USDOT PHMSA Update

2015 API – AGA Joint Committee
Oil & Gas Pipeline Welding Practices

Kenneth Y. Lee
Engineering & Research Division
Office of Pipeline Safety
202-366-2694
kenneth.lee@dot.gov
## What We Regulate

<table>
<thead>
<tr>
<th>System Type</th>
<th>Miles</th>
<th>%Total</th>
<th># Operators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous Liquid</td>
<td>192,396</td>
<td>7%</td>
<td>441</td>
</tr>
<tr>
<td>Gas Transmission</td>
<td>302,825</td>
<td>11%</td>
<td>990</td>
</tr>
<tr>
<td>Gas Gathering</td>
<td>17,429</td>
<td>1%</td>
<td>356</td>
</tr>
<tr>
<td>Gas Distribution (Mains &amp; Services)</td>
<td>2,148,519</td>
<td>81%</td>
<td>1,358</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,644,341</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Some Operators have multiple System Types

| Liquefied Natural Gas                | 133 Plants | 203 Tanks | 83          |

---

To Protect People and the Environment From the Risks of Hazardous Materials Transportation
Standards Update Rule

• NPRM initiated August 2013
• Published January 5, 2015, Effective March 6, 2015
• [https://federalregister.gov/a/2014-30336](https://federalregister.gov/a/2014-30336)
• Updates 22 of the 60+ standards incorporated by referenced, including:
• API 1104, 21st edition to be considered in next round
• Part 192 replaced “API 1104” with “API Std 1104”
Miscellaneous Rule

- NPRM Initiated November 2011
- In final stage - should be published soon
- Discussed in my 2013 presentation, includes......
Self-inspection prohibited

§ 192.305 .....An inspection may not be performed by a person who participated in the construction of that transmission line or main.

§ 195.204 .....An inspection may not be performed by a person who participated in the installation of the pipe or pipeline systems.
Miscellaneous Rule

Welding operator recognized by Parts 192 & 195

— “Welding operator” added where “welder” appears

— § 192.225 & § 195.214: Welding must be performed by a qualified welder or welding operator in accordance with welding procedures qualified in accordance with API 1104 or section IX of the ASME...
§ 192.227 Qualification of welders and welding operators.
(a) Except as provided in paragraph (b) of this section, each welder or welding operator must be qualified in accordance with section 6, 12, or 13 of API 1104 or section IX of the ASME....

§ 195.222 Welding: Qualification of welders and welding operators.
(a) Each welder or welding operator must be qualified in accordance with sections 6, 12, or 13 of API 1104 or section IX of the ASME....
Miscellaneous Rule

API 1104, Appendix A:
§ 192.241 Inspection and test of welds.
(c) The acceptability of a weld that is nondestructively tested or visually inspected is determined according to the standards in Section 9 of API Standard 1104. However, if a girth weld is unacceptable under those standards for a reason other than a crack, and if Appendix A to API 1104 applies to the weld, the acceptability of the weld may be further determined under that appendix.

New language:
(c) The acceptability of a weld that is nondestructively tested or visually inspected is determined according to the standards in Section 9 or Appendix A of API Standard 1104, as applicable ...
Other rulemakings in progress

- Plastic Pipe Rule
- Safety of On-Shore Hazardous Liquid Pipelines
- Safety of Gas Transmission and Gathering Lines (includes Integrity Verification Process)
- Excavation Damage Prevention
- Excess Flow Valves (EFV) Expansion beyond Single Family Residences
- Operator Qualification, Cost Recovery and Other Pipeline Safety Proposed Changes
PHMSA Advisory Bulletins

  - ADB-2014-04 (Sept 18, 2014): Potential significant impact flow reversals, product changes and conversion to service may have on the integrity of a pipeline
  - ADB-2014-03 (Sept 12, 2014): Notification(s) required prior to certain construction-related events
  - ADB-2014-02 (May 6, 2014): Lessons Learned From the Release at Marshall, Michigan
Keystone XL

- PHMSA is cooperating agency to the Department of State (Presidential Permit required)
- 2 additional conditions added to original 57, detailed in Final Supplemental EIS:
  - Develop and Implement Quality Management System
  - Hire an Independent Third Party Inspection Company
- Pipeline Safety Conditions (Volume 7, Appendix B):
Construction Quality

• Continues to be focus of PHMSA
• Research project “Improving Quality Management Systems (QMS) for Pipeline Construction Activities” to develop guidance pertaining to issues related to quality of a new pipeline
Interactive Girth Weld Threat

Girth Welds with Low Tensile Strain Capacity

+ 

High Axial Tensile Strain

Reference 2012 PHMSA presentation to API 1104 committee
Girth Welds with Low Tensile Strain Capacity

• Recent incidents:
  – Vintage girth welds
  – Pre-existing hydrogen-assisted WM/HAZ cracks
  – Evidence of little or no plastic deformation

• Codes have no requirement for girth weld tensile strain capacity
High Axial Tensile Strain

- Recent incidents:
  - Ground movement
  - Slopes with wet clay soils
  - Rising water table & pipe buoyancy

- Pipeline operators should evaluate and mitigate this risk. Methods may include:
  - Preventing pipeline movement
  - Monitoring pipeline movement
  - Removing/reinforcing girth welds with low strain capacity
Kentucky Girth Weld Failure (Feb 2014)

• PHMSA Corrective Action Order 2-2014- 1001H (February 13, 2014)
• 30”x 0.323” X65 gas transmission (1965)
• Ignition and fire, 2 injuries & 2 homes destroyed
• Ground movement - excessive axial loading
• Pre-existing girth weld hydrogen assisted crack was likely failure initiation point
• http://www.wdrb.com/story/26571543/analysis-existing-cracks-a-cause-in-kentucky-pipeline-blast