

# Odorization WI Pipeline Safety 2024

## Consultation

Expert advice & answers to your natural gas questions

- Compliance
- Plan Development
- Public Awareness
- Mapping

## Engineering

Operations-ready engineering and design support

- Pipelines
- Regulator Stations
- Odorization Systems
- Cathodic Protection

## Construction

Specialized pipeline & utility construction experience

- Tapping & Stopping
- Directional Boring
- System Installation
- Welding

## Operations

Complete, custom system or pipeline operation

- Operator of Record
- Surveys
- Maintenance
- Testing

## GIS Services

ESRI GIS Based Compliance Tool set for Natural Gas

- Easy Access
- Real Time Tracking
- Perform and Record
- Fully Supported

## Corrosion

Operations-ready engineering and design support

- Design
- Installation
- Maintenance
- ECDA

## Odorization

Chevron Phillips blends available all across the Midwest:

- Bulk Deliveries
- Closed Loop Trucks
- Qualified Deliveries
- Field Maintenance

**Your Full-Spectrum Natural Gas Solutions Provider**  
With Locations in:

**Olney, Illinois**

**Shelbyville, Kentucky**

**Belleville, Illinois**

**Unionville, Missouri**

**Wichita, Kansas**

**Kirksville, Missouri**

**Indianapolis, Indiana**

**Princeton, Minnesota**

**Products and Partnerships**



# Today's Discussion

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- What do I need to know before I begin a design?
- Types of systems available. Which is right for my situation?
- Design
- Installation
- Operating and maintenance
- Stuff we have learned
- How defensible is our monitoring program?
- Pickling
- Q and A

# Good Designs Start with Good Information

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- Maximum Flow Rate
- Minimum Flow Rate
- Annual Flow
- Is measurement happening at the site? Can I get a signal? What type of signal?
- Pressures? Maximum, Minimum, Static, Differential, Actuation, Injection.
- Power requirements
- Scada
- Electrical Codes – Classification?
- Refill, maintenance, odor control requirements
- Injection point availability



# Types of Systems Available

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- Bypass
- Pulse Bypass
- Injection (Different types of injection)
- 192.625 (e) Equipment for odorization must introduce the odorant without wide variations in the level of odorant.

# Bypass

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# Pulse Bypass



# Injection Pump

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# Injection Solenoid/Drip

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# Design

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- We have all of the answers to our design questions. We know what types of odorizing schemes are available. Which type is best for my situation?
- **Bypass** might be best if.....
  - Initial cost and maintenance costs need to be controlled
  - The flow rate will be VERY consistent allowing me to specify and control differential with an orifice plate
  - Taking a pressure drop of 1 – 3 psig is no problem
  - You can bury a tank at the location (Or otherwise control temperature)
  - You do not require remote command and control

# Design Considerations

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- If a BYPASS will not work then consider these factors:
  - Site layout, flooding, trees, security, accessibility
  - Am I more comfortable relying on a pump or a solenoid?
  - Are ANY emissions OK? Hot topic right now.
  - What kind of command/control/Scada do I want?
  - What kind of support can I count on from factory/representatives/service providers?
  - Cost. Up front and later.
  - Once I select a type and vendor then work with vendor to determine the best size.
  - Sizing the storage tank is HUGE. Why? Hint, bigger is not always better.
  - Do I need a cover? Do I need a building?

# More Design/Installation

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- Containment?
- Concrete pad/supports
- Distance from power, SCADA, the injection point
- Filling the tank/performing maintenance
- Odor control
- Blanket and actuation gas supply
- Pressure testing
- Relief Valves. Pressure Vessels. Different meanings for different people.....

# More Design/Installation

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- Cathodic protection considerations – isolation
- Grounding. AC issues, Lightning





# Operating and Maintaining Odorizers

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- Monitoring Program (We will circle back to this)
- Alarms
- Calculating the Injection Rate
- 192.625 (f) To assure the proper concentration of odorant in accordance with this section, each operator must conduct periodic sampling of combustible gases using an instrument capable of determining the percentage of gas in air at which the odor becomes readily detectable.
- OQ – AOC Training
- Maintenance, what and how often. Yearly, every other year, # strokes?
- If a vendor what about OQ, Part 199, Insurance?

# Stuff We Have Learned

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- Do NOT oversize storage tanks. Plan for a size that requires at least one refill per year.
- $X \text{ MCF/Year} * 1 \text{ MMCF}/1000\text{MCF} * 0.75 \text{ lb/MMCF} * .147 \text{ Gal/lb} = \text{Gallons Used per Year}$
- The typical Interstate pipeline gas quality tariff allows up to 7 lbs of water per MMCF!
- If your odorant sets for a long period of time even with a natural gas blanket over it, water may accumulate in your tank and eventually dilute your odorant or cause freezing issues in your systems. Mercaptans are *hydrophilic*.
- How do I know I have water in my odorant?

# Stuff We Have Learned

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- Freezing in the injection line, sight glass or probe.
- Odorant filters have “black stuff” in them.
- Tank level gauge is going up instead of down....



# Stuff We Have Learned

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- What can we do about water?
- Filter/dry your blanket gas
- Add Methanol/Propanol
- Add more odorant
- Buy from a reputable source
- Recycle the odorant





# Stuff We Have Learned

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- Bypass odorizers stink at odorizing widely variable loads and very small loads (192.625 E)
- Pumps need to be maintained. They will fail. Are you prepared?
- Batteries die. You need a proactive exchange program.
- Solenoids can fail open. You need a plan for that.
- Electronic parts/screens/keypads fail or become “obsolete”. Depreciate an odorizer for 20 years if you can and hope for 30.
- Pumping proportional to time rarely works well for a gas utility (need a flow signal 192.625 E)
- Providing actuation gas (from a non-pipeline source) can be a pain
- Signals from flow computers generally work better than pulses
- Signals from flow computers generally need a barrier installed

# Stuff We Have Learned

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- Pressure moves odorant. Most odorizer failures occur not because of failing parts but because pressures get out of whack (bulk tank pressures can be highly influenced by the sun/ambient temp)
- Don't skip the backpressure regulator if using a YZ pump injection unit.
- If your bulk odorant tank gauge doesn't work right fix it or you will eventually have a big problem
- Don't use your odorizer as an injector for fluids designed to control static electricity
- If you design for injection directly upstream of a pressure cut, the pressure control tech will hate you
- Stuff that works great but maybe needs maintained is better than stuff that doesn't work at all.
- The system operator(s) will generally err on the side of under-odorization if they are the same persons that takes call-outs. If not, over-odorization is more likely.
- Odor fade is a real phenomenon. Plan for it, look for it.



# Effective Monitoring

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- Maintain injection rates that are effective. What is effective?
- Sniff tests at a variety of locations by a variety of individuals.
- Sonosics Normal Sense of Smell Test (Annual/After Covid?)
- Odor Handy – TBM Specific instrument. Very effective tool, why?
- We have found multiple instances where techs performing sniff tests fooled themselves into “good” readings. Why?
- We have found multiple instances of portions of systems experiencing fade issues.

# Pipeline Pickling

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- It is definitely a best practice.
- If you don't do it with new pipelines you are putting your customers and company at risk.
- It is an art and a science.
- To be done correctly, need concentration, time, ability to move gas (flare?). Higher pressures pickle quicker. Cleaner is better with new steel pipelines.
- Develop a plan/leverage past experiences. Enlist assistance.





# Our Goal

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- Lowest Cost? NO!
- Protect our customers, our company and ourselves.
- Good lawyers/expert witnesses know where the \$\$ are.
- “You Couldn’t Smell the Gas”
- Poor odorizer performance/maintenance/reliability. Injection Rate?
- Questionable odorant quality
- Odor intensity checks



**I never learn anything  
talking. I only learn things  
when I ask questions.**

Lou Holtz

