

GAS GATHERING LINES

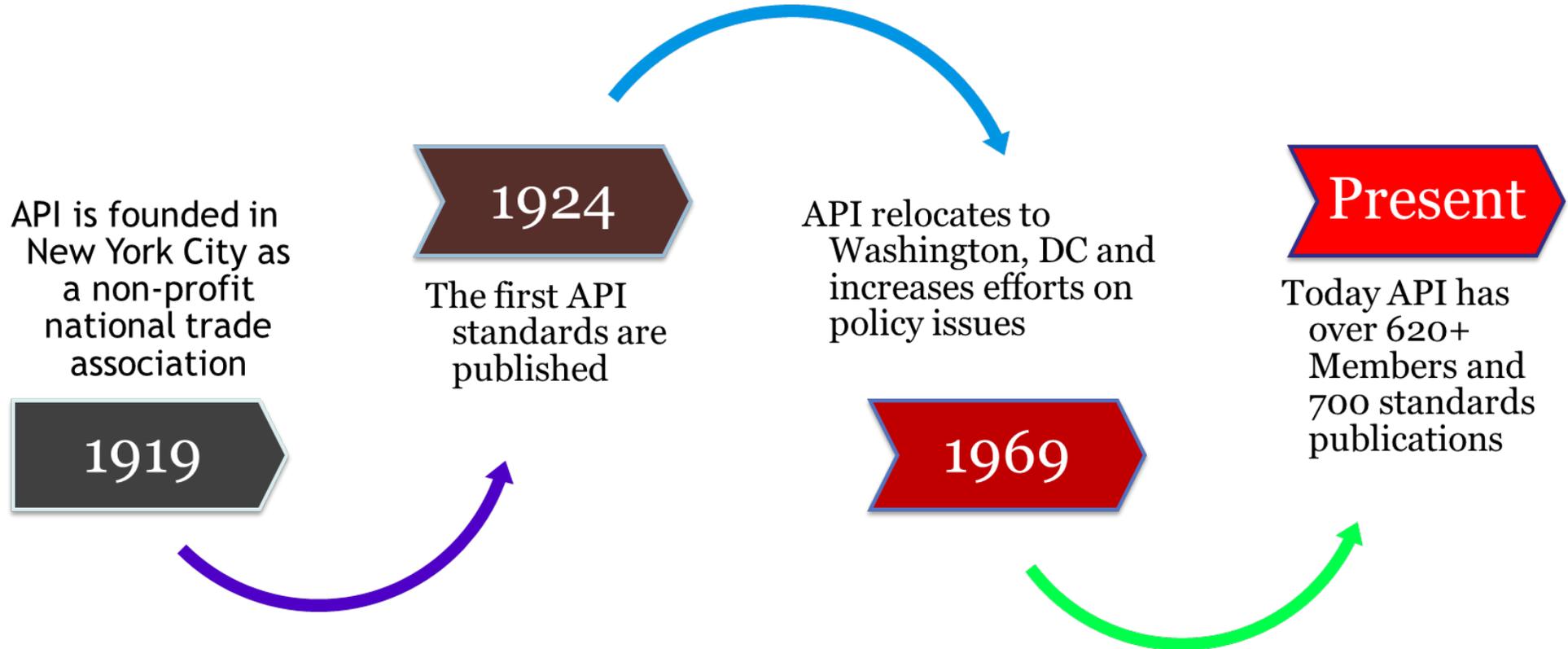
2020 PHMSA R&D Forum

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AGENDA

- 1 Overview: American Petroleum Institute (API)
- 2 Gas Gathering: Current State
- 3 Industry Challenges and R&D Opportunities

API History



API Mission



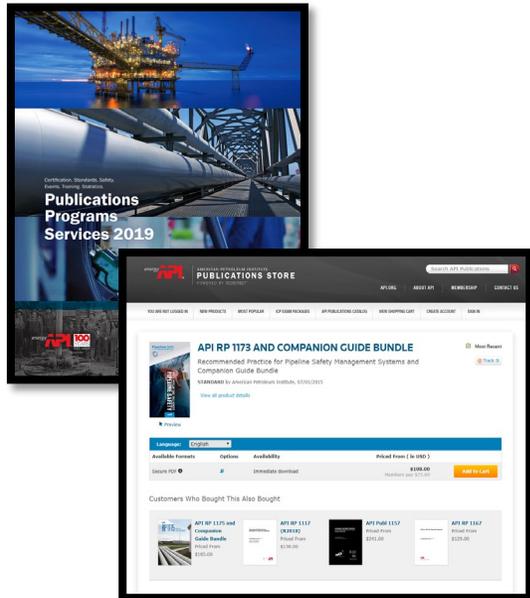
To **promote safety** across the industry globally and to **influence public policy** in support of a strong, viable U.S. oil and natural gas industry

API Members



Largest U.S. Association Representing 600+ Companies Involved in All Aspects of the Oil and Natural Gas Industry

API Standards



Setting Standards Since 1924: Promote safety, environmental protection, reliability and sustainability through proven engineering practices

API's Standards:

- Cover all industry segments
 - ❑ **Upstream:** Exploration & Production
 - ❑ **Downstream:** Refining & Marketing
 - ❑ **Midstream:** Pipeline, Rail & Truck transportation, Petroleum Measurement
- American National Standards Institute (ANSI) accredited
- API now publishes ~700 standards
- Over **650** citations in U.S. Regulations

API STANDARDS PROGRAM ACCREDITATION

- ❑ API is accredited by the American National Standards Institute (ANSI)
- ❑ ANSI accreditation requires:
 - ✓ Openness, Balance, Consensus and Due Process
 - ✓ Approved and Published Procedures
 - ✓ Requirement for Standards Updates
 - ✓ Regular Program Audits



Pipeline SMS

Pipeline Safety STARTS WITH YOU

API Pipeline Standards

INTEGRITY

- RP 1133** Managing Hydrotechnical Hazards for Pipelines Located Onshore or within Coastal Zone Areas
- RP 1160** Managing System Integrity for Hazardous Liquid Pipelines
- Std 1163** In-line Inspection Systems Qualification
- RP 1176** Assessment and Management of Cracking in Pipelines
- Bull 1178** Integrity Data Management and Integration
- TR 1179** Hydrostatic Testing as an Integrity Management Tool *

CONSTRUCTION, INSPECTION, AND REPAIR

- RP 1111** Design, Construction, Operation, and Maintenance of Offshore Hydrocarbon Pipelines
- RP 1161** Pipeline Operator Qualification
- RP 1169** Basic Inspection Requirements - New Pipeline Construction
- RP 1172** Construction Parallel to Existing Underground Transmission Pipelines
- RP 1177** Steel Pipeline Construction Quality Management Systems

UNDERGROUND STORAGE

- RP 1115** Design and Operation of Solution-mined Salt Caverns Used for Liquid Hydrocarbon Storage
- RP 1170** Design and Operation of Solution-mined Salt Caverns Used for Natural Gas Storage
- RP 1171** Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs

PUBLIC SAFETY AND DAMAGE PREVENTION

- RP 1102** Steel Pipelines Crossing Railroads and Highways
- RP 1109** Marking Liquid Petroleum Pipeline Facilities
- RP 1162** Public Awareness Programs for Pipeline Operators
- TR 1166** Excavation Monitoring and Observation for Damage Prevention

MANAGEMENT SYSTEMS

- RP 1160** Managing System Integrity for Hazardous Liquid Pipelines
- RP 1173** Pipeline Safety Management Systems
- RP 1174** Onshore Hazardous Liquid Pipeline Emergency Preparedness and Response
- RP 1175** Pipeline Leak Detection - Program Management
- RP 1177** Quality Management Systems for Steel Pipeline Construction

CYBERNETICS AND CONTROL ROOM

- RP 1130** Computational Pipeline Monitoring for Liquids Pipelines
- TR 1149** Pipeline Variable Uncertainties and Their Effects on Leak Detectability
- Std 1164** Pipeline SCADA Security
- RP 1165** Pipeline SCADA Displays
- RP 1167** Pipeline SCADA Alarm Management
- RP 1168** Pipeline Control Room Management
- RP 1175** Pipeline Leak Detection - Program Management

* - Publishing Soon

Gas Gathering Definitions

- ❑ **How to define “Gathering Line”**
 - ❑ End of Production – Beginning of Gathering
 - ❑ Incidental Gathering Lines
 - ❑ End of Gathering – Beginning of Transmission

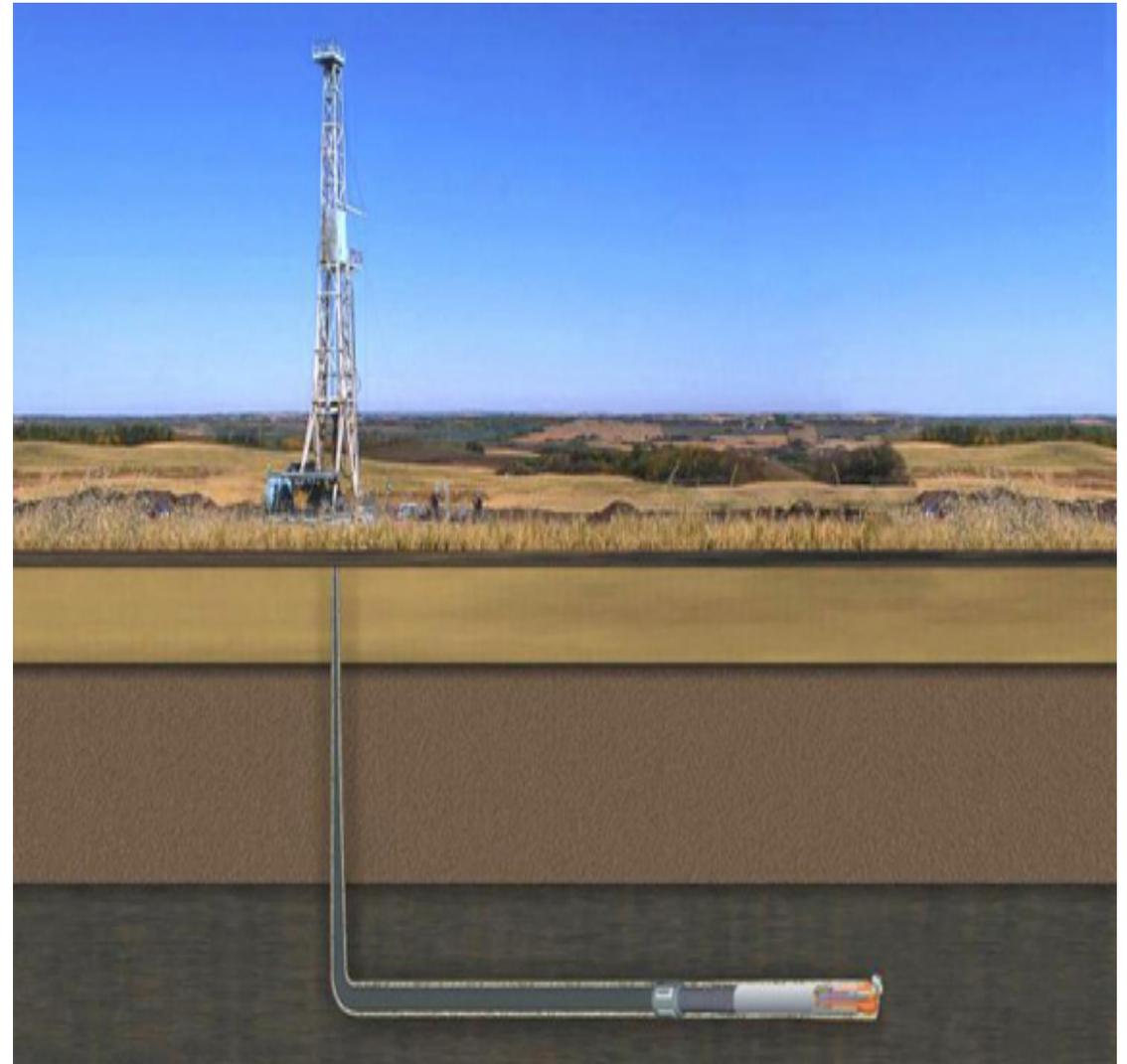
❑ Considerations for Rural Gathering Lines

- ❑ Level of Risk?
 - ❑ Rural Gathering Lines Greater than 12" OD
 - ❑ Operating at 20% SMYS
 - ❑ Potential Impact Radius

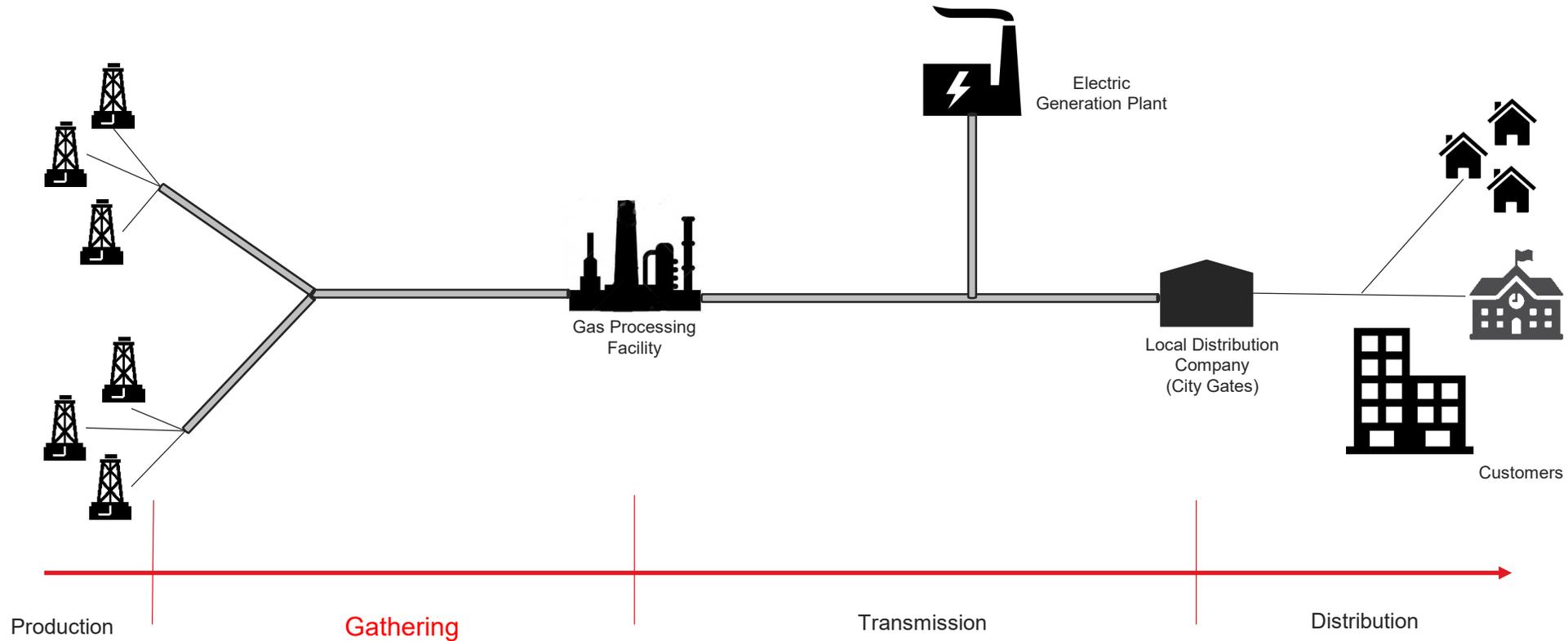
Safety Provisions for Large Diameter Rural Gas Gathering Lines

Broad Context: Gathering Overview

- Increase in US natural gas production, especially unconventional production in shale regions
- Increased production resulting in larger diameter, larger pressure gathering lines
- Most of these new lines are **Class 1 Rural Gathering** lines, not subject to federal standards
- Regulators and industry share a common goal of safe and reliable pipeline transportation



Broad Context: Gathering Overview



Existing Gas Gathering Regulations (cont'd)

- Extent of Currently Regulated Gas Gathering (GG) - § 192.8
 - Approximately 18,380 miles of GG is currently regulated, per 2017 Annual Reports (See following slides)
- Only regulated GG must comply with reporting requirements in Part 191.

Class Locations



New Regulations

- PHMSA has expressed concerns with the safety of rural gas gathering lines, particularly larger diameter, higher pressure lines
 - Pre-shale gas development = small-diameter, low-pressure lines
 - Post-shale gas development = vast majority small-diameter, low-pressure lines + some larger diameter, higher pressure lines
- Industry is committed to addressing PHMSA's concerns
 - Reasonable, risk-based approach for continued safe operation of rural gas gathering lines

Gas Gathering – Estimate of Unregulated Mileage

Gas Gathering – Unregulated – PHMSA Estimate – through 2017	Total Miles
Current Estimate	438,884

Gas Gathering - Type A, Area 2 (high stress, $\geq 8.625''$) Proposed in Rulemaking – 2017 Estimate					
Diameter	$\geq 8.625''$ to $< 12.75''$	12.75"	$> 12.75''$ to $\leq 16''$	$> 16''$	Total Miles
Estimate through 2017	49,381	21,068	13,503	13,391	97,342

$> 12.75''$ diameter gas gathering ~ 26,894 miles

PHMSA Proposed Rulemaking

- August 2011
 - Advanced Notice of Proposed Rulemaking (ANPRM) soliciting comments with respect to improving regulation of onshore gas gathering lines
- January 2012
 - Pipeline Act of 2011, Section 21, mandates DOT review existing gathering line regulations and report to congress
- March 2012
 - Government Accountability Office (GAO) recommends PHMSA collect data on Federally unregulated gathering lines
- August 2014
 - GAO recommends PHMSA address high-diameter, high-pressure gathering lines
- April 2016
 - Notice of Proposed Rulemaking (NPRM) for gas gathering lines
- June 2019
 - Gas Pipeline Advisory Committee (GPAC) recommendation

GPAC Recommendations

Scope of New Regulations

- > 8.625” OD and
> 20% SMYS
- Requirements:
 - Damage Prevention
 - Line Markers
 - Public Awareness
 - Leak Surveys
 - Design, Installation, Construction
 - Emergency Plans

Definitions and Endpoint of Gathering

- Monitor API RP 80 Workgroup

Reporting Requirements

- Annual Reports for Currently Unregulated Gathering Lines
- Address Possibility of Unknown Data
- Phase-In Period of 24 months

Safety Requirements

- Address Composite Pipe
- Extend Compliance Timeframes
- MAOP Determination Based on 5-Year High Or Other Criteria

Congressional Provisions

PHMSA Reauthorization

Senate Commerce

- Leak Detection

House T&I

- Mapping Gathering Lines

House E&C



Issues Recognized by PHMSA and Congress

- **Many operators do not know exactly where their gathering lines are located:**
 - R&D idea: Method for Locating Plastic Pipe, Mapping Accuracy . . .
- **Detecting leaks on pipelines may help reduce methane emissions:**
 - R&D idea: Smart Ball Technologies, Drones . . .
- **Gathering pipelines are typically not buried very deep:**
 - R&D: Method to Prevent / Remediate Erosion . . .

Questions?

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