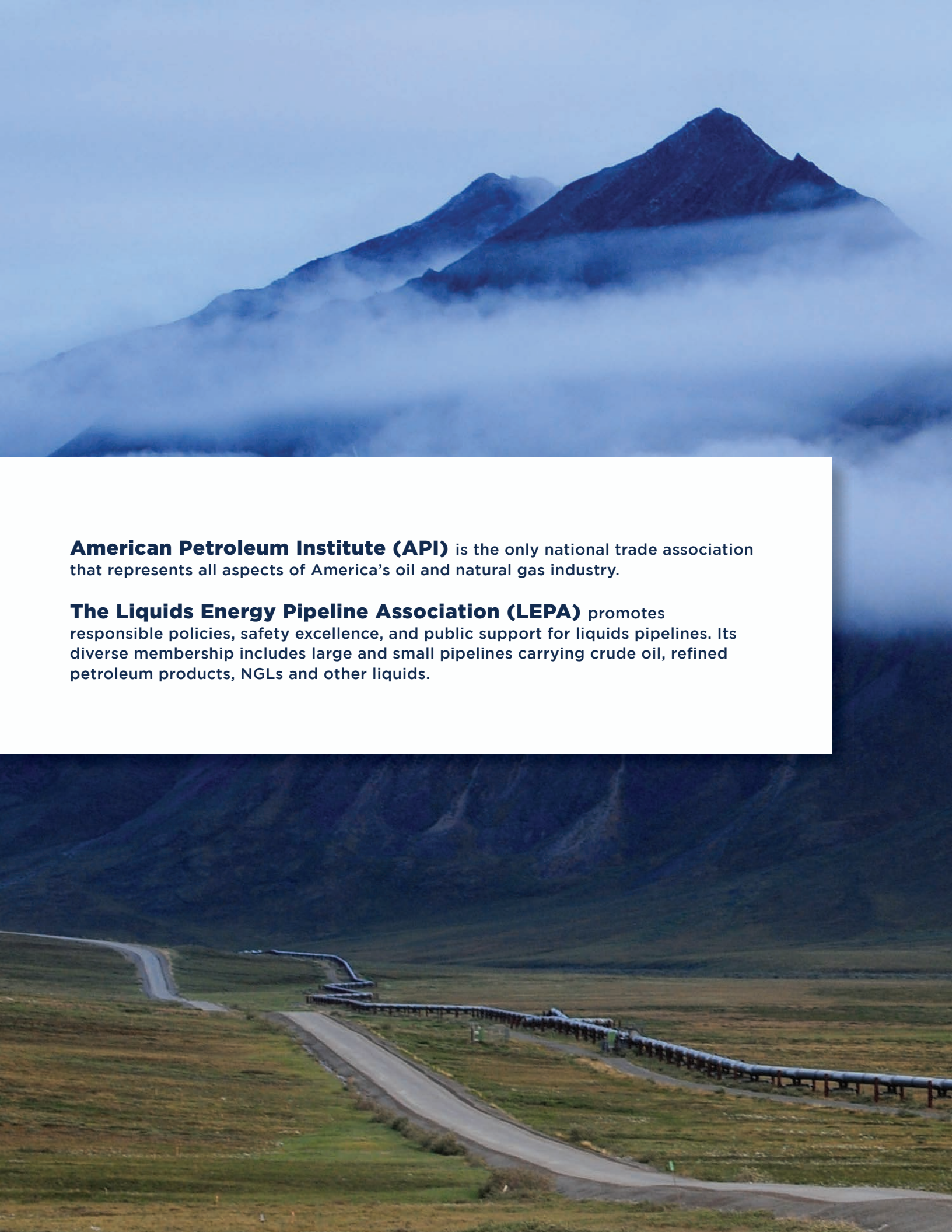
2024 PIPELINE PERFORMANCE REPORT

& 2023-2025 PIPELINE EXCELLENCE STRATEGIC PLAN

API | LIQUID ENERGY PIPELINE ASSOCIATION



American Petroleum Institute (API) is the only national trade association that represents all aspects of America's oil and natural gas industry.

The Liquids Energy Pipeline Association (LEPA) promotes responsible policies, safety excellence, and public support for liquids pipelines. Its diverse membership includes large and small pipelines carrying crude oil, refined petroleum products, NGLs and other liquids.

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STEVEN A. YATAURO
PRESIDENT, EXXONMOBIL PIPELINE COMPANY LLC
Chair, API-LEPA Pipeline Safety Excellence Steering Committee

Message from the

PIPELINE SAFETY EXCELLENCE STEERING COMMITTEE CHAIR

Today, when change is all around us, one constant the American public can rely on is pipeline safety and reliability.

Out of sight and out of mind, pipelines consistently deliver the energy our nation depends on with fewer incidents per barrel delivered every year. These products are at the root of a vital supply chain that both drives productivity, innovation and growth and provides a wide array of benefits to businesses and consumers. Pipelines remain critical to achieving the goals of energy dominance and energy security while adding lower-carbon options for our country.

Importantly, as the demands on our nation's pipeline network have increased – the U.S. again set domestic oil production records in 2024 – pipeline safety performance continues to improve. Our industry constructed more than 3,000 additional pipeline miles and delivered greater than 15% more barrels of liquids between 2019 and 2023, yet pipeline incidents declined significantly. According to the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration, total liquid pipeline incidents decreased 13%, or by 42 incidents, since 2020. Looking more closely at the data, incidents affecting people or the environment declined 13%; integrity management incidents were down 33%; and operations and management incidents decreased 22%.

Although these metrics represent significant progress in safe and responsible performance, the pipeline industry remains committed to continuous improvement by advancing technological innovations and enhancing standards. Pipeline operators share the goal of reducing CO_2 emissions by capturing and storing them underground, and, in 2024, operators proactively advanced a new recommended practice (RP) for CO_2 pipeline transportation, which is expected to be published in 2025. Another example was the publishing of RP 1185, Pipeline Public Engagement*, which encourages meaningful, two-way engagement between operators and the communities where we operate. RP 1185 was the culmination of a multi-year effort to establish a framework that seeks to strengthen trust, transparency, responsiveness and accountability with our public stakeholders and government representatives.*

Those are just two examples of the tremendous work our industry completed last year toward improving our industry's safe and responsible operations. I invite you to learn more about our other efforts to mitigate pipeline corrosion, improve workforce development and prevent cyberattacks, along with additional new focus areas in the following update to the API/LEPA 2023-2025 Strategic Plan.

Entrusted with transporting the resources that underpin both our lifestyles and national security, pipeline operators remain committed to the never-ending pursuit of enhancing safety and reliability. I hope you enjoy the following overview of both our past results and future plans as we continue to work toward zero incidents.

STEVEN A. YATAURO
President, ExxonMobil Pipeline Company LLC
Chair, API-LEPA Pipeline Safety Excellence Steering Committee

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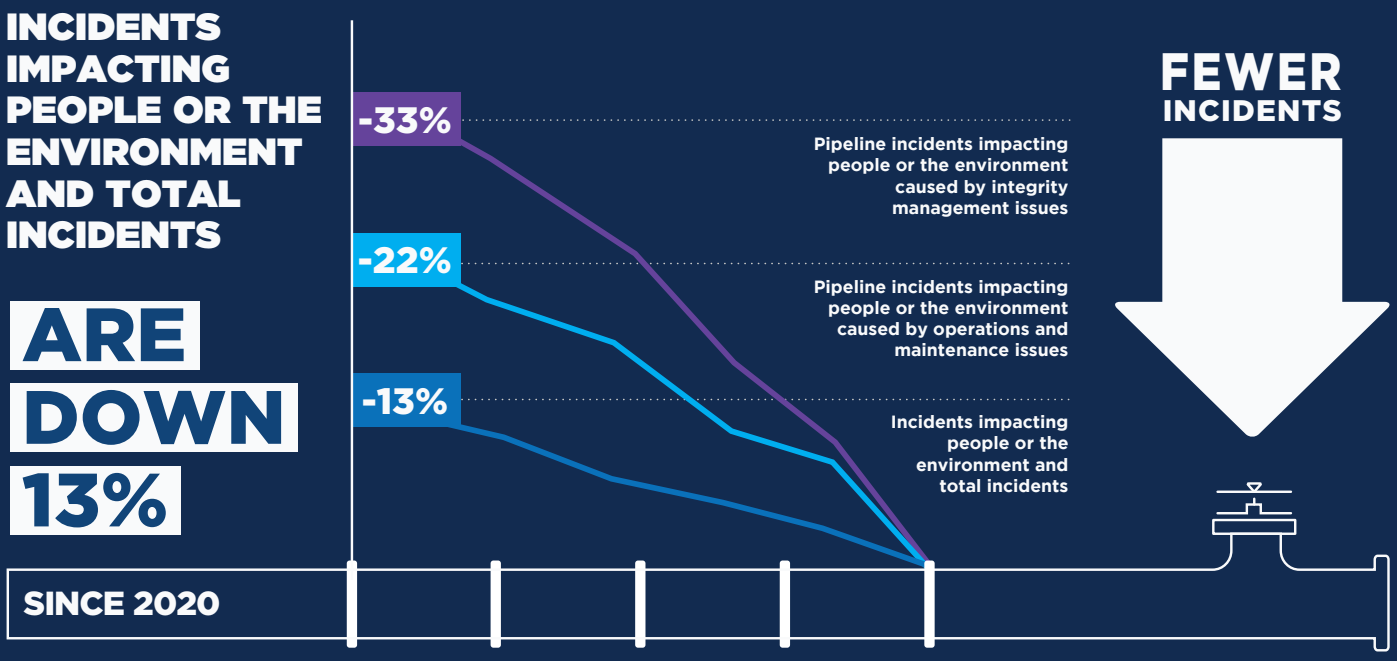
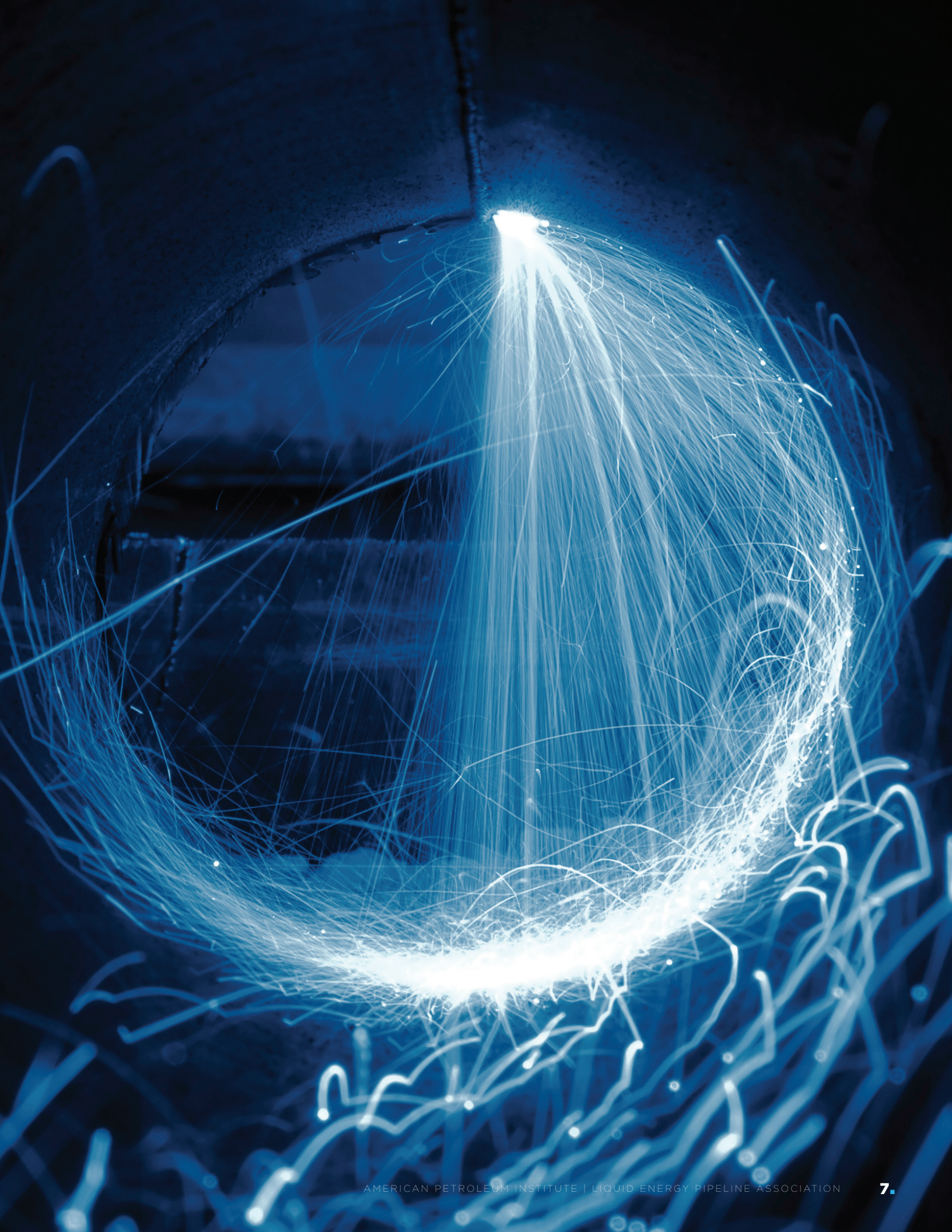


EVEN AS BARRELS DELIVERED HAVE INCREASED OVER 15%

Data from the U.S. Pipeline and Hazardous Materials Safety Administration & U.S. Federal Energy Regulatory Commission



Positive Community Impacts

KEVIN BOLLAND

Kevin Bolland's father started the family engine building and repair business in 1962 in Beaver Falls, Pennsylvania. The family business started off working on riverboats, coal mining, sand and gravel before evolving into engine building and reconstructions for compressor stations used in natural gas pipelines.

Along with the family business, Kevin learned to race from his father, first with go-karts, then motorcycles and eventually cars, a journey based on his evolving choice. He worries that an electric vehicle mandate might eliminate this choice for others in the future.

Kevin knows what a family-owned small business needs to thrive. "We need to take full advantage of our nation's energy resources, to give consumers affordable choices and drive the development of a trained workforce." Kevin knows the pipeline sector provides the energy and jobs his region needs.

Demand growth from manufacturing reshoring and data centers operationalizing artificial intelligence (AI) will increase the need for energy infrastructure as well as a skilled and qualified workforce needed to safely manage complex operations. Pipelines will provide high-paying jobs for this workforce and bring consumers the energy they need.

Workforce development programs can build the necessary skills and competencies for prospective employees supporting the energy industry, including family-owned businesses like Kevin's. Kevin participates in the Beaver County Career and Technology Center Advisory Board and believes in the importance of innovative approaches like virtual reality training, which can take trainees to gas compressor stations to do valve adjustments and maintain engine parts without the physical constraints. For Kevin, "it starts with the brick and mortar and the foundation, the people like us that actually create the opportunity, the jobs for the local market."

Positive Community Impacts

DELORA HESUSE

Delora Hesuse testified before Congress on the importance of energy production and infrastructure to the Navajo Nation and her community of Nageezi, New Mexico. Delora's father was a Navajo tribal councilman for 20 years, and her family has received minerals revenue since 1952 for access to oil and natural gas reserves underground. According to Delora, production royalties have improved her community's way of life, providing critical income in places of low employment and lack of access to electricity and running water. Energy provides the elements that Delora's community "use in our everyday life," including kerosene, gas and propane.

Policies to limit production on federal or tribal lands limit benefits to the local community. Restrictive onshore leasing rules, including bans on development near Chaco Canyon, impede investment in energy development on federal lands. In fact, new leases on federal lands are down 91% compared with the 20-year average.

Delora's testimony, along with participation in parades and fairs to spread this message, aims to protect her livelihood and the potential for "our children to live a better life." For Delora, "we just need to be heard. You know, we have a voice. We're here."

Pipelines connect these producing areas to refineries and processing centers, ultimately transporting the energy safely to manufacturing

centers, gas stations and airports. Pipeline operators are committed to working together for decades to come with the communities in which they operate, including establishing relationships built on trust, transparency, respect for cultural needs and equity. For both new and existing projects, operators seek to solicit community input, provide pertinent information and address concerns wherever possible. It's about improving the way of life and protecting the livelihood for Delora and many others just like her.

Positive Community Impacts

MICHAEL HOPKINS

Community partnerships and investments from pipeline operators and the energy industry help essential service providers continue their critical work amid rising inflation. A partnership with the Children's Service Center (CSC) in Wilkes-Barre, Pennsylvania made the mental health, primary care and substance use disorder services a reality today for those in need, according to CSC President Michael Hopkins. Thanks to industry support, the CSC and its adults-serving affiliate, the Robinson Counseling Center, serve 11,000 people and employ nearly 500 staff. The CSC celebrated 160 years of continuous service in April 2022.

Following an expansion project during the 2008 economic downturn and a devastating flood in 2011, investments from energy companies through a sustainability campaign helped the Dietrich Theater in Pennsylvania get back on track. Now, the theatre knows it will be there for future generations, a goal of its Executive Director, Erica Rogler.

Jamie Byrd, the Assistant Executive Director of Camp Freedom, tells a similar story. Industry support has allowed the camp to provide life-saving services to disabled veterans, first responders and Gold Star family members across 2,350 acres of land. Camp Freedom's year-round outdoor adventures to support healing have benefited over 8,500 veterans and their families along with over 3,500 first responders and their families.

Pipelines traveling through communities provide a steady source of tax revenue for local services. The U.S. Bureau of Labor Statistics recently cited a 20% cost increase in basic necessities, forcing American families to do more with less. The need for organizations like the Children's Service Center and Camp Freedom has never been greater.

Pipeline operators not only provide good-paying jobs and contribute to state and local economies, but they also support school systems, first responders and many other essentials in communities across the country.

Positive Community Impacts

SARAH JOHNSON

Sarah has lived in Pennsylvania for nearly four decades. She cites the longevity of her presence in the Keystone State to her work in the oil and natural gas industry. The company Sarah works for provides essential services to midstream and upstream energy facilities, including tank cleaning, casing, containment and water hauling. A recent study showed that the oil and natural gas industry supported more than 423,000 jobs, provided over $40 billion in wages and contributed over $75 billion to the state's economy in 2021. The average wage among industry jobs is 65% greater than the U.S. average.

Sarah believes that without the industry, thousands of workers like her may not have stayed in the state for so long. From pipeline operators and truck drivers to contractors and manufacturers, America's oil and natural gas industry supports a wide range of jobs across the state, with research showing that every direct job in the industry generates 3.6 additional jobs in Pennsylvania.

Permitting reform is essential to American energy dominance and supporting our workforce. Burdensome regulations and government red tape have made it nearly impossible to build anything in our country, squandering tens of thousands of good-paying American jobs.

Smart, comprehensive permitting reform will help ensure transparency, predictability, timeliness and durability. More than 80% of Americans support streamlining the permitting process for energy infrastructure projects. Reforms to the National Environmental Policy Act, Clean Water Act and judicial reform will help ensure we can build the infrastructure needed today and into the future. With critical liquid pipeline projects like the Portland-to-Montreal Pipeline taking 13 years between initial proposal and eventual cancellation, permitting reform is critically needed.

A Strategic Plan to

IMPROVE PIPELINE SAFETY

- **ZERO INCIDENTS**

  Only with a goal of zero safety incidents can accidents be minimized.

- **ORGANIZATION-WIDE COMMITMENT**

  Safety is emphasized at every level, from employees who accept personal responsibility for safety to managers who are vital to reinforcing a safety culture.

- **A CULTURE OF SAFETY**

  Promoting a workplace culture where safety is an enduring value that all employees share.

- **CONTINUOUS IMPROVEMENT**

  Pipeline operators believe that no matter how safe they already are, they can always improve safety.

- **LEARN FROM EXPERIENCE**

  Pipeline operators learn how they can improve safety from their own experiences and from other pipeline operators.

- **SYSTEMS FOR SUCCESS**

  Safety management systems bring a consistent, holistic structure to safety management, helping to improve safety performance.

- **EMPLOY TECHNOLOGY**

  From enhancing the performance of “smart pigs” and remote sensing systems to innovative ways to analyze and interpret integrity data, operators constantly develop new ways to advance pipeline safety.

- **COMMUNICATE WITH STAKEHOLDERS**

  Operators know that communicating and establishing a positive relationship with the public and other stakeholders is vital to improving safety.

2023-2025

PIPELINE STRATEGIC GOALS

1

PROMOTE ORGANIZATIONAL AND WORKFORCE EXCELLENCE

Develop and promote a robust safety culture through continuous improvement mechanisms and voluntary industry implementation of Pipeline SMS. Transform industrywide sharing into a robust, sustainable program and emphasize the benefits and power of data integration. Attract, train and retain a work force that is qualified to manage complex operations. Boost operator and first responder planning, preparedness and response capabilities.

2

IMPROVE SAFETY THROUGH TECHNOLOGY AND INNOVATION

Drive industrywide engagement in advancing pipeline inspection capabilities to achieve the pipeline industry's goal of zero incidents. Create sustainable, workable frameworks for operator leak detection management and enhance detection capabilities. Improve corrosion detection and response capacity, as well as geohazard detection and mitigation capabilities.

3

INCREASE STAKEHOLDER AWARENESS AND ENGAGEMENT

Improve industry's engagement with the public and government through the adoption and implementation of a recommended practice. Promote robust and effective public awareness and damage prevention programs to reduce excavation damage from all parties and protect critical infrastructure systems.

4

ADDRESS CYBERSECURITY THREATS

Prevent cybersecurity incidents from occurring by engaging in effective policymaking, advancing cybersecurity best practices and promoting sharing and learning among operators and regulators. Promote safe and timely responses after cyber events through industrywide guidance.

5

ADVANCE SAFE AND SUSTAINABLE ENERGY FUTURE

Facilitate pipeline transportation and storage of CO_2 through revised emergency planning and response guides for operators and expanded training for first responders. Prepare guidance for safe CO_2 pipeline construction and operations and participate in industry CO_2 pipeline research. Limit environmental and community impacts using a midstream conservation program for pipeline rights-of-way and expand liquids participation in environmental partnerships.

1 PROMOTE ORGANIZATIONAL AND WORKFORCE EXCELLENCE

Objective 1.1:

Expand Safety Management Practices

Pipeline operators are voluntarily and proactively implementing API Recommended Practice (RP) 1173, *Pipeline Safety Management Systems*, to improve safety performance and reinforce safety culture. Following the RP's initial publication in 2015, an Industry Team formed, comprised of liquids and gas gathering, transmission and distribution pipeline operators, as well as contractors and trade associations. The Team provides a unified approach to grow PSMS maturity, expand voluntary efforts, build safety culture and learn from others. The Team continues to focus on four strategic initiatives: increase industry participation, support operator and contractor journeys, engage stakeholders and provide governance and oversight.

In 2024, operators made significant progress revising RP 1173, 1st edition, published a computer-based training for field staff, began assessments of contractors' Pipeline SMS programs and conducted a first-of-its-kind annual survey. API formed an RP 1173 Task Group to identify sections of the RP needing enhanced clarity or necessary revisions, including integrated safety culture characteristics into each program element and creating annexes for very small operators, pipeline process safety and public engagement. The annex for very small operators aims to scale Pipeline SMS implementation to a feasible and realistic expectation for operators with fewer employees or reduced throughput while not jeopardizing the foundational integrity of the RP. API and the Industry Team also rolled out a Contractor Assessment Program alongside the existing operator counterpart to assess contractors' Pipeline SMS programs and increase consistency with operator systems. In 2024, four contractor assessments were conducted along with seven operator assessments. The Team also revised its survey approach for both new and returning implementers to better identify barriers to implementation for those early in the journey and improve effectiveness for long-term implementers, along with providing a new contractor survey as well.

In 2025, API will ballot the second edition of RP 1173 and the Team will resolve any comments, aiming to publish the document in late 2025 or early 2026. The Team will also support additional assessments with both contractors and operators, routinely publishing updated benchmarking data for past participants. The Team will use the 2024 Annual Report, which highlights survey results, to engage external stakeholders on industry's voluntary progress while soliciting future improvements and working on an RP for pipeline safety metrics. Industry members will prepare for the 2026 safety culture survey among both liquids and gas transmission operators, continuing progress from the 2020 and 2023 cycles. These efforts, among many others, will maintain industry's proactive work while continuously improving safety performance and safety culture.

Objective 1.2:

Promote Timely Safety Sharing and Learning

The liquids pipeline industry has a long track record of sharing and learning to drive continuous improvement in pipeline safety. Liquids pipeline operating companies commit significant resources to supporting sharing and learning activities and integrating lessons learned from the experiences of others into their practices as part of the industry safety culture. Sharing experiences, knowledge and best practices is a cornerstone of operators' safety and integrity programs and is one of the pillars of SMS programs. API and LEPA member company representatives worked together to develop the *Guide to Sharing* and *Guide to Learning* to provide

a clear and simple process for determining whether and how to share safety lessons with peers across the pipeline industry and facilitate lesson learning. Sharing and learning occurs routinely among pipeline operators at many levels across the industry through meetings and conferences, peer-to-peer networking and benchmarking, webinars, podcasts, and other means. The liquids industry is promoting timely sharing of safety information and other important data and information that can help improve industry-wide performance and individual operators' best practices.

Throughout 2024, liquids operators used a broad range of platforms to support sharing and learning opportunities, including six podcasts to share information on API standards, Recommended Practices (RPs), and safety and integrity programs. In July, an operator hosted a webinar to share lessons learned from a CO_2 release at a facility in Louisiana, followed by a roundtable on CO_2 pipeline safety and development with senior representatives of PHMSA and the U.S. Department of Energy. Additionally, API sponsored the May 2024 Pipeline Conference and Exposition which was attended by nearly 800 participants, and held the 2024 Pipeline Information eXchange (PIX) event in November, with several hundred industry representatives attending. The PIX event included an industry workshop sponsored by API's Pipeline Integrity Group on Improving Pipeline Corrosion Management, with more than 80 participants attending. The outputs from the workshop will be used to support the development of an API RP on integrity management and assessment of metal loss in pipelines. Throughout the year, pipeline operator roundtable discussions and panel sessions on industry safety topics also occurred at API-LEPA Policy Group and Executive Leadership meetings, and requests for information (RFIs) were exchanged among API and LEPA member companies to share information and best practices for a range of pipeline safety topic areas. API and LEPA representatives also participated in industry conferences across the globe to promote industry sharing and learning, raising awareness of the use and application of industry consensus standards, and advocating for industry adoption of safety management systems, workforce development initiatives, and public awareness and engagement.

For 2025, the liquids pipeline industry will continue sponsoring informal roundtable discussions on a regular basis to address topic areas that affect pipeline operators. These informal exchanges will supplement more formal and established tools including webinars, workshops, safety tailgates, the API PIX Forum and the Pipeline Conference. In addition, liquids operators will conduct peer-to-peer benchmarking sessions to promote information sharing at a more in-depth level among operators to help solve problems related to similar challenges (e.g., corrosion failures on pipeline ROWs). One of the key areas of focus will be on the timely sharing of safety information and lessons learned through pipeline integrity incidents. Industry will conduct member surveys following sharing-and-learning events to capture how operators are incorporating learnings into manuals, procedures, process improvements, training and other programs.

Objective 1.3:

Attract, Train and Retain a Quality Workforce

Pipeline operators identified workforce development as an industry challenge, requiring a technically educated and experienced workforce to manage the complex operations of over 200,000 miles of liquid transmission pipelines across the U.S. To meet the expectation of safe operations, operators need to attract, train and retain a quality workforce in both the short- and long-term. This goal requires promoting science, technology, engineering and mathematics (STEM) career opportunities, developing competency-building programs for prospective employees, training and upskilling current workers and retaining high performers in the industry.

In 2024, API and LEPA held STEM education events, developed communications materials and formed the Workforce Development Group (WDG). LEPA also created a website promoting industry career opportunities. Recognizing the need for increasing public literacy on energy issues, API held two events on the litany of opportunities available in the oil and gas industry in Houston, Texas, and Las Cruces, New Mexico. The events gathered more than 10,000 students across two locations critical for the industry, with operators and service providers participating to demonstrate technology and safety initiatives. Additionally, API formed the WDG to review the existing SkillsReady curriculum, launched in 2022, to build off its foundational energy education program and develop a pipeline-specific curriculum for competency and skills-building. LEPA worked with a cross-functional team of engineering and human resource professionals to develop communications materials highlighting the benefits of a career in pipelines. The work produced materials available for sharing at recruiting events and display online. Through LEPA, the team designed and built a dedicated website, CareersInPipelines.com, to access the pipeline job promotion materials and serve as a landing site for interested candidates. The site will also maintain a pipeline job board that regularly collects and presents on the board job openings from LEPA member companies. The site and jobs board will go live in 2025.

In 2025, API will hold additional state education days and support the WDG's identification of gaps in existing curriculum and industry needs for skills

and competencies in entry-level or turnover-prone positions. Once those needs are identified, the WDG will work with existing workforce development partners and API's training programs to develop a curriculum addressing these skill gaps. API will continue engagement with organized labor, as well, including participation in the API Pipeline Conference and improving coordination between labor and industry. With the CareersInPipelines.com website and jobs board going live in 2025, LEPA will socialize the site and its materials with member companies for use in their pipeline employee recruiting efforts. LEPA also plans to roll out social media campaigns microtargeted around job fairs to highlight pipeline opportunities.

Objective 1.4:

Boost Operator and First-responder Planning, Preparedness and Response Capabilities

Effective emergency planning, training and response require advanced planning with the operator and local emergency authorities, with operators bearing the ultimate responsibility for pipeline incident response. The pipeline industry offers a host of free training opportunities and guidance documents to improve preparedness in the event of an emergency. Conducting drills and exercises by all parties also develops relationships and ensures response personnel are properly trained and maintain their skills.

In 2024, the pipeline industry through API and LEPA continued to support a *free, online pipeline response training program for first responders*. Developed in partnership with the National Association of State Fire Marshals (NASFM), the program trains local emergency personnel to respond safely to a pipeline emergency. The API-LEPA Emergency Response Group (ER Group) worked with NASFM to launch a new online training course on responding to CO_2 pipeline emergencies. The training was based on the API-LEPA CO_2 response guidance document, which was published in 2023. Additionally, the ER Group developed and published *Guidelines for Air Monitoring Tactics for Emergency Response*. This document is intended to guide first responders on how to conduct air monitoring during oil and chemical releases. The subteam of emergency response and public engagement experts worked to socialize training and guidance documents with first responders by sharing promotional materials at ER conferences and further outreach. These efforts showed progress on the utilization of the free training program for pipeline response, including increases of 16% in completions, 25% in CO_2 response, 65% in site users and 39% in returning sessions.

In 2025, the ER Group is focused on reviewing Recommended Practice 1174, *Onshore Hazardous Liquid Pipeline Emergency Preparedness and Response*. The first edition of this RP was published 10 years ago. Its update will be reflective of the strides that the pipeline industry has made in preparedness and response, and it will also address emerging challenges faced today. The subteam will also continue engaging first responders on existing resources through conferences, outreach efforts (including public awareness campaigns) and drills and exercises. As new guidance is finalized, the subteam will push these materials to target audiences to improve response preparedness.

2 IMPROVED SAFETY THROUGH TECHNOLOGY AND INNOVATION

Objective 2.1:

Advance Pipeline Inspection Technology and Analytics

Detecting and identifying conditions which represent a threat to pipeline integrity are central to ensuring the safe operation and reliability of pipelines. Pipeline operators inspect their systems on regular schedules, looking for indications that a pipeline or pipeline facility may need maintenance. Through these regular inspections using in-line inspection (ILI) and non-destructive examination (NDE) systems, pipeline operators analyze the health of pipelines and identify and fix issues before they become a problem. The systems include high-precision sensors and advanced methods of computational analytics to detect, characterize and locate anomalies in pipelines. Decisions on which anomalies require maintenance are supported by sophisticated engineering assessment methods and tools. Through its internal member company programs and membership in Pipeline Research Council International (PRCI), the liquids pipeline industry continuously leads initiatives to drive improvements in ILI and NDE technologies that have contributed to a decrease in pipeline releases that impact people or the environment.

In 2024, industry completed several important studies on ILI and NDE systems' improvements, including multiple test trials of these systems at the PRCI Technology Development Center (TDC). The ILI test trials provided data to support improvements in ILI systems' specifications for detecting, identifying, locating and sizing anomalies in pipelines. Performance trials were completed at the TDC to evaluate the ability of ILI systems to provide pipeline condition information for cracking and longitudinal seam anomalies, selective seam weld corrosion (SSWC) and hard spots. Work in 2024 showed continued improvements in detection and sizing of cracks in pipelines and development of standardized procedures in ILI-NDE data alignment, working directly with ILI and NDE service providers to share test results to improve detection and characterization capabilities. A comprehensive report published in 2024 detailed the results of performance trials completed in prior years on evaluating ILI systems to provide pipeline condition information for dents with coincident and closely aligned features, including corrosion, gouges and cracks. The results of the work demonstrated that the performance of all ILI systems tested for detecting, identifying and sizing dents and features coincident within pipe wall deformations is relatively uniform across all the ILI systems, and that operators can use ILI data to support fitness-for-purpose assessments with confidence. API will integrate the results into the 2nd edition of RP 1183, Assessment and Management of Dents in Pipelines. Also in 2024, work was completed on the evaluation of x-ray computed tomography (XRCT) and its application to support development of industry reference standards for crack and seam anomalies. Work also advanced related to measuring material properties and fracture toughness of existing pipelines in the ditch, each of which are important parameters for assessment of the impacts of detected anomalies on pipeline integrity. In 2024, API published the 2nd Edition of Technical Bulletin 1178, Integrity Data Management and Integration, and the 1st Edition of RP 1187, *Pipeline Integrity Management of Landslide Hazards* (see Objective 2.4). API also completed work on the 1st Edition of *Technical Report 1189, Internal Corrosion at Pipeline Facilities*, which was published in February 2025. Revisions to other important pipeline safety standards also continued in 2024, including RP 1176 (management and assessment of cracks) and RP 1183 (assessment and management of dents).

In 2025, work will continue advancing ILI and NDE technologies for crack and seam anomaly detection and assessment, and further development of industry databases and reference standards that can be accessed by operators and technology service providers to improve inspection and engineering assessment tools. Continuing work will also be conducted to drive ILI and NDE performance improvements for cracks, SSWC and hard spots. Development of procedures and training materials

for improving NDE field measurements will continue in 2025, including industry workshops, PRCI's annual NDE Open House event and webinars for deployment of significant research results. Additionally, work will continue in 2025 to develop and update industry standards that pertain to pipeline integrity, and will include revisions to API Standard 1163, continuing work on revisions to RP 1176 (with expected publication of the 2nd Edition in 2025) and RP 1183. New RPs for integrity management and assessment of metal loss and guidance for reconfirmation of maximum allowable operating pressure of natural gas pipelines using ECA approaches will be initiated in 2025, as well.

Objective 2.2:

Enhance Leak Detection Capabilities

Liquids pipeline operators use multiple complementary programs to detect leaks and ruptures, including tracking product delivery volumes, monitoring pressure and flow sensors, and regular visual inspections of their systems from the ground and air. Operators are assisted by API RP 1175, which provides a framework for building and evaluating a comprehensive leak detection strategy; API RP 1130 for computational pipeline monitoring (CPM); and API TR 1149 to manage the uncertainties in data from the various inputs that are used to monitor pipeline systems for indications of a leak. RP 1130 and RP 1175 establish a suite of considerations for developing a program that is consistent with operating conditions and product types being transported since variability exists on the types of systems, techniques and approaches used by operators.

In 2024, the API-LEPA Leak Detection Subteam (LD Subteam) completed its second industrywide survey on liquids pipeline leak detection programs to assess current industry performance and trends and identify improvement opportunities. The 2024 survey was coordinated with a PRCI research project that is developing a technical best practice for CPM systems on liquid pipelines that will support industrywide adaptation of CPM, improve the rapid detection of leaks and reduce leak consequences. PRCI will publish the report in 2025. Through the PRCI Leak Detection Strategic Research Priority (LD SRP), several research projects were advanced that support the liquids industry strategic plan, including testing of in-line acoustic sensing systems for leak indications and detailed analysis of the current state-of-the-art technologies for external leak detection. The LD Subteam continued its work in 2024 through five separate work teams that are tasked with developing technical reports and guidance documents that relate to improving leak detection capabilities, working in coordination with API's Cybernetics and Control Room Management policy groups.

Looking forward to 2025, the liquids pipeline industry will advance leak detection programs/systems through the five work teams established under the LD Subteam and provide resources to support and provide direction for the PRCI LD SRP. In 2025, the LD Subteam will publish guidance documents that integrate PRCI research and development (R&D) results. Continued collection of LD program data through the annual survey process and PRCI research will further define current capabilities and industry strengths and where improvement opportunities exist. The LD Subteam and PRCI's Leak Detection SRP Steering Team will hold a workshop in 2025 to obtain industry subject-matter expertise on the development of the risk tool being developed under Work Team 1. Also in 2025, API will review and revise RP 1168, *Pipeline Control Room Management*.

Objective 2.3:

Improve Corrosion Detection and Response

Corrosion failures occur most frequently within pipeline facilities, and API has published RP 1188, *Hazardous Liquid Pipeline Facilities Integrity Management,* and TR 1189, *Internal Corrosion in Pipeline Facilities*, to establish best practices for corrosion management in facilities. Industry has recently highlighted incidents that occur on pipeline rights-of-way (ROWs) that impact people or the environment (IPE) and advancing ILI technology development and engineering assessment methods to determine when repairs are needed. Significant effort and attention have addressed corrosion prevention, mitigation, detection and repair in recent years, and a more detailed level of data analysis is warranted to better understand the root causes of corrosion-related failures.

In 2024, the liquids industry completed work on TR 1189 (published in February 2025) to further address corrosion best practices at pipeline facilities and supplement RP 1188 with specific focus on internal corrosion prevention and management. Work was also completed in 2024 on developing protocols for detailed incident data and root cause failure analysis (RCFA) for corrosion failures. The work will expand on the PHMSA database for incident statistics and the liquids industry Pipeline Strategic Data Tracking System (PSDTS) database to better understand the factors that are contributing to incidents and provide information that can be directed to improve pipeline integrity programs. The liquids industry held a workshop in November 2024 on improving pipeline corrosion integrity management, with the input from participants helping develop a new API RP on assessment and integrity management of metal loss in pipelines.

In 2025, the Pipeline Integrity Group (PLIG)

Corrosion Subteam will initiate the development of a comprehensive industry standard that addresses all aspects of corrosion integrity management for pipeline systems, including the application of modern engineering assessment methods for corrosion features. Work on the standard will be coordinated with other industry trade associations and other API and industry standards as appropriate, including API RP 1160, *Managing System Integrity for Hazardous Liquid Pipelines*, 3rd Edition, API Standard 1163, *In-line Inspection Systems Qualification*, 3rd Edition, and RP 1173, *Pipeline Safety Management Systems*.

The PLIG Corrosion Subteam will also work with liquids operators to conduct the detailed RCFA for corrosion incidents and make improvement recommendations through bulletins or technical reports on findings from the analysis completed. Also, the liquids pipeline industry will continue its work with PRCI on improving industry metal loss assessment criteria, evaluating vapor corrosion inhibitors for tank bottom metal loss prevention, and evaluating the effectiveness of different types of maintenance pigs to clean pipelines and improve ILI systems performance.

Objective 2.4:

Increase Geohazard Detection and Mitigation Capabilities

Geohazards caused by ground movement and landslides are recognized as an important integrity threat to address in liquid pipeline safety programs. Recently, pipeline failures have resulted from landslides after excessive precipitation events placed strain on pipelines. These conditions and recent incidents have raised increased awareness of the need for effective management of geohazard threats and development of an industry consensus standard to manage and mitigate landslides and other ground movement events.

In 2024, API published RP 1187, *Pipeline Integrity Management of Landslide Hazards*. RP 1187 provides practical guidelines for effective management of ground movement hazards and reflects a collective effort of pipeline industry operators and geohazard subject-matter experts to leverage the extensive research that has been conducted on the impact of geohazards on pipeline integrity, as well as the practical experiences of pipeline operating companies. The RP includes guidance on conducting fitness-for-purpose (FFP) evaluation of pipelines within geohazard sites and recommends mitigation and remediation techniques that can be utilized as FFP limits are reached. Following publication of RP 1187 in August 2024, an industry podcast was sponsored to promote the document and advocate for application of its principles as a basis for benchmarking existing geohazard management programs.

Throughout 2025, API will continue to sponsor industry information-sharing events, pipeline operator roundtable discussions, and other opportunities for continued sharing and learning regarding management and mitigation of landslides and their potential effects on pipeline integrity. The liquids pipeline industry is also supporting R&D through PRCI on cutting-edge technologies for tracking pipeline and land movement. Advances in drone technology and analytics hold the potential for improved monitoring of pipelines and terrain to identify potential geohazards and take mitigating action.

3 INCREASE STAKEHOLDER AWARENESS AND ENGAGEMENT

Objective 3.1:

Improve Stakeholder Engagement

Pipeline operators have long since recognized the need for two-way engagement with public and community stakeholders. Expanding the efforts of one-way awareness outlined in API RP 1162, *Public Awareness Programs for Pipeline Operators*, the industry looked to expand engagement efforts throughout the lifecycle of a pipeline, including the planning, construction and operations phases through API RP 1185, *Pipeline Public Engagement*. This framework provides consistent guidance for proactive engagements with the public based on transparency, respect, reciprocity, inclusiveness, accessibility and equity.

In 2024, API, LEPA and pipeline operators completed a multi-year effort with federal and state regulators, local government representatives, first responders and members of the public in publishing the 1st edition of RP 1185. The document establishes a paradigm shift from current one-way communications to offering community stakeholders pertinent information on new or existing projects, seeking and addressing concerns and establishing trust in durable, long-term relationships. Following publication, the industry created an Implementation Team to develop tools to support operator journeys, including fact sheets, briefs on flexible and scalable implementation and tactical booklets, all provided on the *www.PipelinePublicEngagement.com* website. Operators shared implementation challenges, successes and lessons learned in recurring forums to learn from peers and collectively improve public engagement. Industry members also socialized these efforts with government partners to demonstrate industry's proactive efforts, especially around planned low-carbon infrastructure projects across the country. Additionally in 2024, operators maintained their public awareness campaigns, shared learnings from the 2023 Public Awareness Program Effectiveness Research Survey (PAPERS), conducted state education days and engaged first responders on free tactical preparedness guides and training.

In 2025, pipeline operators will continue implementation through the use of maturity models and tools roadmaps, planning and implementation tools, and computer-based training. The Implementation Team will also conduct an initial RP 1185 Annual Survey to identify implementation challenges, develop further tools and training and gauge early implementation progress. The Team will support sharing and learning forums throughout the year to exchange leading practices and encourage proactive efforts to develop lasting relationships with community members. The industry will look to increase first-responder preparedness and conduct state engagement days across the country to improve awareness on the importance of energy infrastructure and promote STEM career opportunities. Operators will also continue public awareness efforts while still advocating for the incorporation by reference of RP 1162, 3rd edition, to replace the antiquated 1st edition from 2003 and survey stakeholders through the 2025 PAPERS cycle.

Objective 3.2:

Promote Innovative Approaches to Excavation Damage Prevention

Despite decades of public awareness campaigns, the failure to call or click 811 before digging remains the leading cause of excavation incidents. While third-party strikes remain the majority of excavation-related incidents, the industry continues to try to reduce first- and second-party incidents most directly under their control. Similarly, an increase in incidents on submerged or underwater pipelines highlighted the need for additional guidance during marine construction or dredging projects for One Call Centers (OCC), locators, excavators and facility owners alike. To meet these goals, the API/LEPA Damage Prevention Work Group (DPWG) has focused on closing state exemptions, standardizing OCC data, improving marine damage prevention guidance and improving state enforcement of existing requirements.

In 2024, the DPWG worked with API's regional staff and stakeholder partners to introduce or amend legislation in several priority states to eliminate problematic exemptions for certain stakeholder groups to call or click 811 prior to excavation. While these efforts are often subject to state legislative calendars, the group continues to encourage more stakeholders to follow the 811 process to protect critical underground infrastructure. DPWG members also worked to improve guidance on marine construction and dredging near pipelines, including revising the Common Ground Alliance's (CGA) Best Practice for marine signage, enhanced training and pre-work checklists to avoid excavation damages. The group also introduced a standardized list of work types for OCCs to replace the current, open-form submissions, which are harder to trend consistently, and advocated for standardization among ticket types. Additionally, the DPWG analyzed root causes for first- and second-party incidents to develop recommendations for reducing such incidents in the future.

In 2025, the DPWG is kicking off an initiative to improve state enforcement of existing damage prevention rules and requirements. States vary widely in their application of violations and fines against repeat offenders or negligent parties who fail to call or click 811, and the group is identifying the states with highest compliance and lowest compliance to encourage state-level enforcement and PHMSA oversight. The DPWG will also continue state legislative efforts to close problematic exemptions while monitoring, and when necessary, amending, proposals on the 811 process to maintain safe excavation practices. It will also look to further standardize OCC data for work types and ticket types and support ongoing standardization efforts led by similar groups. The group will continue supporting efforts to improve marine damage prevention and look to finalize the CGA Best Practice while also implementing specific recommendations to reduce first- and second-party incidents.


2019

4 ADDRESS CYBERSECURITY THREATS

Objective 4.1:

Prevent Cybersecurity Incidents

The U.S. pipeline network is critical to the functioning of the national energy supply and security, which makes it a prime target for cyberattacks. The 2021 ransomware attack provided examples of both the criticality of pipeline systems and the importance of pipeline cyber defenses. The pipeline industry shares the cybersecurity objectives of policymakers to protect critical infrastructure, provide reliable energy for society, safeguard public safety and the environment and protect the intellectual property and marketplace competitiveness of companies. Pipeline companies employ layers of security to protect against cascading failure, including mechanical controls that are not capable of being overridden through any cyber compromise of industrial control systems.

In 2024, API and LEPA supported member company engagement with federal government transportation and security agencies. API and LEPA facilitated a visit by representatives of the Transportation Security Administration (TSA), Department of Homeland Security and Federal Bureau of Investigation to liquids and natural gas pipeline facilities to help them better understand energy infrastructure and how best to partner with industry on its protection. The 19th annual API Cybersecurity Conference brought together the leading subject-matter experts in cybersecurity to promote technology advancements, sharing and learning and exchanging industry best practices.

In late 2024 and into early 2025, API and LEPA worked with member companies to provide comments to a TSA proposal to impose regulatory requirements on pipeline operator cybersecurity programs. TSA based the rulemaking proposal on its pipeline cybersecurity Security Directives (SDs) with the intent to make the temporary program requirements of the SDs a permanent part of federal regulations. API and LEPA developed comments in areas such as performance-based security measures, supply chain risk management, secure-by-design systems, and codification of industry guidance. In 2025, API and LEPA will continue engagement with the federal government as it considers issuing a final rulemaking and/or reissuing expiring SDs.

Objective 4.2:

Safe and Timely Restart after Cybersecurity Events

Based on pipeline operator responses to cyberattacks, API and member companies have begun to develop a recommended practice that can provide a common framework for pipeline operators to manage safe and timely restart of a pipeline system after a cybersecurity event, which will include a scalable and flexible methodology that provides understanding between pipeline operators and public stakeholders. This recommended practice will be applicable to all pipelines beyond TSA designated critical infrastructure, and once a system is compromised, this document will identify necessary responses to provide mechanisms for recovery until the Supervisory Control and Data Acquisition (SCADA) system has restored full functionality.

In early 2024, the API Construction & Operations Group (COG), with multiple other API working groups, held a two-day industry workshop to discuss the need and capabilities required to provide industry guidance for pipeline operators to return a pipeline system to normal operations after a cyberattack or all hazard events. The absence of such a framework could result in misguided regulatory actions and expectations for returning to operations (especially manual operations). Without this framework, there is a potential for inconsistencies in operator preparedness and procedures for returning to normal operations. The 2024 workshop identified

the initial groundwork requirements to develop the necessary knowledge, personnel, and regulatory considerations to outline a program that offers guidance for pipeline operators to regain full control of their system. Based on the overwhelming industry response from the workshop, API assembled a task group to develop the appropriate guidance to address this issue.

In 2025, the new task group will begin to develop a detailed table of contents and further details for a full risk-based framework identifying SCADA system requirements and operational procedures to return to operations, including manual operations where appropriate, following a shutdown or switch to manual operations as a result of a cyberattack or all hazard events. This guidance will cover operational technology and information technology where interdependence exists and is needed for control, monitoring, and restart. The framework will cover returning to functionality (e.g., manual operations) and returning to normal remote operations. In 2026, API expects to publish a recommended practice for operators that covers returning to normal operations after a cyberattack.

5 SAFE AND SUSTAINABLE ENERGY FUTURE

Objective 5.1:

CO_2 Pipeline Transportation and Storage

Over 5,000 miles of carbon dioxide (CO_2) pipelines currently operate in the United States. For over 40 years, pipelines have safely delivered CO_2 for use in energy, food production and medical applications, as well as the manufacture of products such as refrigerants, foam rubber, fire extinguishers and carbonated beverages. New CO_2 pipeline systems have been proposed and/or are under development to transport CO_2 from carbon capture locations to permanent underground storage sites. The safety record of CO_2 pipelines is strong, with substantially fewer incidents per mile over the last five years than either crude oil or refined products pipelines. Even as the safest method to transport large volumes of CO_2 long distances, opportunities exist to improve CO_2 pipeline-specific best practices around emergency planning and response, integrity management and stakeholder outreach.

In 2024, the API Pipeline Integrity Group formed a task group that developed a recommended practice (RP) for CO_2 transportation by pipeline. When finalized, the RP will provide guidance for design, construction, operation and maintenance of new CO_2 pipelines and the conversion of existing pipelines into CO_2 service. API's CO_2 RP will complement existing standards on transporting CO_2 via pipeline while also filling gaps that have been identified in those standards. In early 2025, the RP was balloted and approved through API's Standards development process with comments and recommendations submitted for revisions to the document. Also in 2024, API, LEPA and member companies supported pipeline sector research for CO_2 pipeline service, including participation in industry workshops sponsored through DOE, PHMSA, and PRCI that were focused on CO_2 pipeline transportation safety.

In 2025, interested stakeholders including member companies, government and public stakeholders will provide comments on the proposed API RP for CO_2 transportation by pipeline. After the comment period ends, the RP Task Group will review and address all comments submitted, document how each comment was resolved and propose revisions to the RP based on those comments. API expects to publish a finalized RP by the end of the year. In 2025, API and LEPA member companies will also review a draft proposed PHMSA CO_2 pipeline rulemaking made public by the Biden administration before it left office. The draft was never published in the Federal Register so did not become an official proposal, but industry subject-matter experts are reviewing the draft language and identifying opportunities for improvements to the draft version of the rulemaking to present to PHMSA for discussion prior to the Federal Register publication and in preparation for when PHMSA does publish a formal rulemaking proposal. Like 2024, API and LEPA member companies will maintain an ambitious schedule of CO_2 pipeline research and development in 2025. In cooperation with PRCI's Emerging Fuels Institute, R&D projects will be initiated to work toward evaluating the use of odorants to support leak detection; providing guidance on threshold concentrations of trace elements at carbon capture sources; and exploring the potential impacts of trace elements in the captured CO2 streams on pipeline integrity and fracture control.

Objective 5.2:

Limit Environmental and Community Impacts

While America's natural gas and oil companies remain committed to responsibly delivering the affordable and reliable energy the public needs and wants, we recognize we must also do so sustainably. That means reducing our impact on the environment. API and LEPA members are actively working together to track and improve their sustainability performance while striving for appropriate engagement and transparency with communities and stakeholders. Right-of-way (ROW) conservation programs serve as one way of achieving these goals, providing an integrated and systematic approach to planning, implementing and sustaining ROW land management that is value-driven. The results are enhanced safety, community benefits, operational efficiencies and a healthier ecosystem, while maintaining state and federal regulatory compliance.

In 2024, several ROW conservation projects were initiated and maintained by API and LEPA member companies in coordination with local communities, state and federal government, non-governmental organizations (NGOs) and academia. Numerous conservation projects have been undertaken throughout the country, including in Illinois, Louisiana, Pennsylvania, Oklahoma, Texas, Minnesota, North Carolina, Washington and Tennessee. The ROW conservation efforts provide a scalable, adaptable approach that can be systematically applied by operators regardless of location. API also maintains strategic partnerships and engagements with conservation organizations such as Pheasants/Quail Forever, The Nature Conservancy, Texan by Nature, the Rocky Mountain Elk Foundation and others to support conservation efforts that promote healthy and sustainable habitats for a variety of species.

In 2025, API and LEPA member companies will continue to collaborate and share successes and approaches to their conservation efforts to advance similar efforts throughout the industry and where appropriate. Member companies will also look to utilize these conservation efforts to advance their engagement and relationships with non-traditional allies at the local, state and federal levels. These improved relationships will provide a platform for increased education and advocacy on the benefits of these conservation efforts to advance the range of applications that can be considered by midstream operators. Additional ROW conservation projects are expected to be implemented in 2025 as the program continues to gain momentum. API will leverage its full suite of resources (e.g., state government affairs, mobilization, communications, etc.) to support members in planning, implementing and maintaining these conservation efforts to support growth and greater adoption throughout the industry.

Objective 5.3:

Reduce Emissions from Pipelines, Tanks and Facilities

In 2023, The Environmental Partnership (TEP) launched two new liquids pipeline programs - *Maintenance & Integrity* and *Energy Efficiencies in Operations* – to drive best practices that reduce energy consumption and emissions and prevent product releases to the environment. Liquids pipeline companies are integral in the supply chain, and are responsible for moving oil and natural gas from the wellhead through transportation infrastructure to get fuels and feedstocks to market.

In 2024, TEP welcomed new midstream companies and additional commitments from companies that already are TEP participants. These companies' actions build on TEP's collective knowledge base, and through their commitment to implement these new programs, the companies help add to broader industry progress in proactively improving environmental performance while delivering affordable, reliable energy around the world.

In 2025, efforts will continue to increase participation and modify methods of consistent analysis based on the first year of reporting. Also, a third program addressing emission reduction from tanks and pipeline facilities operations is being considered in 2025. A key target for liquids pipeline emission reductions is optimizing tank inspections, as work required to conduct tank out-of-service inspections (following API Standard 653) generates significant emissions and waste and is often not needed at the frequency mandated by regulation. In 2025, API and LEPA will continue to work with PHMSA under the current regulatory environment to support the inclusion of Section 6.4.3 of the latest edition of API Standard 653 currently incorporated by reference, which allows for a risk-based, performance-based approach to tank inspections.

2024

PERFORMANCE REPORT

2024 Pipeline Performance Report

KEY PERFORMANCE INDICATORS

Measuring the performance of pipelines is a critical way to assess pipeline safety and whether their safety is improving. Pipeline operators and PHMSA collect hundreds of different data points measuring how safely pipelines are operating and the reasons behind pipeline incidents when they occur.

Particularly useful measures of pipeline safety examine incident size, location, commodity and cause. The liquids pipeline industry uses the following measures to better understand pipeline incident trends and develop strategies for improving pipeline safety. As a sign of overall safety performance, the liquids pipeline industry tracks a core set of key performance indicators (KPIs). These KPIs are based primarily on incidents impacting people or the environment. They were created through a recommendation of the U.S. National Transportation Safety Board in a collaborative effort between PHMSA, pipeline operators and public pipeline safety advocates represented by the Pipeline Safety Trust. They reflect the highest priority pipeline operators place on protecting people and the environment. The liquids pipeline industry has remained focused on safety, with pipeline incidents declining across the board. The pipeline industry tracks its performance with six industrywide KPIs:

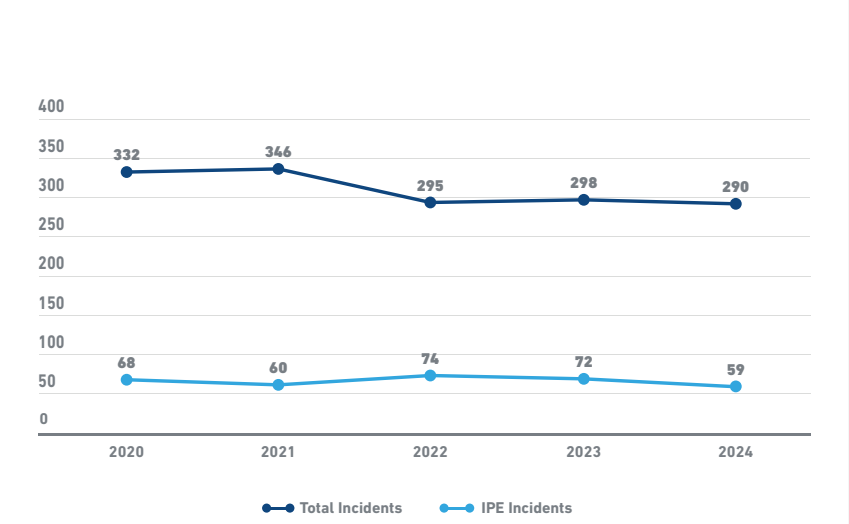
1. **Total incidents impacting people or the environment**
2. **Integrity management incidents impacting people or the environment**
3. **Operations & maintenance (O&M) incidents impacting people or the environment**
4. **Other incidents impacting people or the environment**
5. **Incidents per million barrels delivered**
6. **Incidents impacting people or the environment per million barrels delivered**

Integrity management incidents are those having to do with the pipeline itself, such as corrosion, cracking, or weld failure. Operations and maintenance causes include equipment failure or incorrect operations. Other incidents include those caused by excavation damage, natural force damage, such as landslides, and other outside force damage.

KEY PERFORMANCE INDICATORS

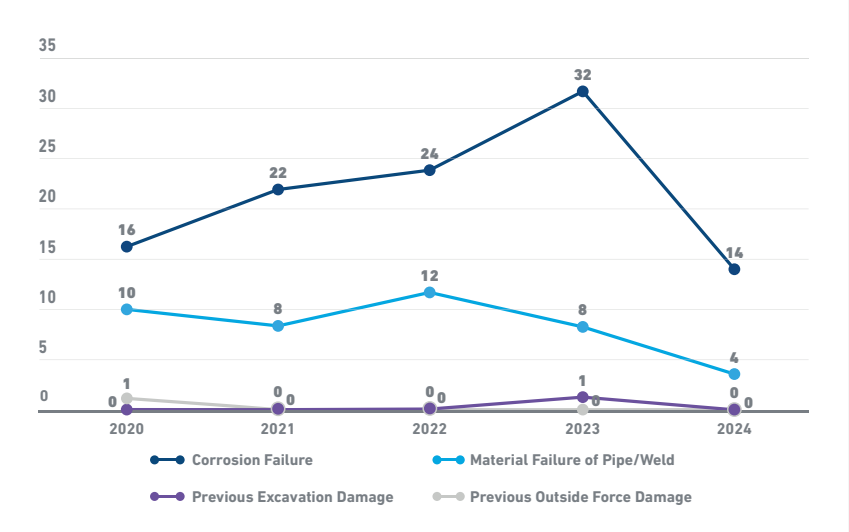
1 TOTAL INCIDENTS VS. INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT (2020-2024)

Pipeline incidents impacting people or the environment decreased 13% from 2020 to 2024. Total pipeline incidents dropped 13% as well over the last five years, with 42 fewer incidents in 2024 compared to 2020. A full description of the specific types of incidents impacting people or the environment can be found on page 60.



2 INTEGRITY MANAGEMENT INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT (2020-2024)

Incidents related to the pipeline itself, such as corrosion, cracking or weld failure, were down 33% over the last five years in areas impacting people or the environment. Corrosion failures were down 13% and material failure of the pipe or weld were down 60% since 2020.

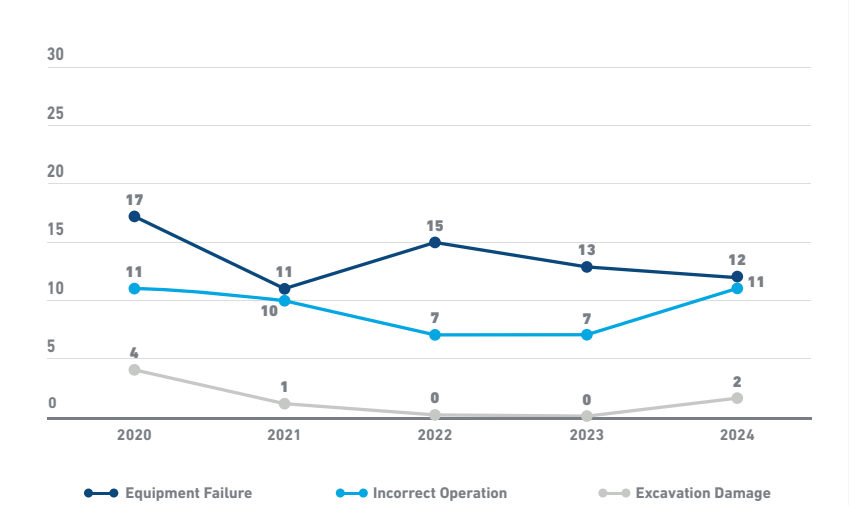


2024 PIPELINE PERFORMANCE REPORT

KEY PERFORMANCE INDICATORS

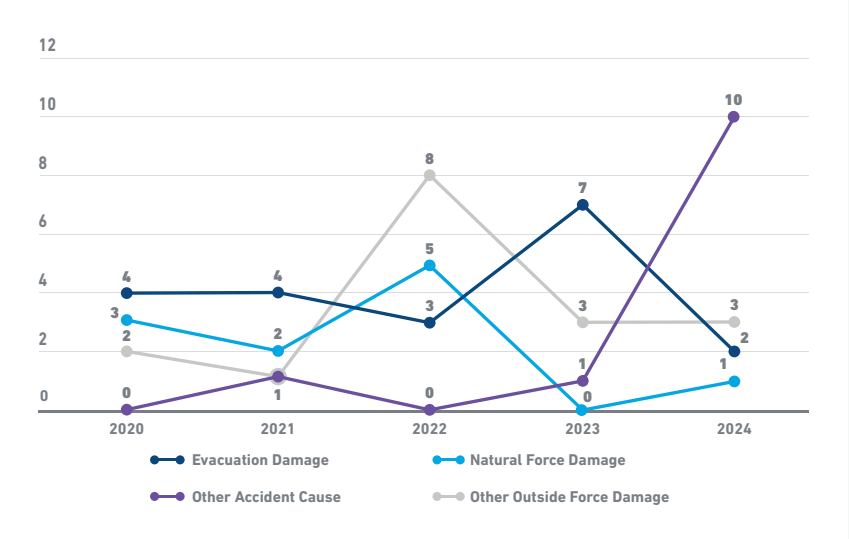
3 OPERATIONS & MAINTENANCE INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT (2020-2024)

Incidents related to maintaining pipeline equipment or operating the pipeline and its valves or pumps were down 22% over the last five years in areas impacting people or the environment. In these areas, incidents caused by excavation damage due to insufficient locating practices dropped 50% and incidents caused by equipment failure decreased 29%, while incidents caused by incorrect operation stayed flat from 2020 to 2024.



4 OTHER INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT (2020-2024)

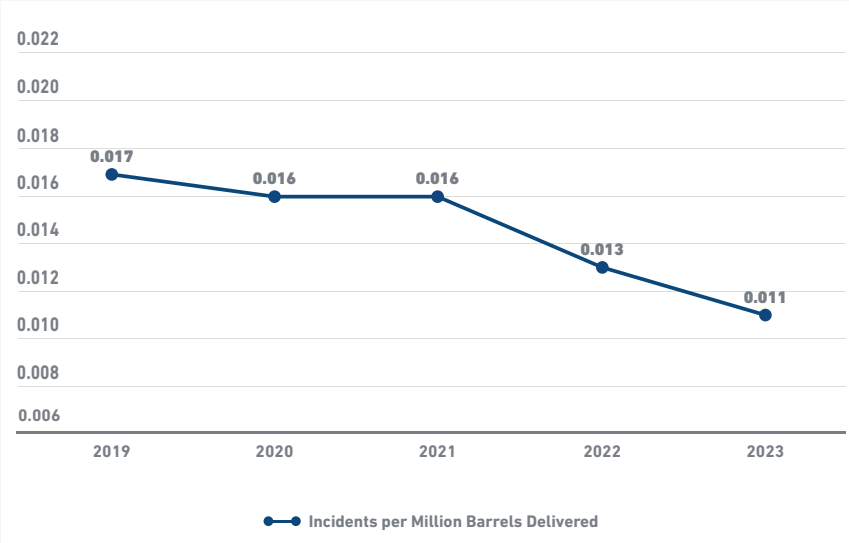
Incidents impacting people or the environment from "other" causes increased from nine to 16 incidents over the last five years. Incidents caused by excavation damage fell from four to two. Incidents from natural force damage, such as landslides, decreased from three to one, and incidents from other outside force damage, like a boat dragging an anchor which strikes a pipeline, increased from two to three between 2020 and 2024.



INCIDENTS PER MILLION BARRELS DELIVERED

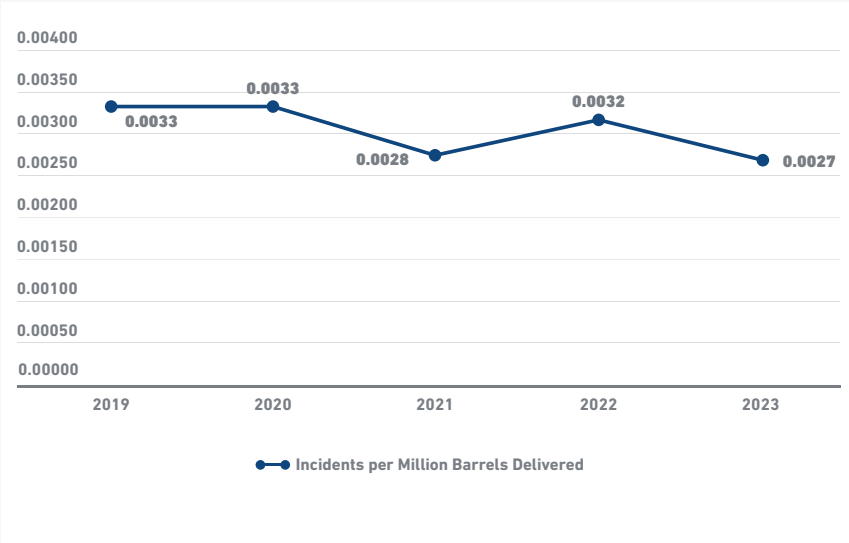
5 INCIDENTS PER MILLION BARRELS DELIVERED (2019–2023)

Total incidents per barrel delivered fell 33% from 2019 to 2023 (the most recent year barrels delivered data is available). In 2019, there were 0.017 incidents per million barrels delivered and that fell to 0.011 incidents per million barrels delivered in 2023. That means that, at the same time pipeline operators delivered 16% more crude oil and petroleum products, total pipeline incidents were down 22%.



6 INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT PER MILLION BARRELS DELIVERED (2019-2023)

Incidents impacting people or the environment per million barrels delivered declined 18% from 2019 to 2023 (the most recent year barrels delivered data is available). In 2019, there were 0.0033 incidents impacting people or the environment per million barrels delivered. In 2023, that rate fell to 0.0027 incidents impacting people or the environment per million barrels delivered. While operators delivered 16% more barrels of energy, they also reduced incidents impacting people or the environment 7% between 2019 and 2023.



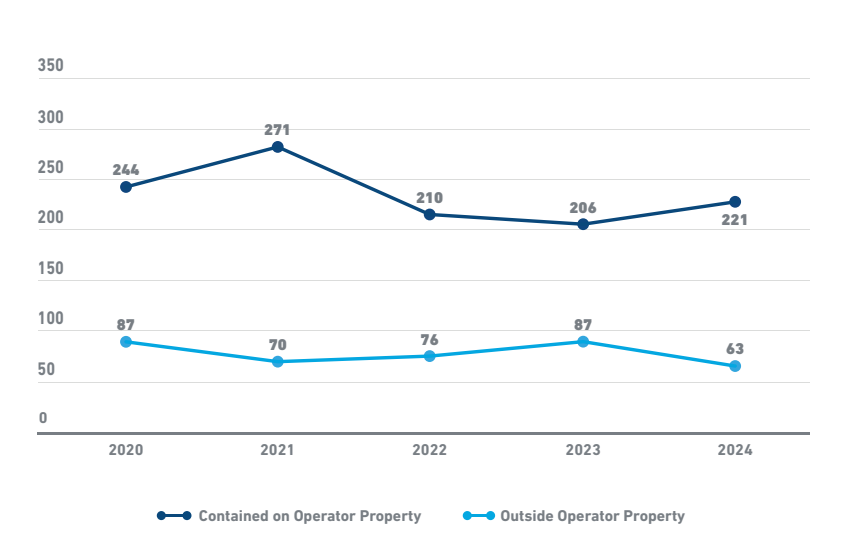
2024 PIPELINE PERFORMANCE REPORT

INCIDENTS BY LOCATION

The location of a pipeline incident matters both when gauging the impact of an incident and developing strategies to prevent incidents in the future. Pipeline operators place the greatest emphasis on preventing and minimizing impacts to people or the environment. Tracking these incidents helps operators focus on this priority. Additional measures of incident impacts are whether they are contained on operator property or outside the operator's facilities, specifically in high consequence areas (HCAs), a regulatory term used by PHMSA.

7 PIPELINE INCIDENTS INSIDE AND OUTSIDE OPERATOR PROPERTY (2020–2024)

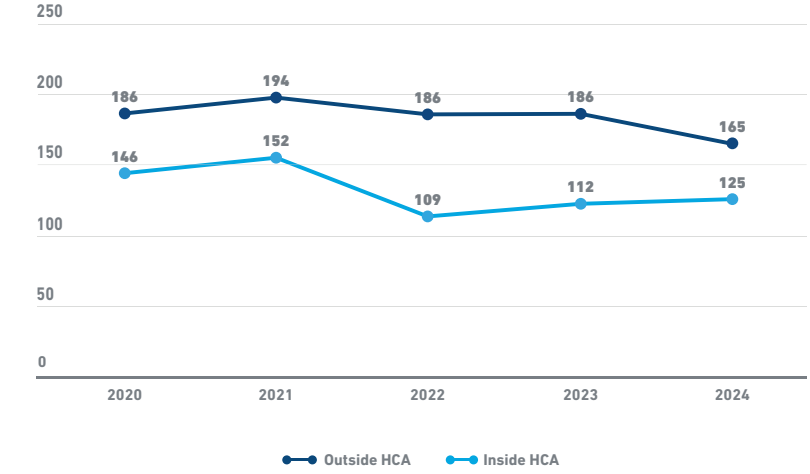
In 2024, 78 percent of onshore incidents from liquids pipelines were contained within an operator's property. Examples of pipeline operator properties include pump stations, tank farms and terminals. Incidents occurring or reaching outside of operator property decreased 28 percent from 2020 to 2024.



INCIDENTS BY LOCATION

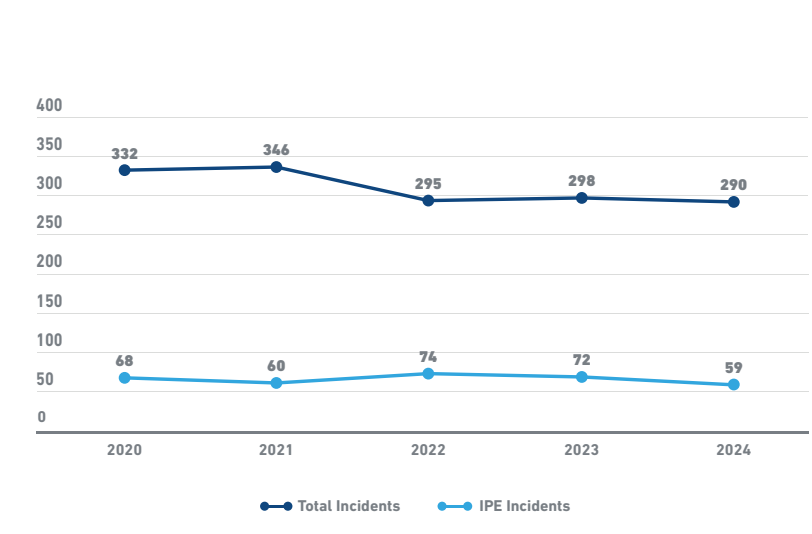
8 PIPELINE INCIDENTS INSIDE AND OUTSIDE HCAs (2020–2024)

Liquids pipeline incidents occurring in high consequence areas (HCAs) declined 14% over the last five years. Through federal regulation, PHMSA defines HCAs as areas of population concentration, commercially navigable waterways or sensitive environmental locations. HCA data differs from incidents impacting people or the environment because, under PHMSA regulation, an incident can have no impact on people or the environment, remain wholly within an operator's facility and still count as an HCA if that facility is surrounded by an HCA.



9 TOTAL INCIDENTS VS. INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT (2020–2024)

Pipeline incidents impacting people or the environment decreased 13% from 2020 to 2024. Total pipeline incidents dropped 13 %, as well, over the last five years, with 42 fewer incidents in 2024 compared to 2020. A full description of the specific types of incidents impacting people or the environment can be found on page 60.

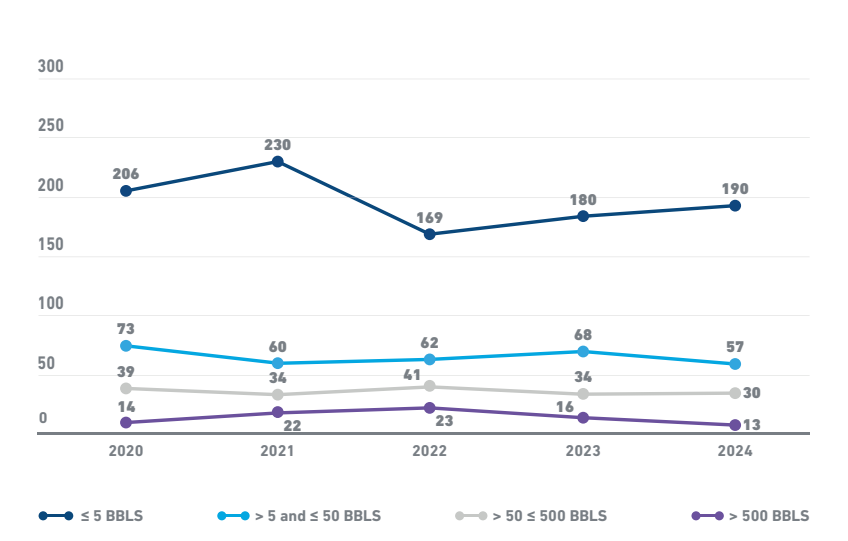


2024 PIPELINE PERFORMANCE REPORT

INCIDENTS BY SIZE

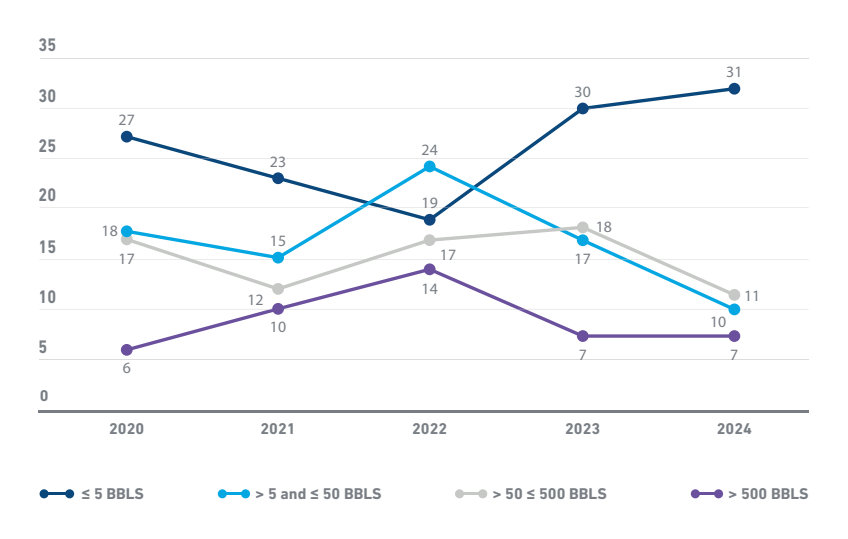
10 LIQUIDS PIPELINE INCIDENTS BY SIZE (2020–2024)

Most pipeline incidents are small. In 2024, 66% of incidents were less than five barrels and 85% were less than 50 barrels. Large pipeline incidents are also the rarest. In 2024, only 4% of incidents were 500 barrels or larger, and these large incidents are down 7% over the last five years.



11 INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT BY SIZE (2020–2024)

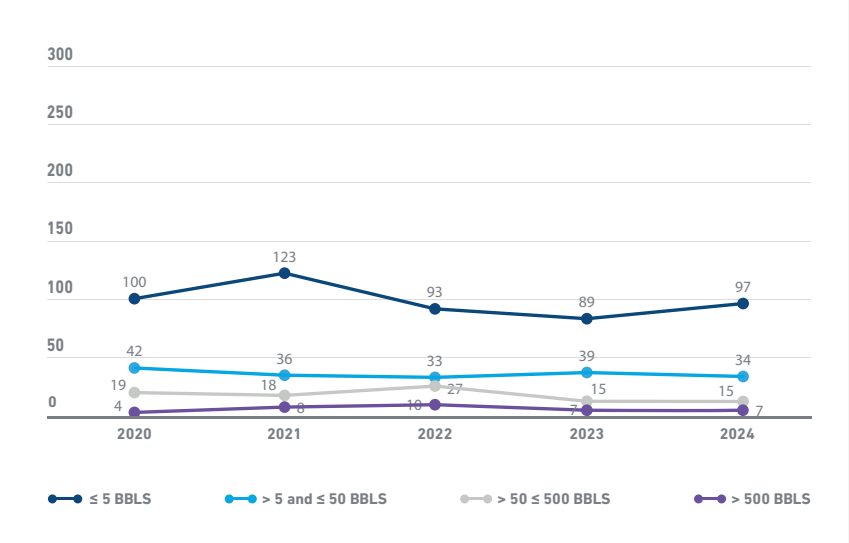
Most incidents impacting people or the environment are small. In 2024, approximately 53% of such incidents were less than five barrels and 69% were less than 50 barrels, with only 12% of incidents impacting people or the environment 500 barrels or larger.



INCIDENTS BY SIZE

12 CRUDE OIL INCIDENTS BY SIZE (2020–2024)

Similar to total incident trends, the majority of crude oil pipeline incidents are small in size. In 2024, 63% of crude oil incidents were five barrels or smaller and 86% of crude oil incidents were smaller than 50 barrels. Only 5% of crude oil incidents were over 500 barrels in 2024.

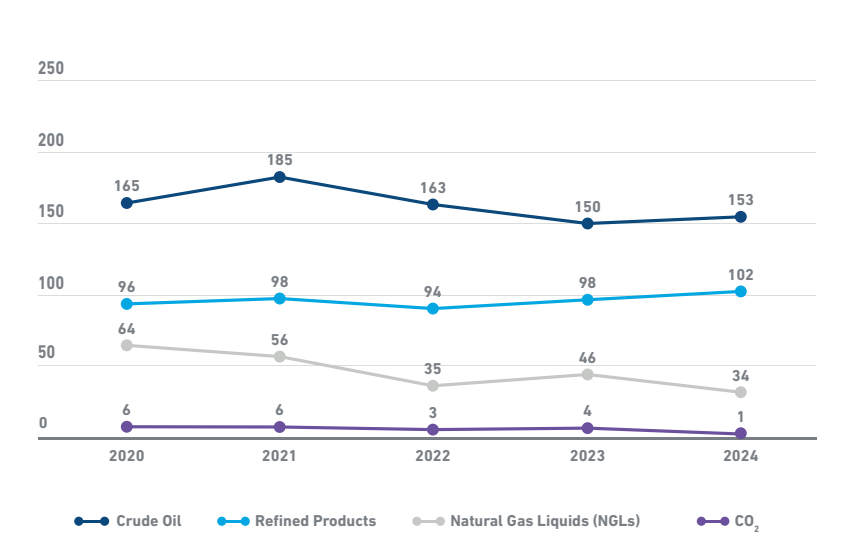


2024 PIPELINE PERFORMANCE REPORT

INCIDENTS BY COMMODITY

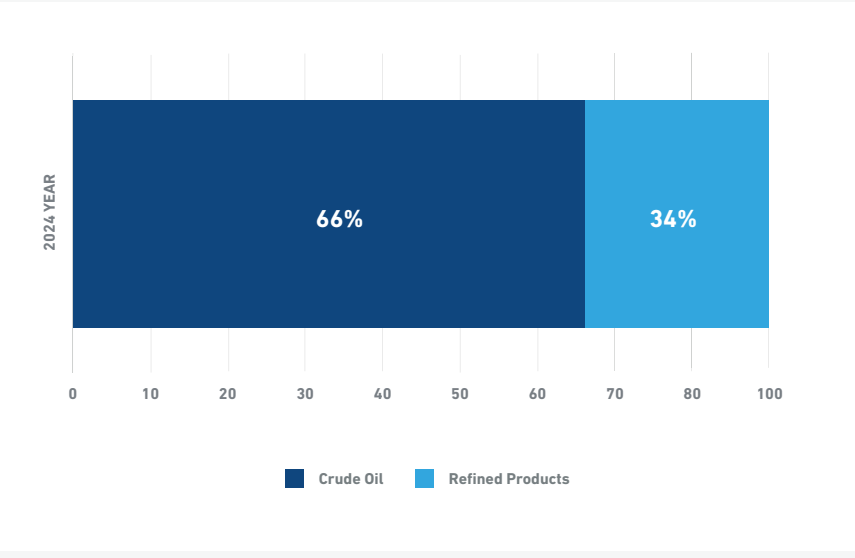
13 ALL INCIDENTS BY COMMODITY (2020–2024)

In 2024, crude oil incidents represented 53% of total incidents, with refined products at 35% and natural gas liquids at 12% of total incidents. The number of annual crude oil incidents is down 7% from 2020. The single carbon dioxide pipeline incident in 2024 represented 0.3% of total liquids pipeline incidents.



14 INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT BY COMMODITY (2024)

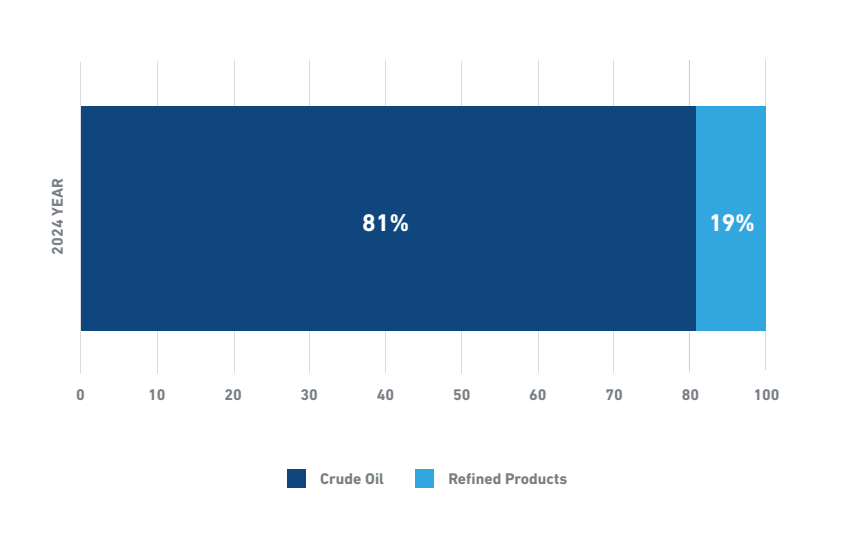
In 2024, there were 39 crude oil incidents, representing 66%, and 20 refined products incidents, representing 34%, impacting people or the environment.



INCIDENTS BY COMMODITY

15 PERCENT OF BARRELS RELEASED IMPACTING PEOPLE OR THE ENVIRONMENT BY COMMODITY (2024)

Crude oil incidents impacting people or the environment in 2024 represented 81% of the total, with refined products reflecting 19% of released barrels from liquids pipelines.

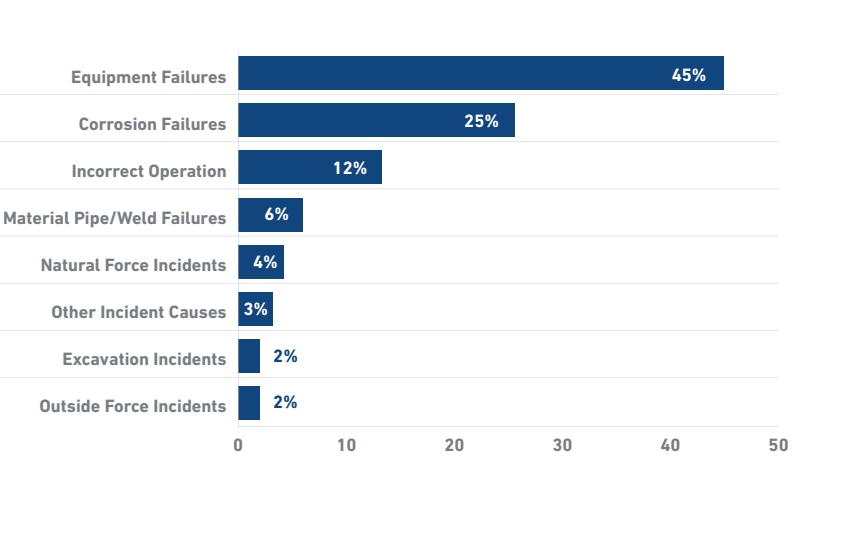


2024 PIPELINE PERFORMANCE REPORT

INCIDENTS BY CAUSE

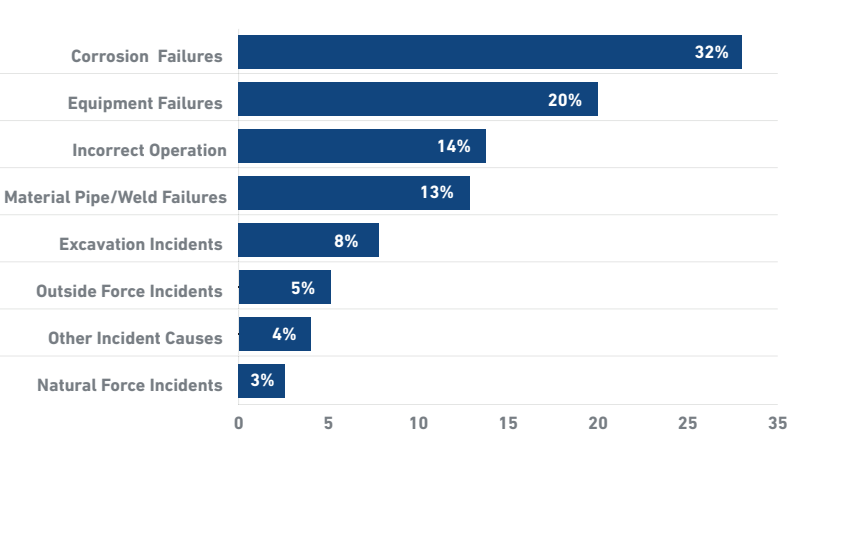
16 LIQUIDS PIPELINE INCIDENTS BY CAUSE (2020–2024)

Equipment failure is the most frequent cause of all liquids pipeline incidents. Over the last five years, equipment failure represented 45% of incidents, corrosion failure 25% and incorrect operation 12%. Material pipe/weld failures, which include cracking, a primary source of large volume releases, represented only 6% of incidents since 2020. Excavation incidents represented 2% of total liquids pipeline incidents between 2020 and 2024.



17 INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT BY CAUSE (2020–2024)

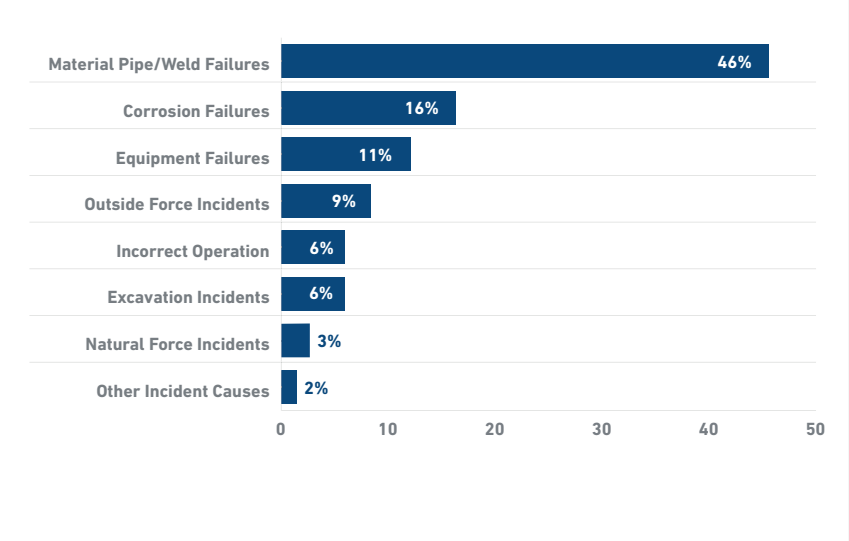
Over the last five years, corrosion failures (32%) were the most frequent cause of incidents impacting people or the environment, followed by equipment failure (20%), incorrect operation (14%) and material pipe/weld failures (13%). Excavation incidents represented 8% of incidents impacting people or the environment between 2020 and 2024.



INCIDENTS BY CAUSE

18 PERCENT OF BARRELS RELEASED IMPACTING PEOPLE OR THE ENVIRONMENT BY CAUSE (2020–2024)

Material pipe/weld failures (46%) were responsible for the most barrels released in incidents impacting people or the environment, followed by corrosion failures (16%) and equipment failures (11%). Excavation incidents caused 6% of barrels released between 2020 and 2024.

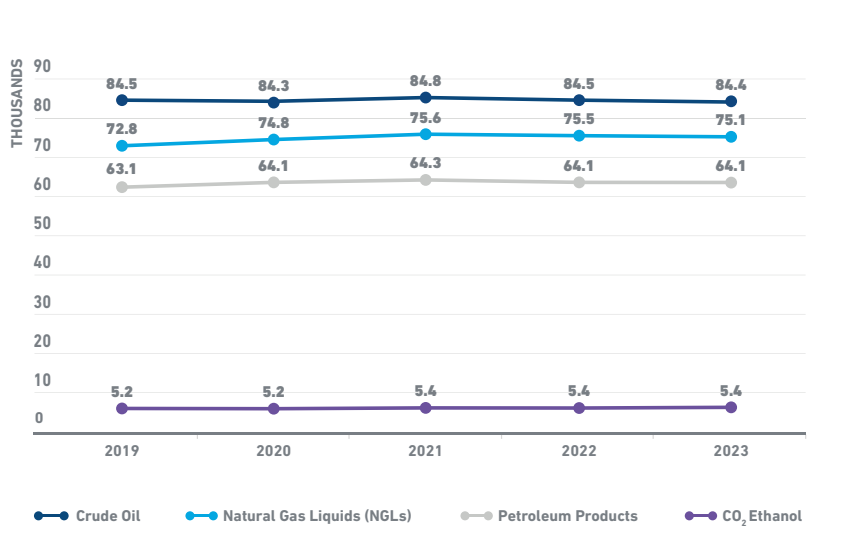


2024 PIPELINE PERFORMANCE REPORT

PIPELINE MILES AND BARRELS DELIVERED

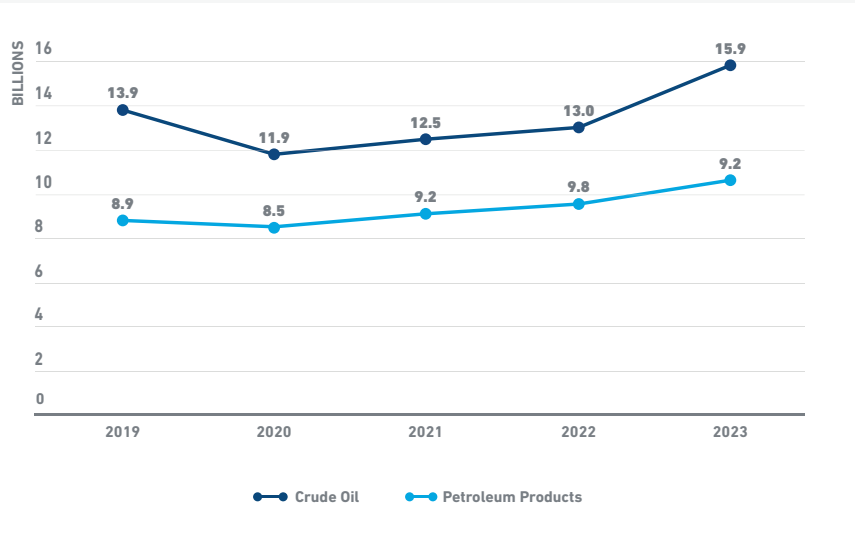
19 MILES OF U.S. PIPELINE BY PRODUCTS (2019-2023) (thousands)

At the end of 2023 (the most recent year this data is available), there were 228,881 total miles of liquids pipelines, with crude oil pipelines representing 37% of the total at 84,363 miles, natural gas liquids reflecting 33% (75,065 miles) and petroleum products at 28% (64,101 miles).



20 BARRELS DELIVERED BY U.S. PIPELINE (2019-2023) (billions)

In 2023, there were 26.4 billion crude oil and petroleum products barrels delivered by pipeline, with crude oil at 15.9 billion barrels (representing approximately 60%) and petroleum products at 10.5 billion barrels (representing 40%) of the barrels delivered. Total barrels delivered reflect a 16% increase from 2019.



DATA TABLES

KEY PERFORMANCE INDICATORS

1 TOTAL INCIDENTS & INCIDENTS IMPACTING PEOPLE AND THE ENVIRONMENT (2020-2024)

YEAR	IPE INCIDENTS	INCIDENTS	TOTAL INCIDENTS
2020	68	264	332
2021	60	286	346
2022	74	221	295
2023	72	226	298
2024	59	231	290
Total Releases	**333**	**1228**	**1561**
% Change Since 2020	**-13%**	**-13%**	**-13%**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety, March 2025

2 INTEGRITY MANAGEMENT INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT (2020-2024)

YEAR	CORROSION FAILURE	MATERIAL FAILURE OF PIPE/WELD	PREVIOUS EXCAVATION DAMAGE	PREVIOUS OUTSIDE FORCE DAMAGE	TOTAL INCIDENTS
2020	16	10	0	1	27
2021	22	8	0	0	30
2022	24	12	0	0	36
2023	32	8	1	0	41
2024	14	4	0	0	18
Total Releases	**108**	**42**	**1**	**1**	**152**
% Change Since 2020	**-13%**	**-60%**	**0%**	**-100%**	**-33%**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety, March 2025

DATA TABLES

KEY PERFORMANCE INDICATORS

3 OPERATIONS AND MAINTENANCE INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT (2020-2024)

YEAR	EQUIPMENT FAILURE	INCORRECT OPERATION	EXCAVATION DAMAGE DUE TO INSUFFICIENT LOCATING PRACTICES	TOTAL INCIDENTS
2020	17	11	4	32
2021	11	10	1	22
2022	15	7	0	22
2023	13	7	0	20
2024	12	11	2	25
Total Releases	**68**	**46**	**7**	**121**
% Change Since 2020	**-29%**	**0%**	**-50%**	**-22%**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety, March 2025

4 OTHER INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT (2020-2024)

YEAR	EXCAVATION DAMAGE	NATURAL FORCE DAMAGE	OTHER ACCIDENT CAUSE	OTHER OUTSIDE FORCE DAMAGE	TOTAL INCIDENTS
2020	4	3	0	2	9
2021	4	2	1	1	8
2022	3	5	0	8	16
2023	7	0	1	3	11
2024	2	1	10	3	16
Total Releases	**20**	**11**	**12**	**17**	**60**
% Change Since 2020	**-50%**	**-67%**	**N/A**	**50%**	**78%**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety, March 2025

DATA TABLES

INCIDENTS PER MILLION BARRELS DELIVERED

5 INCIDENTS PER MILLION BARRELS DELIVERED (2019-2023)

	2019	2020	2021	2022	2023
Total Barrels Delivered	22,792,211,582	20,383,545,445	21,746,539,037	22,840,773,470	26,402,438,617
Source: U.S. Federal Energy Regulatory Commission					
Total Incidents	384	332	346	295	298
Source: PHMSA					
Incidents Per Million Barrels Delivered	0.017	0.016	0.016	0.013	0.011

6 INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT PER MILLION BARRELS DELIVERED (2019-2023)

	2019	2020	2021	2022	2023
Total Barrels Delivered	22,792,211,582	20,383,545,445	21,746,539,037	22,840,773,470	26,402,438,617
Source: U.S. Federal Energy Regulatory Commission					
Incidents Impacting People or the Environment	76	68	60	74	72
Source: PHMSA					
Incidents Impacting People or the Environment Incidents Per Million Barrels Delivered	0.0033	0.0033	0.0028	0.0032	0.0027

DATA TABLES

INCIDENTS BY LOCATION

7 PIPELINE INCIDENTS INSIDE AND OUTSIDE OF OPERATOR PROPERTY (2020-2024)

YEAR	OUTSIDE OPERATOR PROPERTY	CONTAINED ON OPERATOR PROPERTY	OFFSHORE	TOTAL INCIDENTS
2020	87	244	1	332
2021	70	271	5	346
2022	76	210	9	295
2023	87	206	5	298
2024	63	221	6	290
Total Releases	**383**	**1152**	**26**	**1561**
% Change Since 2020	**-28%**	**-9%**	**500%**	**-13%**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety, March 2025

8 PIPELINE INCIDENTS INSIDE AND OUTSIDE HCAs (2020-2024)

YEAR	OUTSIDE HCA	INSIDE HCA	TOTAL INCIDENTS
2020	186	146	332
2021	194	152	346
2022	186	109	295
2023	186	112	298
2024	165	125	290
Total Releases	**917**	**644**	**1561**
% Change Since 2020	**-11%**	**-14%**	**-13%**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety, March 2025

DATA TABLES

INCIDENTS BY LOCATION

9 TOTAL INCIDENTS & INCIDENTS IMPACTING PEOPLE AND THE ENVIRONMENT (2020-2024)

YEAR	IPE INCIDENTS	INCIDENTS	TOTAL INCIDENTS
2020	68	264	332
2021	60	286	346
2022	74	221	295
2023	72	226	298
2024	59	231	290
Total Releases	**333**	**1228**	**1561**
% Change Since 2020	**-13%**	**-13%**	**-13%**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety, March 2025

INCIDENTS BY SIZE

10 LIQUID PIPELINE INCIDENTS BY SIZE (2020-2024)

YEAR	≤ 5 BBLS	> 5 AND ≤ 50 BBLS	> 50 AND ≤ 500 BBLS	> 500 BBLS	TOTAL INCIDENTS
2020	206	73	39	14	332
2021	230	60	34	22	346
2022	169	62	41	23	295
2023	180	68	34	16	298
2024	190	57	30	13	290
Total Releases	**975**	**320**	**178**	**88**	**1561**
% Change Since 2020	**-8%**	**-22%**	**-23%**	**-7%**	**-13%**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety, March 2025

DATA TABLES

INCIDENTS BY SIZE

11 INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT BY SIZE (2020-2024)

YEAR	≤ 5 BBLS	> 5 AND ≤ 50 BBLS	> 50 AND ≤ 500 BBLS	> 500 BBLS	TOTAL INCIDENTS
2020	27	18	17	6	68
2021	23	15	12	10	60
2022	19	24	17	14	74
2023	30	17	18	7	72
2024	31	10	11	7	59
Total Releases	**130**	**84**	**75**	**44**	**333**
% Change Since 2020	**15%**	**-44%**	**-35%**	**17%**	**-13%**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety, March 2025

12 CRUDE OIL INCIDENTS BY SIZE (2020-2024)

YEAR	≤ 5 BBLS	> 5 AND ≤ 50 BBLS	> 50 AND ≤ 500 BBLS	> 500 BBLS	TOTAL INCIDENTS
2020	100	42	19	4	165
2021	123	36	18	8	185
2022	93	33	27	10	163
2023	89	39	15	7	150
2024	97	34	15	7	153
Total Releases	**502**	**184**	**94**	**36**	**816**
% Change Since 2020	**-3%**	**-19%**	**-21%**	**75%**	**-7%**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety, March 2025

DATA TABLES

INCIDENTS BY COMMODITY

13 ALL INCIDENTS BY COMMODITY (2020-2024)

YEAR	CRUDE OIL	REFINED PRODUCTS	NATURAL GAS LIQUIDS (NGLs)	CO_2	BIOFUEL/ ETHANOL	TOTAL INCIDENTS
2020	165	96	64	6	1	332
2021	185	98	56	6	1	346
2022	163	94	35	3	0	295
2023	150	98	46	4	0	298
2024	153	102	34	1	0	290
Total	**816**	**488**	**235**	**20**	**2**	**1561**
% Change Since 2020	**-7%**	**6%**	**-47%**	**-83%**	**-100%**	**-13%**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety, March 2025

14 INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT BY COMMODITY (2020-2024)

YEAR	CRUDE OIL	REFINED PRODUCTS	BIOFUEL/ETHANOL	TOTAL INCIDENTS
2020	36	31	1	68
2021	35	24	1	60
2022	56	18	0	74
2023	46	26	0	72
2024	39	20	0	59
Total	**212**	**119**	**2**	**333**
% Change Since 2020	**8%**	**-35%**	**-100%**	**-13%**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety, March 2025

DATA TABLES

INCIDENTS BY COMMODITY

15 PERCENT OF INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT BARRELS RELEASED BY COMMODITY (2020-2024)

YEAR	CRUDE OIL	REFINED PRODUCTS
2020	10%	90%
2021	54%	46%
2022	87%	13%
2023	87%	13%
2024	81%	19%
% Change Since 2020	**71%**	**-71%**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety, March 2025

INCIDENTS BY CAUSE

16 LIQUID PIPELINE INCIDENTS BY CAUSE (2020-2024)

CAUSE	TOTAL INCIDENTS	PERCENTAGE
Equipment Failures	706	45%
Corrosion Failures	386	25%
Incorrect Operation	193	12%
Material Pipe/Weld Failures	97	6%
Natural Force Incidents	67	4%
Other Incident Causes	40	3%
Excavation Incidents	38	2%
Outside Force Incidents	34	2%
Total	**1561**	**100%**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety, March 2025

DATA TABLES

INCIDENTS BY CAUSE

17 INCIDENTS IMPACTING PEOPLE OR THE ENVIRONMENT BY CAUSE (2020-2024)

CAUSE	TOTAL INCIDENTS	PERCENTAGE
Corrosion Failures	108	32%
Equipment Failures	68	20%
Incorrect Operation	46	14%
Material Pipe/Weld Failures	42	13%
Excavation Incidents	28	8%
Outside Force Incidents	18	5%
Other Incident Causes	12	4%
Natural Force Incidents	11	3%
Total	**333**	**100%**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety, March 2025

18 BARRELS RELEASED IMPACTING PEOPLE OR THE ENVIRONMENT BY CAUSE (2020-2024)

CAUSE	BARRELS RELEASED	PERCENTAGE
Material Pipe/Weld Failures	80,897	46%
Corrosion Failures	28,185	16%
Equipment Failures	19,669	11%
Outside Force Incidents	16,343	9%
Incorrect Operation	10,942	6%
Excavation Incidents	10,771	6%
Natural Force Incidents	4,463	3%
Other Incident Causes	2,788	2%
Total	**174,058**	**100%**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety, March 2025

DATA TABLES

INCIDENTS BY CAUSE

19 MILES OF U.S. PIPELINE BY PRODUCT (2019-2023)

	2019	2020	2021	2022	2023
Crude Oil	84,475	85,294	84,826	84,538	84,363
Petroleum Products	63,107	64,111	64,253	64,136	64,101
Natural Gas Liquids (NGLs)	72,753	74,819	75,601	75,456	75,065
CO_2/Ethanol	5,164	5,167	5,356	5,373	5,353
Total Miles	**225,499**	**229,391**	**230,036**	**229,503**	**228,881**

Source: Pipeline and Hazardous Materials Safety Administration, PHMSA Pipeline Safety as of March 2025.

20 BARRELS DELIVERED BY U.S. PIPELINE (2019-2023)

	2019	2020	2021	2022	2023
Crude Oil	13,935,745,435	11,874,328,801	12,531,034,346	13,021,837,140	15,939,710,013
Petroleum Products	8,856,466,147	8,509,216,644	9,215,504,691	9,818,936,330	10,462,728,604
Total Barrels	**22,792,211,582**	**20,383,545,445**	**21,746,539,037**	**22,840,773,470**	**26,402,438,617**

Source: U.S. Federal Energy Regulatory Commission

APPENDIX

DEFINITIONS & NOTES

Barrels

One barrel of crude oil or petroleum products is equivalent to 42 gallons.

Barrels Released

PHMSA requires operators to report intentional releases of natural gas liquids in gas form into the atmosphere during maintenance activities. This process displaces residual hydrocarbons in gas state from the section of pipeline set to undergo maintenance. Unintentionally released barrels of crude oil and petroleum products form the basis of "barrels released" data and analysis in this report. Barrels released data in this report do not include intentional blowdown releases.

In-line Inspection Device, or "Smart pig"

An in-line inspection (ILI) device, commonly referred to as a "smart pig," is a diagnostic tool that travels inside the pipeline scanning the pipe walls for imperfections and recording the data for later analysis.

Natural Gas Liquids

Petroleum products that are liquids when traveling through a pipeline under high pressure and gases at atmospheric pressure are generally referred to as natural gas liquids (NGLs). Examples of NGLs transported by pipeline include propane, ethane and butane. They occur naturally in petroleum deposits and are produced along with crude oil or natural gas (methane). NGLs are separated from crude oil and natural gas after production and sent to manufacturers (ethane, butane) as an industrial raw material to produce consumer goods such as polymers, fertilizers and home products, or for other commercial, agricultural or residential uses (propane).

Incidents Impacting People or the Environment (IPE) Criteria

If the criteria in either tier below is met for a crude oil or refined products pipeline, the incident counts as an IPE:

- **TIER 1:** Regardless of location of incident: fatality; injury requiring inpatient hospitalization; ignition; explosion; evacuation; wildlife impact; water contamination (ocean/seawater, groundwater or drinking water); or public/ non-operator private property damage.
- **TIER 2:** For location of incident "not totally contained on operator-controlled property": unintentional release volume greater than or equal to five gallons and in an HCA; unintentional release volume greater than or equal to five barrels and outside of an HCA; water contamination; or soil contamination.

PHMSA Incident Reporting

Pipeline operators regulated by PHMSA are required to report data related to pipeline incidents, including location, cause and consequences. PHMSA compiles this information in a publicly available online database. The pipeline safety data used in this report was obtained from PHMSA in March 2025.

Recommended Practice

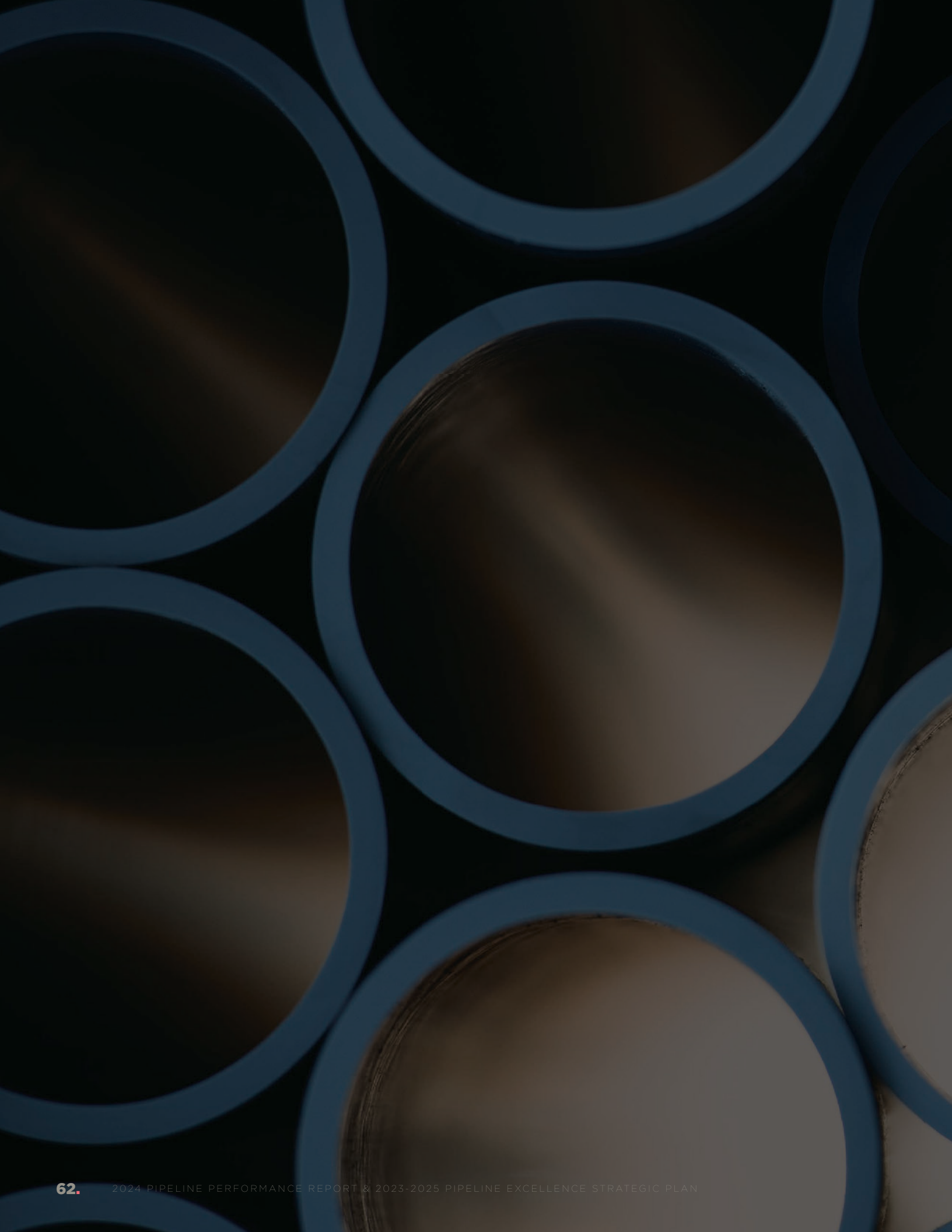
A document that communicates proven industry practices. RPs may include both mandatory and nonmandatory provisions.

Refined Products

Products derived from the process of refining crude oil. Examples of refined products include gasoline, kerosene and lubricating oil.

Crude Oil

Includes condensate, light, medium and heavy unrefined hydrocarbons extracted from underground petroleum formations.



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