Getting Focused on Seams

PHMSA Seam Workshop July 20, 2011

Terry Boss

Sr. Vice President, Environment Safety and Operations

Interstate Natural Gas Association Of America

INGAA Leadership:

Allan Bradley
Chairman, INGAA;
President & CEO,
Questar Pipeline Co.

Don Santa
President & CEO, INGAA

Interstate Natural Gas Association Of America

INGAA Member Companies:

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

Mission of INGAA Foundation

INGAA Foundation Leadership:

Dan Martin
Chairman, INGAA Foundation; Sr. Vice President, Pipeline Safety, El Paso Corporation

Don Santa
President & CEO, INGAA

The INGAA Foundation, Inc.

INGAA Foundation Mission:

Advance the use of natural gas for the benefit of the environment and the consuming public; and facilitate efficient construction and safe, reliable operation of the North American natural gas pipeline system.

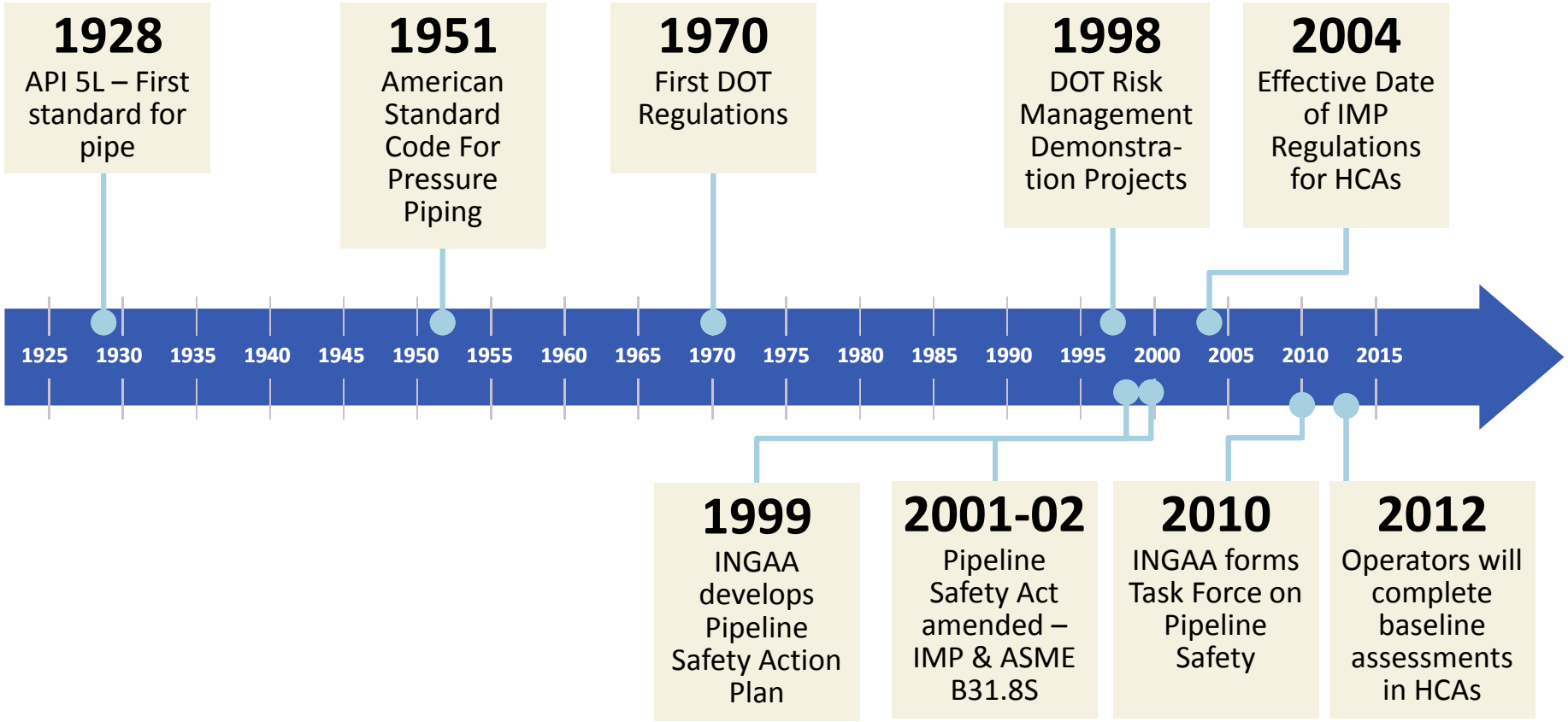
Foundation membership is comprised of:

33	Construction Companies
27	Pipeline Manufacturers/Service
23	Consulting/Research Firms
22	Pipeline Companies
17	Engineering Companies
13	Equipment Manufacturers
4	Legal Services Firms
3	Associations

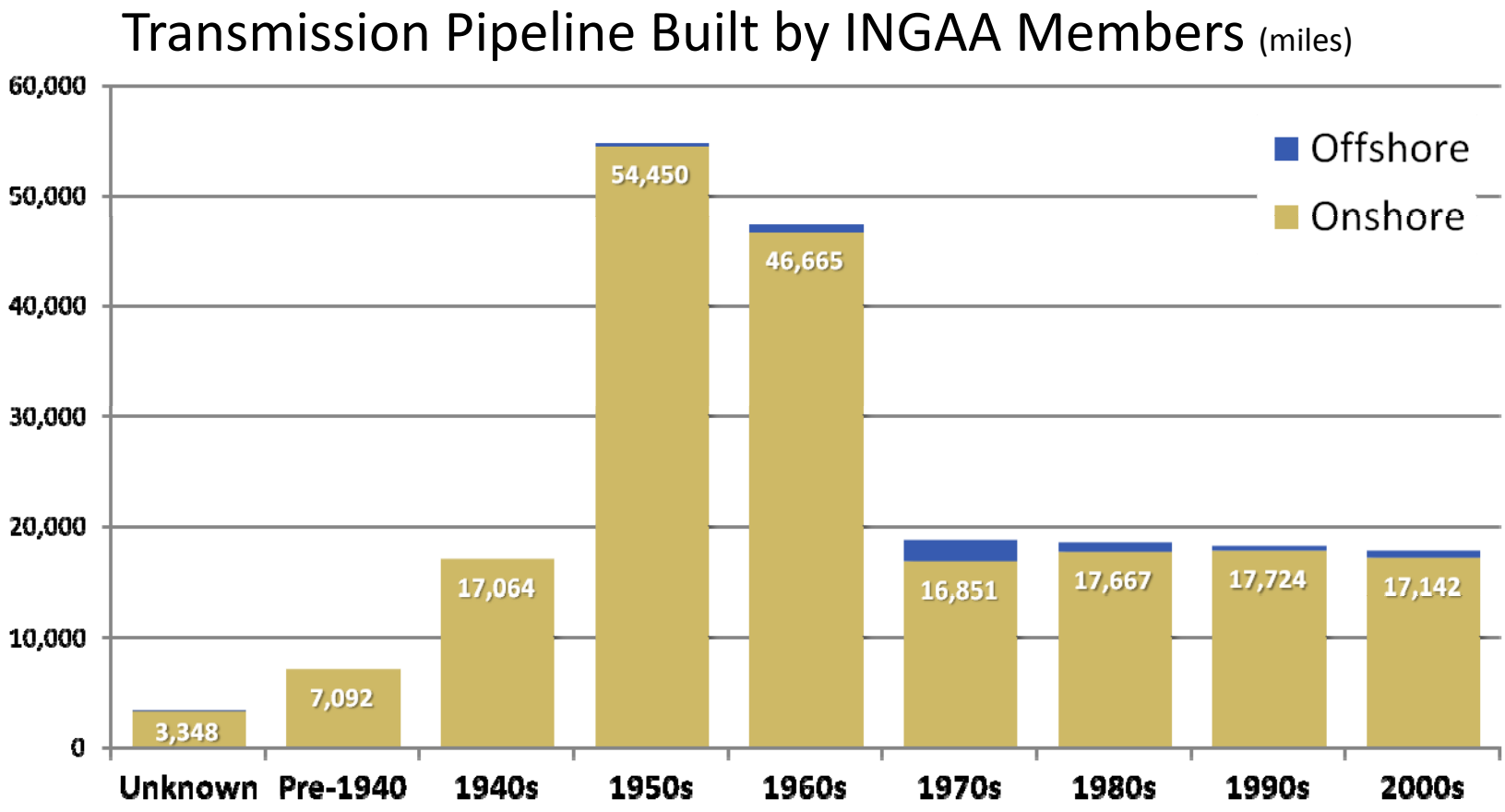
Challenge of Workshop: Improve Management of Seam Issues

- What are Seam Anomalies?
- What are Consequences of Seam Anomalies? (latent/leak/rupture)
- Probability of Occurrence? (how / when / where)
- Behavior of Seam Anomalies? (stable / growing)
- Active Management of Seam Anomalies?
  - Risk Assessment?
  - Identification?
  - Characterization?
  - Remediation?

Company Practices, Codes, Standards, Regulations and Technology have Existed and Evolved



Understand the Pipeline Inventory



Source: PHMSA web site, annual report data submitted by INGAA operators for 2009

Need to Understand Vintage Pipe and Technology

THE INGAA FOUNDATION, INC.

Integrity Characteristics of Vintage Pipelines

Prepared for The INGAA Foundation, Inc.,
in conjunction with American Gas Foundation by:
Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201-2693

F-2002–50435

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History of Line Pipe Manufacturing in North America

Prepared by J.F. Kiefner and E.B. Clark

ASME 1996

I00396

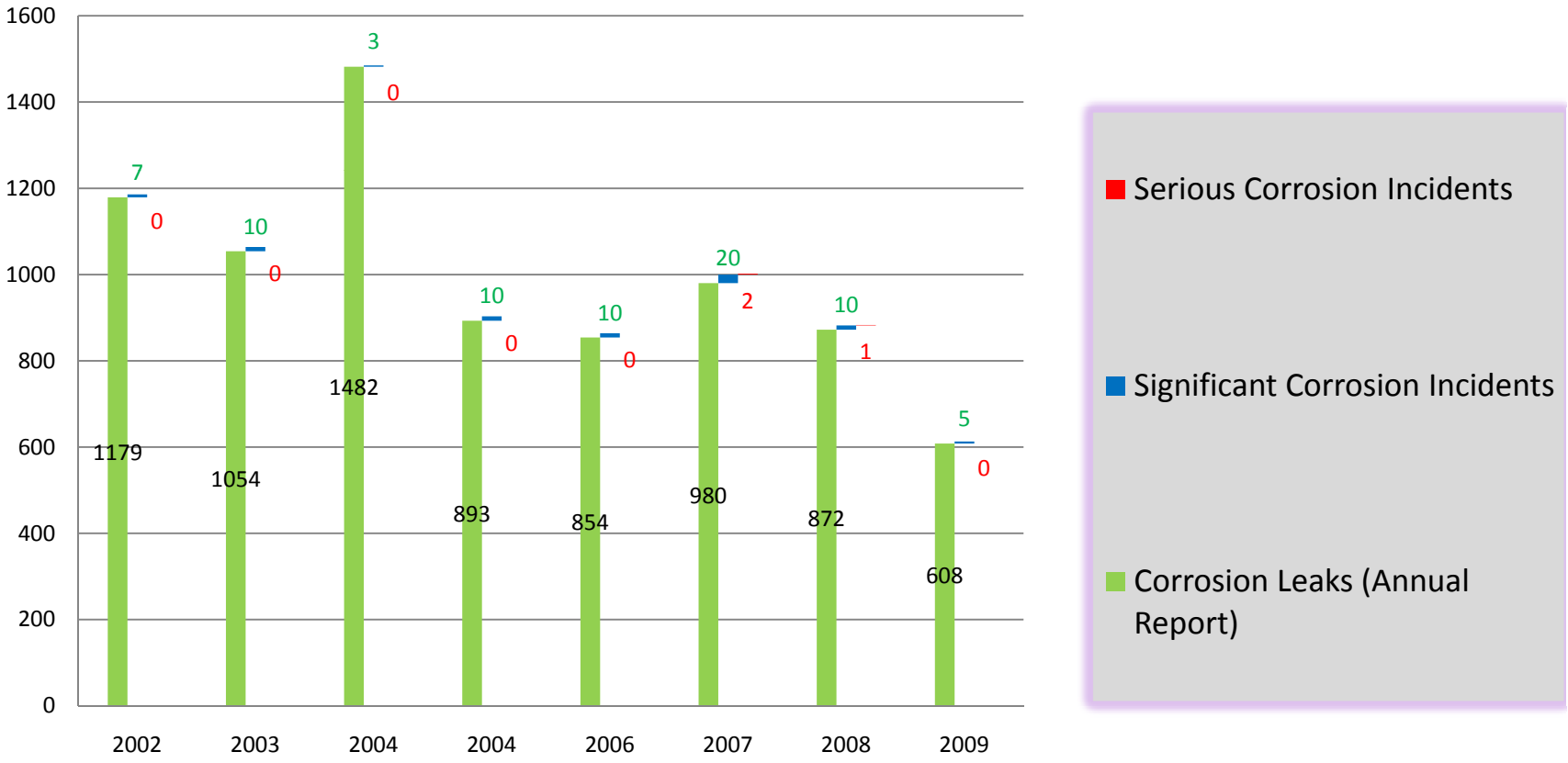
Threat Categories

21 Causes

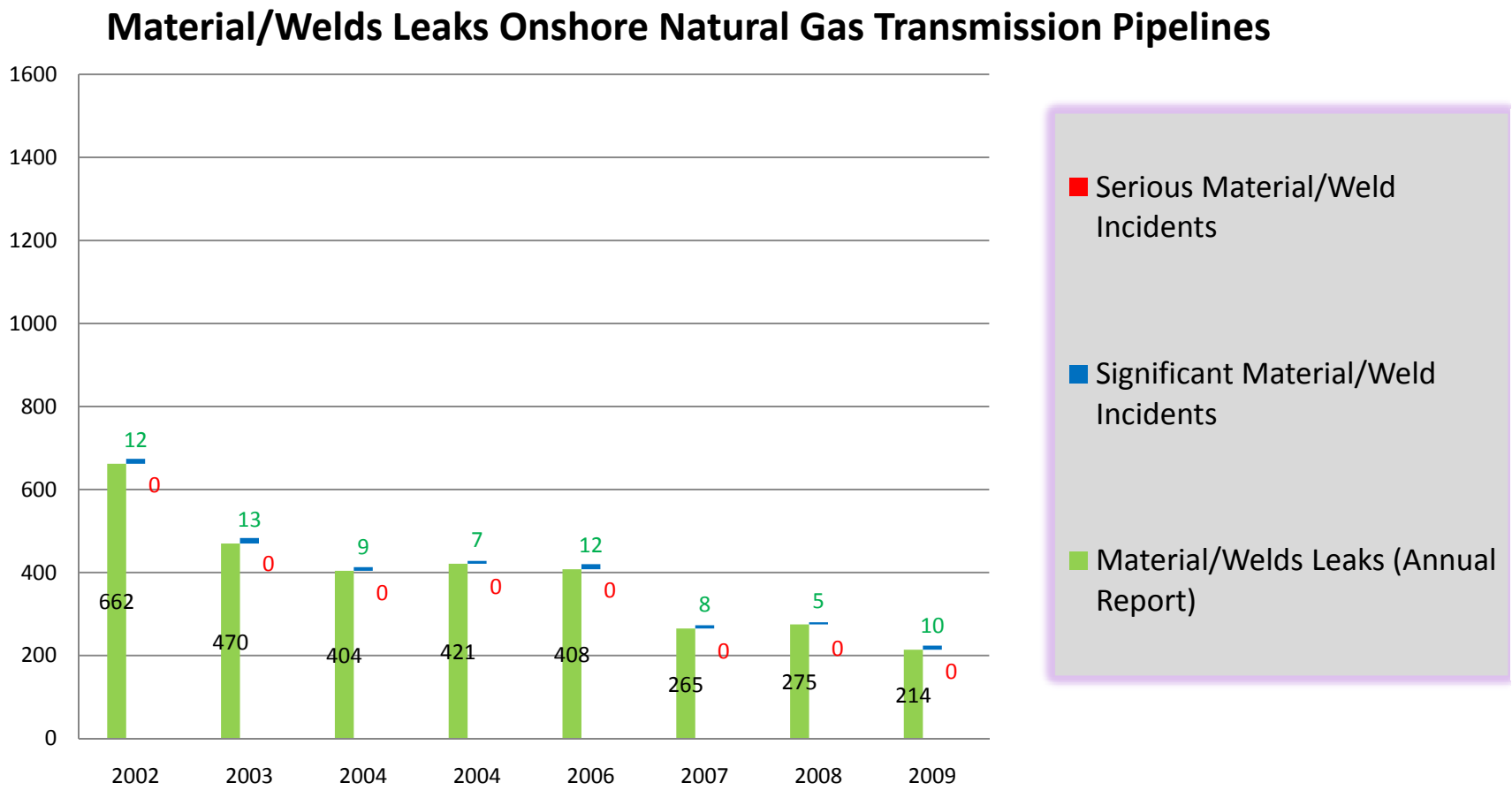
Time Dependent Threats	External Corrosion	External Corrosion
	Internal Corrosion	Internal Corrosion
	SCC	SCC
Residence Threats	Manufacturing	Defective Pipe Seam
		Defective Pipe
	Construction	Defective Pipe Girth Weld
		Wrinkle Bend or Buckle
		Defective Fabrication Weld
	Equipment	Stripped threads/broken pipe/coupling failure
		Seal/pump packing failure
		Gasket O-ring Failure
		Control/Relief Failure
		Miscellaneous
Time Independent Threats	Third Party Damage	Damage inflicted by first, second, or third parties
		Previously Damaged Pipe
		Vandalism
	Incorrect Operations	Incorrect Operational Procedure
	Weather and Outside Forces	Cold Weather
		Lightning
		Heavy Rains or Floods
		Earth Movements

Integrity Performance by Cause

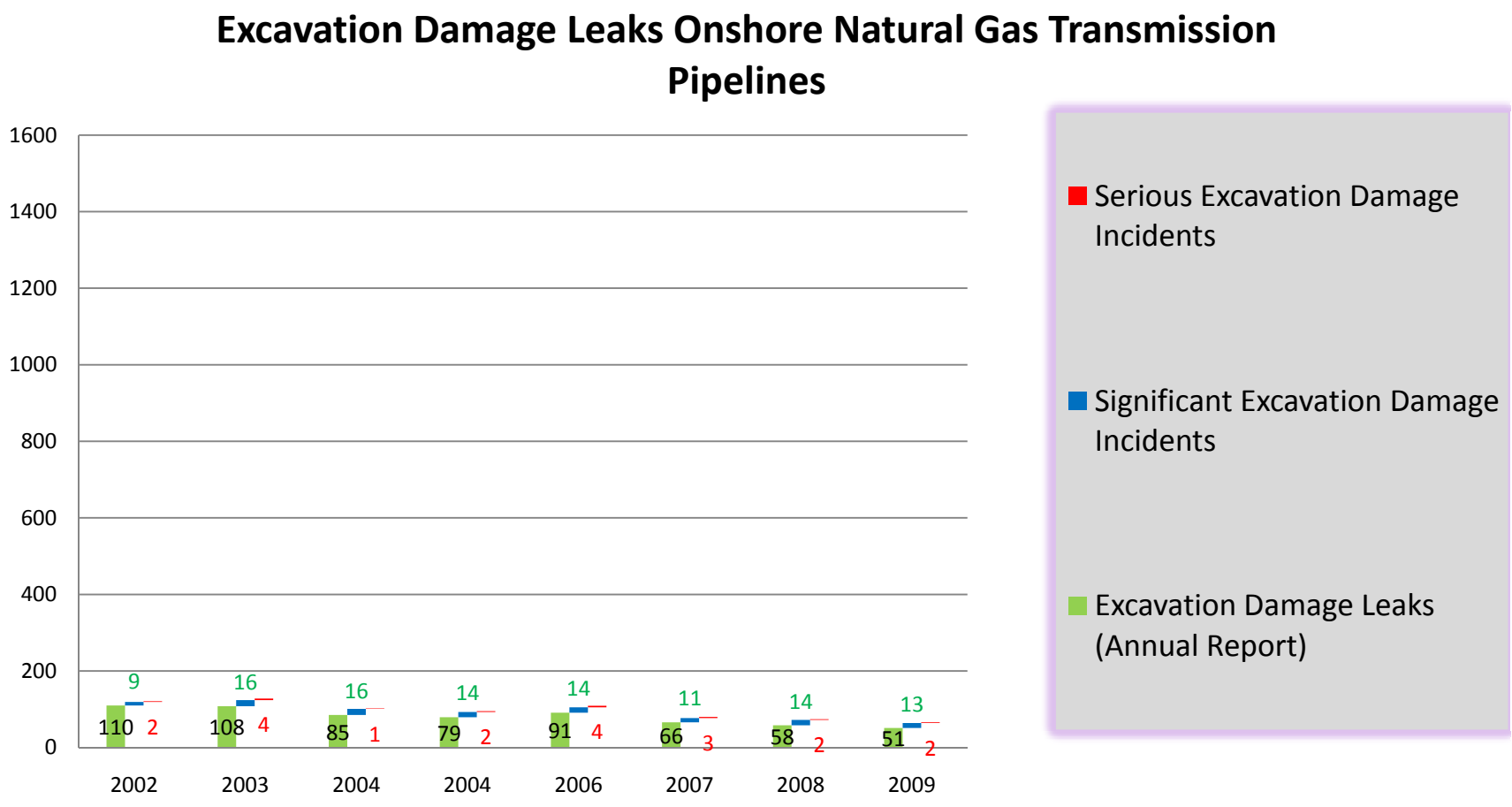
Corrosion Leaks Onshore Natural Gas Transmission Pipelines



Integrity Performance by Cause



Integrity Performance by Cause



Previous PHMSA Studies that Address Seam Issues

Baker

Department of Transportation
Research and Special Programs Administration
Office of Pipeline Safety

Kiefner & Associates incorporated

CorrMet Engineering Services, P.C.

TTO Number 5

Integrity Management Program
Delivery Order DTRS56-02-D-70036

Low Frequency ERW and
Lap Welded Longitudinal Seam
Evaluation

FINAL REPORT
Revision 3

Submitted by:
Michael Baker Jr., Inc.
April 2004

In association with:
Kiefner and Associates, Inc.
CorrMet Engineering Services, PC

ChallengeUs.

FINAL REPORT

Managing the Integrity

of Early Pipelines –

Crack Growth Analysis

and Revalidation Intervals

To

U.S. Department of Transportation

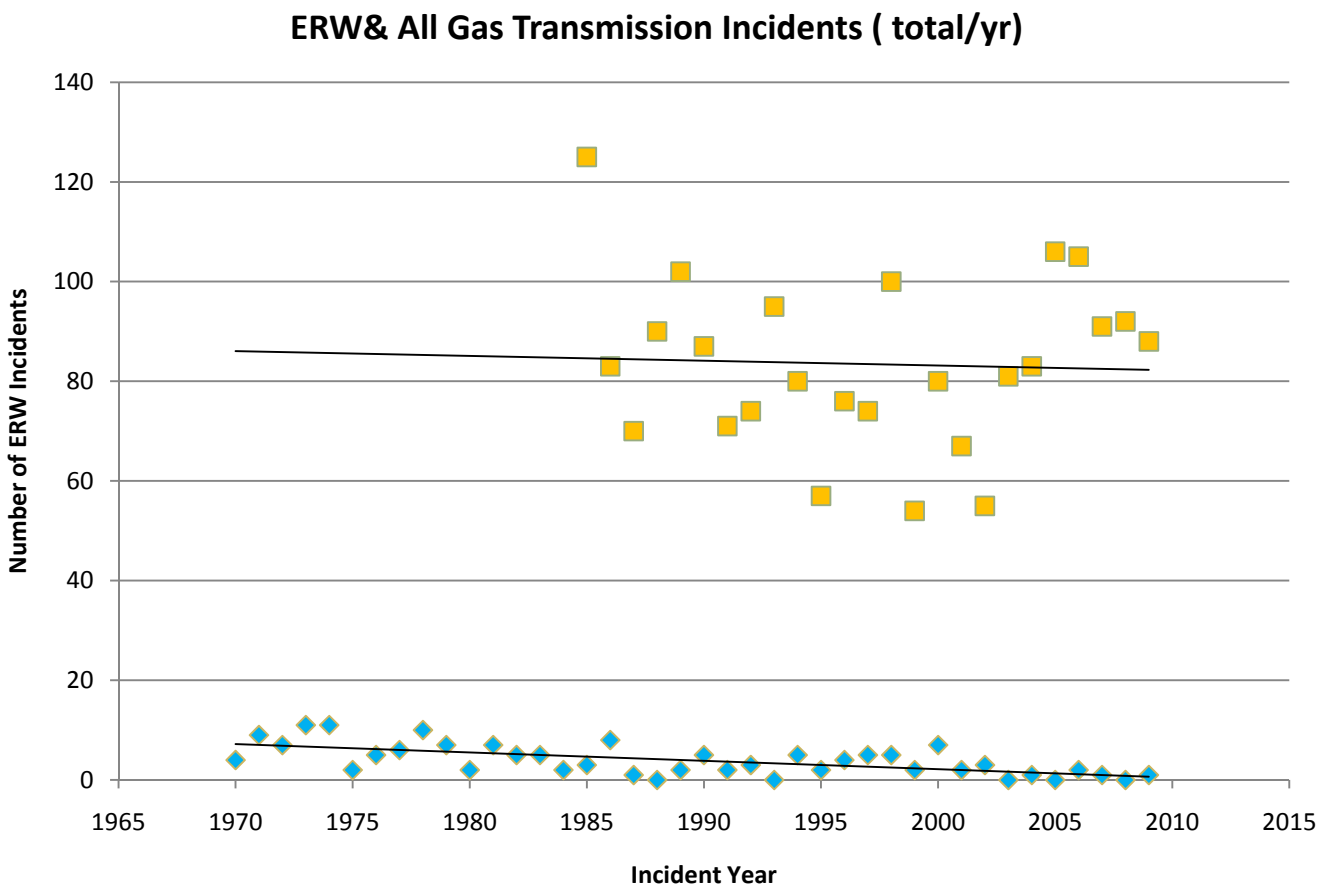
Research and Special

Projects Agency

Contract DTRS56-03-T-0003

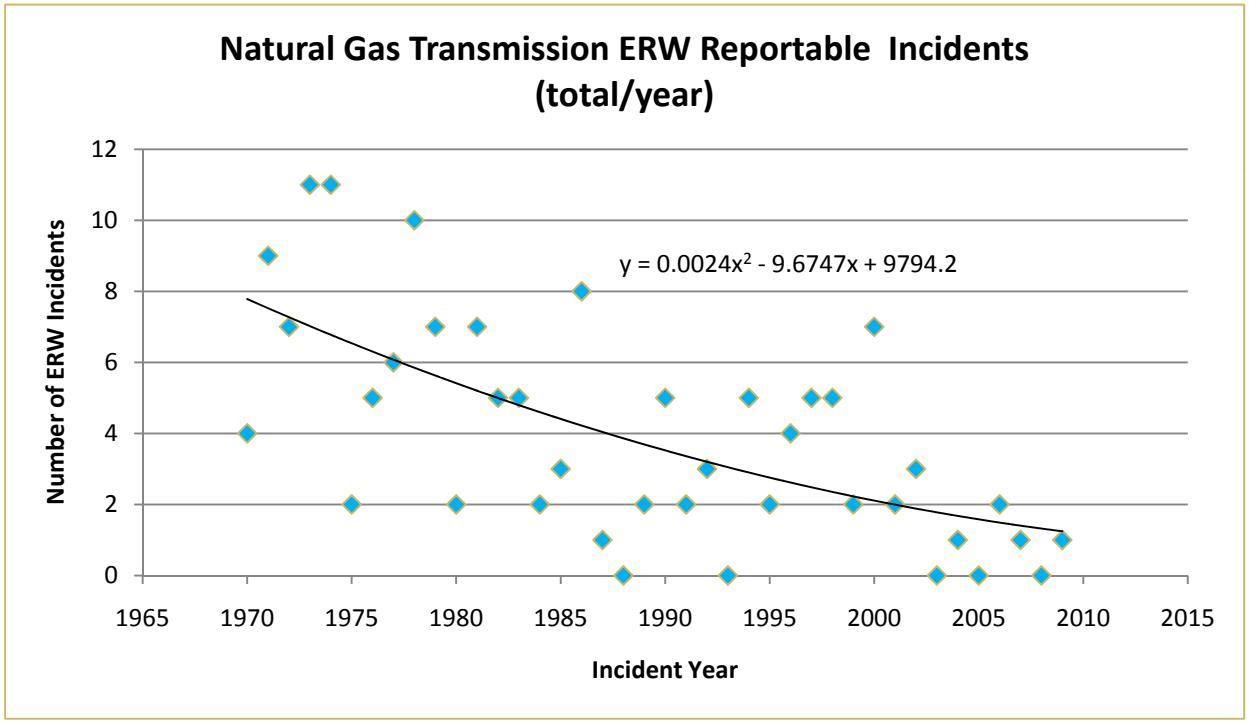
February 2005

Putting ERW Reportable Incidents in Perspective



Source: PHMSA Incident Database

ERW Reportable Incident Rate is Declining as Pipe Ages



Source: PHMSA Incident Database

Longitudinal Weld Seams Reappear as an Highlighted Issue for Gas Transmission

Preliminary Analysis of

Publicly Available Evidence

Supporting a Failure Cause of the

PG&E San Bruno Incident

INGAA Pipeline Safety Committee

May 5, 2011

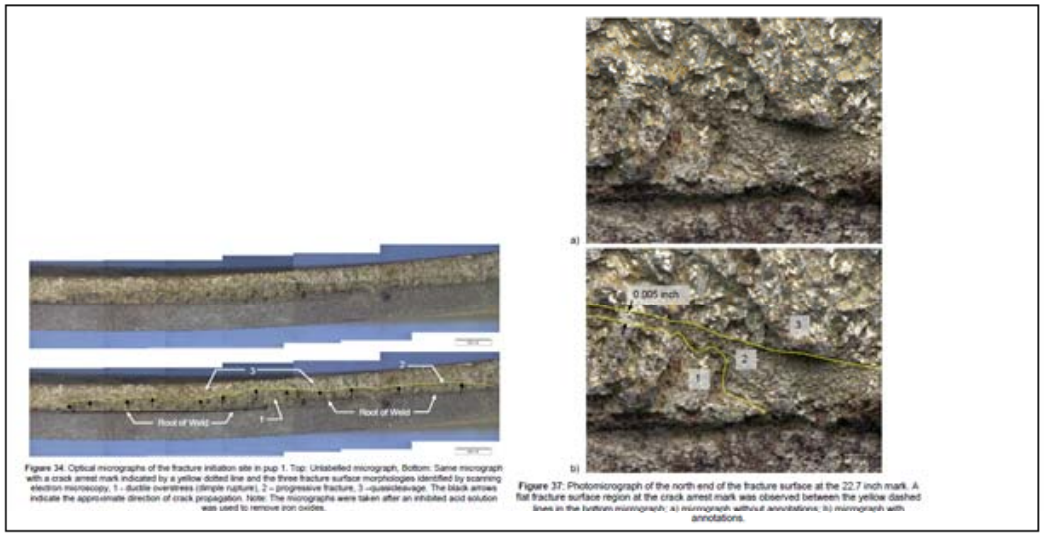


Figure 1. Source: NTSB Metallurgical Report 3A, exhibit 459184. The NTSB photos show the lack of penetration, the ductile Zone 1 and striated Zone 2.

INGAA

Guiding Principles of Pipeline Safety

- **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.

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Thank You