

Panel 1: National Perspectives on Key Technical Challenges



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**Pipeline Research and Development Forum
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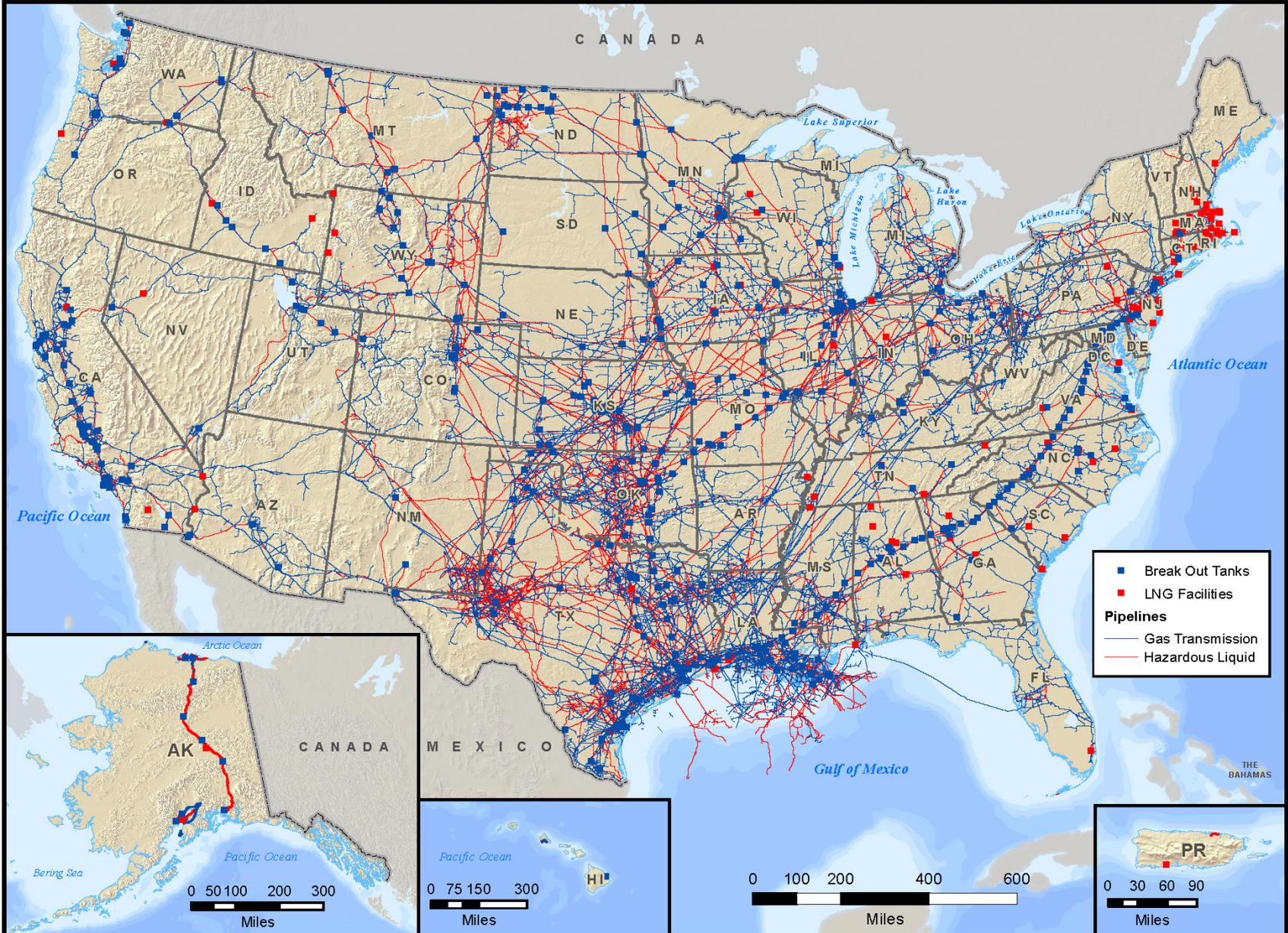
What PHMSA OPS Regulates

System Type	Miles	% Miles	# Operators
Hazardous Liquid	212,189 7,920 Tanks	8%	517
Gas Transmission	300,390	11%	1,032
Gas Gathering	18,186	1%	351
Gas Distribution (Mains & Services)	2,230,727	80%	1,295
Total Pipeline Miles	2,761,492	100%	Note: Some operators have multiple system types
Liquefied Natural Gas	151 Plants	226 Tanks	83
Underground Gas Storage	397 Facilities	17,458 Wells	124



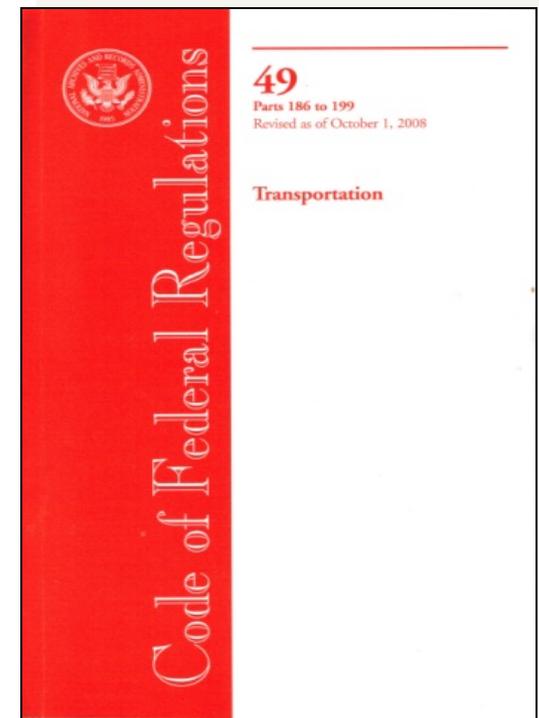
Gas Transmission and Hazardous Liquid Pipelines in the United States

National Pipeline Mapping System



Some of PHMSA's Roles and Responsibilities

- **Minimum safety standards: 49 CFR Parts 190-199, including:**
 - Part 192: Natural Gas Pipelines
 - Part 195: Hazardous Liquids Pipelines
 - Part 193: LNG Facilities
- **Inspection & Enforcement**
- **Safety Awareness & Outreach**
- **Research & Development**



Research Program Performance Since 2016 Pipeline R&D Forum

- Last Forum: Nov 16-17, 2016 in Cleveland. 330 attendees
- Core & CAAP University Research Programs:
 - PHMSA solicited 23 topics
 - Received 131 White Papers & 62 Proposals
 - Awarding 30 projects: \$14M PHMSA + \$5.3M Resource Sharing
<https://primis.phmsa.dot.gov/matrix/>
- **See Program Backgrounder at registration desk for more details**



Recently Completed Projects Include:

- EMAT Guided Wave ILI of Unpiggable Natural Gas Pipelines
- Emissions Quantification Validation Process
- Natural Gas Pipeline Leak Rate Measurement System
- Rapid Aerial Small Methane Leak Survey
- In-Ditch Validation Methodology for Determination of Defect Sizing
- Framework for Verifying and Validating the Performance and Viability of External Leak Detection Systems
- Intrinsically Locatable Technology for Plastic Piping Systems
- Pipeline Damage Prevention Radar
- Characterization and Fitness for Service of Corroded Cast Iron Pipe



Recent Incidents Highlight the Need for Pipeline Research

- Sept. 2015 Centreville, VA: Gasoline pipeline leak at 4" corrosion fatigue crack in dent



Recent Incidents Highlight the Need for Pipeline Research

- Nov 2017 South Dakota: ~9,700 barrel oil spill



Recent Incidents Highlight the Need for Pipeline Research

- February 2018 Dallas, TX: House explosion & fatality from gas distribution leak



Recent Incidents Highlight the Need for Pipeline Research

- March 2014 Plymouth, WA: Explosion at LNG facility
- Jan 2018 Cameron Parish, LA: LNG storage tank leak



Thank You!/RD&T Program Contacts

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PHMSA RD&T Providing/Supporting:

