



Interstate Natural Gas Association of America
Assuring the Integrity of Infrastructure

A summary of studies and solutions



Natural Gas Transmission Pipelines



What is a “transmission pipeline”?

- A high-pressure and generally larger-diameter pipeline that transports gas from the production area to the market area.
- Definition from Pipeline and Hazardous Material Administration (PHMSA):
 - *Transmission line* means a pipeline, other than a gathering line, that:
 - (1) Transports gas from a gathering line or storage facility to a distribution center, storage facility, or large volume customer that is not down-stream from a distribution center;
 - (2) operates at a hoop stress of 20 percent or more of SMYS; or
 - (3) transports gas within a storage field.

How many miles of transmission pipeline are in the U.S.?

- 302,110 miles of natural gas transmission pipeline⁽¹⁾
- 202,703 miles of natural gas pipelines are operated by INGAA members⁽²⁾

Who are the owners of transmission pipeline?

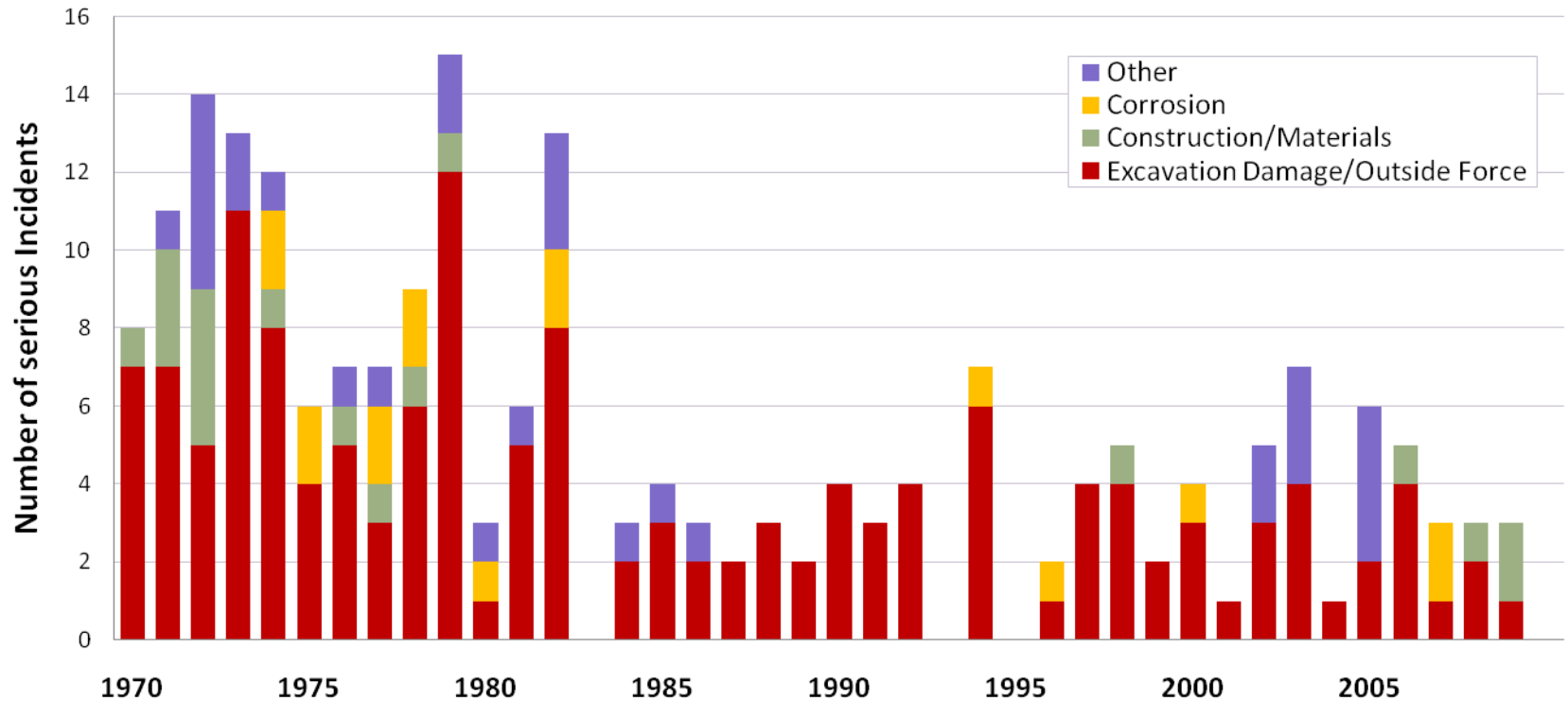
- Interstate pipeline
- Intrastate pipeline
- Local distribution company (LDC)
- Municipalities

(1) 296,441 miles onshore + 5,669 miles offshore; (2) 197,869 miles onshore + 4,834 miles offshore

Serious Transmission Pipeline Incidents Involving Public are Declining



Excavation Damage Remains Primary Cause

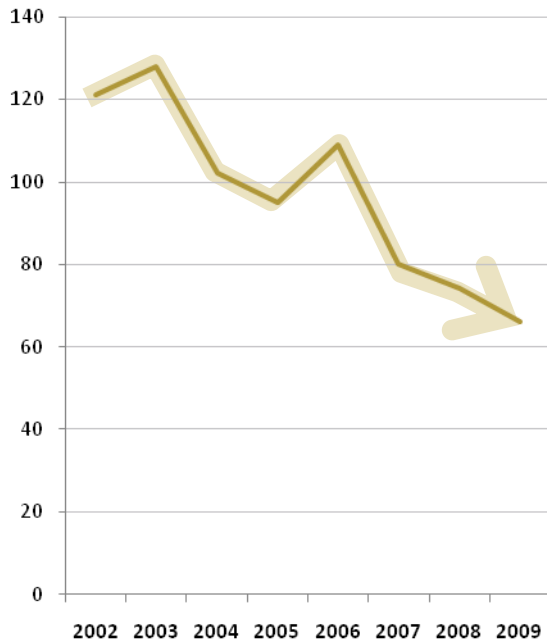


Transmission Pipeline Leaks are Declining



2002 – 2009: Significant progress was made to reduce pipeline leaks

Excavation Damage Leaks



54% reduction

Corrosion Leaks



46% reduction

Material & Weld Leaks



65% reduction

What Does the Safety Data Mean?

- Serious incidents involving the public have been declining for four decades
 - Leak trends indicate efforts are delivering positive results
- However, significant incidents - while infrequent - are still occurring at an unacceptable level
- Integrity management standards provide a framework for managing pipeline safety threats
 - Studies show that effective mitigation requires a comprehensive approach based on data integration and risk assessment
 - There is no simple solution for ensuring pipeline safety – multiple tools and processes must be employed and tailored to each particular pipeline

Pipeline safety is a shared responsibility – between operators, the government and the public

INGAA – Who We Are



- Trade association representing natural gas transmission pipeline operating companies in North America
- 26 member companies, representing approximately 203,000 miles of PHMSA regulated transmission pipeline*
- Leaders in furthering pipeline safety through studies, committees, workshops, electronic media and interaction with PHMSA
- Provide opportunities for developing and sharing industry best practices and proactive in assisting other pipeline industry segments
- Members are regulated for pipeline safety directly by the Pipeline and Hazardous Material Administration (PHMSA) of the U.S. Department of Transportation**
- Members are regulated economically by the Federal Energy Regulatory Commission (FERC)

**PHMSA regulated transmission pipelines operated both onshore and offshore by INGAA members, as reported in the PHMSA 2009 Annual report*

***2011 New INGAA Member Pacific Gas & Electric is regulated by the California Public Utilities Commission*

INGAA MEMBER COMPANIES

- Alliance Pipeline Ltd.
- Boardwalk GP, LLC
- CenterPoint Energy
- Cheniere Energy, Inc
- Dominion
- DTE Pipeline Company
- El Paso Corporation
- Enbridge Energy Company, Inc.
- EQT Corporation
- Iroquois Pipeline Operating Company
- Kinder Morgan
- National Fuel Gas Company
- National Grid
- New Jersey Resources
- NiSource Gas Transmission & Storage
- ONEOK Partners
- Panhandle Energy
- Questar Pipeline Company
- Sempra Pipelines and Storage
- Southern Star Central Gas Pipeline
- Spectra Energy
- TransCanada Corporation
- Transwestern Pipeline Company LLC
- Williams Gas Pipeline Company
- Williston Basin Interstate Pipeline Company

New INGAA Member:

- Pacific Gas & Electric Company

Our members are leaders...

...in research and technology
development for pipeline safety

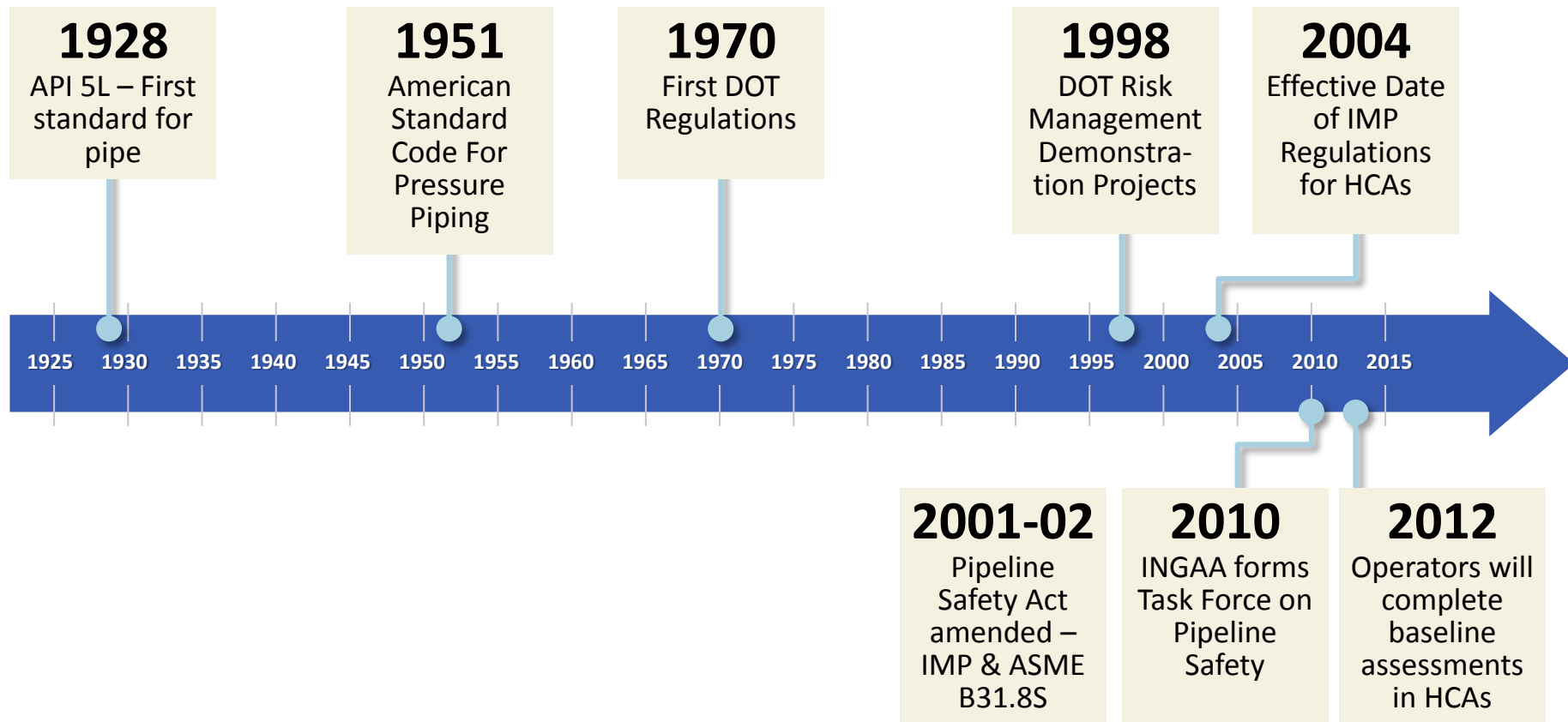
... in consensus building for
engineering standards, guidelines

... and in developing publications
for safe natural gas transmission
pipeline design, construction,
operations and maintenance

- **Our goal is zero incidents** - a perfect record of safety and reliability for the national pipeline system. *We will work every day toward this goal.*
- **We are committed to safety culture** as a critical dimension to continuously improve our industry's performance.
- **We will be relentless in our pursuit of improving** by learning from the past and anticipating the future.
- **We are committed to applying integrity management principles on a system-wide basis.**
- **We will engage our stakeholders** - from the local community to the national level - so they understand and can participate in reducing risk.



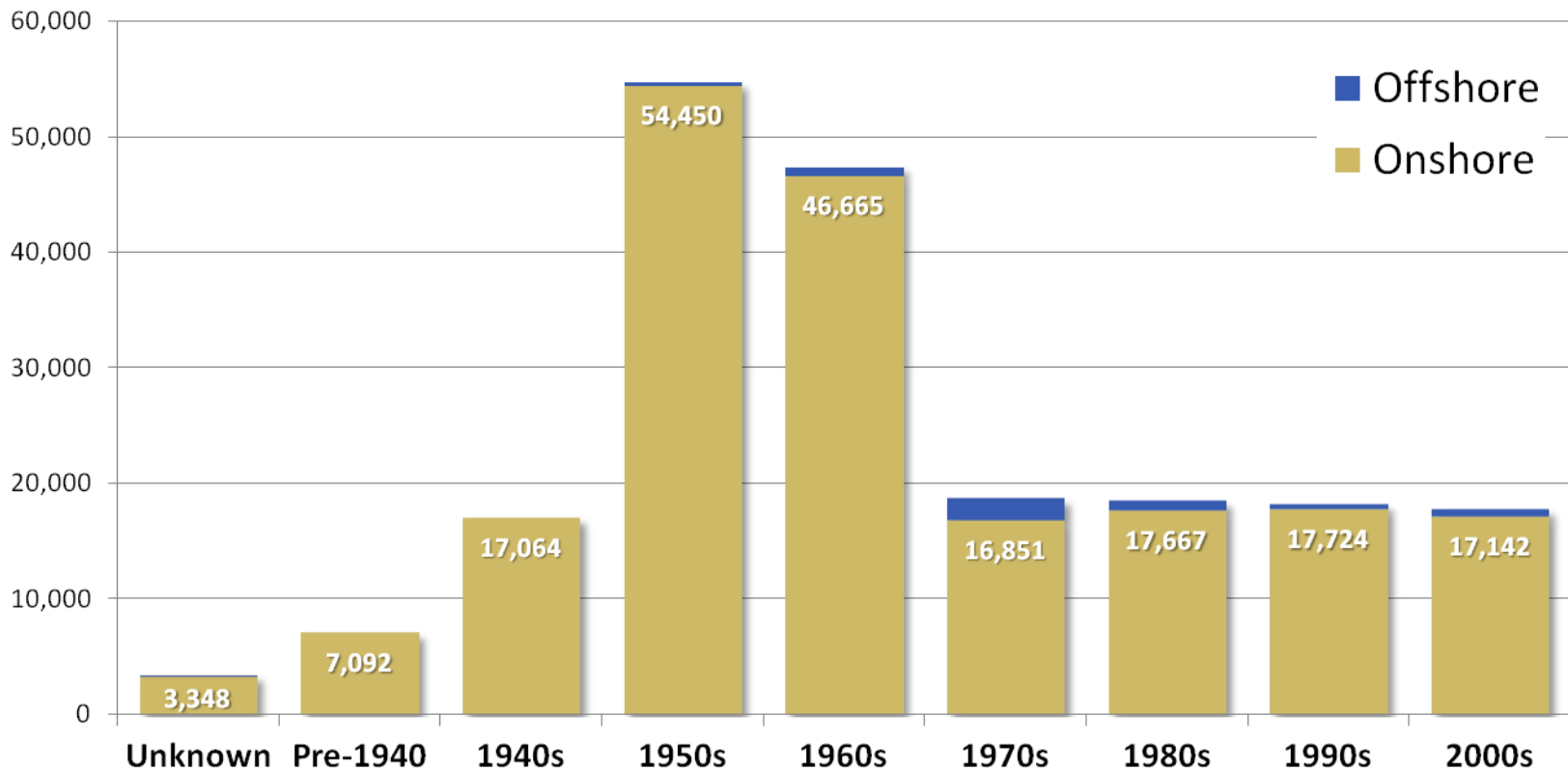
Pipeline Safety Standards are Part of Industry History



When Were Transmission Pipelines Built?



Transmission Pipeline Built by INGAA Members (miles)



Pipeline Safety – Fitness for Service



Age alone is not a significant indicator of transmission pipeline fitness for service

- More important factors for determining pipeline fitness are:
 - The material of the pipe
 - How it was constructed
 - How it has been operated
 - How it has been maintained
- Manufacturing and construction flaws in older pipelines are stable unless the operating environment changes
- Our ability to prevent and detect problems and, if necessary, repair or replace pipe has improved with risk assessment programs, pipeline testing, and advances in technology
 - The first step of pipeline safety is at the mill where manufactured pipe is inspected and tested to show pressure holding capability
 - Additional inspection and a final testing of pressure holding capability is performed after construction prior to placing a pipeline in service
 - Monitoring, testing and assessments are performed during operations to ensure ongoing safety

Standards for Assessing Older Pipelines

Progress in Assessment and Replacement

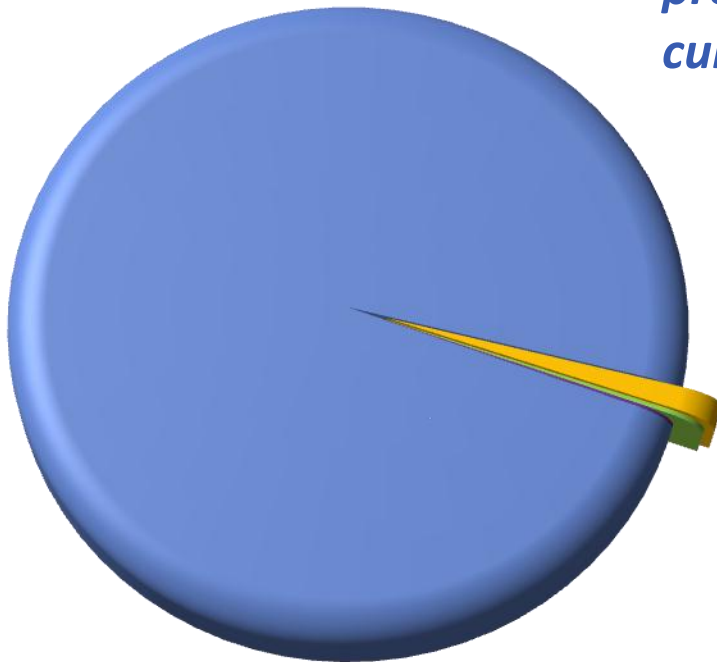


- PHMSA regulations issued in 1970, established specific safety practices and engineering record retention requirements for all pipelines, including pipelines constructed prior to 1970
 - Properties and risks of older materials and construction processes have been classified and cataloged⁽¹⁾, providing for better risk identification
 - Regulations require conservative assumptions regarding material properties when properties are unknown
 - Consensus standards require unknown properties to be accounted for in pipeline risk assessments through the use of conservative assumptions
 - Integrity Management Regulations, effective 2004, required operators to assess risks for all pipelines in HCAs, pipelines
- The installation date is known for more than 98.3% of INGAA transmission pipelines ⁽²⁾
- From 2002 to 2009
 - INGAA operators confirmed the installation date or took out of service 6,133 miles (65%) of pipe with an unknown installation date⁽²⁾
 - INGAA operators took out of service or replaced 2,275 miles of pipe installed prior to 1950²

Vast Majority of Pipeline is at the Highest Recommended Standard



Over 98% of INGAA pipe is coated and protected from corrosion with electrical current known as cathodic protection (CP)



- Coated Pipe with Cathodic Protection
- Bare Pipe with Cathodic Protection
- Bare Pipe
- Plastic Pipe

What about the rest?

- Bare steel pipelines typically operate at lower pressures, in remote areas and can be more susceptible to external corrosion
- From 2002 to 2009, INGAA Operators removed or replaced 1,713 miles of bare transmission pipe
 - 973 miles (28%) of bare pipe with CP was removed or replaced
 - 741 miles (61%) of bare pipe with no CP was removed or replaced

INGAA Member Integrity Assurance Programs



- In compliance with Federal Pipeline Safety Standards and the referenced engineering standards, INGAA operators apply comprehensive operations and maintenance processes to all transmission pipelines to ensure fitness for service
- ~77% of INGAA operated transmission pipelines have readily available documentation of having been pressure tested at least once*
- ~53% of total INGAA operated transmission pipelines have been baseline assessed utilizing an integrity management process based on consensus engineering standards*
- ~4.5% of INGAA pipeline miles are classified as operating within High Consequence Areas (HCAs) subject to the PHMSA Integrity Management Program*
 - ~91% of INGAA operated pipeline mileage within HCAs have readily available documentation of having been pressure tested at least once*
 - ~87% of INGAA operated pipeline miles within HCAs have been baseline inspected utilizing the PHMSA integrity assessment process. (100% are required to be completed by December 17, 2012)*