



# *2016 Michigan Seminar*

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**Pipeline and  
Hazardous Materials  
Safety Administration**

**ODORIZATIION  
ISSUES**



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## GAS REPORTS

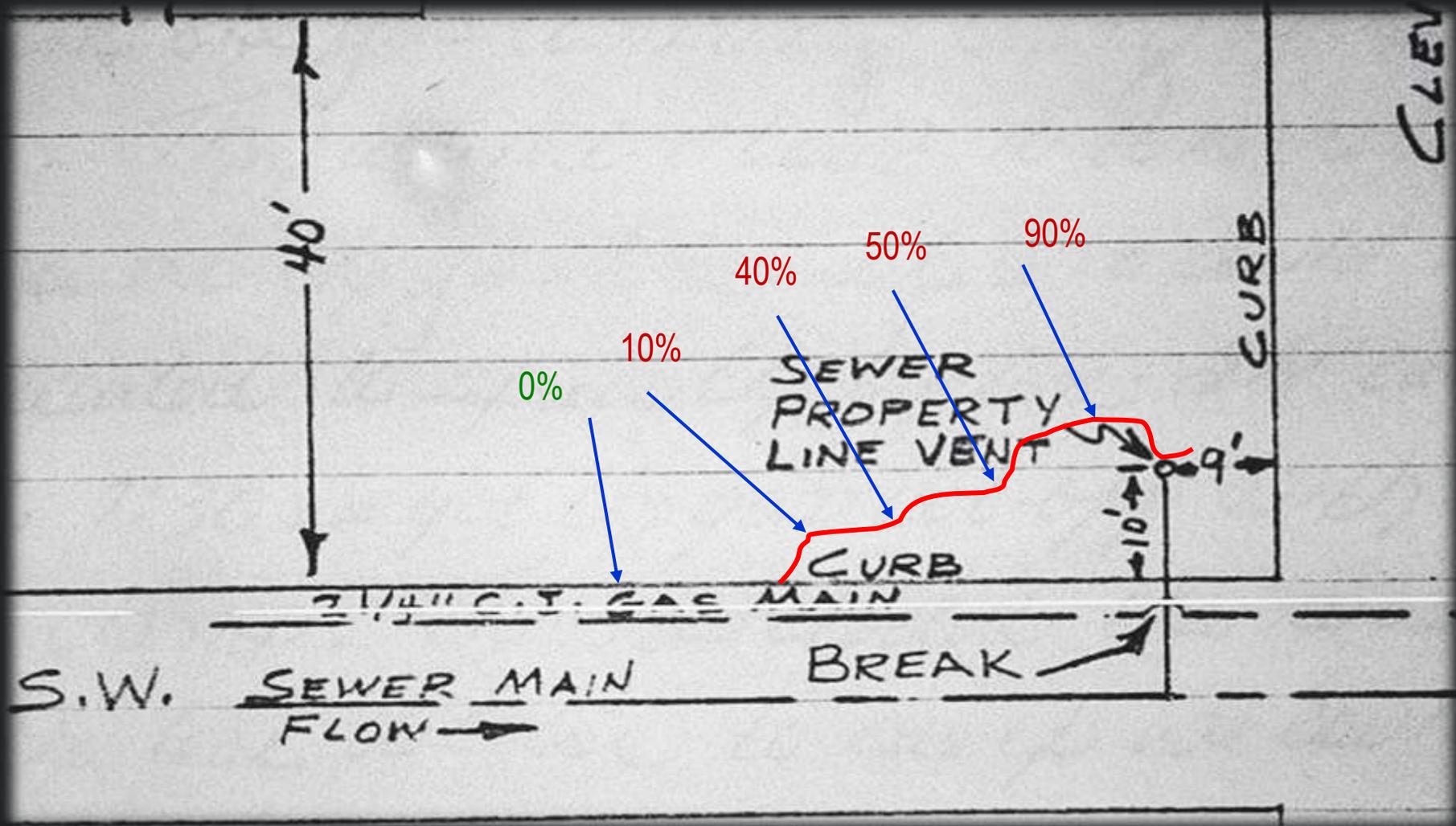
**(11) Respond promptly to a report of gas odor in or near a building, unless covered by emergency plan**



**§192.605(b)**

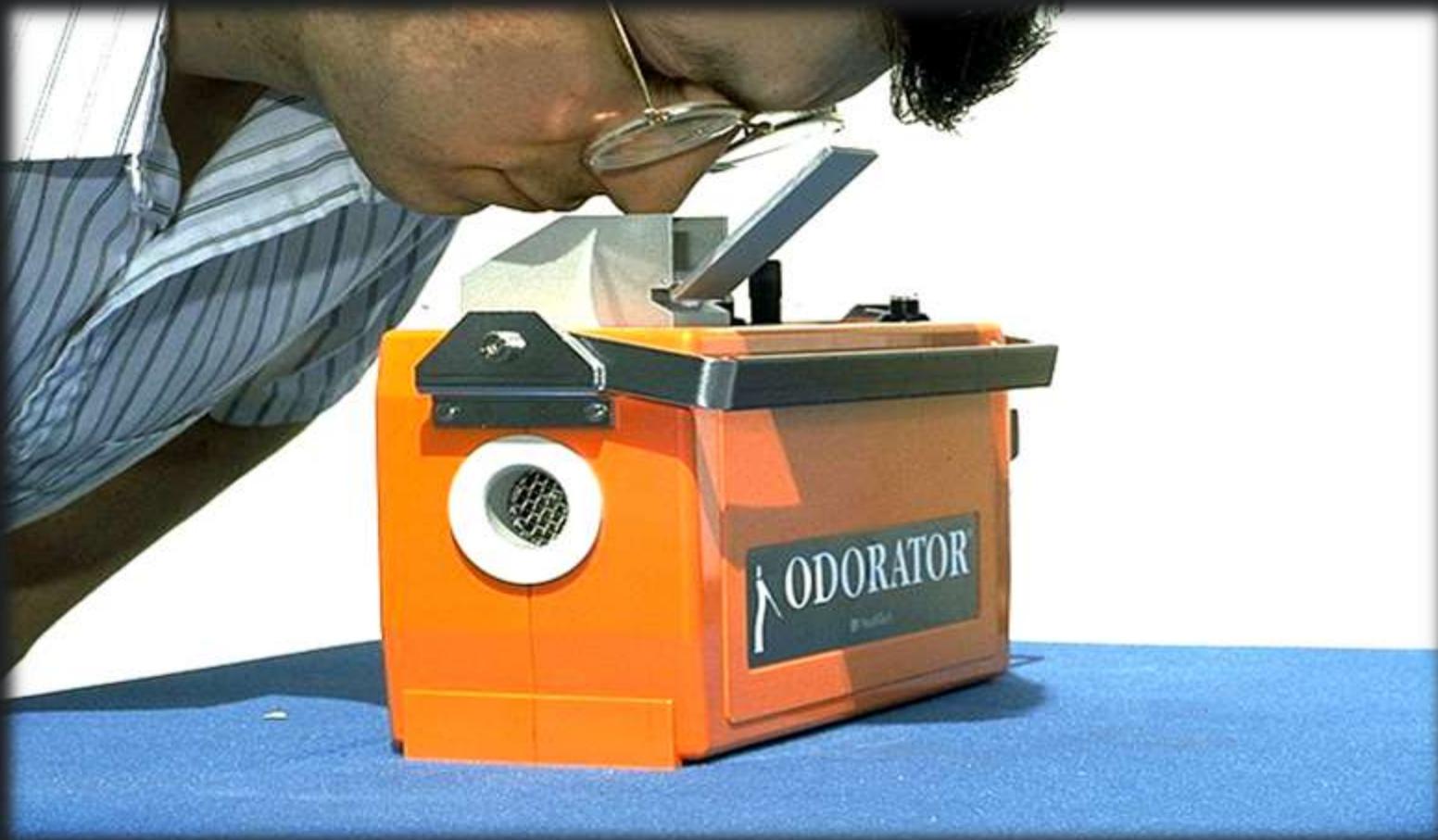


# PLOT GAS MIGRATION





# Odorant Concentration Verification





# QUESTION

- Which pipelines must always be odorized?
- Distribution 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.*



## 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.



- **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. For the most part, each gas operator has determined the range of odorant concentration needed in its system for compliance with regulatory standards.*



## 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.



# 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.



# 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..."
- **Detectable** - "**1** : to discover the true character of **2** : to discover or determine the existence, presence, or fact of..."
- **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.*

Merriam-Webster Dictionary, on-line edition



## 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.



# 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>

**Gas Company Smell Test**

Availability: **In Stock**

SKU: GST

A simple and very cost-effective way to meet government standards, and ensure that your workforce can smell the odor of natural gas.

Price: **\$1.90**



**Smell Identification Test**

Availability: **In Stock**

SKU: SIT 001

The Smell Identification Test [UPSIT] is our comprehensive 40-item test and is the only olfactory test on the market today that can be self-administered. It is the most reliable (test-retest  $r=0.94$ ) and accurate olfactory test available.

Provides an absolute indication of smell loss (anosmia; mild, moderate, or severe microsomia) as well as an index to detect malingering. Norms from nearly 4,000 men and women spanning the entire age range provide a basis for examinee percentile rank. Available in American, Arabic, British, Chinese (Simplified), Chinese (Traditional), Dutch, French, German, Italian, Japanese, Portuguese, and Spanish.



[More Views](#)





# 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.



# 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.



# FACTORS WHICH AFFECT ODOR INTENSITY OR PERCEPTION

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



## 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.



# GUIDANCE

1. The one-fifth LEL is based on the operators' gas composition.
2. 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.
3. Records should reflect the person actually doing the sniff test.
4. Some operators conduct sniff tests with two individuals, to get more conclusive results.



## GUIDANCE

5. Test locations to verify odorant levels should include system end points (extremities).
6. Operators must have written procedures for the testing of odorization.
7. Operator needs to specify the frequency of odorization tests.
8. The operator should retain records of the odor level and odorant concentration test results.
9. Odorizer injection rates are not stand alone proof of adequate odorization.



## GUIDANCE

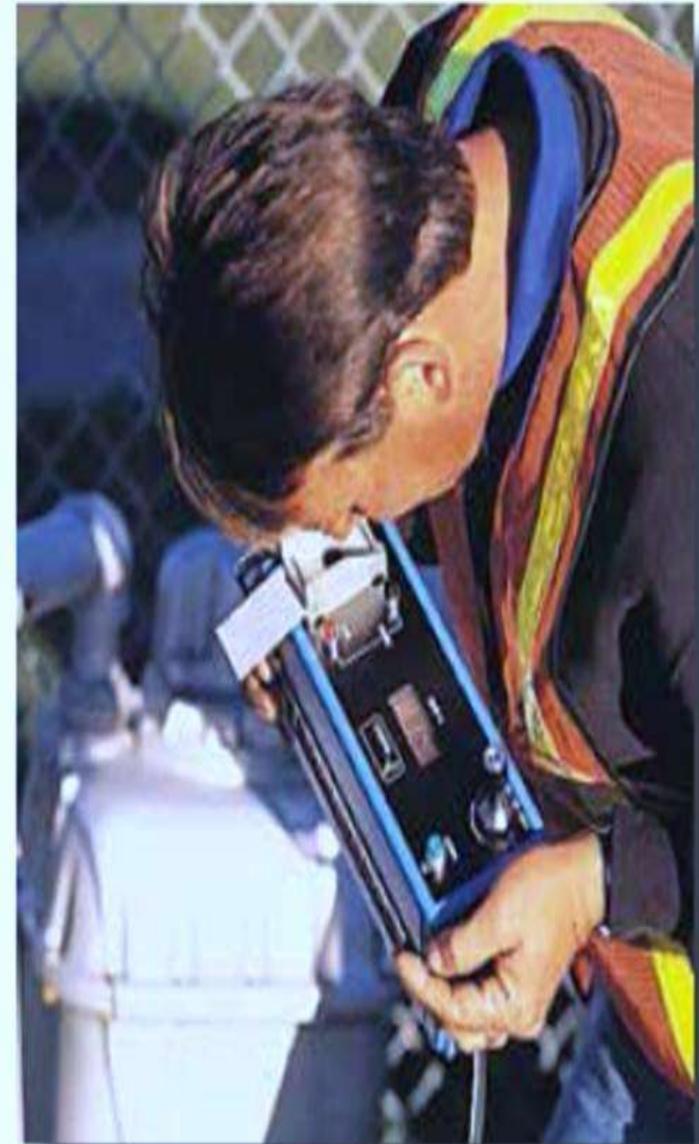
10. Special attention to odorization requirements should be applied to transmission (and transmission laterals) lines where class 3 areas exist.
11. Class location studies are needed to substantiate unodorized pipelines.
12. Operator's line designation plan may help in the determination of line classification of transmission or lateral.



# ODORATOR

## *Operating Information*

The ODORATOR mixes natural or propane gas with air in concentrations from zero to approximately 2% for natural gas or 1% for propane. The operator slowly opens the linear flow metering valve which allows sample gas to enter the instrument and then he sniffs the mixed exhaust at the exhaust port. This operation is continued until the odorant level in the exhaust is readily detectable at which time the operator presses and holds down the “read” button to observe the relative percent gas concentration in air on the digital display. Correction charts are included for both correcting and interpolating the instrument’s readings over its full measurement range and when used at elevation.





# O&M & EMERGENCY PLANS

Specificity and details  
for  
written procedures



# specificity

Would you order  
Strawberry?  
Cherry?  
Raspberry?  
Cinnamon?  
Red Velvet Cake?

Or . . .

Would you  
Just order RED?





Mosquito?



Flea?



details



Or . . .  
Spider?



Hippopotamus?



# O&M Plans

- ▣ Details
  - Who
  - What
  - When
  - Where
  - Why
  - How
  - Other information to provide clarity



# O&M Manuals

- ▣ the plans should be an outline for compliance.
  - They should either say what you do  
or,
  - You should do what they say

Either way you will be in compliance with your own procedures



# O&M Manuals

## Example:

There are two types of full encirclement sleeves.

- **Type A** is nonpressure-containing
- **Type B** is pressure-containing

*Note:* Dresser-style reinforcement sleeves, weldovers, pumpkins, and possum bellies are also pressure-containing sleeves used in special-case repairs. Consult with the appropriate supervisor for their application



# O&M Manuals

- ▣ Only the right combination of specificity and detail will provide what we essentials to achieve these goals and give us the compliance we want and need.



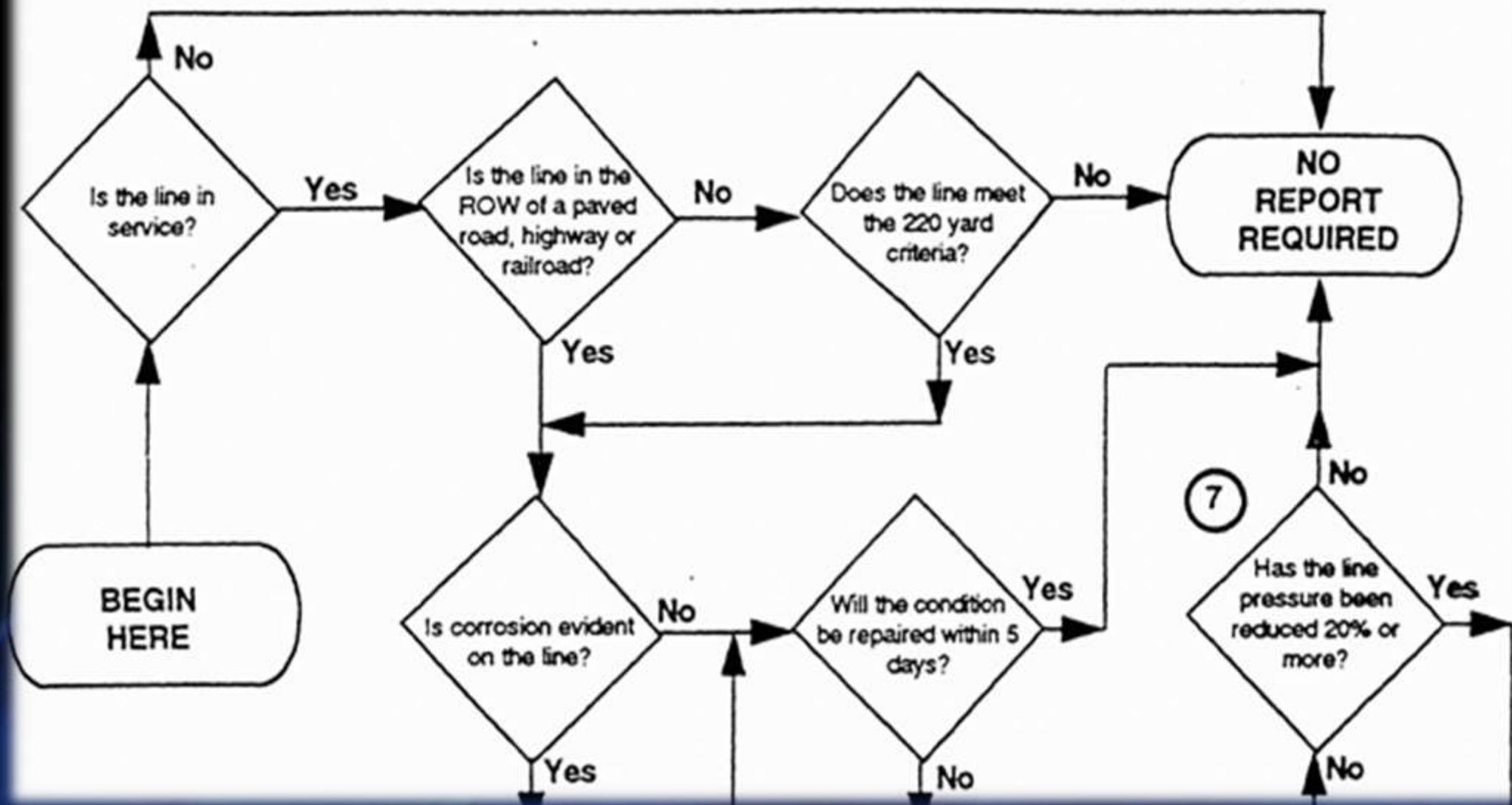
# Specificity & Detail

- ▣ Other things that add specificity, detail and clarity
  - Flowcharts, Drawings and photos
  - Tables
  - Definitions
  - References to DOT codes



# Specificity & Detail - Flowcharts

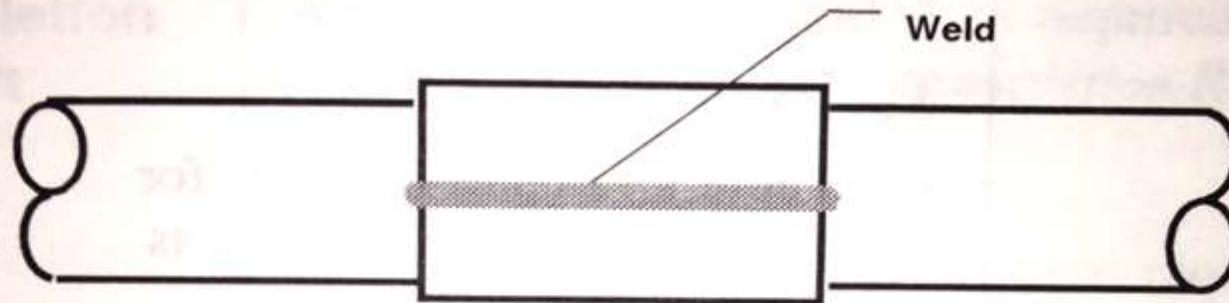
## Safety Related Condition Evaluation for Reporting



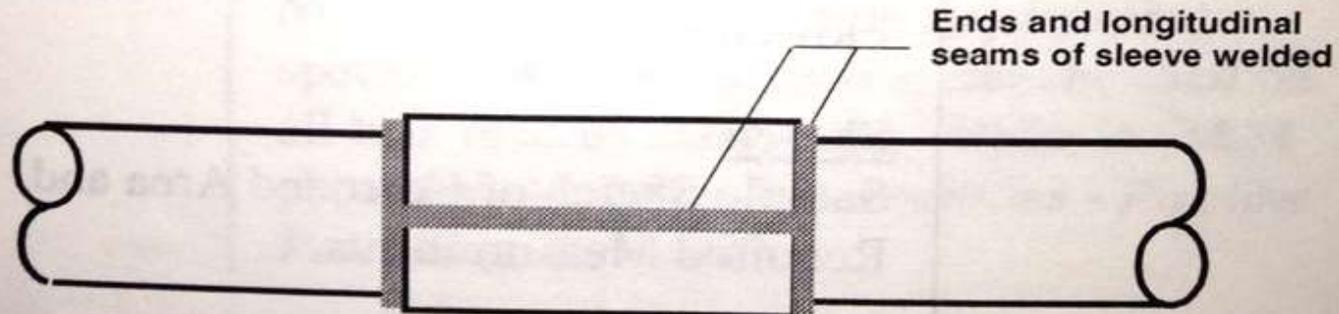


# Specificity & Detail -Drawings

## Type A Sleeve

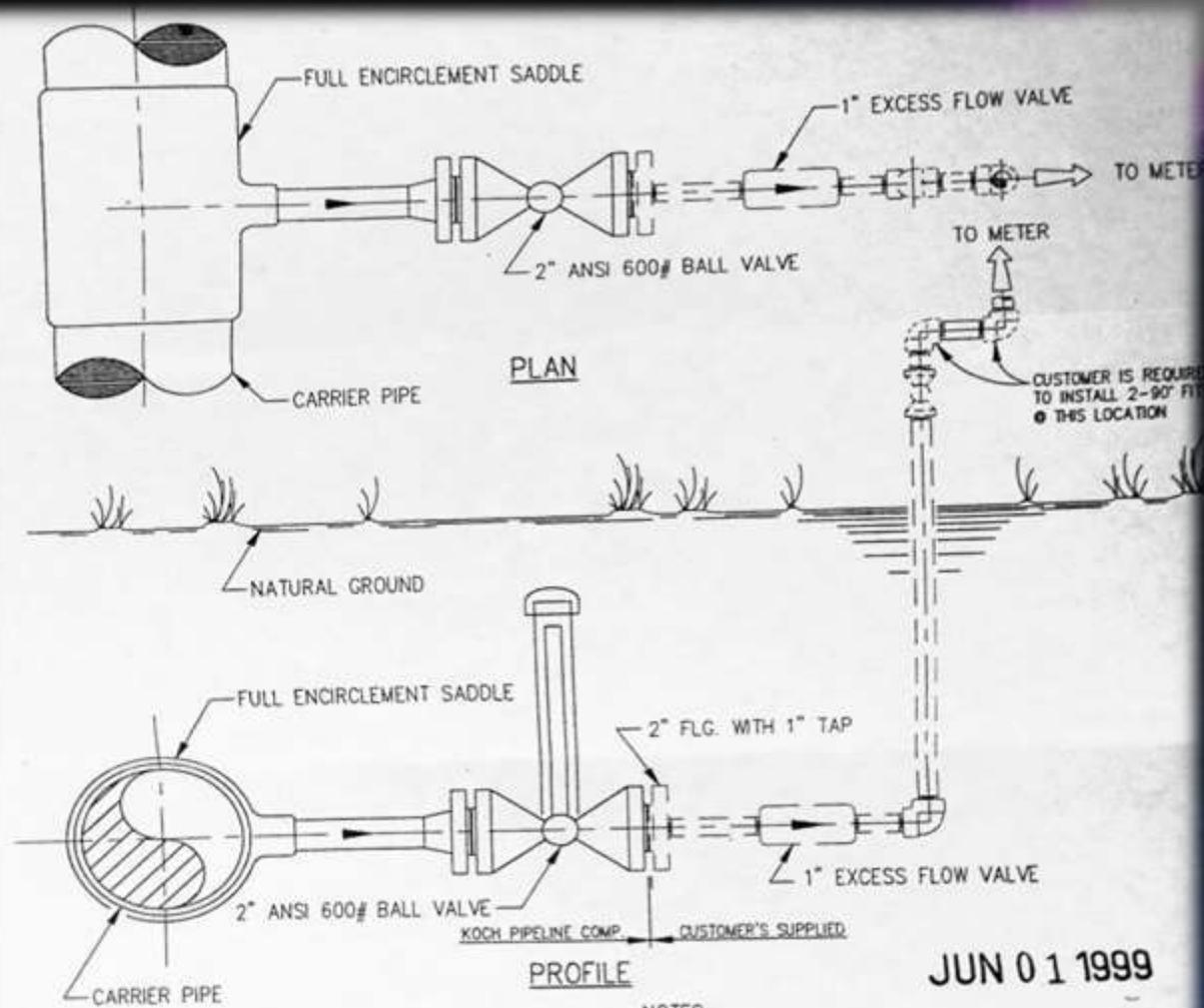


## Type B Sleeve





# Specificity & Detail -Drawings



TYPICAL 2" FARM TAP

- NOTES:
1. CUSTOMER TO PROVIDE BARRICADE OR FENCE TO PROVIDE ADEQUATE PROTECTION FROM 3RD PARTY DAMAGE.
  2. CUSTOMER TO PROVIDE METER TO KGPC SPECIFICATIONS FOR CUSTODY TRANSFER.
  3. ANY CHANGES TO MAXIMUM FLOW (I.E. ADDING CUSTODY) MUST BE REFERRED TO KGPC OPERATIONS IN ORDER TO BE APPROVED.



# Specificity & Detail -Tables

**Table 1 - Repair Methods for Manufacturing Type Defects**

Manufacturing Defect Type			Sleeve Type		Use Filler Material w/Sleeve	Rep by Re
			"A"	"B"		
In Seam Weld -- Not Leaking	DSAW	Undercut	Yes	Yes	No	Y
		Incomplete Fusion	Yes	Yes	No	Y
		Incomplete Penetration	Yes	Yes	No	Y
		Crack	Yes	Yes	No	
	ERW or Flash Weld	Upturned Fiber	No	Yes	No	
		Incomplete Fusion	No	Yes	No	
		Penetrator	No	Yes	No	
		Cold Weld	No	Yes	No	
		Crack	No	Yes	No	
		Seam or Lap	Yes	Yes	No	



# Specificity & Detail -Definitions

## Definitions

**Assembly area** -- an area where the pipeline lies *within 300 feet* of either a building or a small, well-defined outside area (such as a playground, recreation area, outdoor theater, or other place of public assembly) that is occupied by *20 or more* people for *at least 5 days* a week for *10 weeks* in any 12-month period. *Note:* The days of the week need not be consecutive.

**Barrier** -- something that may limit expansion of development.

**Dwelling** -- an occupied residence (house, apartment, or residential house trailer).  
*Note:* Each residence in an apartment counts as an individual dwelling.



# Specificity & Detail

- ▣ Other things that add specificity, detail and clarity
  - References to other Company Manuals or Plans that contain more details and specificity
    - ▣ Corrosion
    - ▣ Safety
    - ▣ Measurement
    - ▣ Design



# Passive vs. Active

▣ Example:

“The incident needs to reported to the pipeline controller.”

*Rewritten.*

The first employee having knowledge of the emergency and/or arriving on the emergency scene will report incident information within 15 min. of notification and/or arriving at the site, to the pipeline control center by telephone or company radio.



# Passive vs. Active

## General Emergency Respon- sibilities

General emergency responsibilities involve:

- First Employee Having Knowledge of Emergency and/or Arriving on Emergency Scene
- Appropriate Supervisors
- Area Manager or His/Her designee
- Pipeline Control Center
- Houston Operations Department
- Reporting and Documenting

### First Employee Having Knowledge of Emergency and/or Arriving on Emergency Scene

**Initial Action** - When an employee is notified of a gas pipeline leak, break, or emergency situation that requires prompt and effective response, the employee should obtain the following information:

- Name of person finding or reporting the leak or emergency situation.
- Telephone number and location where this person can be contacted.
- Severity of leak, break, or emergency.

... to a known reference



# Tips to Recognize the Passive Voice

## KEY WORDS

- Be
- Is
- Are
- A
- Was
- Were
- Has been
- Have been
- Will be
- Being



# Passive vs. Active

## ▣ Example:

Extensive training on the new safety procedures is required to be attended by the maintenance staff.

## **Rewritten.**

The entire maintenance staff is required to attend extensive training on the new safety procedures from 8 -11 a.m. next Monday in the Welding Shop.



# Passive vs. Active

Correct the following five sentences to practice changing passive to active voice.

1. Hunger was what Bill felt.
2. Reading is enjoyed by Mary.
3. The town was destroyed by fire.
4. Funny is what clowns are.
5. Cheese was liked by Sara.



# Passive vs. Active

Hunger was what Bill felt.

Bill felt hungry. (*Bill* is the subject, *felt* is the action)



# Passive vs. Active

Reading is enjoyed by Mary.

Mary enjoys reading (*Mary* is the subject, *enjoys* is the action)

Reading is enjoyed by Mary.



# Passive vs. Active

The town was destroyed by fire.

Fire destroyed the town (*Fire* is the subject, *destroyed* is the action)

Reading is enjoyed by Mary.



# Passive vs. Active

Funny is what clowns are.

Clowns are funny (*Clowns* is the subject, *funny* is the action)

Reading is enjoyed by Mary.



# Passive vs. Active

Cheese was liked by Sara.

Sara likes cheese (*Sara* is the subject, *likes* is the action)

I. Reading is enjoyed by Mary.



# Specificity & Detail

- ▣ Problems can occur with operators who fall back on specifics in their OQ Plan to avoid the specifics in their O&M.



# Specificity & Detail

- ▣ Although OQ Plans have specifics, they are not usually available onsite for verification by inspection personnel during O&M activity inspections or emergencies;
  - hence the need for a certain level of specificity and detail in the O&M and Emergency plan procedures



# O&M Plans

- ▣ Remember in the end,
  - The plans should either say what you do  
or,
  - You should do what they say

Either way you will be in compliance with your own procedures