



**Pipeline and Hazardous Materials Safety Administration
Office of Pipeline Safety**

Pipeline Safety Research & Development Program

Workgroup#1: Rehabilitation of Aging Cast Iron Pipelines

Chris McLaren

December 1, 2021



Good Morning & Welcome!

PHMSA Leader: Chris McLaren, Program Manager

Industry Co-Leader: Saadat Khan, Director of Gas Distribution Asset & Engineering NYS, National Grid

- Thank you for choosing this Workgroup
- We have an important charge for you:
 - Listening/Learning
 - Assist in developing PHMSA's future research agenda



Workgroup Objectives

1. Updating the audience on the challenges and funded research to date associated with this workgroup subject
2. Identifying technical gaps that address key challenges
3. Developing a list of important topics for future PHMSA funded research from identified gaps



Agenda at a Glance



Today's Agenda – December 1

Time	Presentation	Speaker
10:00 AM	Introduction to Workgroup	Workgroup Leader PHMSA Workgroup Leader Industry
10:30 AM	Research Funding Organization Presentations	Presenters 1-4
11:30 AM	Q&A	
12:00 PM	Contractor Support Introduction & Description	S&K Facilitate
12:10 PM	Research Gap Brainstorming Session	Workgroup Participants
12:45 PM	Lunch Break & CAAP Poster Presentations During Lunch similar gaps will be combined.	
2:45 PM	Review gaps identified following the combination.	Workgroup Leaders
3:15 PM	Sticky Note Exercise – Round 1 & 2 Workgroup prioritizes R&D Gaps	S&K Facilitate
4:15 PM	Break	
4:30 PM	Workgroup Research Topic Roadmapping	Workgroup Leaders & Participants
6:00 PM	Workgroup Closeout Day 2 closeout	Workgroup Leader



Tomorrow's Agenda – December 2

10:00 a.m. PHMSA's Year-Round R&D Solicitation

10:10 a.m. Workgroup Readouts

The results of this Workgroup will be presented at 10:10 a.m. tomorrow ETZ.

Return to the event meeting page to find the entry link to Day 3.



PHMSA Funded Research

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

PHMSA: Your Safety is Our Mission



PHMSA Related Research

Project Title	Summary
Above-ground Detection Tools Including Disbondment and Metal Loss for all Metals Including Cast-Iron Graphitization (\$415,121)	Project developed/tested a mobile platform for detecting coating disbondment and external corrosion by measuring magnetic fields from above ground. Alternating current is injected into the pipe being tested and creates magnetic fields around the pipe. These fields are affected by corrosion and disbondment.
Characterization and Fitness for Service of Corroded Cast Iron Pipe (\$514,140)	The project developed a Fitness-For-Service model and method for operators to characterize and grade graphitic corrosion defects on cast iron natural gas pipe.
Broadband Electromagnetic Technology Sensor to Assess Ferrous Pipes without Removing Coatings in Both Traditional and Keyhole Excavations (\$293,403)	The project enhanced/tested a portable, cost effective, and reliable direct-assessment tool capable of detecting metal loss, pits, and cracks in ferrous pipes without coating removal and can be used through keyhole and traditional excavations.

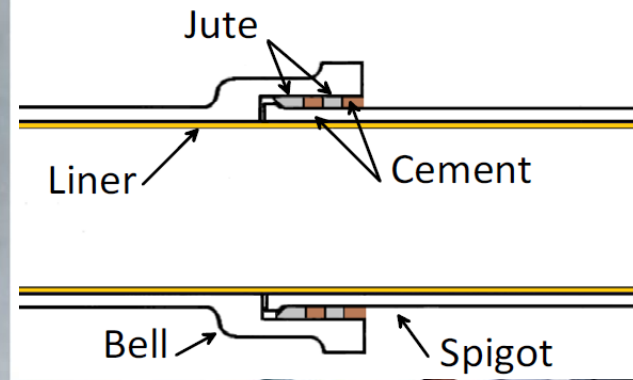


PHMSA Related Research (cont.)

Project Title	Summary
Technology Transfer, Demonstrations and Post-Mortem Testing of Cast Iron and Steel Pipe Lined with Cured-in-Place Pipe Liners (\$477,571)	The project reviewed CIPP performance information and tested extracted field-aged CIPP lined pipe to extremes. A demonstration assessed the full planning, installation and post-installation process that can be evaluated by present-day standards and concerns
Evaluation of Structural Liners for the Rehabilitation of Liquid and Natural Gas Piping Systems (\$425,650)	Project conducted an assessment of structural liners and composites and their interaction with the pipe to demonstrate their capability to carry the loads of a degraded host pipe.



Structural Liner Installation



Notable Research Impacts

- Project final reporting provide very useful information about the issues covered
 - Several papers have been published
- No Technology Transfer yet registered to a vendor
- No Knowledge Transfer yet registered to standards bodies



Graphitic Corrosion



Aboveground Assessment



Related Policy Issues



Slide title

§192.489 Remedial measures: Cast iron and ductile iron pipelines.

(a) General graphitization. Each segment of cast iron or ductile iron pipe on which general graphitization is found to a degree where a fracture or any leakage might result, must be replaced.

(b) Localized graphitization. Each segment of cast iron or ductile iron pipe on which localized graphitization is found to a degree where any leakage might result, must be replaced or repaired, or sealed by internal sealing methods adequate to prevent or arrest any leakage.




Slide title

Reconditioned Cast Iron

NOTICE: This report is required by 49 CFR Part 191. Failure to report may result in a civil penalty as provided in 49 USC 60122.

OMB No. 2137-0629
Expiration Date 5/31/2024

 U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration	ANNUAL REPORT FOR CALENDAR YEAR 20__ GAS DISTRIBUTION SYSTEM	DOT USE ONLY	
		Initial Date Submitted	
		Report Submission Type	
		Date Submitted	

PART B - SYSTEM DESCRIPTION					Report miles of main and number of services in system at end of year.						
1. GENERAL											
	STEEL				PLASTIC	CAST/ WROUGHT IRON	DUCTILE IRON	COPPER	OTHER	Reconditioned Cast Iron	SYSTEM TOTAL
	UNPROTECTED		CATHODICALLY PROTECTED								
	BARE	COATED	BARE	COATED							
MILES OF MAIN					<i>Calc</i>	<i>Calc</i>	<i>Calc</i>	<i>Calc</i>	<i>Calc</i>	<i>Calc</i>	<i>Calc</i>
NO. OF SERVICES					<i>Calc</i>	<i>Calc</i>	<i>Calc</i>	<i>Calc</i>	<i>Calc</i>	<i>Calc</i>	<i>Calc</i>



Slide title

<https://www.phmsa.dot.gov/pipeline/gas-distribution-integrity-management/gas-distribution-integrity-management-program-performance-measures>

Pipeline Miles by Material - Gas Distribution

Time run: 11/30/2021 1:15:24 PM

Portal - Data as of 11/29/2021 9:31:20 PM

Region: (All Column Values) State: (All Column Values)

		2020		
System Type	Pipe Material	Total Miles	% of Miles	# of Services
MAIN	STEEL	519,196.0	22.7%	
	PLASTIC	787,876.4	34.5%	
	OTHER MATERIALS	1,299.0	0.1%	
	IRON	20,490.9	0.9%	
	COPPER	8.5	0.0%	
SERVICES	STEEL	199,629.0	8.7%	15,245,043
	PLASTIC	718,883.5	31.5%	52,272,825
	OTHER MATERIALS	27,453.5	1.2%	2,287,481
	IRON	91.1	0.0%	7,191
	COPPER	9,425.2	0.4%	655,762
Grand Total		2,284,353.1	100.0%	70,468,302

Pipe Material	Pipe Material Detail	Calendar Year	MAIN			SERVICES		
			Total Miles	% of Miles	# of Services	Total Miles	% of Miles	# of Services
IRON	RECONDITIONED CAST IRON	2020	34.5	0.17		0.0	0.0	
		2019	33.0	0.15		0.0	0.02	1
		2018	28.2	0.12		0.0	0.0	
		2017	26.8	0.11		0.0	0.0	
		2016	20.9	0.08		0.0	0.0	
	2015	20.7	0.07		0.0	0.0		
	DUCTILE IRON	2020	476.3	2.32		2.1	2.29	207
		2019	493.0	2.26		2.2	2.18	219
		2018	513.0	2.19		2.5	2.89	244
		2017	536.2	2.14		2.6	2.68	250
		2016	547.5	2.05		2.7	2.24	260
		2015	574.7	2.03		2.9	2.25	282
		2014	624.7	2.08		3.1	2.07	301
		2013	671.7	2.13		3.4	2.02	320
		2012	730.1	2.20		3.5	1.90	336
		2011	750.4	2.18		6.6	3.06	726
	CAST/WROUGHT IRON	2020	784.0	2.22		11.8	5.21	1,093
		2019	19,980.1	97.51		89.0	97.71	6,984
		2018	21,272.6	97.59		99.2	97.80	8,064
		2017	22,868.0	97.69		84.2	97.11	6,985
2016		24,471.4	97.75		93.4	97.32	7,652	
2015		26,201.0	97.88		118.5	97.76	9,345	
2014		27,764.9	97.90		127.7	97.75	10,028	
2013		29,359.1	97.92		149.2	97.93	11,618	
2012		30,904.2	97.87		164.3	97.98	11,991	
2011		32,406.4	97.80		183.5	98.10	13,511	
2010	33,668.5	97.82		207.9	96.94	15,408		
2010	34,591.5	97.78		215.4	94.79	20,728		

Thank You!

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