

# CO<sub>2</sub> Pipeline Safety

Protecting Communities & the Environment

**Statistics show the transportation of CO<sub>2</sub> 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.<sup>1</sup>**

– U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA)

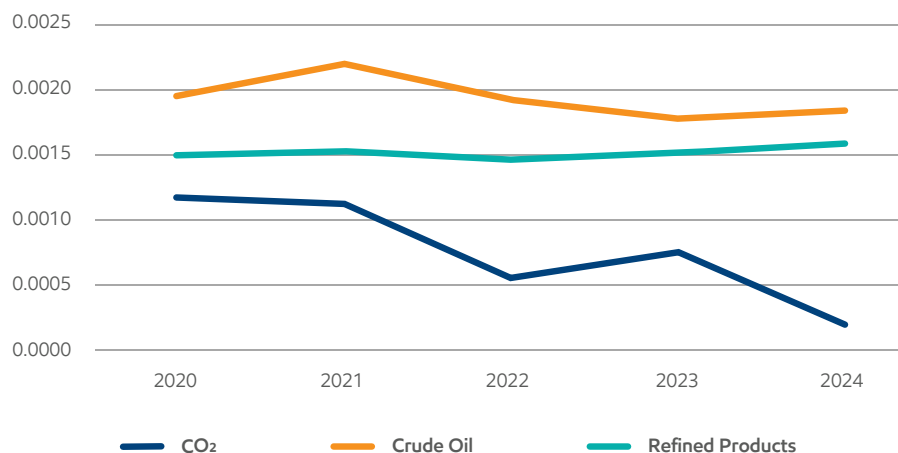
**CO<sub>2</sub> pipelines have a low risk profile. CO<sub>2</sub> pipeline accidents release on average only 0.0025% of all the CO<sub>2</sub> transported per kilometer per year.<sup>2</sup>**

– Stanford University

**CO<sub>2</sub> pipelines have operated in the U.S. for more than 50 years.**

- Approximately 5,500 miles of CO<sub>2</sub> pipelines safely transport about 68 million tons of CO<sub>2</sub> per year in the U.S.
- Federal pipeline safety data show CO<sub>2</sub> pipeline incidents are rare on a per mile basis.
- From 2000–2025, the average yearly CO<sub>2</sub> pipeline incident rate was less than 0.002 incidents per pipeline mile.
- CO<sub>2</sub> pipeline releases typically result in relatively minor, on-site impacts. About 20% of property damage related to incidents since 2010 has affected public areas, with the vast majority limited to operator facilities and equipment.

**Liquids Pipelines Incidents Per Mile<sup>5</sup>**



**PHMSA CO<sub>2</sub> Pipeline Incident Data**

| Year          | Incidents <sup>3</sup> | Fatalities | Injuries <sup>4</sup> |
|---------------|------------------------|------------|-----------------------|
| 2000          | 1                      | 0          | 0                     |
| 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                     |
| <b>TOTALS</b> | <b>116</b>             | <b>0</b>   | <b>1</b>              |
| <b>AVG/YR</b> | <b>4.6</b>             | <b>0</b>   | <b>0</b>              |

<sup>1</sup> Pipeline and Hazardous Materials Safety Administration, Carbon Dioxide Pipeline Regulation and Safety Oversight, p. 15, March 2023. <https://puc.sd.gov/commission/dockets/HydrocarbonPipeline/2022/HP22-002/testimony/Navigator/MHerethExhC.pdf>

<sup>2</sup> Yannick Schueler, Sarah D. Saltzer, and Sally M. Benson, "Accident Analysis of CO<sub>2</sub> Pipeline Failures: Patterns, Detection, and Consequences," International Journal of Greenhouse Gas Control 152 (May 2026): 104621, <https://doi.org/10.1016/j.ijggc.2026.104621>

<sup>3</sup> PHMSA defines reportable incidents as releases that involve a fatality or injury requiring hospitalization, an explosion or fire, a release of five gallons or more, or estimated property damage exceeding \$50,000, including cleanup and repair costs.

<sup>4</sup> PHMSA defines injuries as those sustained as a result of the incident and requiring both hospital admission and at least one overnight stay.

<sup>5</sup> Liquid Energy Pipeline Association, CO<sub>2</sub> Pipeline Safety: Track Record of Safety, 2025. <https://liquidenergypipelines.org/Documents/en-us/ace6627c-879d-426b-9c20-00e84ac88ba/1>

*The one reported injury involved a contractor hurt during the excavation of a CO<sub>2</sub> pipeline.*

As with any beneficial industrial process, transporting CO<sub>2</sub> involves risks, including that at very high concentrations CO<sub>2</sub> can displace oxygen. Recognizing these risks, government and industry focus on safe design, construction and operating practices. This focus has resulted in the industry's 50-year history of safe operations. Building upon this track record, ExxonMobil Pipeline Company (EMPCo) continues to lead the development of enhanced safety practices and standards.

## Government Regulation

- Hundreds of federal safety requirements govern CO<sub>2</sub> pipeline construction, inspection, maintenance, monitoring and emergency response.
- Federal law allows states to assume safety authority over intrastate hazardous liquid and CO<sub>2</sub> pipelines.
- PHMSA and relevant state agencies audit, inspect and enforce compliance of federal and state safety requirements.

## Integrity Management Programs

- Federal law requires Integrity Management Programs (IMP) for pipelines in High Consequence Areas (HCAs), such as populated areas.
- IMPs are risk-based systems that assess the risks to the safe operation of each pipeline and customize operations programs to mitigate those risks.
- The primary elements of an IMP include identifying, prioritizing and managing risks; performing integrity assessments; integrating data from multiple monitoring sources; conducting preventive maintenance and making repairs.
- Inspections include using diagnostic tools called "smart pigs" that travel inside pipelines scanning the pipe walls for items that should be addressed.

## CO<sub>2</sub> Pipeline Monitoring

- EMPCo's controllers monitor pipeline operations 24/7 from our state-of-the-art operations control center.
- The control center is connected to pipeline facilities by cellular and/or satellite communications and can shut down pipelines with a press of a button.
- On-site, technicians regularly inspect the pipeline facilities and rights-of-way.
- Specially trained pilots conduct aerial patrols along the pipeline route to look for unusual conditions.

## CO<sub>2</sub> Pipeline Emergency Preparedness

- EMPCo has developed an industry leading safety culture and integrity management program designed to prevent incidents from happening.
- To help prepare for the rare possibility of an incident, we regularly meet and train with emergency response officials and first responders.
- We attend Local Emergency Planning Committee (LEPC) meetings organized by county/parish emergency response officials and conduct in-person briefings with public officials along our routes. During these meetings we provide guidance and on-site training. We also conduct periodic drills with first responders to practice emergency response tactics.
- EMPCo provides grants for emergency response equipment to fill gaps as much as practicable.

## Recognized Safe Operator

- The American Petroleum Institute (API) has honored EMPCo with its top safety award four years in a row, 2022-2025.
- The National Association of State Fire Marshals (NASFM) recognized EMPCo's promotion of emergency preparedness with its Norman Mineta Excellence in Transportation Safety Award.
- API experts rated EMPCo's pipeline safety management system with some of the highest scores in the history of API's safety audit.

## Snapshot of Satartia CO<sub>2</sub> Incident

The most significant CO<sub>2</sub> pipeline incident occurred in a hilly region near Satartia, MS. Forty-five people sought medical care at the nearby hospital, no one needed to be admitted overnight and no lives were lost.

The release was caused, not by the CO<sub>2</sub> flowing through the pipeline, but by a landslide that placed so much force on the pipe, it broke in two. CO<sub>2</sub> pipelines are built with such strong materials to withstand great pressures that this remains the only full-bore rupture of a CO<sub>2</sub> pipeline.

In response, ExxonMobil and the rest of industry enhanced their practices in three key areas: geohazard monitoring and prevention to mitigate the risks of land movement, dispersion analysis modeling to better predict CO<sub>2</sub> flow over hilly, complex terrains and emergency preparation to better coordinate and train with first preparation. Today's operations are safer as a result.



EMPCo led industry efforts to enhance CO<sub>2</sub> pipeline emergency response standards. We now conduct the industry's first hands-on CO<sub>2</sub> emergency response training at Texas A&M's TEEX Brayton Fire Training Field, Louisiana's Fire and Emergency Training Academy and the Mississippi Fire Academy.



EMPCo operates a mobile training trailer that allows us to take emergency response training directly to fire departments. The trailer contains pipeline props and other materials we use to provide realistic, hands-on training.