Transportation Research Board Pipeline Study

Washington, DC

December 7, 2017
OVERVIEW

- Discuss Potential Failure Modes / Specific Hazards
- Review Leading Indicators / Precursors
- Accident / Incident Data
Potential Failure Modes/Specific Hazards

- Includes potential hazards associated with jurisdictional portion of gas systems only
  - Excavation leaks
  - Corrosion leaks
  - Vehicular damage leaks
  - Component/equipment failure leaks or overpressure
  - Natural forces causing system damage and leaks
LEAKS – EXCAVATION

- Potential is always there on any system for 3rd party damage
  - Even with State laws in place to call 1st
Unprotected steel tanks and piping may corrode
  - Based on soil conditions
LEAKS – VEHICULAR DAMAGE
LEAKS/OVERPRESSURE – COMPONENT/EQUIPMENT FAILURE

- Potential leak from either regulator vent
- Potential for over-pressure
Flooding and other natural forces have the potential to cause leaks.
We are listed as #17 based on retail gallons sold

434 jurisdictional systems
One Retailer: Representative of the Industry

- NH & ME JLP sites = 1,565
- CT & VT JLP sites = 692
UG steel piping and containers – potential corrosion leaks

- 314 jurisdictional systems out of 434 systems were analyzed for the last 3 years:
  - 130 systems have UG steel tanks
  - 12 systems have UG steel pipe
10 of the 130 UG tanks had low cathodic protection readings

2 of the 12 UG Steel Piping Systems had low cathodic protection readings

None of the systems resulted in a leak for the past 3 years analyzed
Reliable leading Indicators Data–Precursor Examples

- Leak Survey Results:
  - 864 leak surveys
    - 30 small leaks found on AG piping– 3.4%
    - repaired right away
## Reliable Leading Indicators Data - Precursor Examples

<table>
<thead>
<tr>
<th>Year</th>
<th>1st Stage Regulators</th>
<th>2nd Stage Regulators</th>
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<tbody>
<tr>
<td>2015</td>
<td>28</td>
<td>183</td>
</tr>
<tr>
<td>2016</td>
<td>8</td>
<td>148</td>
</tr>
<tr>
<td>2017</td>
<td>7</td>
<td>89</td>
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<td>43</td>
<td>420</td>
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Reasons for replacement of regulators
- Manufacturer service life recommendation
- Physical condition
- Sizing issue from additional load added
- High lockup pressure/creep
- Damaged
“Incident” means any of the following events:

1) Release of LP gas that results in one or more of the following consequences:
   - (i) A death or personal injury with in-patient hospitalization;
   - (ii) Property damage of $50k or more but excluding cost of gas lost;
   - (iii) Unintentional gas loss of 3 million cubic ft or more
     - Equates to 82,463 gallons of liquid propane (36.38 cubic ft/gallon of propane) \(3M \div 36.38 = 82,463\)

2) An event that’s significant in the judgment of the operator without meeting above requirements
States Knowledge of Reportable Incidents

NH PUC

- 14 years of enforcement with LPG
- No reportable incidents based on 49 CFR191.5 (Immediate notice of certain incidents) or 191.9 (Distribution system – Incident report)
- Finding some code issues from time to time
  - Not seeing incidents
  - Only a handful of reportable incidents received based on more stringent State requirements
States Knowledge of Reportable Incidents

- Maine PUC – no PHMSA reportable LPG Incidents of record
- Only a couple of State reported incidents
Frequency of Particular Accident Causes
Understanding Risk

- Does the industry understand its risk?

HAZARD vs RISK

A HAZARD is something that has the potential to harm you.

RISK is the likelihood of a hazard causing harm.

REDUCE

TRANSFER

ACCEPT

AVOID
We’ve discussed potential failure modes
We’ve reviewed the associated hazards
We’ve discussed test results that are the same each year
We don’t have incidents to discuss frequency
Reportable Incident Data = rare at best
QUESTIONS?

- Thank you for your time!