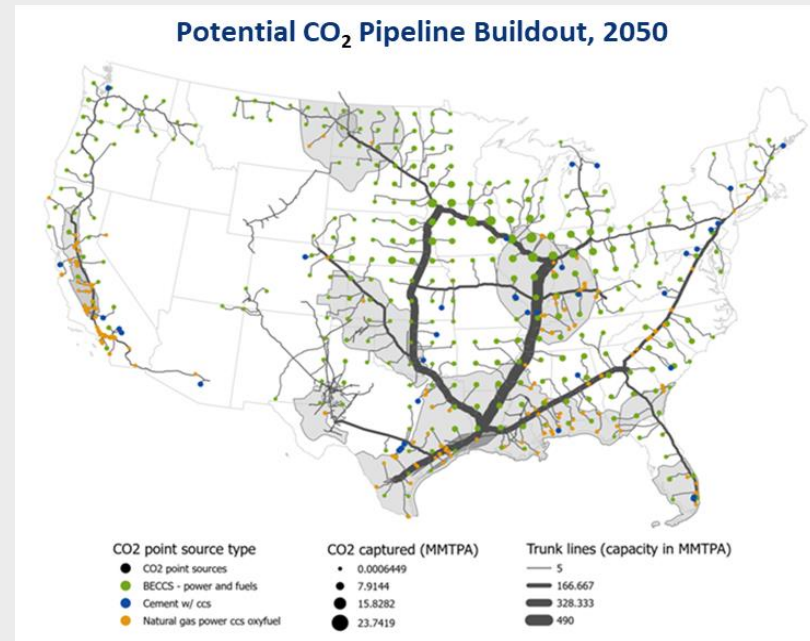


API CO₂ PIPELINES POLICY & STANDARDS

US DOE FECM ANNUAL MEETING
PITTSBURGH, PA
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Source: Center for Energy and the Environment,
Princeton University, "Princeton's Net-Zero America
Study, Annex I: CO₂ Transport and Storage
Infrastructure Transition Analysis," 2020.

API 2024 Pipeline Strategic Priorities



Pipeline Infrastructure Development

Communication & Education
Infrastructure Permitting



Stakeholder Engagement

Public Engagement and Awareness – RPs 1162 and 1185
Conservation Program



Pipeline Safety & Security

Regulations and Legislation (PHMSA CO₂ Pipeline NPRM)
Standards Development
API-LEPA 2023-2025 Performance Excellence Strategic Plan – *Safe and Sustainable Energy Future*



Climate & Low Carbon Energy



Workforce Development & Diversity

2024 Strategic Priorities CO₂ Pipelines

Regulations & Standards

- Develop RP for CO₂ Pipeline Safety
- Drive narrative around CO₂ reg update

R&D

- R&D through PRCI EFI & CO₂ Taskforce
- Engagement with DOE & PHMSA on R&D Alignment

Training

- Finalize build-out of CO₂ ER curriculum with National Association of State Fire Marshals

Integrating Research Into Standards

- Aim to minimize duplication of effort / maximize synergies with other SDOs that are also working to develop industry standards for CO₂ transportation by pipeline
- Standards inform and can be referenced in regulations
- Continuous engagement with stakeholders is key

Research gaps identified by consensus industry Roadmaps fed to DOE, PHMSA, PRCI, and others



Completed R&D fed back to SDOs for inclusion in codes and standards

API CO₂ Pipeline Recommended Practice (RP)

- **Current status & timing of RP development – *CO₂ Transportation by Pipeline***
 - Basis for RP – recognition of current standards, enhancing where needed
 - Consensus developed on RP framework
 - RP Task Group has been formed - 100+ representatives, broad range of SMEs and stakeholders engaged; operators, engineering SMEs, PHMSA, OEMs
 - Coordination with other committees in API working on CO₂ standards
 - Coordination with other SDOs, point to continuous improvement (R&D gaps)
 - Expect to publish in early 2025
- **Key topic areas being addressed**
 - Integrity management & re-purposing of assets
 - Impurities management, equations of state (anthropogenic sources, CO₂ hubs)
 - Measurement
 - Dispersion modeling, risk assessment
 - Odorants, Leak Detection
 - Fracture initiation, propagation, and control
 - Considerations in siting, design, construction
 - Emergency response, Public Engagement

API CO₂ RP to be Supported by Parallel Efforts

• Permitting

- Significant challenges to CO₂ pipeline permitting
- Midwest states public opposition
- Preemption, eminent domain, setback, and other state and local issues

• Emergency Response

- Published Tactical Guidelines for CO₂ Emergency Preparedness/Response
- NASFM Training Portal
- Texas A&M TEEC CO₂ pipeline training

• Public Engagement and Education

- Working with all stakeholders
- RP 1185 – will be an important element of CO₂ pipeline infrastructure build out
- Roll-out and “How To” guidelines
- Benefits of Pipeline Campaigns

PIPELINE PUBLIC ENGAGEMENT
RECOMMENDED PRACTICE 1185

INTRODUCTION
Recommended Practice (RP) 1185 for Pipeline Public Engagement will help pipeline operators gain input from the public on proposed and existing pipelines. RP 1185 provides a scalable and flexible framework with implementation specifics dependent on the type, size and location of a pipeline and existing programs already in place.

NEW AND DIFFERENT
RP 1185 goes beyond traditional public awareness one-way information flows from a pipeline to the public. RP 1185 will help pipeline developers and operators proactively engage the public through conversation, providing equity and inclusivity for input from a broader range of the public, different perspectives and potential concerns.

BENEFITS

- Everyone can develop relationships, build trust and achieve meaningful involvement in the engagement process.
- Operators gain perspectives and information needed to consider, develop and operate pipelines within their community.
- Public participants learn about, better understand, and share their perspectives on pipelines in or proposed for their community.

STAKEHOLDERS

- Pipeline operators
- Developers of proposed pipeline projects
- Interested parties in the public
- Governments
- Rights holders

TYPES OF COVERED PIPELINES

- Existing hazardous liquids
- Existing gas transmission
- Proposed hazardous liquids
- Proposed gas transmission
- Gathering pipelines

ENGAGEMENT ELEMENTS

RP 1185 includes six elements to apply when engaging the public at any point in a pipeline's lifecycle, from early design and siting, through operation, maintenance and emergency response, to abandonment and decommissioning.

- COMMIT AND ALIGN** Describes how operators, through their management, demonstrate the organization's commitment to stakeholder engagement.
- IDENTIFY, UNDERSTAND AND CONFIRM** Describes stakeholders who should be the subject of engagement.
- PLAN AND PREPARE** Describes how operators get ready for stakeholder engagement activities.
- SHARE INFORMATION** Describes what operators should share as part of baseline information.
- ASK, LISTEN AND RESPOND** Describes how operators engage with stakeholders.
- MONITOR, EVALUATE AND ADJUST** Describes how operators assess, document, verify and improve stakeholder engagement performance.

CORE PRINCIPLES

- OPENNESS AND TRANSPARENCY** Frank discussion, sharing of truthful, timely, and relevant information, and willingness to listen and learn and nurturing an environment of transparency.
- RESPECT** Considering and respecting others' points of view by listening to questions, understanding concerns, and allowing each other to share perspectives.
- RECIPROCITY** Communication and action for mutual benefit, listening as well as speaking, being responsive to inquiries and interests, and sharing responsibility for interactions and relationships.
- INCLUSIVENESS** A deliberate effort to involve parties interested in the subject or action.
- ACCESSIBILITY** Commitment to provide a variety of methods and opportunities for all interested stakeholders to participate.
- EQUITY** Deliberation and decision-making that take into account the needs, circumstances, and resources of all stakeholders.

EXPERTISE, RESEARCH AND TECHNOLOGY DRIVE API PIPELINE SAFETY STANDARDS THAT SUPPORT REGULATION

API Pipeline Standards



Pipeline SMS

INTEGRITY

- RP 1110** Pressure Testing of Steel Pipelines for the Transportation of Gas, Petroleum Gas, Hazardous Liquids, Highly Volatile Liquids, or Carbon Dioxide
- 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
- RP 1181** Pipeline Operational Status Determination
- RP 1183** Assessment and Management of Dents in Pipelines
- RP 1188** Hazardous Liquid Pipeline Facilities Integrity Management

CONSTRUCTION, INSPECTION, AND REPAIR

- RP 1111** Design, Construction, Operation, and Maintenance of Offshore Hydrocarbon Pipelines
- RP 1161** Pipeline Operator Qualification
- RP 1169** Pipeline Construction Inspection**
- RP 1172** Construction Parallel to Existing Underground Transmission Pipelines
- RP 1177** Steel Pipeline Construction Quality Management Systems
- RP 1184** Pipeline Facility Construction Inspection**

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
- RP 1185** Pipeline Public Engagement

GATHERING LINES

- RP 80** Definition of Onshore Gas Gathering Lines
- RP 1182** Construction, Operation, and Maintenance of Large Diameter Rural Gas Gathering Lines

* = Revision forthcoming in 2024

** = Supported by an API Individual Certification Program

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
- TR 1149** Pipeline Variable Uncertainties and Their Effects on Leak Detectability
- Std 1164** Pipeline Control Systems Cybersecurity
- RP 1165** Pipeline SCADA Displays
- RP 1167** Pipeline SCADA Alarm Management
- RP 1168** Pipeline Control Room Management
- RP 1175** Pipeline Leak Detection - Program Management



Pipeline Safety NPRM/PHMSA Reauthorization – CO₂

- OMB review of NPRM ongoing now
 - Meetings held with OMB – LEPA, Pipeline Safety Trust, API, others
- Forming an ad hoc team to review the content of NRPM
 - API & LEPA to align with other trades as appropriate and submit comments
- CO₂ RP can inform rulemaking and updates to CO₂ pipeline safety regulations
- Pipeline Safety Reauthorization and NPRM timing

Thank you for the opportunity to share information on this important industry topic.

