ExxonMobil | Pipeline

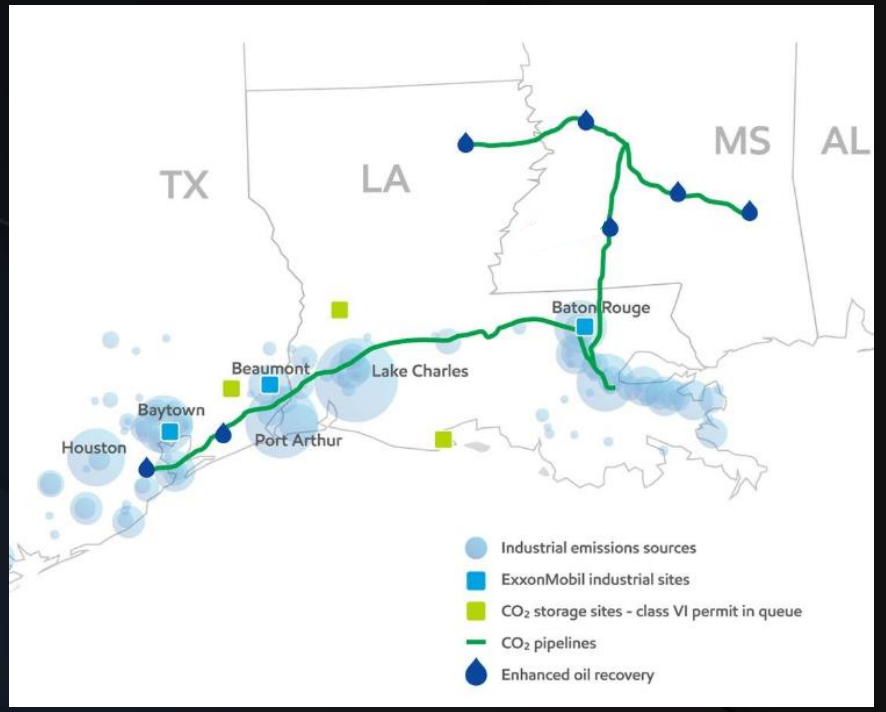
CO_2 Pipeline Safety

October 2026

ExxonMobil Pipeline Company

- Owns, operates and/or has joint interest in **>15,000 miles** of inland and offshore pipelines
- Transports more than **5MBPD** of crude oil, refined products, liquefied petroleum gases, natural gas liquids, CO2 and chemical feedstocks
- Operates **37** above- and below-ground storage facilities, including **four** salt caverns
- Manages the safe transportation of **some of the industry's most critical and technically demanding products**
- Operates the **largest crude oil pipeline by volume**
- Operates **largest CO_2 pipeline network in world**
  - ~250 miles in Louisiana

ExxonMobil Gulf Coast CO_2 Pipeline Network



Recognized as a Safe and Responsible Operator

- **Industry Safety Award Four Years In a Row**
  - Received the API's premier safety award, 2022-2025
  - Rates the strength of both operators' safety records and their safety practices

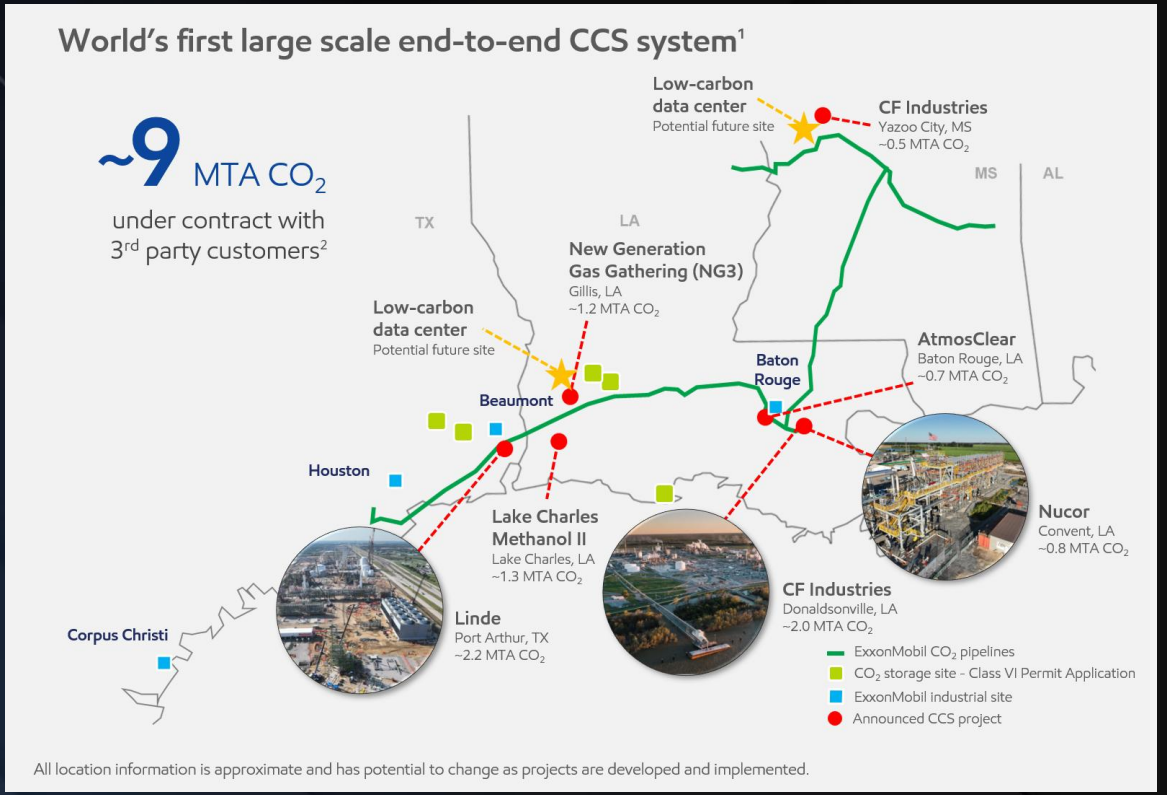
- **Recognized Emergency Response Leadership**
  - Earned the Norman Mineta Excellence in Transportation Safety Award from the National Assn of State Fire Marshals for promotion of emergency preparedness

- **Third-Party Audit Excellence**
  - Achieved some of API's highest-ever audit scores for safety culture and integrity management
  - Top performer of all operators audited



CO_2 Pipelines Provide Important Services

- **Enhanced Oil Recovery (EOR)**
- **Sample commercial uses**
  - Medical procedures
  - Fire suppression
  - Carbonation
  - Food processing
  - Dry ice
  - Special effects
- **Carbon Capture and Storage in Louisiana**
  - CF Industries – 2 MTA CO2
  - Nucor – 0.8 MTA
  - Lake Charles Methanol II – 1.3 MTA
  - NG3 – 1.2 MTA
  - Atmos Clear – 0.7 MTA



CO_2 Pipelines Provide Significant Public Benefits

- **CO_2 pipelines and CCS**
  - Sustain jobs by enabling manufacturers to lower their carbon emissions to satisfy environmental regulations and compete in the global marketplace
  - Provide millions of dollars in state and local tax revenues
  - Create well-paying construction jobs
  - Provide greater economic value to land along the pipeline
  - Encourage economic development
  - Reduce the carbon-intensity of many products and activities that Louisianians enjoy, allowing them to continue at affordable prices
  - Reduce the amount of CO_2 that would have entered the atmosphere

Building infrastructure promotes further economic investment

"CO_2 capture and storage will extend LA's presence in Energy by creating 17,000 potential new jobs, **$76 Billion in potential capital** for communities throughout LA from announced projects alone, and driving economic growth on a scale unimaginable for LA."

– Gov. Jeff Landry

"Statistics on the transportation of CO_2 in its supercritical form has been safer relative to other hazardous liquids/gases; releases have been rare, and releases have rarely impacted people or the environment."

– Pipeline and Hazardous Materials Safety Administration (PHMSA)

Recognizing and Mitigating Risk

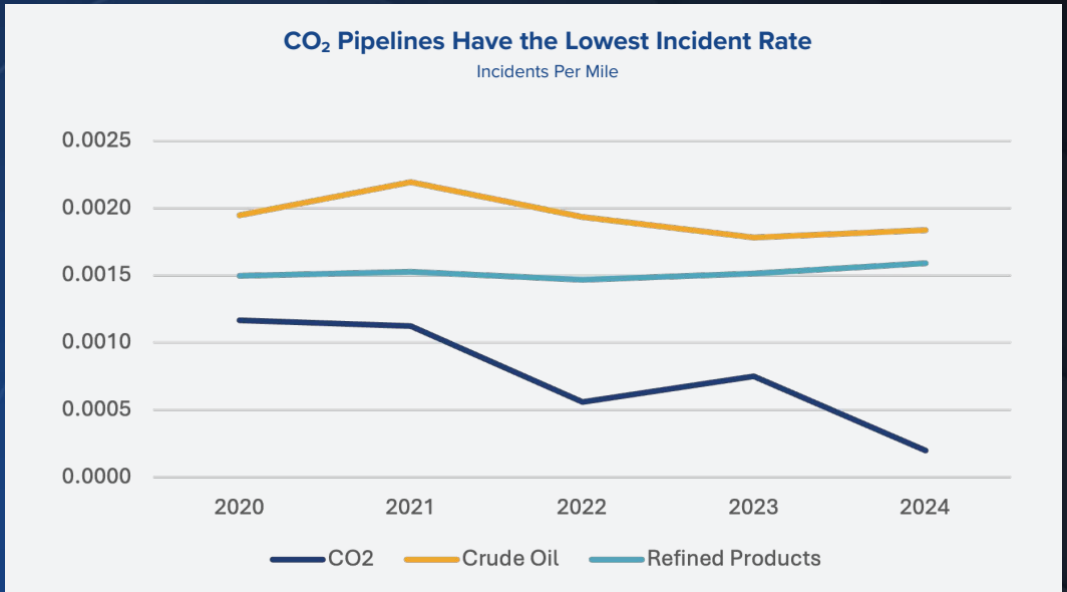
- **As with any industrial process, there are risks involved in transporting CO_2.**
- **CO_2**
  - Necessary for life
  - Relatively harmless in normally encountered concentrations. Humans exhale it, and plants live on it.
  - Not flammable
  - In higher concentrations, CO_2 can displace oxygen.
- **Government and pipeline operators focus on enhancing safety and mitigating risk.**

Elements of Safety

Regulation	Construction	Stream Analysis
Integrity Management	Pipeline Monitoring	Public Awareness
Emergency Response	Standards & Research	Community Outreach

CO_2 Pipelines Have Been Operating Safely for Decades

- **~5,200 miles of CO_2 pipelines safely transport ~66 million tons of CO_2 per year in the U.S.**
  - From 2001 to 2024, PHMSA recorded an average of less than five reportable incidents[1] per year, no fatalities and one injury[2]
  - Only injury was a contractor hurt during an excavation of a CO_2 pipeline
  - Of all incidents since 1994, 25 occurred on the ROW; 75 within facilities



PHMSA CO_2 Pipeline Incident Data, US			
Year	Incidents[1]	Fatalities	Injuries[2]
2001	1	0	0
2002	4	0	0
2003	7	0	0
2004	3	0	0
2005	2	0	0
2006	7	0	0
2007	4	0	1
2008	7	0	0
2009	4	0	0
2010	6	0	0
2011	4	0	0
2012	2	0	0
2013	5	0	0
2014	5	0	0
2015	7	0	0
2016	9	0	0
2017	9	0	0
2018	5	0	0
2019	4	0	0
2020	6	0	0
2021	6	0	0
2022	3	0	0
2023	4	0	0
2024	1	0	0
TOTALS	115	0	1
AVG/YR	4.8	0	0

[1]PHMSA defines reportable incidents as releases that involve a fatality or injury that requires hospitalization, an explosion or fire, a release of five gallons or more, or estimated property damage exceeding $50,000, including cleanup and repair costs.

[2]PHMSA defines injuries as those sustained as a result of an incident, which require hospital admission and at least one overnight stay.

Stanford University Research

After analyzing PHMSA data and operator incident reports, Stanford University researchers concluded, from 1994-2024:

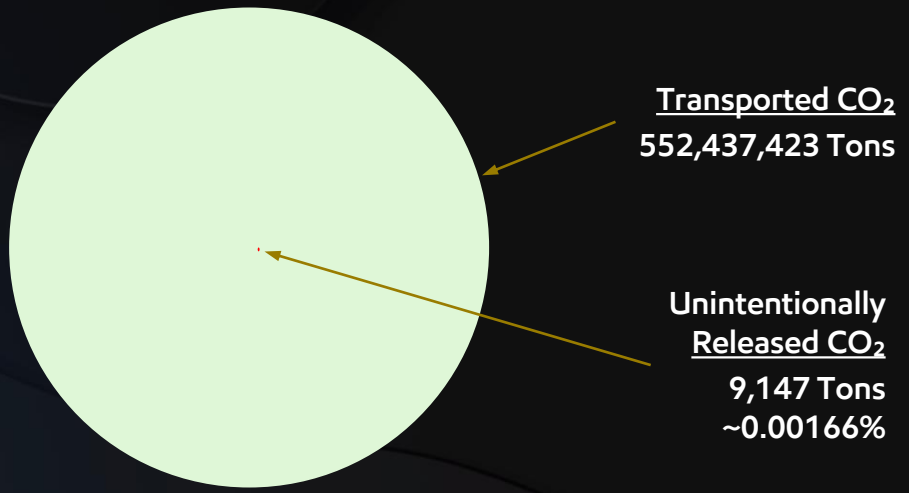
"CO_2 pipelines have a low risk profile,
despite public concerns amplified by accidents like Satartia.

CO_2 accidents release on average only **0.0025%** of the transported CO_2 (**0.10** metric tons/**220** lbs. of CO_2 per km per year) while…

Natural Gas pipeline accidents release **0.0077%** of transported NG (**0.49** metric tons/**1,080** lbs. of NG per km per year)."

"CO_2 accidents released only 0.0017% of transported CO_2 over the last decade."

Amount of CO_2 Transported vs Released 2014-2024



Yannik Schueler, Sarah D . Saltzer, Sally M. Benson
Accident Analysis of CO2 Pipeline Failures: Patterns, Detection, and Consequences
International Journal of Greenhouse Gas Control (March 2026)

Federal and State Regulations

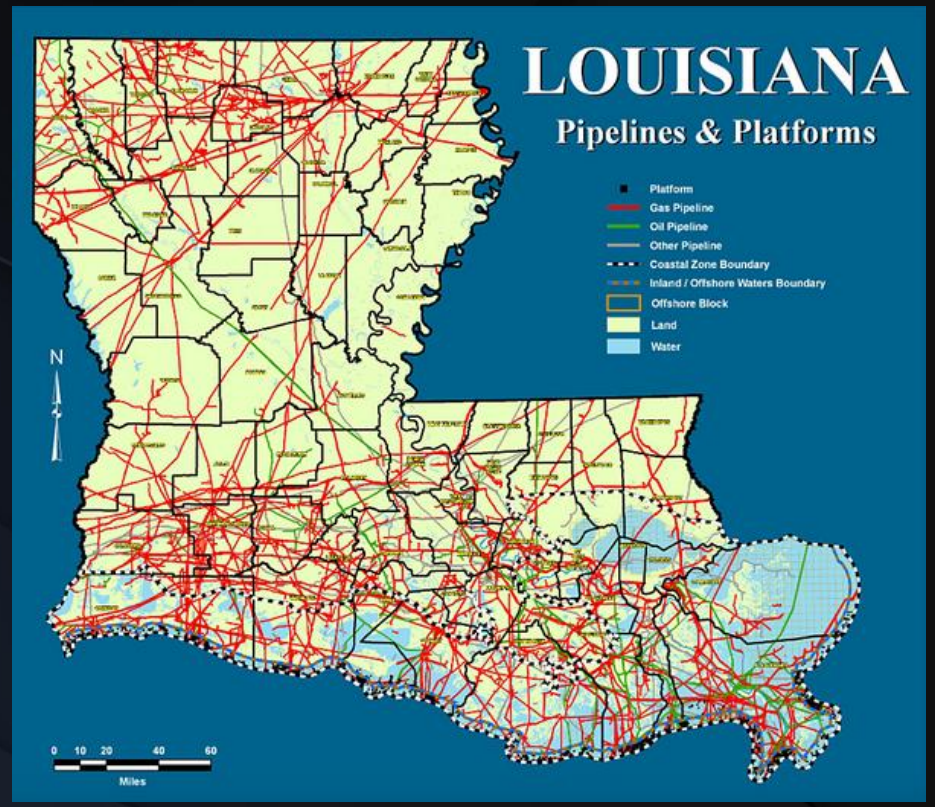
- **Pipelines transporting CO_2 in a supercritical state are covered by hundreds of federal requirements**
  - As a result of the Pipeline Safety Reauthorization Act of 1988, PHMSA expanded its federal pipeline safety regulations to cover CO_2 pipelines in 1989.
  - 49 CFR Part 195 prescribe federal safety requirements on the construction, inspection, maintenance, monitoring and incident response for CO_2 pipelines.

Category	PHMSA Regulation	Regulatory Activity
A - General	CFR 195.3	Requirements for design, construction, operation, control room management, integrity management and emergency response
	CFR 195.11	Regulated rural gathering lines
B - Reporting	CFR 195.52	Notice of Incident - Operators must report incidents at the earliest practicable moment following discovery
C - Design Requirements	CFR 195.106	Internal Design Pressure
	CFR 195.111	Fracture Propagation - CO_2 pipelines designed to mitigate effects of fracture propagation
	CFR 195.112	New pipe - Requirements associated with installation of new pipe
D - Construction	CFR 195.206	Material Inspection - Visual inspection of components prior to installation
	CFR 195.210	Pipeline Location - Right of way selected to avoid dwellings
	CFR 195.234	Welds: Nondestructive testing
	CFR 195.248	Cover over buried pipeline
	CFR 195.250	Clearance between pipe and underground structures
	CFR 195.260	Valves: Location

Category	PHMSA Regulation	Regulatory Activity
E - Pressure Testing	CFR 195.304	Test Pressure
F - Operation & Maintenance	CFR 195.402	Procedural manual for operations, maintenance, and emergencies
	CFR 195.403	Emergency response training
	CFR 195.406	Maximum Operating Pressure
	CFR 195.407	Communications
	CFR 195.414	Inspections of pipelines in areas affected by extreme weather
	CFR 195.412	Inspection of rights-of-way
	CFR 195.440	Public Awareness
	CFR 195.446	Management of control rooms for operating and monitoring pipeline systems
	CFR 195.452	Integrity Management programs for inspection and maintenance of pipelines
G - Operator Qualification	CFR 195.505	Ensure pipeline personnel performing covered tasks are qualified
H - Corrosion Control	CFR 195.563	Cathodic Protection

Federal and State Regulations

- **49 CFR 60105-60106 allow for States to assume safety authority over intrastate hazardous liquid and CO_2 pipelines.**
  - PHMSA authorized the Louisiana Department of Conservation and Energy (C&E) to enforce federal pipeline safety regulations as well as those enacted by the Louisiana legislature, for intrastate pipelines.
- **C&E regulates more than 4,500 miles of hazardous liquids pipelines in Louisiana.**
  - Anhydrous Ammonia
  - Chlorine
  - Sulfuric Acid
  - Sodium Hydroxide
- **PHMSA and C&E audit, inspect and enforce compliance of federal and state CO_2 pipeline safety requirements.**



Construction

- **CO_2 pipeline systems are designed to be safe**
  - Route selection leverages existing ROWs and avoids HCAs as much as practicable
  - Safety systems designed to mitigate identified risks
- **Built to be fit-for-purpose with proven materials**
  - Steel mills are certified and pipe inspected before leaving mill
  - Typically, thicker-wall carbon steel pipe, which can act as a mechanical buffer
  - ANSI 900 standards to withstand greater pressures
  - Fracture control as indicated
  - Corrosion-resistant coatings
  - Cathodic protection systems
- **Construction practices maintain safety**
  - Welds are inspected and x-rayed
- **Inspected, tested and proven before startup**
  - LDCE audits and inspects pipeline construction activities
  - Pipeline hydro-tested before startup
  - Commissioning designed to ensure safe operation

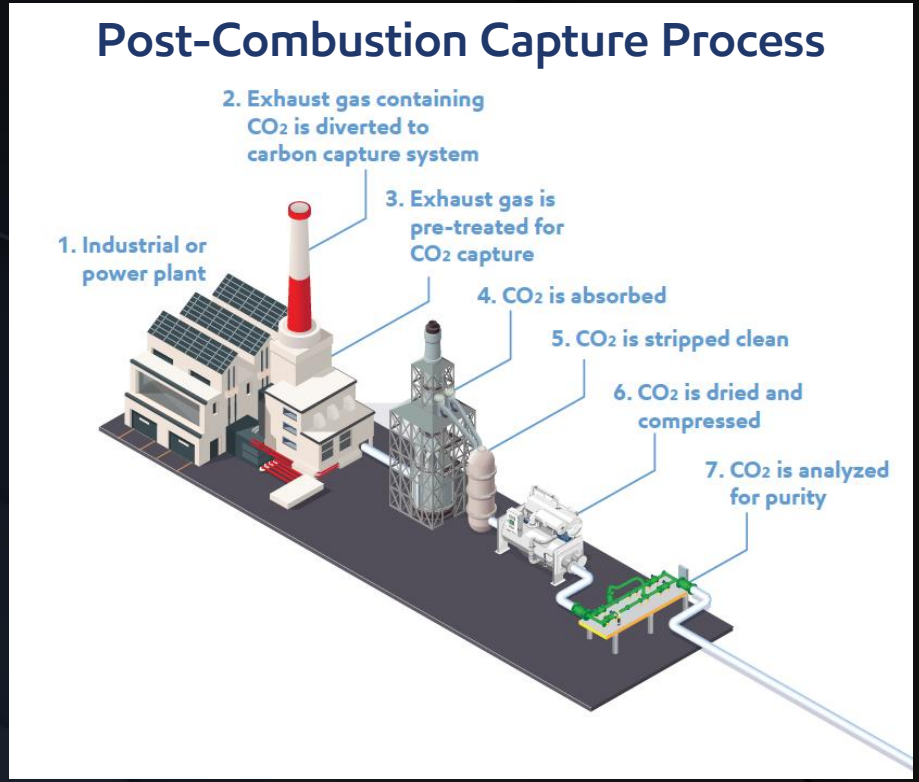


Pipeline-Quality CO_2 Stream

- **Carbon capture process provides pipeline-ready CO_2 stream**
  - Pre-Combustion Capture
    - Flue gas is diverted from stack to the capture system
    - Impurities are removed
    - CO_2 is dehydrated to remove water
  - Post-Combustion Capture
    - Extra steps to separate and strip CO_2 from flue gas

- **Cleaned, dried CO_2 stream is compressed and analyzed for "purity" before being placed into pipeline in a supercritical state**

- **Stream quality is constantly monitored**
  - Safety systems detect high-water level and prompt pipeline shutdown

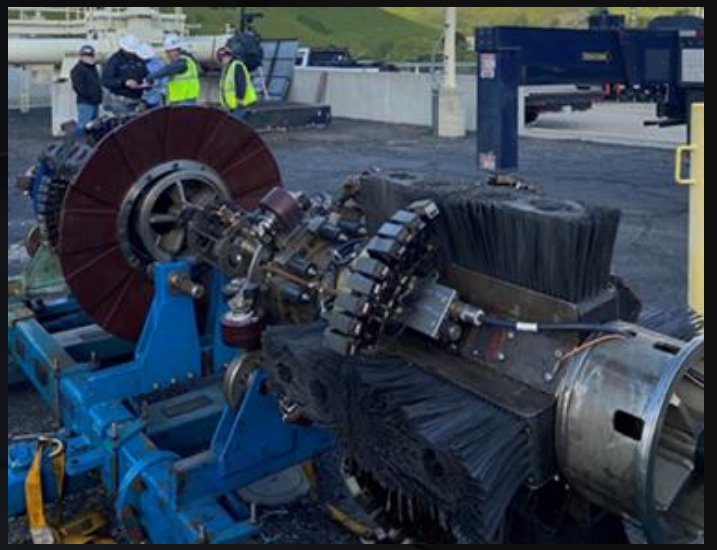


Integrity Management Programs

- **Federal regulations require Integrity Management Programs (IMP) for CO_2 pipelines that cross High Consequence Areas (HCAs)**

- **Risk-based approach toward maintaining safe operations**
  - Assesses risks to the fitness of the pipeline
  - Customizes a maintenance system that mitigates those risks

- **Primary elements**
  - Identifying, prioritizing and managing risk
  - Performing integrity assessments and inspections
    - Including in-line inspections (smart pigs) and hydro-tests
  - Integrating data from multiple monitoring sources
  - Conducting preventive maintenance and making repairs



CO_2 Pipeline Monitoring

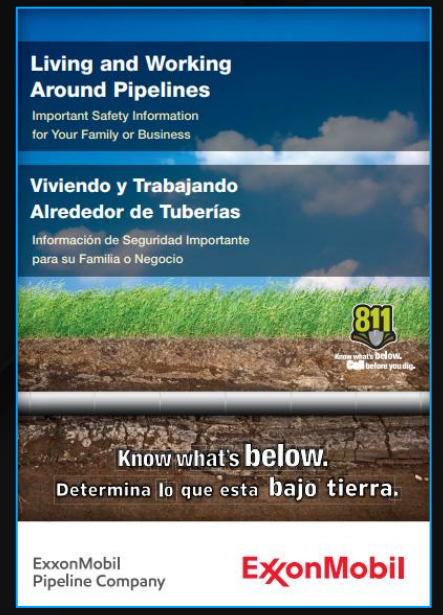
Multiple layers of CO_2 pipeline monitoring

- On-site
  - Pipeline technicians visually inspect pipeline facilities and rights-of-way as a part of their regular, everyday work
- From the air
  - Pilots, trained to recognize unusual features needing further inspection, inspect the ROW biweekly
- Remotely
  - Operations control centers are connected to pipeline facilities by cellular and/or satellite communications
  - Specially trained controllers oversee pipeline operations and monitor pipeline pressures and flows, 24/7
  - Leak detection systems alarm if sense pressure drops or other unusual circumstances
  - Operators can shut systems down with a push of a button



Public Awareness

- **49 CFR 192.616 and 49 CFR 195.440 require CO_2 pipeline operators to develop and implement public awareness programs**
  - API Recommended Practice (RP) 1162, "Public Awareness Programs for Pipeline Operators" incorporated by reference into federal regulations
- **Designed to provide stakeholder audiences with information about pipeline ops, pipeline safety, damage prevention and emergency readiness**
  - 1) Affected public living, working or congregating near the pipeline; 2) emergency responders and officials; 3) local public officials; and 4) excavators
- **ExxonMobil Pipeline Company's comprehensive public awareness program**
  - Communicate with stakeholder groups on a regular basis
  - Install pipeline ROW markers according to 49 CFR 195 requirements
  - Meet with and brief locally elected officials to apprise them of pipeline operations
  - Meet with and brief emergency responders on a regular basis
  - Conduct gap analyses for required equipment
  - Attend LEPC/OSHEP meetings





One-Call Program

- Despite joint government and industry efforts, third-party damage remains a leading cause of pipeline incidents
- All regulated pipelines are included in Louisiana's State One Call System (LA 811)
- Field Technicians review and respond to all One Calls within 850 feet of pipelines per State response timeline requirements
  - Responses to One Call tickets are documented and are sent to the state one call center and excavator
- For all work within 25 feet of pipelines, field technicians physically verify and mark pipelines, including depth, prior to work
  - Monitor all work activity during execution





Emergency Preparedness

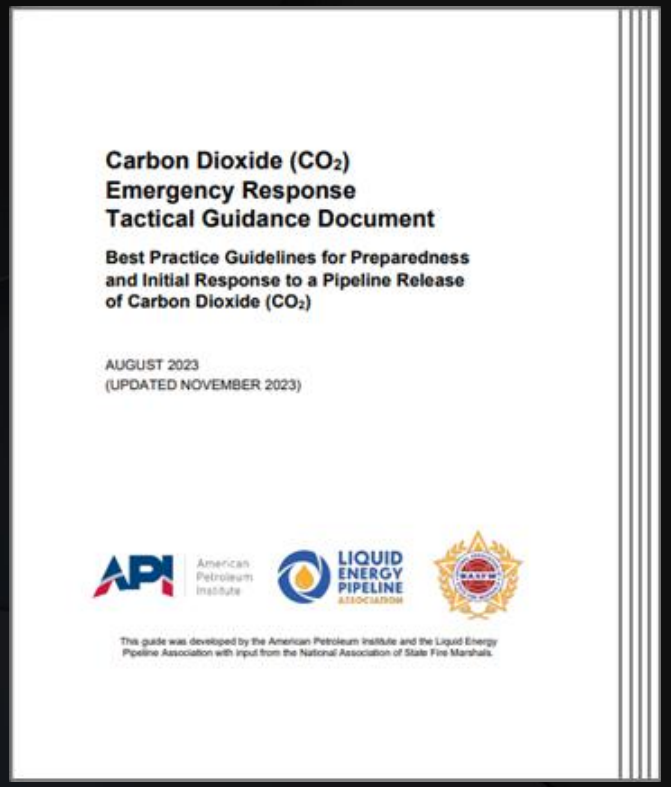
- **Regulations require Emergency Response Plans (ERP)**
  - Outlines risk scenarios
  - Helps identify, classify, and detail effective response to emergencies

- **Regulations require Emergency Response Drills to be conducted with local emergency responders on a regular basis**
  - Goals
    - Practice and identify areas of improvement for the plans
  - Frequency
    - Worst-case scenario drills conducted every three years
    - Other scenarios drills conducted annually
  - Participants
    - Potential first responders, including local municipal and volunteer fire departments, EMS, Parish and Municipal law enforcement, OHSEP, third-party response contractors, LA State Police, elected officials
  - Planning
    - Operators participate in ICS training and assign specific roles in the ICS structure
    - Field response personnel complete HAZWOPER and Emergency Response training

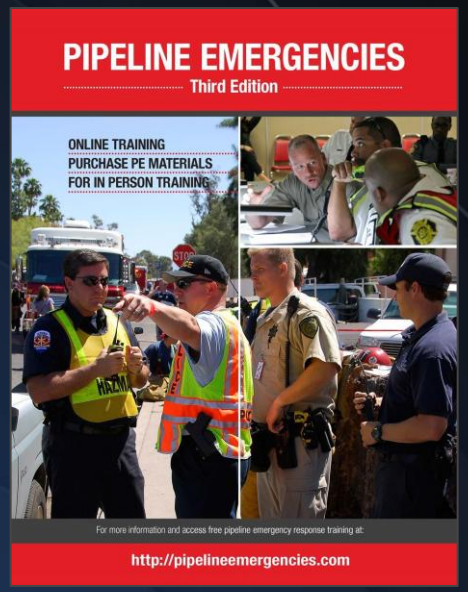


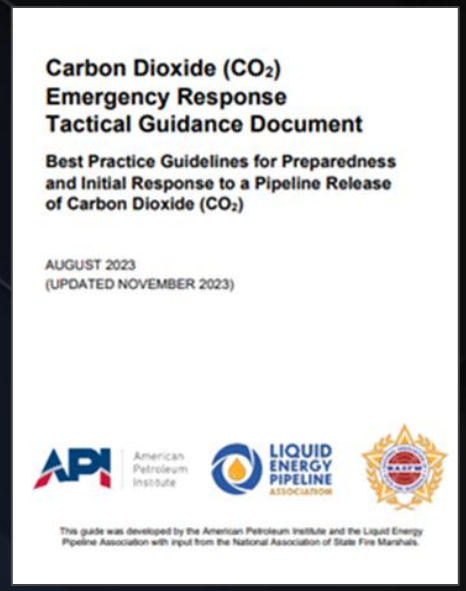
Emergency Response Learnings

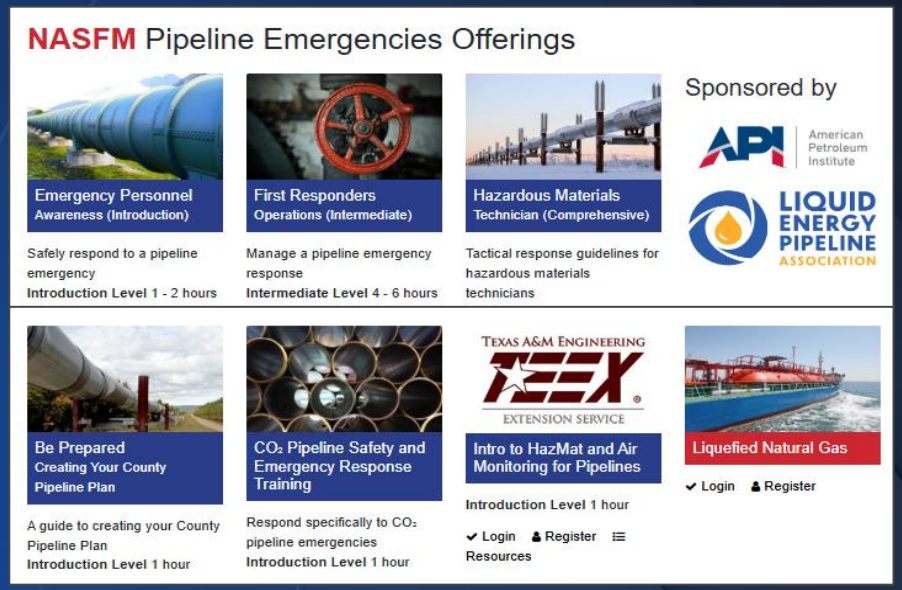
- **Some Lessons Learned**
  - Short duration of incidents makes it important to establish immediate communication with Unified Command/Incident Commander
  - Reliance on first responders along routes requires operators to train them on CO_2 response tactics
  - Potential for evacuation order calls for briefing emergency management officials
  - Potential for shelter-in-place order calls for ability to implement community air monitoring as soon as practicable
  - Potential for health impacts calls for briefing healthcare providers
  - Public interest calls for engaging with affected public and providing facts to media



Emergency Responder Training Resources









EMPCo CO_2 Emergency Responder Training

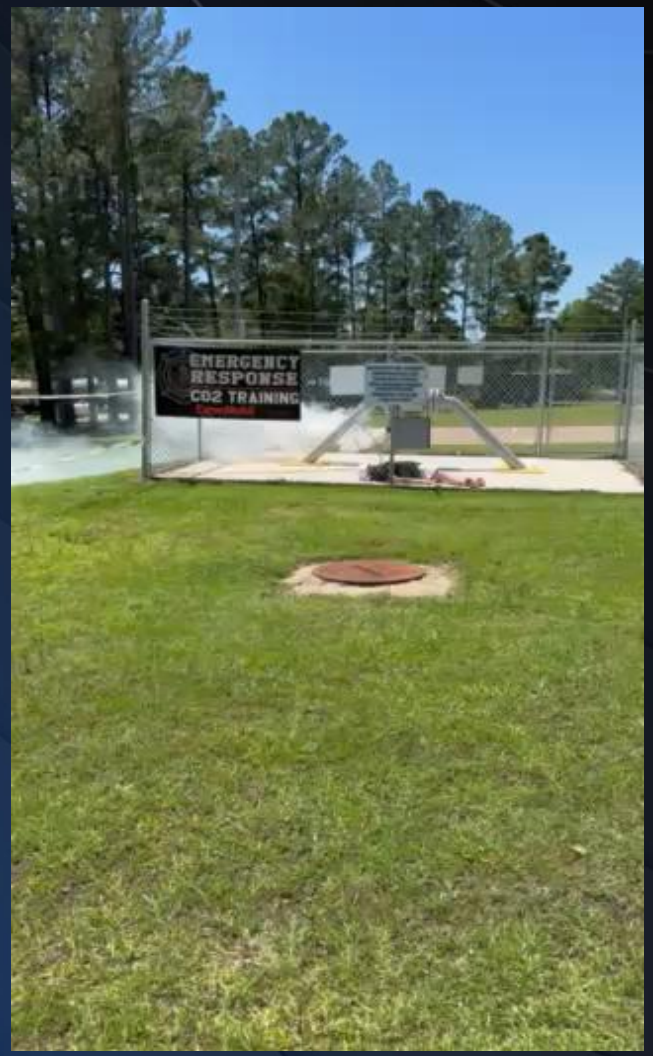
- **ExxonMobil's Industry-Leading Firefighter Training**
  - Specifically designed to help prepare firefighters to manage hazardous liquids and CO_2 pipeline emergencies.
  - The classroom and hands-on training
  - EMPCo provides the training free-of-charge
- **EMPCo has trained nearly 700 firefighters, representing over 100 fire departments**
- **CO_2 module initiated 1Q2023**
  - Integrated API-LEPA-NASFM ER guide on how to plan, prepare and respond to CO_2 releases



On-Location Training at Regional Facilities



3 regional locations
13 total trainings
500 available seats in 2026





No cost to responders, local governments or taxpayers

Standards & Research

- **Industry is engaged in a never-ending pursuit of continuous safety improvement**
- **API Recommended Practice 1192 on CO_2 pipeline transportation**
  - EMPCo helped lead industry effort to review and enhance current industry best practices
  - Published December 2025
  - New recommended standards for CO_2 design, construction, operation, maintenance, and emergency preparedness
- **Emerging Fuels Institute (EFI) of the Pipeline Research Council International (PRCI)**
  - ExxonMobil among founding members
  - Conducted gap analysis of scientific research on CO_2 pipeline topics
  - Progressing research to advance knowledge in key operational and safety areas





Community Outreach

- **Stakeholder engagement promotes pipeline safety**

- **Our Priorities**
  - Conduct consistent, meaningful community engagement
  - Focus on building lasting relationships with community
  - Enhance safety awareness and emergency preparedness
  - Identify community investment opportunities
  - Increase awareness and understanding of CO_2

- **2026 LA Educational Initiatives**
  - Conducted CO_2/CCS camps at Southern Univ for the 4th year
  - Trained Ascension Parish teachers to provide CO_2/CCS curriculum to more than 1,700 students
  - Investing in professional development with SOWELA





CO_2 pipelines have operated safely in the U.S. for more than 50 years

Elements of Safety

Regulation	Construction	Stream Analysis
Integrity Management	Pipeline Monitoring	Public Awareness
Emergency Response	Standards & Research	Community Outreach


ExxonMobil