



Significant Events on the Pipeline Right of Way – Our Stakeholders Are Raising the Bar

Bathtub Curve Analysis

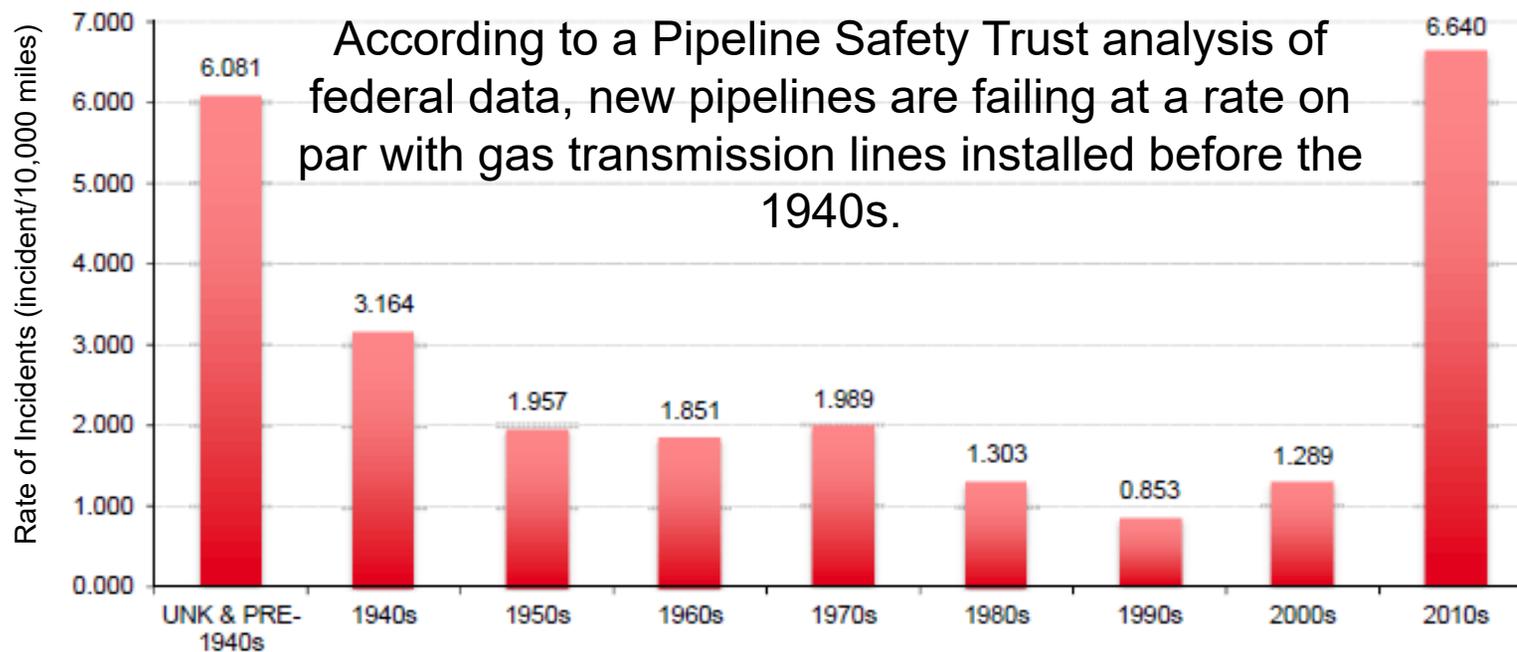
Wendy Wagster
Director Operations, Safety & Integrity, INGAA



PST Bathtub Curve Headline of SNL



Average number of annual incidents from 2005 through 2013 per 10,000 miles of onshore gas transmission pipe (by decade of pipe installation)



As of March 2015.
Sources: U.S. Pipeline and Hazardous Materials Safety Administration, Pipeline Safety Trust

As the U.S. rushes to build gas pipelines, the failure rate of new pipes has spiked.

Quotes from SNL article



“...we're trying to put so many new miles of pipeline in the ground so fast that people aren't doing construction ... the way they ought to...” Carl Weimer, director of the Pipeline Safety Trust

“...heightened focus on construction inspections may not be catching everything...” Robert Miller, chairman of the National Association of Pipeline Safety Representatives

The push to build new pipelines to transport abundant shale supplies appears to be having a materially adverse impact on pipeline safety.

Goal of SNL article



"If it's brand new, if it's all new materials, if everybody was doing their job correctly, why would we have an uptick in ... failures?" Miller, who is also the Arizona Corporation Commission's pipeline safety section supervisor, said. "You can only attribute that, in my personal opinion, to **poor construction practices or maybe not enough quality control**, quality assurance programs out there to catch these problems before those pipelines go into service."

How PST arrived at the Graph



- Pipeline Safety Trust used the PHMSA incident report that was published in March of 2015
- They filtered the data to include:
 - Onshore Pipelines
 - Transmission systems
- PST correlated the number of incidents to the mileage of pipe installed (per decade) from the PHMSA annual report

Incidents on the 2010s Pipe

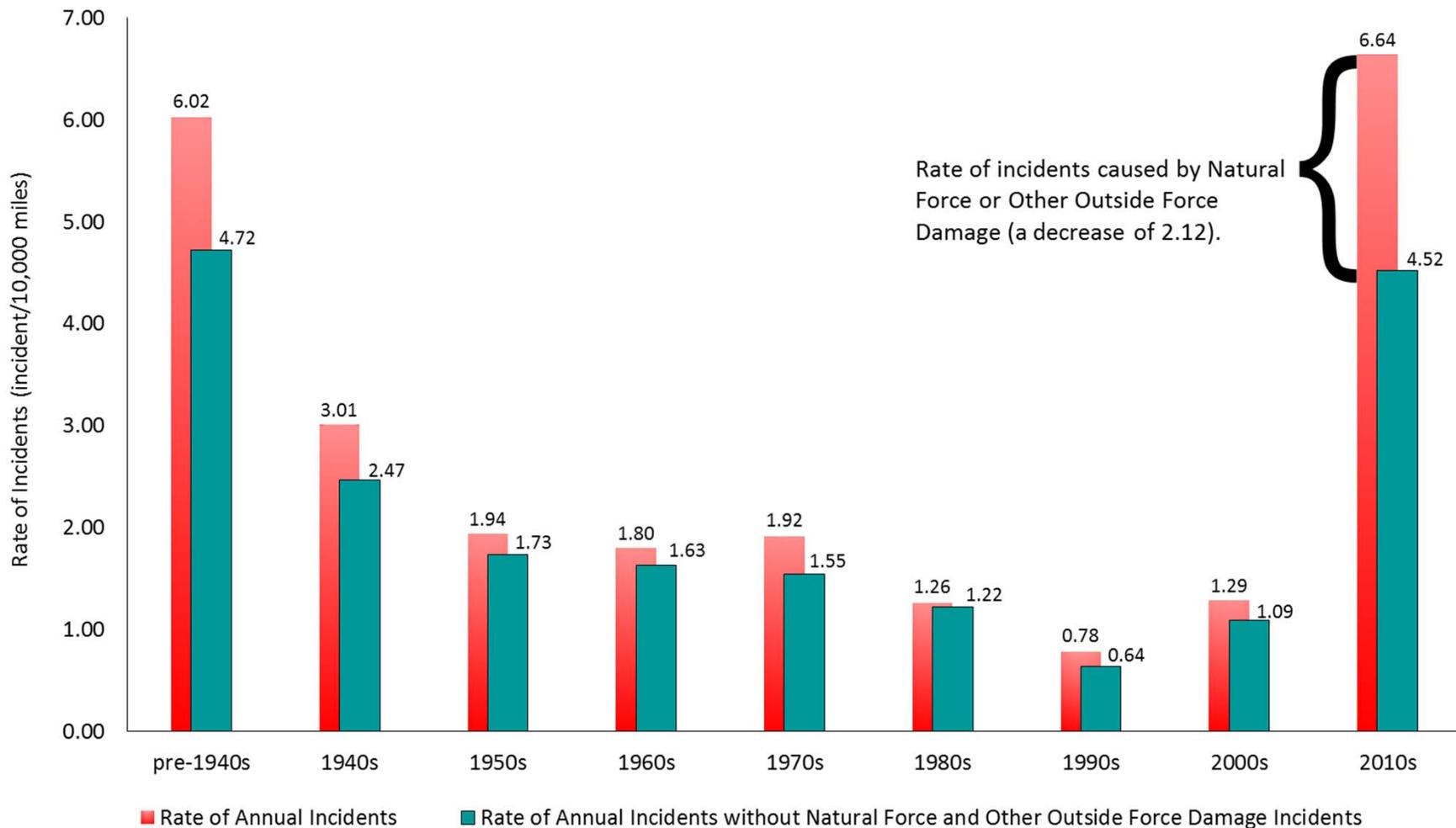


- From 2005 through 2013 there were 11 incidents on pipe that was installed in 2010 or later.
 - There was one rupture
 - Five leaks
 - Zero fatalities
 - Zero injuries
- The one incident ignited was a one-inch power gas line.
- The estimated cost of public property damage is zero dollars

Understanding Incidents in 2010s



Average number of annual incidents from 2005 through 2013 per 10,000 miles of onshore gas transmission pipe (by decade of pipe installation)



Natural Force and Other Outside Force Damage



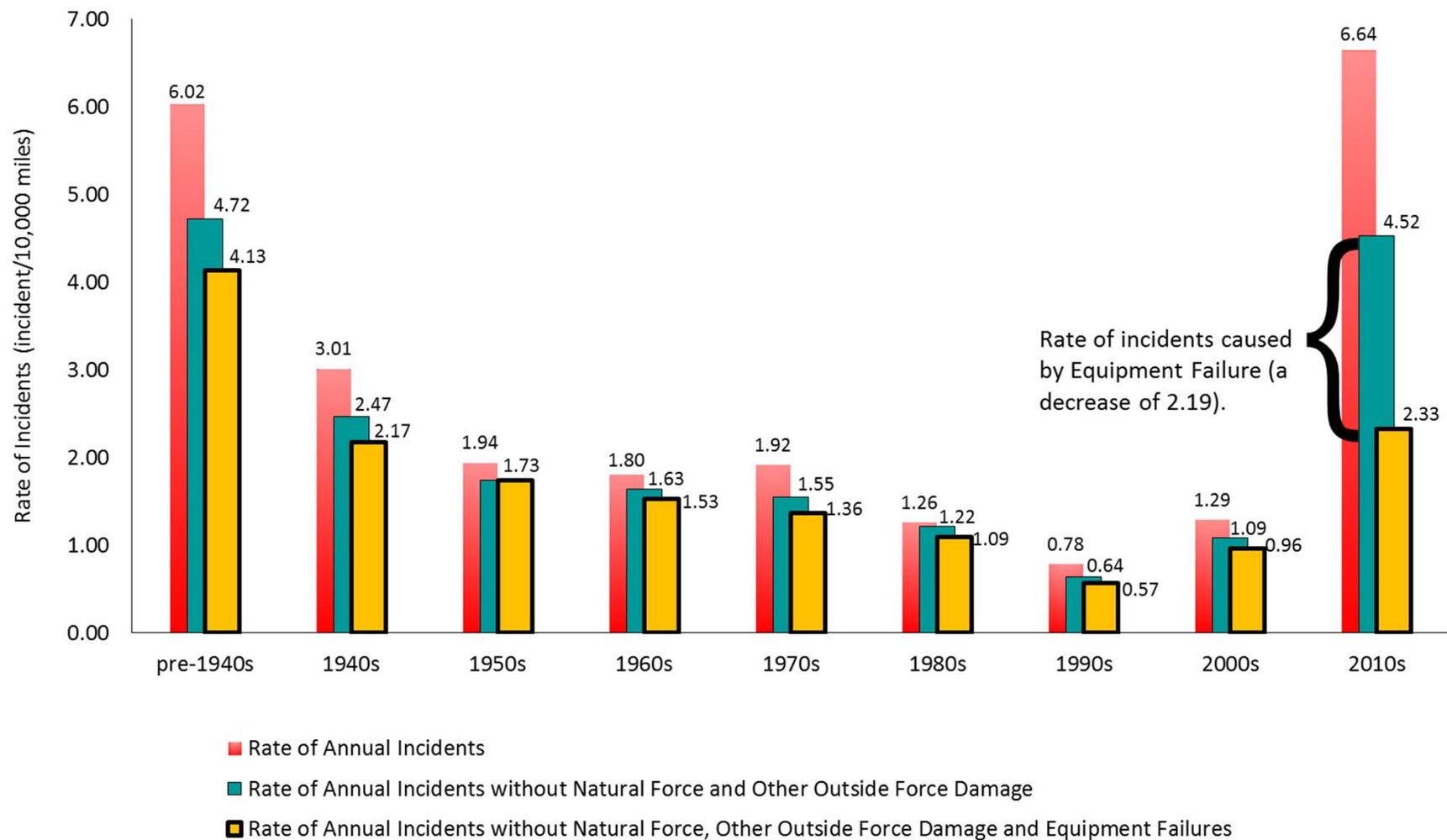
- Natural Force: one incident reported in 2011
 - Earth settlement caused stress on a one-inch power gas line. The one-inch line broke at a fitting. The gas that was released ignited because of a near by generator.

- Other Outside Force: one incident reported in 2010 and one in 2012
 - A water line adjacent to a natural gas pipeline had a small pin hole leak. The water spraying through the pin hole water blasted the natural gas pipeline and caused a leak.
 - A rock was pinned to the underside of the pipe and caused a dent with a crack. This pipe was installed in 1959 and has been reclassified to proper decade.

Understanding Incidents in 2010s



Average number of annual incidents from 2005 through 2013 per 10,000 miles of onshore gas transmission pipe (by decade of pipe installation)



Equipment Failures



- Equipment Failures: four incidents reported
 - While installing a pig bar assembly, the hot tap machine experienced a failure. The section of pipe had to be blown down and a conventional fitting was installed.
 - A bolt on sleeve was used to repair a defect. The bolt on sleeve began leaking and had to be removed. The section of pipe with the defect was replaced with new pipe.
 - The sensing line froze on a pilot-operated relief valve which caused the relief valve to open and vent gas. The amount of gas released was greater than 3,000 Mcf.
 - During the installation of 16-inch hot tap, on a 30-inch mainline, the tapping machine became lodged in the 16-inch hot tap valve.

Remaining Incidents in 2010s



- Excavation Damage: one incident reported in 2010
 - A contractor was installing a new 12 inch pipeline adjacent to an existing 10 inch. During the road bore of the new 12 inch line the 10 inch line was damaged and had to be replaced.
- Material Failure: one incident reported in 2011 and one in 2013
 - During construction a backhoe slid into the pipeline and caused mechanical damage. This damage was not reported at the time of the incident and the line was put in-service.
 - While installing a stopple by-pass a leak developed at the interface between the split tee and mainline pipe. It was determined that cracking occurred in the transition weld. This hot tap was cutout and replaced.
- Other Incident: one incident reported in 2013
 - While completing the repair of the stopple bypass incident a new weld cracked and caused a second repair.

Construction Related Failures



- For pipelines installed in the 2010 decade there were a total of 11 incidents that occurred from 2010 through 2013.
- Out of the 11 incidents that occurred three are attributable to construction.
 - Earth settlement that stressed and broke a one-inch power gas line. (2011)
 - A rupture occurred on a 30-inch pipeline do to mechanical damage that occurred during construction. (2011)
 - During the installation of a new pipeline contact was made with the existing adjacent pipeline. (2010)

What the INGAA Foundation is Doing



Making Safety Personal

Building Interstate
Natural Gas Transmission
Pipelines: A Primer

Specification and
Purchase Of Segmentable
Induction Bends and
Elbows

Guidelines for Parallel
Construction of Pipelines

Pipeline Construction
Safety Guidelines

Overview of Construction
Quality Management
Systems

Practical Implementation
of Construction Quality
Management Systems

Line Pipe Quality Series

Guidelines for Natural Gas
Line Crossings

Training Guidance For
Welding & Coating
Construction Workers and
Inspectors

Best Practices In Applying
API 1104, Appendix A

Lessons Learned
Repository

Field Applied Coatings
Best Practices

Guidelines on Winter
Construction

Third Party Construction
Inspector Guidelines

