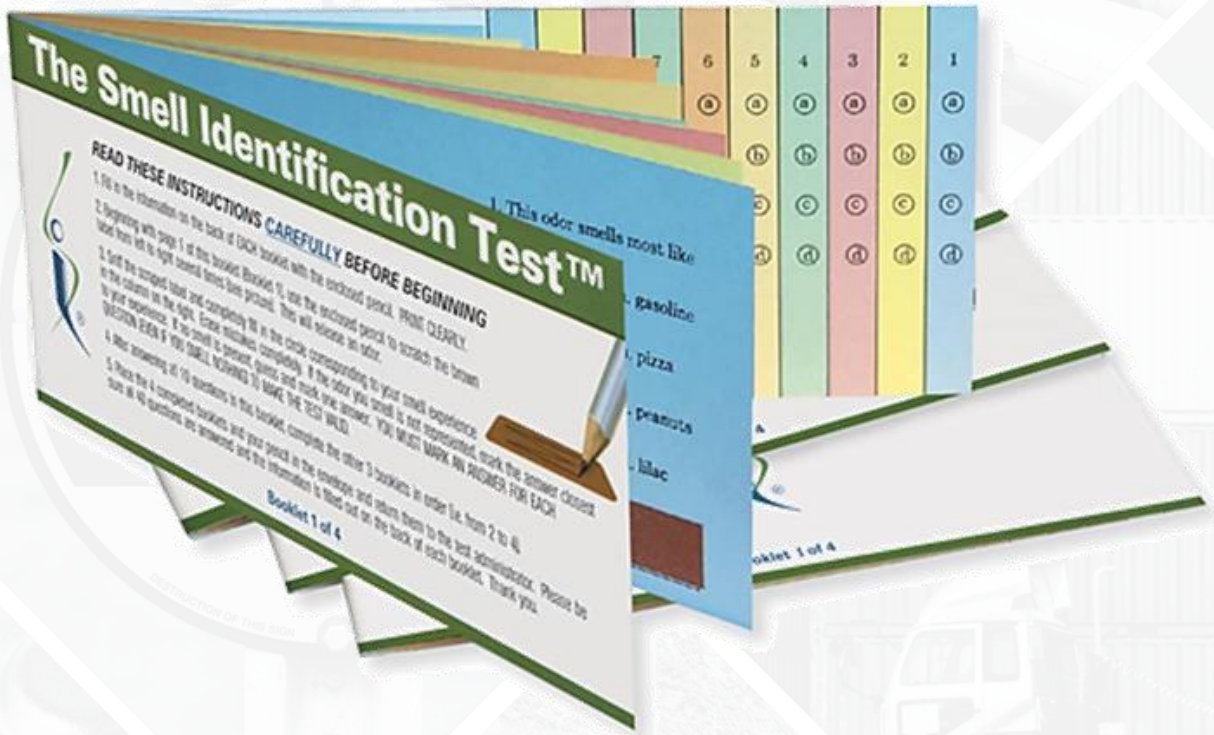
Gas Company Smell Test

A simple way to meet government standards, and ensure that you workforce can smell the odor of natural gas

Normal Sense of Smell?

Smell ID Test for the Public

- The University of Pennsylvania Smell Identification Test™ is a comprehensive 40-item test.
  - It is the most reliable and accurate olfactory test available
- Provides an absolute indication of smell loss (anosmia)



Regulations And Compliance

Regulations And Compliance

- Required levels of odor for compliance.
  - What limits have companies prescribed in their O&M Manuals?
  - Even though the regulations state 1/5 LEL, if an operator has set more stringent levels the testing personnel must follow the O&M and react accordingly
- The same holds true for injection rates described in the O&M Manual

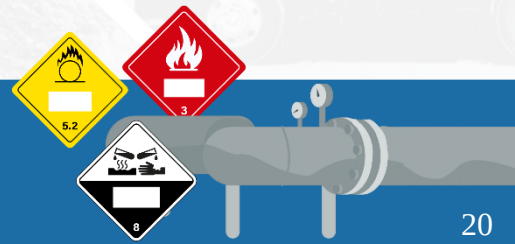
Question

- What is the minimum allowable odorant injection rate for regulatory compliance?
- There is no injection rate specified in the code. The only requirement for injection rates is in §192.625(e)
  - Equipment for odorization must introduce the odorant without wide variations in the level of odorant

Interpretation

So, what is “wide variation” - OPS interpretation October 31, 1973

- An acceptable range for variation of odorant concentration would be within a range no lower than a concentration which is readily detectable at one-fifth of the lower explosive limit by the typical person.
- The intent of the regulations is that the operator would not make variations in odorant concentration that could cause unwarranted public reaction.



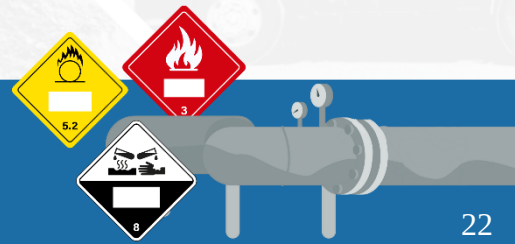
Odorant Concentration Verification

Readily Detectable Level

Threshold Detection Level

Test Points

- End of system, farthest point in pipe miles from odorizer
- Areas of low or changing flow rates
- Known problem areas
- Downstream of areas where liquids collect
- New construction, steel or plastic
- Random test locations



Odor Audits

Document Review Can Find:

- Incorrect reporting of odor intensity
- Lack of variation in reported odor levels
- Erratic readings at same location
- Consistent change in odor levels
  - Change in sense of smell
- Lack of required information
- Failure to follow company standards

Considerations

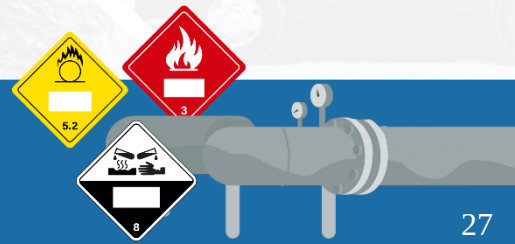
- The one-fifth LEL is based on the operators' gas composition
- Sniff tests are qualitative tests that should be performed by individuals with a normal sense of smell
  - Considerations such as gender, age, smoking habits, colds, and other health-related conditions such as allergies or colds that could affect the sense of smell should be considered in selecting individuals to perform sniff tests

Considerations

- Records should reflect the person doing the sniff test
- Some operators conduct sniff tests with two individuals, to get more conclusive results
- Test locations to verify odorant levels should include system end points (extremities)

Considerations

- Operators must have written procedures for the testing of odorization
- Operator needs to specify the frequency of odorization tests
- The operator should retain records of the odor level and odorant concentration test results
- Reverse flow in lines can affect odorization requirements



Considerations

- Odorizer injection rates are not stand-alone proof of adequate odorization
- Special attention to odorization requirements should be applied to transmission (and transmission laterals) lines where class 3 areas exist
- Class location studies are needed to substantiate unodorized pipelines
- Operator's line designation plan may help in the determination of line classification of transmission or lateral

Why Audit Odorization?

The Value of Regular Odorization Audits by the Operator

- Insure that odorization is continuous
- Verify that odorization is consistent
- Make sure the odorant works
- Meet regulatory requirements

Conducting the Odorization Audit

- Records and documents
- Odorizing equipment
- Personnel qualifications
- Test points and equipment
- Total leak call rate

Records and Documentation

- Injection rates
- Amounts and types of odorant purchased
- Odorizer inspection reports
- Test results from odor concentration meter tests

Records and Documentation

- Training records
- Types of odor calls received
- Results of odor call investigations
- Total number of odor calls received

Odorizing Equipment

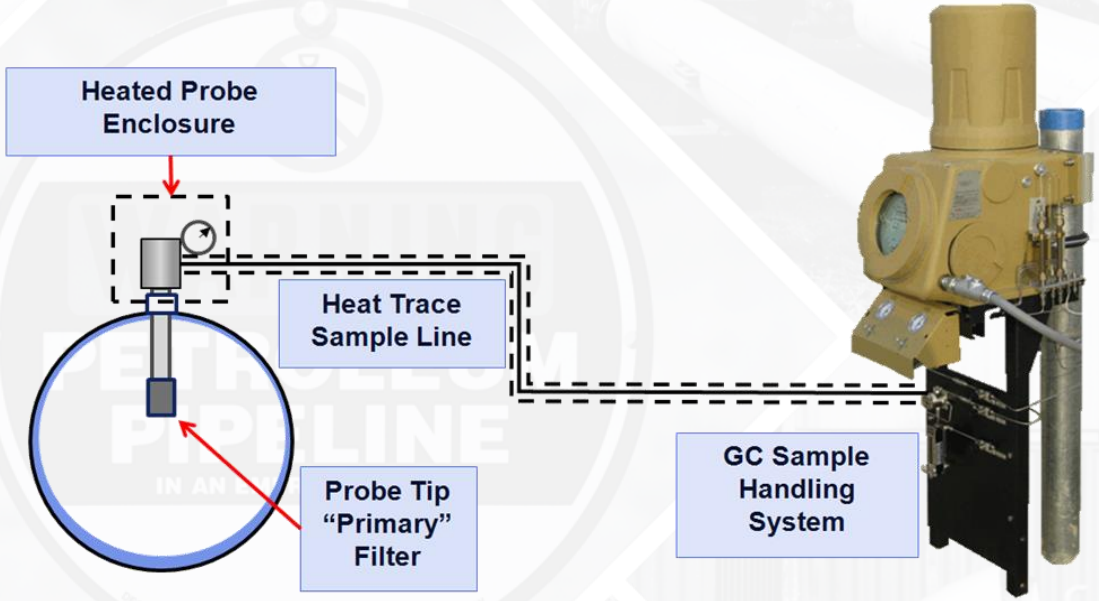
- Types of odorizers
- Type of odorant used
- Maintenance activity
- Locations

Personnel Qualifications

- Training on test instruments
- Sense of smell
- Variations in sensitivity
- Training for the masses
- “Nasal Appraisal”

Test Points and Equipment

- Location of test points
- Testing frequency
- Odor concentration meters
- Chromatographs



Pipeline Gas Chromatograph Fundamentals

Leak Call Ratios

- Frequency of calls
- Types of leaks/sources found

Evaluation

- Is the odor continuous?
- Is the odor consistent?
- Is the program working as designed?

Conclusions From a Successful Audit

- Operator is knowledgeable
- Program meets its goals
- Operator is serious about Public Safety

Thank you


1.4
EXPLOSIVE
*
1
1005
2
WARNING
PETROLEUM
PIPELINE
IN AN EMERGENCY CALL
DESTRUCTION OF THIS SIGN
VIOLATES FEDERAL LAW