Accident Statistics for Recently Installed Pipelines (2010-2015)

Pipeline Safety Trust Conference
New Orleans, Louisiana
October 21, 2016

Chris Hoidal, PHMSA Region Director
Time to Failure
All Reported Hazardous Liquid Accidents and Gas Transmission Incidents (2010-2015)
# Hazardous Liquid Mileage and Accident Trends (2010-2015)

<table>
<thead>
<tr>
<th>Year</th>
<th>Overall Mileage</th>
<th>Mileage Installed in Decade 2010-2019</th>
<th>Accident Reports Received on F7000-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>181,986</td>
<td>1,914</td>
<td>350</td>
</tr>
<tr>
<td>2011</td>
<td>183,580</td>
<td>2,587</td>
<td>345</td>
</tr>
<tr>
<td>2012</td>
<td>186,221</td>
<td>5,470</td>
<td>366</td>
</tr>
<tr>
<td>2013</td>
<td>192,412</td>
<td>11,422</td>
<td>401</td>
</tr>
<tr>
<td>2014</td>
<td>199,659</td>
<td>19,730</td>
<td>445</td>
</tr>
<tr>
<td>2015</td>
<td>207,981</td>
<td>25,035</td>
<td>455</td>
</tr>
</tbody>
</table>
Location of HL Accidents (All Reported 2010-2015)
Regardless of Installation Date

- Totally Contained on Operator-Controlled Property: 71%
- Pipeline Right-of-Way: 23%
- Originated on Operator-Controlled Property, but then flowed or migrated off the property: 5%
- Offshore: 1%

Regardless of Installation Date
HL Accident Locations for Failure Occurring within 3 Years of Installation Date (2010-2015)

- Totally contained on operator-controlled property: 79%
- Originated on operator-controlled property, but then flowed or migrated off the property: 12%
- Pipeline right-of-way: 9%
System Components Involved in HL Accidents (2010-2015)

- **ONSHORE PIPELINE, INCLUDING VALVE SITES**: 33%
- **ONSHORE TERMINAL/ TANK FARM EQUIPMENT AND PIPING**: 24%
- **ONSHORE PUMP/ METER STATION EQUIPMENT AND PIPING**: 34%
- **ONSHORE BREAKOUT TANK OR STORAGE VESSEL, INCLUDING ATTACHED APPURTENANCES**: 8%
- ***OTHER** includes Offshore and Onshore Belowground Storage

*Other components include Offshore and Onshore Belowground Storage.*
Causes of Failure for HL Accidents Occurring within 3 Years of Installation (2010-2015)

- INCORRECT OPERATION: 24%
- EQUIPMENT FAILURE: 63%
- EXCAVATION DAMAGE: 1%
- MATERIAL FAILURE OF PIPE OR WELD: 2%
- NATURAL FORCE DAMAGE: 3%
- CORROSION FAILURE: 4%
- OTHER INCIDENT CAUSE: 2%
- OTHER OUTSIDE FORCE DAMAGE: 1%
Equipment Failure: Top Cause (63%) in HL Accidents Occurring within 3 Years of Installation (2010-2015)

- Other Equipment Failure: 17%
- Threaded Connection/Coupling Failure: 14%
- PUMP OR PUMP-RELATED EQUIPMENT: 25%
- Malfunction of Control/Relief Equipment: 16%
- Non-Threaded Connection Failure: 20%
- Failure of Equipment Body (except Pump), Tank Plate, or Other Material: 2%
- Defective or Loose Tubing or Fitting: 6%
Incorrect Operation (24%) in HL Accidents Occurring within 3 Years of Installation (2010-2015)

- Equipment not installed properly: 39%
- Other incorrect operation: 22%
- Pipeline or equipment overpressured: 8%
- Tank, vessel, or sump/separator allowed or caused to overfill or overflow: 13%
- Valve left or placed in wrong position, but not resulting in a tank, vessel, or sump/separator overfill or facility overpressure: 13%
- Wrong equipment specified or installed: 5%

To Protect People and the Environment From the Risks of Hazardous Materials Transportation
## Barrels Lost in HL Accidents Occurring within 3 Years of Installation (2010-2015)

<table>
<thead>
<tr>
<th>Location of the Accidents where System Installed were within three years of Accident</th>
<th>UNINTENTIONAL RELEASE (in BBLs)</th>
<th>RECOVERED (in BBLs)</th>
<th>NET LOSS (in BBLs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTALLY CONTAINED ON OPERATOR-CONTROLLED PROPERTY</td>
<td>25,691</td>
<td>17,868</td>
<td>7,823</td>
</tr>
<tr>
<td>ORIGINATED ON OPERATOR-CONTROLLED PROPERTY, BUT THEN FLOWED OR MIGRATED OFF THE PROPERTY</td>
<td>2,833</td>
<td>1,748</td>
<td>1,085</td>
</tr>
<tr>
<td>PIPELINE RIGHT-OF-WAY</td>
<td>44,068</td>
<td>778</td>
<td>43,290</td>
</tr>
<tr>
<td>Grand Total</td>
<td>72,593</td>
<td>20,394</td>
<td>52,199</td>
</tr>
</tbody>
</table>
Causes of HL Accidents Occurring in Pipeline ROW
Based on the Barrels Lost Occurring within 3 Years of Installation (2010-2015)

- Natural Force Damage: 26%
- Corrosion Failure: 1%
- Material Failure of Pipe or Weld: 69%
- Incorrect Operation: 2%
- Excavation Damage: 1%
- Equipment Failure: 1%
- Other Outside Force Damage: 0%
Data Takeaways

• Spill rates occur at a disproportional rate on newly installed HL pipelines.
• Vast majority of the number of spills are occurring at facilities and not on ROW (Only 9%).
• The majority of the unrecovered spill volume (83%) however is experienced on the ROW.
• Equipment error and incorrect operation represent 87% of the failure causes on newly (last 3 years) installed pipelines.
• Need more research and data analysis on failure causes for the ROW-related spills. Just two spills – both with associated ground movement-induced stress – represented 95% of spill volume.