

# PHMSA Cased Pipeline Integrity Assessment Workshop

Chicago, IL  
July 15-16, 2008

Scott Meierotto

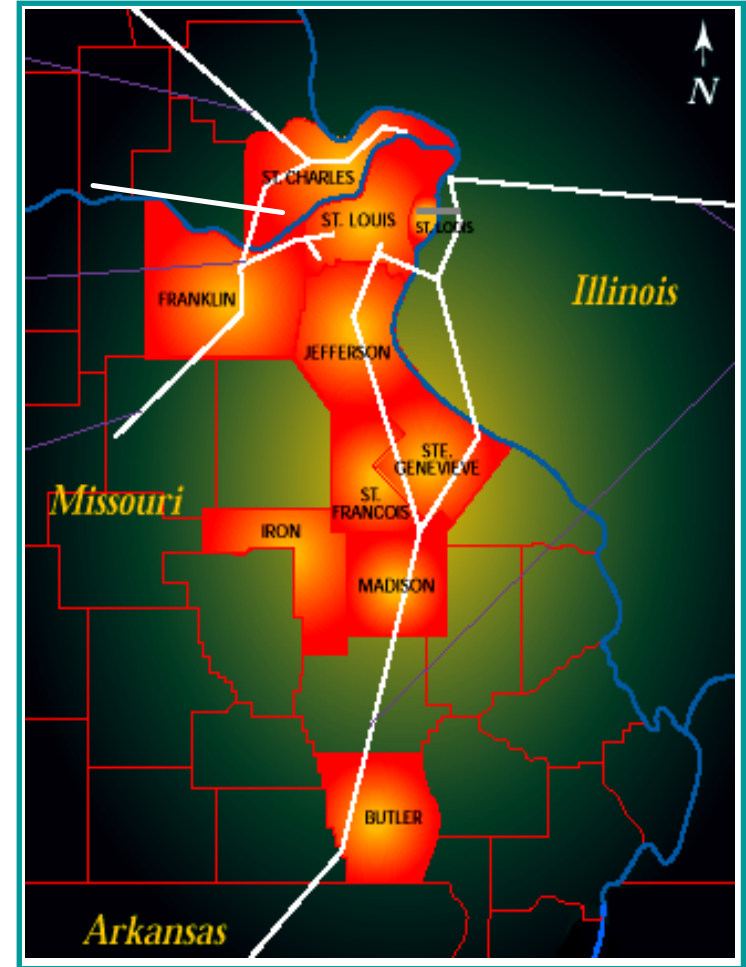


# Discussion Topics

- System Description
- Assessment Method Selection
- Current Status
- Findings
- Moving Forward/Summary

# System Description

- LDC - Greater St. Louis Metropolitan Area
- Laclede/Missouri Natural (MONAT)
  - 631,000 Customers
  - 222 Miles of DOT Reported Transmission Lines
    - 30 Miles Actual Transmission
    - 16 Miles Gathering/Storage
    - 176 Miles Integrated (>20% SMYS)
    - 132 Miles in HCA
      - 4.6 Transmission/Gathering



# Casing Description

- 105 Casings on Transmission
- 80 Casings in HCAs (1.3 Miles or 1% of the total)
  - Diameter 8" - 30"
  - Length 11' - 316'
  - 20 > 120' in Length (GW not appropriate)

# Assessment Methods

- ILI
  - Traditional
    - Not applicable for our system.  
Distribution-Unbarred Tees, Size Reductions,  
Reduced Port Valves
  - Tethered
    - Require significant piping modifications
    - Take out of service
  - Robotic
    - TIGRE NYSearch – Counting on availability!!!!!!!!!!

# Assessment Methods

- HYDROTEST
    - Limited benefit
    - Take out of service
    - IC currently not a threat – Don't want to introduce water unnecessarily
  - ECDA
    - Not appropriate for our system
- Coated Casings

# Assessment Methods

- OTHER

- Guided Wave Ultrasonics

- Submitted Notification March 6, 2006
    - Initial 39 Point checklist posted March 10, 2006
    - After several rounds of discussion, Submitted final data May 5, 2006
    - Received “No Objection” response May 10, 2006
    - Clearly stated we were using as a screening tool only, with action at 10% ECL.

Changed to 5% ECL to reflect 18 Point checklist.

Vendor reports 3% ECL

## – Guided Wave Ultrasonics Response Actions

(From 18 point checklist 11/01/07)

<b>Required Pipeline Response</b>			
<b>GWUT Criterion</b>	<b>30% SMYS or Less</b>	<b>30% to 50% SMYS</b>	<b>Over 50% SMYS</b>
Over 5% CSA and identified for examination	Direct examination within 12 months	Direct examination within 6 months	Direct examination within 6 months
	Leak survey once/month	Leak survey once/month	
		MOP < psi @ discovery	Reduce to 80% MOP @ Discovery



# Assessment Methods

- OTHER
  - Direct Examination
    - Removed casing using a Plasma Cutter
      - Minimal damage to CTE coating.
      - Initiated study to evaluate applicability of ECDA on **coated** casings and to determine if removal of entire casing is necessary.

# Status

- Assessed 22 Transmission cased crossings in HCAs
  - 16 using Guided Wave (2 additional partially inspected)
    - Shot distance 17 - >100'
  - 11 Casing stripped off
    - 3 100%
    - 8 Ends and top half removed
    - Many of the 16 assessed using GW have had ends removed to facilitate inspection of end seal area, and to shorten overall length
    - Used Boroscope “See Snake” to assist in inspection

# GW Example

16" Carrier

Casing originally 125', Shortened to 98'

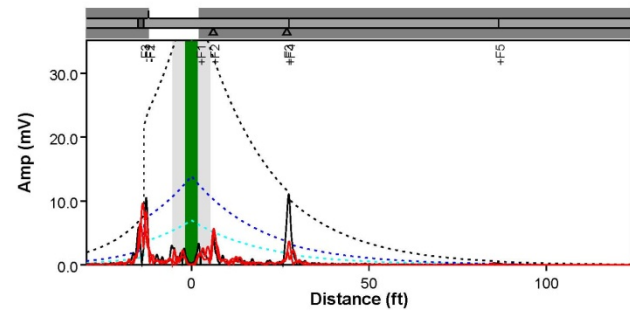
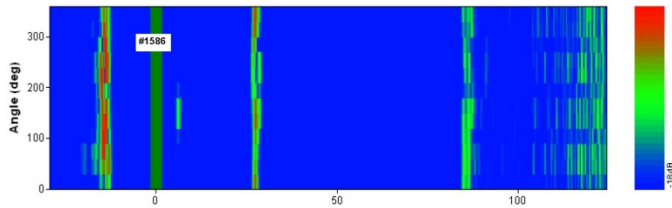
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IMPRO Technologies  
7210 Jadewood Drive  
Houston, Texas 77088

Test ID: G356#1586	Result: OK
Pipe: 16" Line	Ring: R2B16(460)-Circum-35mm
Site: Laclede Gas, St Louis	Config: 6.6FR, T(0,1)
Location: New Sleeve Entran 2'	Calibration: Automatic (2086.53 mV)
Size: 16 inch	Version: 3.93, Wavemaker G356
Tested: 20 Jun 2007 07:51	GPS: 90°27.4752'W, 38°46.7320'N
Tested by: Larry van Deventer[IMPro]	Client: Laclede Gas
	Procedure: GU 1.1

General Notes: (Wall thickness at test location .215" to .220") Grid 168-17/27, North Side of St Charles Rock Rd, Casing Length approx 98'. Test range from North side was 60'. No corrosion was noted above the 3% ECL Line.



16&27&27\_Line-New\_Sleeve\_Entran-2&27-T25-G56#1586.wg3

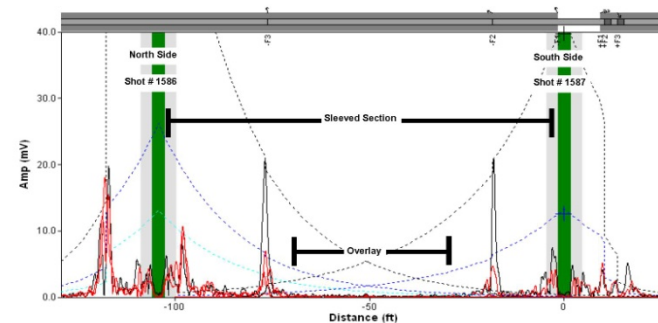
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	Procedure: GU 1.1

Feature	Location	Size (mV)	ECL	Extent	Class	Notes
+F5	86'6"	0.366	-	70	Weld	
+F4	27'5"	13.4	25	80	Weld	
+F3	27'1"	11.1	-	80	Support	
+F2	6'2"	5.28	-	0	Support	
+F1	2'3"	4.02	-	50	Sleeve	Entrance to the sleeved section.
-F1	-12'0"	5.92	-	45	Vent	
-F2	-12'2"	8.13	-	60	Entrance	
-F3	-13'5"	6.52	-	0	45 deg Bend	



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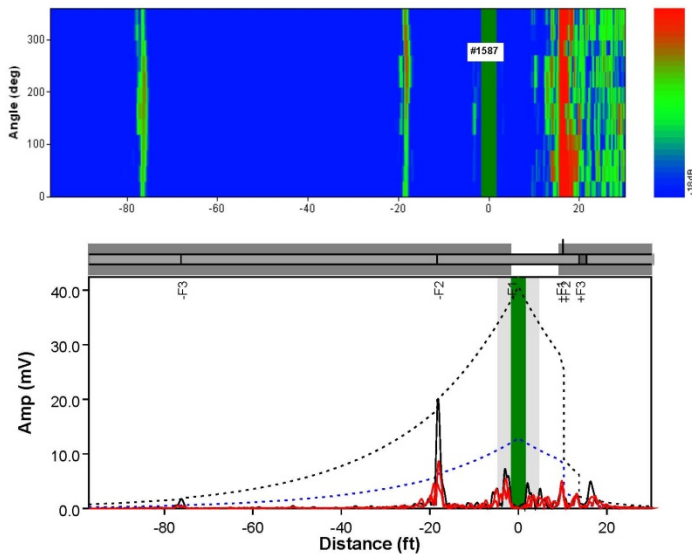




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7210 Jadewood Drive  
Houston, Texas 77088

Test ID: G356#1587	Result: OK
Pipe: 16" Line	Ring: R2B16(460)-Circum-35mm
Site: Laclede Gas, St Louis	Config: 6.4FR, T(0,1)
Location: New Sleeve Entran Neg 2'	Calibration: Automatic (1963.76 mV)
Size: 16 inch	Version: 3.93, Wavemaker G356
Tested: 20 Jun 2007 08:41	Client: Laclede Gas
Tested by: Larry van Deventer[IMPro]	Procedure: GU 1.1

General Notes: (Wall thickness at test location .216" to .219") Grid 168-17/ 27 , South Side of St Charles Rock Rd , Casing Length approx 80' , Test range from South side was 80'. No corrosion was noted above the 3% ECL Line.



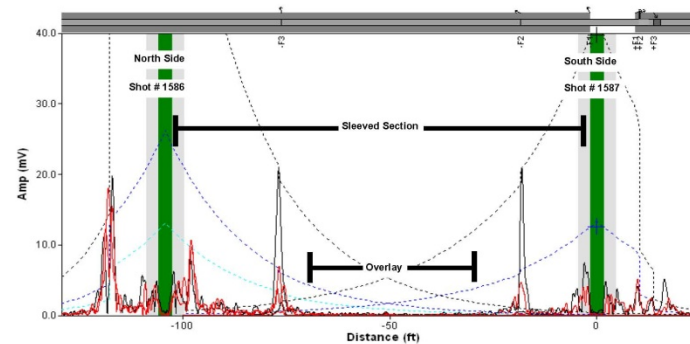
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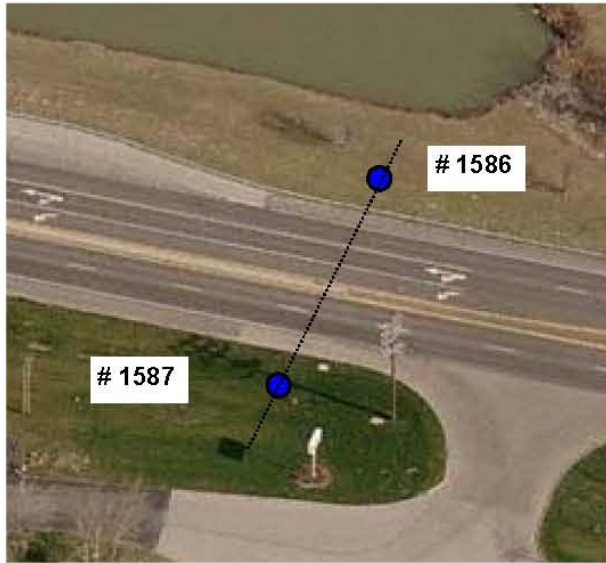
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Location: New Sleeve Entran Neg 2'	Calibration: Automatic (1963.76 mV)
Size: 16 inch	Version: 3.93, Wavemaker G356

Feature	Location	Size (mV)	ECL	Extent	Class	Notes
+F3	13'8"	2.18	-	35	5 deg Bend	
+F2	10'3"	2.91	-	0	Vent	
+F1	9'3"	3.14	-	0	Earth	
-F1	-1'9"	4.41	-	45	Sleeve	Entrance to the sleeved section.
-F2	-18'4"	19.9	25	80	Weld	
-F3	-76'3"	1.76	-	80	Weld	



16&27&27\_Line-New\_Sleeve\_Entran-Neg\_2&27-T25-G56#1587.wg3





# Casings Removed

- Almost all partially filled with water
- Old style “Lug” insulators have failed and caused coating damage
- Minimal remaining CTE seems to provide adequate protection for atmospheric corrosion
- For all cased crossings inspected, only two measurable defects have been found

Under insulator – Passed B31G

Coating damaged by slipping Insulator – Passed B31G

12" Carrier 0.250" wall – 18" Casing 35' Long  
Installed 1964



24" Carrier 0.312" wall – 26" Casing 115' Long  
Installed 1950





Looking North

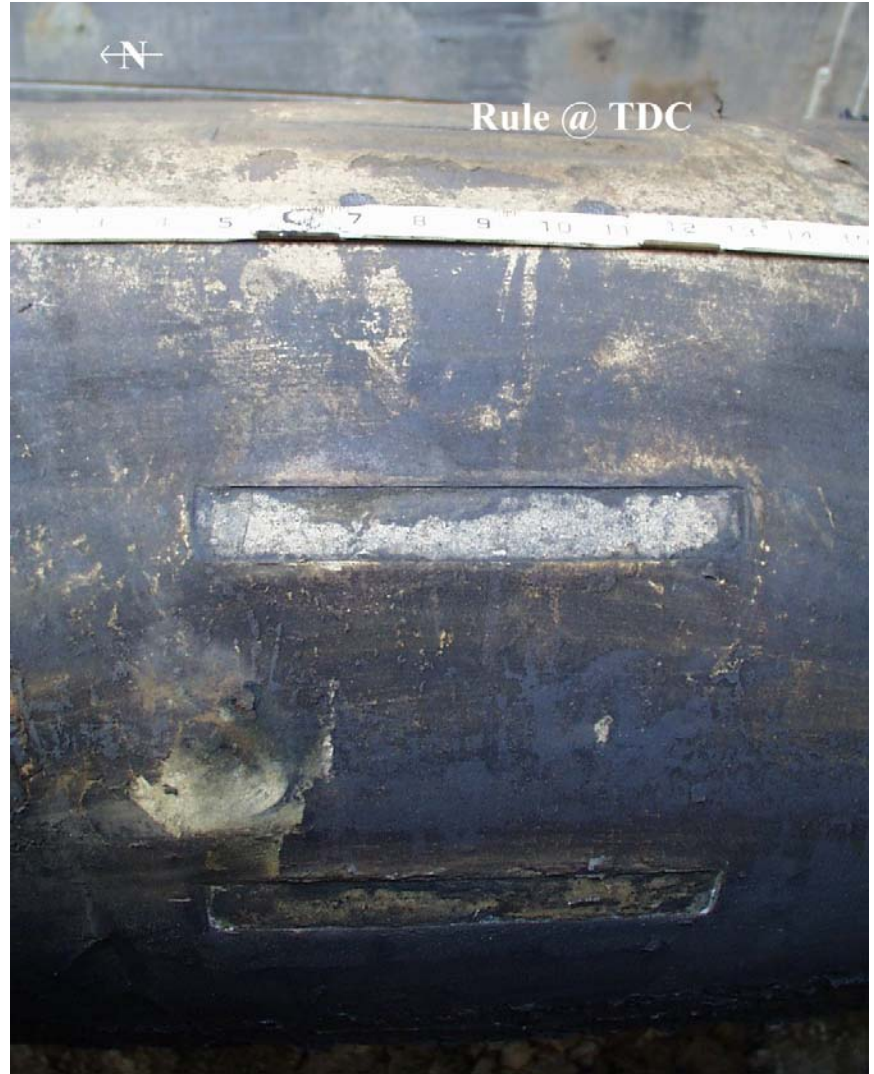


Remaining coating under gouge

Pit .030" Deep



20" Carrier 0.250" wall – 24" Casing 18' Long  
Installed 1951



# Difficult to Assess

24" Carrier

30" Casing 125' long

Installed 1958

Ends relocated in 2001



# Assessment Schedule

Year	Strip	GW	Robot	Replace	Cost (\$1,000)
2005	1	2			41
2006		5			114
2007	2	9			312
2008	5	7			290
2009	5	3	2 (1, 1)		440
2010	1	2	8 (5, 2, 1)	2	600
2011	1	4	4 (3, 1)	3	780
2012	1	4*	9 (1, 1, 2, 2, 3)	2	1,278

\* Two are reassessments from 2005 performed during the GTI Study.

# Moving Forward/Summary

- Installing vents on casings inspected using GW  
(Submitted FAQ June 2007)  
“Assuming a baseline assessment in accordance with 192.921 has been completed for a cased pipe segment in an HCA and any indicated anomalies remediated in accordance with 192.933, if the annular space between the pipe and casing is filled with a high dielectric material, is it acceptable to assume that the threat of external corrosion has been eliminated and integrity inspections for this segment are no longer necessary?”
- GW cannot be used for all crossings

# Moving Forward/Summary

- Counting on availability of Robotic ILI (23 crossings)
- Budgeting to replace 7 crossings where GW is not appropriate, and Robot not currently under development (<20" and >26")
- Other possibilities?
  - High Pressure/Large Diameter Plastic/RTP
  - Hydrotest existing casing then use as carrier
  - Special Permit to include “Distribution Transmission” Lines in DIMP then use resources to address other “riskier” pipelines