The Oil Pipeline Industry Had an Idea . . .

Learning from PPTS 1999-2007

Understanding Hazards

Consequences

Improving Performance

Error-Free Operations

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Pipeline Safety – What More Needs To Be Done?
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What is the Pipeline Performance Tracking System?

- "PPTS": voluntary; open to all liquids pipeline operators
- No membership req’d, no fee imposed
- Industry-run and maintained
- Collecting info since 1999
- Records spills of 5 gallons or more on land, all spills to water (compare old OPS @ 50 barrels)
- In 2007, PPTS participants operated about 85% of OPS miles and total barrel-miles

Team Composed of Diverse Subject Matter Experts

Operator Advisories (www.api.org/ppts)
- Causes/locations with a large share
- Consequences
- New perspective via PPTS
- Guidelines for reporting
- FAQs for consistency

Reports and Fact Sheets

Also, Performance Excellence Team

The data doesn’t go in and not come out!
PPTS Participants Use PPTS

- To measure operator/Industry performance
- To allocate $
  - Maintenance
  - IMP
  - R&D
- To direct regulatory/advocacy effort
- To find new approaches to keeping people and communities safe
Key Elements in PPTS Success

🌟 Commitment
  ➔ Pipeline Leadership
  ➔ API/AOPL

🌟 Care and Feeding (API’s Commitment)
  ➔ QC: Transparency, credibility
  ➔ Program Software/Mechanics
  ➔ Data Mining Team

🌟 Learning
  ➔ Data Mining Team
  ➔ Lectures
  ➔ Website
Dramatic Improvement: Liquids Pipeline Industry Onshore Pipe Spill Record

Releases along the right-of-way have fallen by almost 60%.

All other locations: tanks, caverns, offshore pipe.

## System location and risk

**Facilities piping: more of them, but small**  
**Onshore pipe: fewer of them, but larger**

### Incidents by System Locations, 1999-2007

<table>
<thead>
<tr>
<th>System Location</th>
<th>Number</th>
<th>Barrels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total (annual average, 1999-2007)</td>
<td>476</td>
<td>90,983</td>
</tr>
<tr>
<td><strong>Share of Total</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facilities piping</td>
<td>53%</td>
<td>14%</td>
</tr>
<tr>
<td>Onshore pipeline</td>
<td>37%</td>
<td>65%</td>
</tr>
<tr>
<td>Aboveground Storage Tank</td>
<td>8%</td>
<td>18%</td>
</tr>
<tr>
<td>Offshore pipeline</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Cavern</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Includes releases due to hurricanes Ivan, Katrina and Rita.  
Source: Pipeline Performance Tracking System.
## Where Are People Getting Hurt or Killed?

### Deaths and Injuries by System Part

<table>
<thead>
<tr>
<th>System Part</th>
<th>Incidents (#, ’99-’07)</th>
<th>Empl. (# People)</th>
<th>Contr. (# People)</th>
<th>Other (# People)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fatalities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facilities Piping</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Onshore Pipeline</td>
<td>8</td>
<td>2</td>
<td>2</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>Grand Total</td>
<td>9</td>
<td>3</td>
<td>2</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td><strong>Injuries</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aboveground Storage Tank</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Cavern/belowground</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Facilities Piping</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Onshore Pipeline</td>
<td>16</td>
<td>2</td>
<td>1</td>
<td>30</td>
<td>33</td>
</tr>
<tr>
<td>Grand Total</td>
<td>21</td>
<td>6</td>
<td>7</td>
<td>30</td>
<td>43</td>
</tr>
</tbody>
</table>
### Assessing Consequences: Deaths and Injuries by Cause

<table>
<thead>
<tr>
<th>Cause</th>
<th>Incidents (#, ’99–’07)</th>
<th>Empl. (# People)</th>
<th>Contr. (# People)</th>
<th>Other (# People)</th>
<th>Total (# People)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fatalities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third Party Damage</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Operator Error</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>9</td>
<td>3</td>
<td>2</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td><strong>Injuries</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third Party Damage</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Operator Error (incl.</td>
<td>5</td>
<td>4</td>
<td>6</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>excavation)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pipe mat’l/seam</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Corrosion</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Equipment Malfunction</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>“Other failure” in a Tank</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Other Cause</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>21</td>
<td>6</td>
<td>7</td>
<td>30</td>
<td>43</td>
</tr>
</tbody>
</table>
Reduction in releases along the right-of-way reflects diverse strategies

Source: Pipeline Performance Tracking System, a voluntary spill reporting system involving 85% of the U.S. liquids pipeline mileage
Focus on Corrosion

- Largest cause of ROW spills (46%)
- Reduced by 71% between 1999 and 2007
- 56% are less than 5 barrels
- More important in crude oil systems than in refined product systems
- Billions $ of investment have reduced
  - Inspection and repair in high consequence areas
  - First 5-year cycle is completed
  - Re-inspection for 2nd cycle now begun
Focus on Third Party Damage

- "Third party" is someone other than the operator (first party) or its contractor (second party)
- Excavation or other mechanical damage
- Not the greatest number, but the highest consequence
  - Almost 90% occur along ROW
  - Deaths, injuries
    - 10 of 17 fatalities on ROW due to third party damage
    - 17 of 43 injuries on ROW due to third party damage
  - Large spills
    - 15% of ROW number, but 38% of ROW volume

Source: PPTS, 1999-2007
Who are these "third parties"?

- Landowners (farmers, homeowners, tenants)
- Road construction crews
- Resid./comm'l development, etc.
- "One-call Partners" (pipelines and other underground utilities that pay for "call before you dig" systems)

- Can't forget first and second parties, though – the pipeline operator and its contractors
Onshore pipeline spills where: release occurred at the time of damage, and involving 5 barrels or more, or death, injury, fire or explosion.
Source: Pipeline Performance Tracking System, 1999-2007
70% Decline in Third Party Hits Causing Immediate Failure

* Includes onshore pipeline incidents >=5 barrels or death, injury, fire or explosion
Example of Declines 1999-2007

Incidents Caused by Landowner/Tenant Activity, 1999-2007

Number of Incidents

Thousands of Barrels Released

3-Yr. Averages ending in year shown

- Farming
- Homeowners
Recent Learnings: More detailed choices aid reporting

- **Operator Error: more Other Human Error**
  - Survey: more root cause analysis? Better understanding?
  - Yes. Old categories don’t provide a good reporting path
  - Revise PPTS to increase -- and improve -- categories
    - Reporters don’t have to puzzle over category -- faster
    - Better consistency from incident to incident and operator to operator
Recent Learnings: More detailed choices aid reporting (Facilities)

- **Facilities incidents require details: “granularity”**
  - Different pieces of equipment, different failure mechanisms
  - Diverse industry groups to advise
  - More surveys
  - Improved categories, plus sub-categories
  - PRCI report
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