



U.S. Department of Transportation
Pipeline and Hazardous Materials
Safety Administration



PHMSA

Office of Pipeline Safety

2012 API – AGA Joint Committee
Oil & Gas Pipeline Welding Practices

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Know what's below.
Call before you dig.



President signs Pipeline Safety Act



Ray LaHood
Secretary of Transportation

Cynthia Quarterman
PHMSA Administrator

President Obama



Pipeline Safety, Regulatory Certainty, and Job Creation Act

- Drafted by Congress and signed into law by the President on January 3, 2012
- Reauthorization of Pipeline Safety Program
 - Stronger enforcement tools
 - Increases civil penalties
- http://thomas.loc.gov/home/gpoxmlc112/h2845_enr.xml



Recent Girth Weld Incidents





Interactive Girth Weld Threat

**Girth Welds with
Low Tensile Strain Capacity**

+

High Axial Tensile Strain



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



Low Strength Fittings

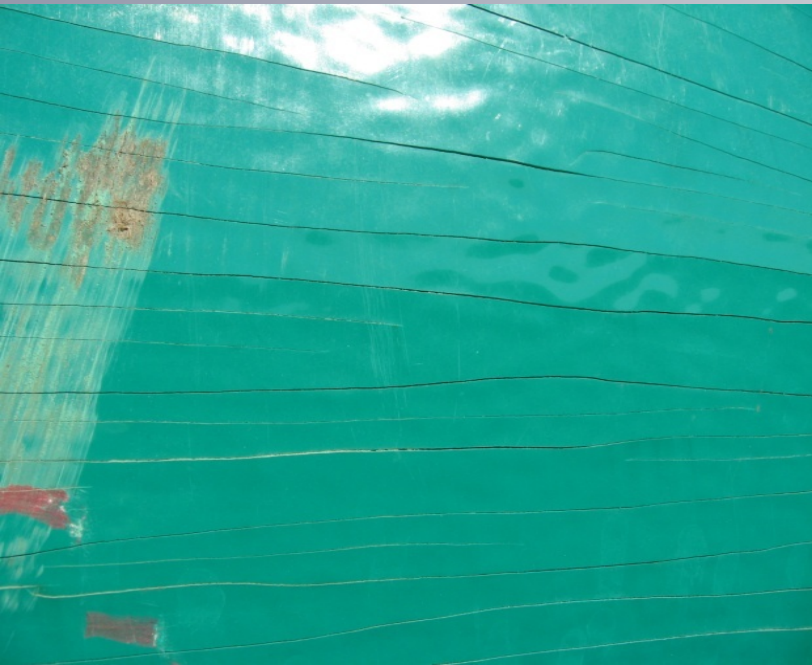
**Hydrotest failure
at 80% of test
pressure**





Low Strength Fittings

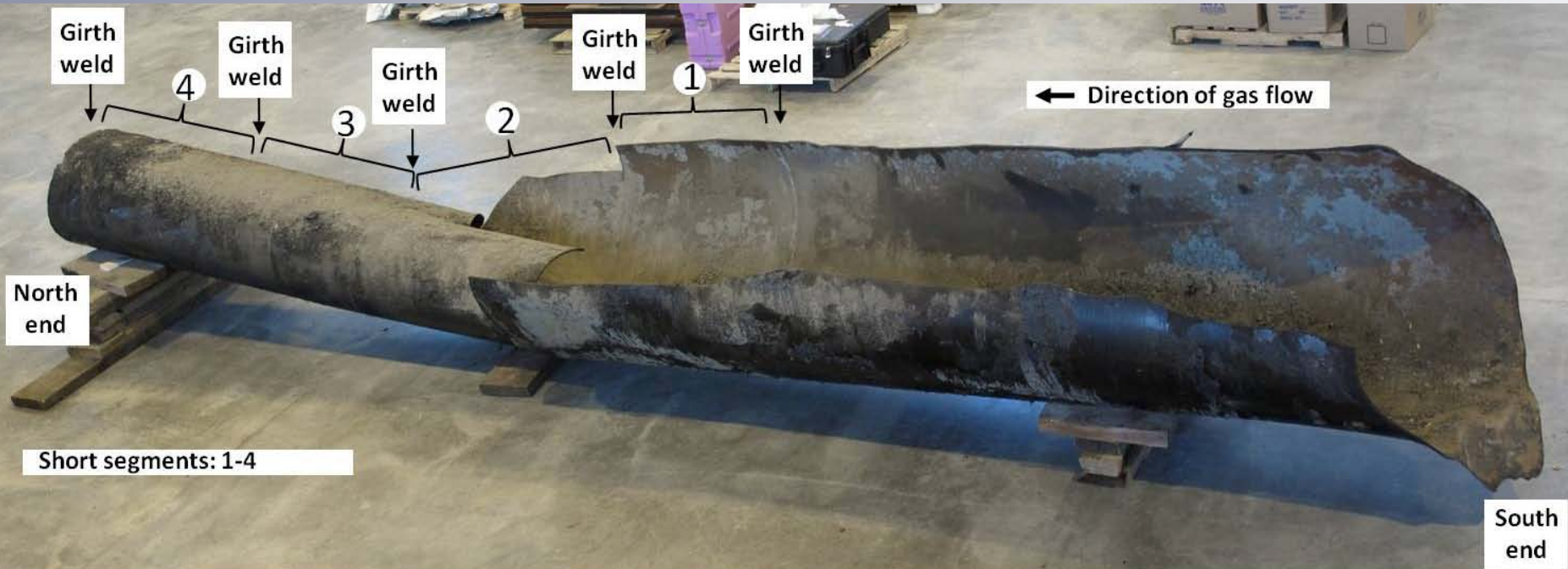
Coating cracks from expansion of fitting during hydrotest





NTSB completes San Bruno Investigation

- NTSB Board Meeting August 30, 2011
- http://www.nts.gov/investigations/2010/sanbruno_ca.html



Photograph of the 28-foot-long ruptured section of pipeline



Recent PHMSA Events

- National Pipeline Safety Forum (April 18, 2011)
 - <http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/National%20Pipeline%20Safety%20Forum%20Record%2004-18-2011.pdf>
- Managing Challenges with Pipeline Seam Welds Workshop (July 20, 2011)
 - <http://primis.phmsa.dot.gov/meetings/MtgHome.mtg?mtg=71>
- Improving Pipeline Risk Assessments & Recordkeeping Workshop (July 21, 2011)
 - <http://primis.phmsa.dot.gov/meetings/MtgHome.mtg?mtg=70>
- **Thank you, all who participated**



Managing Challenges with Pipeline Seam Welds - July 20, 2011 Workshop





Pipe Seam Failures (2002-2010)

Seam Type	Natural Gas	Hazardous Liquid	TOTAL	% of Total
DSAW	9	5	14	18%
Flash Weld	1	5	6	8%
HF-ERW	2	14	16	22%
LF-ERW	5	21	26	35%
Lap Weld	1	2	3	4%
SAW	1	3	4	5%
Other	4	2	6	8%
TOTAL	23	52	75	100%



Pipe Seam Failures

Low Frequency Electric Resistance Weld (LF-ERW)



Submerged Arc Weld (SAW)



LF-ERW





Upcoming 2012 PHMSA Events

- Leak Detection Workshop
- Automatic/Remote Controlled Valve Workshop
- Government/Industry Pipeline R&D Forum
- Details will be posted on below web-page:
 - <http://primis.phmsa.dot.gov/meetings/Home.mtg>



PHMSA funded Research

- Projects completed in 2011 include:
 - Advanced Technology/Methods for AUT Systems Quantification
 - Validation of Assessment Methods for Girth Welding of High Strength Pipelines
 - Update of Weld Design, Testing, and Assessment Procedures for High Strength Pipelines
 - Development of Optimized Welding Solutions for X100
 - In-Situ Hydrogen Analysis for Weld Inspection
- <http://primis.phmsa.dot.gov/matrix>



PHMSA – links

- Pipeline Safety Guidance – Advisory Bulletins, Low Strength Pipe Guidelines, MAOP Rule FAQs
 - <http://www.phmsa.dot.gov/pipeline/guidance>
- Pipeline Construction
 - <http://primis.phmsa.dot.gov/construction/index.htm>
- Pipeline Safety Awareness
 - <http://opsweb.phmsa.dot.gov/pipelineforum>



Thank you

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