

## PIPELINE SAFETY

Pipelines are by far the safest way to transport the energy we need to fuel our ambulances and school buses; to heat our homes and hospitals; and to provide much of the electricity upon which our quality of life depends. Unfortunately, a few well-funded ideological opponents of energy infrastructure use rare and tragic events to paint a misleading picture of your safety around the nation's 2.6 million miles of pipelines.

One of the chief weapons these well-funded groups are using against pipelines is to assert that they are dangerous. The groups will comb through decades of records to find the tragic, and thankfully extremely rare, ruptures leading to injury. Yet



fear-mongering about pipelines is like claiming that airplanes are not the safest form of travel because, unfortunately, airline accidents occasionally happen. Indeed, according to government statistics, we each face a greater risk from car accidents than airplane accidents – and much greater than pipeline accidents. Put another way, worrying about pipeline accidents is like worrying about getting struck by lightning – only more so, since your risk of a fatal lightning strike is one in 6 million, versus a pipeline accident of one in 23 million.

Even better, the industry as a whole gets safer every year. According to the federal safety regulator, the Pipeline and Hazardous Materials Safety Administration (PHMSA), pipeline incidents causing death or major injuries dropped nearly 37 percent from almost 50 per year for the decade from 1997-2006, to 31.5 per year from 2007-2016<sup>1</sup>

*We are proud of our record and post our pipeline operating and safety statistics online for the sake of transparency.*

<sup>1</sup> <https://hlp.phmsa.dot.gov/analyticsSOAP/saw.dll?Portalpages>

Nonetheless, even one accident is one too many, and Kinder Morgan is committed to continuous improvement and relentless risk reduction beyond compliance activities for the protection of people; care for the environment; and the safe operation of our pipelines and facilities in compliance with all rules and regulations. We meet and exceed hundreds of regulations and procedures to regularly monitor, test and inspect the mechanical and operational integrity of our pipelines.

You don't need to take our word for it. We are proud of our record and post our pipeline operating and safety statistics online for the sake of transparency. We outperform our peers in the majority of 36 environmental, health and safety measures.

On a rolling three-year and 12-month average basis, Kinder Morgan's natural gas and products pipelines consistently outperform industry averages. Notably, on a rolling three-year basis for gas transmission line releases, where a pipeline actually ruptures and gas is released to the atmosphere, our incident rate per 1,000 miles of pipeline is nearly half of the industry's average.<sup>2</sup> Other incidents, most of which never affect homeowners and businesses, are also reported because regulations are stringent and require us to collect and report data that goes well beyond protecting public safety and the environment. This includes such incidents as vehicles that hit our facilities along roads and highways, and safely venting gas when compressor stations undergo unplanned shutdowns. As an example, you can review the operating statistics of one of our largest and safest pipeline systems, Tennessee Gas Pipeline (TGP), which serves many areas of the country from South Texas and the Gulf Coast to Boston:

- TGP has an excellent safety record in the Northeast and New England. There have been only two injuries (no fatalities) on our almost 12,000-mile system during the last decade, and those involved vehicles driven by outside parties that struck our facilities adjacent to roads and highways.

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<sup>2</sup> [http://www.kindermorgan.com/content/docs/Gas\\_Pipeline\\_Incidents.pdf](http://www.kindermorgan.com/content/docs/Gas_Pipeline_Incidents.pdf)

- Since 2004, over its entire system, TGP has experienced a total of 62 reportable incidents, including incidents resulting from random acts, such as third-party line strikes, vehicle accidents and lightning strikes, which occurred along its land-based onshore right-of-way.

Another Kinder Morgan stewardship [report](#) that uses 12-month and three-year average rates focuses on products and CO<sub>2</sub> pipelines. The rates represent the number of incidents per 1,000 miles of pipe, the number of barrels spilled per 1,000 miles of pipe, and the number of incidents and barrels spilled per 1 billion barrel miles through pipes that Kinder Morgan operates. Again, all of these reports transparently document our industry-leading – by far – safety record.

## REGULATORY FRAMEWORK

The U.S. Department of Transportation (DOT) houses the federal program that ensures the safety of pipelines, in partnership with state pipeline safety agencies. The Natural Gas Pipeline Act of 1968 and the Hazardous Liquid Pipeline Act of 1979 first established the federal role in pipeline safety. Under these laws, the DOT Secretary regulates pipeline design, construction, operation and maintenance, and spill response planning.

Title 49 of the Code of Federal Regulations codifies the regulations, and they are administered by the Office of Pipeline Safety (OPS) in PHMSA. PHMSA has over 200 staff, two-thirds of whom are devoted to inspection and enforcement.<sup>3</sup> Another 300-400 state pipeline safety inspectors have authority delegated from PHMSA to administer safety programs for those sections of interstate pipelines that are within their state borders. State agencies also regulate pipelines that are wholly within their state.

User fees paid by pipeline operators fund PHMSA's

<sup>3</sup> <https://www.fas.org/sgp/crs/homesecc/R41536.pdf>



pipeline safety programs at authorized levels of almost \$110 million annually. PHMSA uses these funds to conduct programmatic inspections of management systems as well as physical inspections of facilities and construction projects. PHMSA regularly publishes protocols, regulatory orders and guidance manuals. PHMSA also performs system-wide reviews that are focused on high-risk operational issues and sections of pipelines near sensitive environmental areas, high-density populations and navigable waters.

For more than a decade, PHMSA has required operators to implement integrity management programs covering pipeline segments near so-called “high consequence areas.” PHMSA defines high consequence areas containing “populated areas, drinking water

sources and unusually sensitive ecological resources.”<sup>4</sup> These integrity management programs provide for ongoing, continuous evaluation of pipeline conditions; risk assessment; inspection and testing; data analysis; as well



as preventive or mitigative actions and follow-up repairs. These integrity management programs have been mandatory since 2001 for operators with 500 or more miles of regulated liquids pipelines and since 2004 on regulated gas pipelines. Kinder Morgan exceeds PHMSA-required integrity management in repair criteria and risk reduction in both high-consequence area (HCA) mileage and non-HCA mileage.

The pipeline safety regime was strengthened in 2006 with the enactment of the Pipeline Inspection, Protection, Enforcement and Safety Act. Among its provisions was a new national “call before you dig” one-call telephone number – 811 – to require operator

<sup>4</sup> <https://primis.phmsa.dot.gov/comm/FactSheets/FSHCA.htm>

notification of pipeline and other utility structures on property before landowners or state and local governments conduct any construction activities that might impact existing gas, liquid or electricity transmission systems. The Act also gave PHMSA limited authority to conduct enforcement actions against one-call violators if states fail to do so. Kinder Morgan and our trade associations are strong proponents of the 811 program, given the fact that third-party excavation damage is by far the leading cause of serious pipeline incidents. We are working hard in states across the country to educate local officials and landowners about this critical “call before you dig” program.

While PHMSA has the federal jurisdiction over most aspects of pipeline operations and safety, the Federal Energy Regulatory Commission (FERC) has the authority to review and approve the siting of new natural gas pipelines. Companies seeking to build interstate natural gas pipelines must first receive a certificate of public convenience and necessity from FERC. FERC acts as the lead agency in coordinating all applicable federal permits and for compliance with the National Environmental Policy Act. As part of its rigorous process, FERC reviews detailed descriptions of the proposed pipeline, route maps, construction plans, schedules, and statutory or regulatory requirements from other agencies. The application must include comprehensive environmental reports analyzing route alternatives and analyses of impacts on habitat, soils, water, wildlife, cultural resources, socioeconomics, geology, aesthetic resources and land use.

FERC must determine whether a particular pipeline project is in the national interest, based on a project’s impact on other pipelines, the possibility of overbuilding, potential subsidization by existing customers and environmental impacts, among other factors.<sup>5</sup> PHMSA acts as a partner in this process and retains primary

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<sup>5</sup> Federal Energy Regulatory Commission, Certification of New Interstate Natural Gas Pipeline Facilities (Policy Statement), 88 FERC ¶ 61,227, 1999

authority for pipeline safety under the Natural Gas Pipeline Safety Act of 1968.

## **INDUSTRY SAFETY INITIATIVES**

Each of the three major industry trade associations, the American Petroleum Institute (API), the Association of Oil Pipelines (AOPL) and the Interstate Natural Gas Association of America (INGAA), has initiated a variety of important safety campaigns. API also publishes “Recommended Practices” in conjunction with the American National Standards Institute (ANSI) that represent best practices in a variety of areas.

In July 2015, API/ANSI issued “Recommended Practice 1173: Pipeline Safety Management Systems” (RP 1173), a framework for organizations that operate hazardous liquid and gas pipelines jurisdictional to the U.S. Department of Transportation. According to API, RP 1173:

provides pipeline operators with safety management system requirements that when applied provide a framework to reveal and manage risk, promote a learning environment, and continuously improve pipeline safety and integrity. . . . This RP provides a comprehensive framework and defines the elements needed to identify and address safety for a pipeline’s life cycle. . . . This RP presents the holistic approach of “Plan-Do-Check-Act” and is the American National Standard for pipeline safety management systems.<sup>6</sup>

API/ANSI’s RP 1173 was a response to a recommendation from the National Transportation Safety Board (NTSB). Following API’s issuance of the standard, the NTSB Chairman called RP 1173 “an

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<sup>6</sup> [http://www.api.org/Publications-Standards-and-Statistics/Standards/WhatsNew/Publication-Updates/New-Pipeline-Publications/ANSI\\_API\\_RP\\_1173](http://www.api.org/Publications-Standards-and-Statistics/Standards/WhatsNew/Publication-Updates/New-Pipeline-Publications/ANSI_API_RP_1173)



important framework for the pipeline industry’s continuous improvement efforts” that “exceeds our original intent. . . .”<sup>7</sup>

Kinder Morgan is also a member of various organizations or groups that serve to continuously improve pipeline safety through ongoing research activities and the development and improvement of guidelines, standards and procedures. For example, a Kinder Morgan executive chaired the API committee to draft and publish the new Recommended Practice 1173 and worked with AOPL and API toward full industry implementation.

Kinder Morgan is a Platinum Sponsor (the highest level) in the Common Ground Alliance. The CGA is the premier nation wide organization to promote best practices and educate all potential excavators to prevent underground damage. Kinder Morgan employees participate in the CGA’s various committees and their work to create world-class best practices.

Kinder Morgan executives also participate in INGAA, AOPL and API strategic initiatives to improve practices and promote better standards for integrity, operations and construction.

Kinder Morgan is one of the largest contributing members of the Pipeline Research Council International (PRCI). PRCI facilitates collaborative research efforts that leverage the knowledge and experience of numerous pipeline companies, service providers, vendors, equipment manufactures and other organizations on an international level.



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<sup>7</sup> Letter from NTSB Chairman Christopher A. Hart to API President and Chief Executive Officer Jack Gerard, October 22, 2015

## MONITORING AND INSPECTIONS

We keep communities safe in large part because we monitor our pipelines 24 hours a day, seven days a week and 365 days a year using a Supervisory Control and Data Acquisition (SCADA) computer system.

These specialized communication systems allow us to monitor and control equipment on the gas and liquid pipelines we operate. SCADA systems transmit operating status, flow volumes, and pressure/ temperature information including safety alarms from pump and compressor stations, measurement stations, key pipeline valves and other equipment to centralized, manned control facilities. Kinder Morgan uses state-of-the-art communication systems that include cellular, satellite, microwave, radio and traditional telephone lines to reliably transmit this information to and from the control center and provide for real time monitoring and control of the vast Kinder Morgan pipeline network. Whenever operating conditions change, an alarm alerts the operator on duty and the condition is investigated and corrected.

Automated and manual valves along pipeline segments enable them to be shut down and isolated quickly. We also conduct inspections of pipeline rights-of-way by air and ground. Above-ground markers are displayed along rights-of-way to denote the presence of buried pipeline.

We employ internal inspections using sophisticated, computerized inline inspection equipment (aka “smart pigs”), close interval surveys and cathodic protection to protect pipelines from external corrosion.

Traditional “pigs” are scrubbing and scraping devices that clean the inside of piping systems to reduce build-up of waxes and other contaminants. Calling them pigs dates to the earliest versions made of straw because they squealed as they were pulled through the pipe by rope.



“Smart pigs” are inserted into the pipeline at a valve or pump station. They then are pushed along by the products through the pipe measuring and recording any irregularities that may represent or presage corrosion, cracks, laminations, deformations or other defects that could turn into problems. There are three basic types of smart pigs. One uses mechanical arms or other electro-mechanical means to measure the bore of the pipe. These geometry tools can identify a variety of deformations and can sense changes in girth welds and wall thickness. Two other types depend on ultrasonic testing, either via compression waves or shear waves, and magnetic flux leakage (MFL) with the magnetic field oriented either axially or circumferentially. Pipelines monitored under this regimen can last for decades as they are constantly renewed.

For new pipeline systems and occasionally on existing lines, we also use hydrostatic pressure testing to perform strength and leak tests. This process is performed before putting the pipeline into service, or after taking an existing pipeline out of service, filling it with water, raising the internal pressure of the pipe to a designated level well above its allowed “in service pressure,” and holding the pipe at or above that level for a prescribed period of time. API first recommended a hydrostatic test in Standard 5L, published in 1928, and standards have been regularly updated since then.

In our ongoing effort for operational excellence we have developed a unique analytical process which provides a comprehensive, more efficient analysis of pipelines than traditional inline inspection companies provide.

Kinder Morgan Assessment Protocol (KMAP™) is an innovative pipeline integrity solution designed to search for flaws in longitudinal welds. Created as a proactive solution to more thoroughly inspect its pipelines, Kinder Morgan has been successfully using the patented technology for seven years. Today, Kinder Morgan is providing KMAP™ to outside operating pipeline companies across North

America in a continued effort to maximize reliability while minimizing the risk of having a release.

In addition to these existing technologies, PHMSA is sponsoring research and development projects focused on “leak detection; detection of mechanical damage; damage prevention; improved pipeline system controls, monitoring and operations; and, improvements in pipeline materials.”<sup>8</sup>

We have an active public awareness program designed to prevent third-party damage, and we are a member of numerous "call-before-you-dig" programs, including the national “811” one-call system. Our senior employees give their time to several federal, state and industry safety advisory groups. Our employees work closely with local emergency response organizations to educate them regarding our pipelines and help conduct regular training on how to respond in the unlikely event of an emergency.



## **BENEFITS, OVERSIGHT AND THE BOTTOM LINE**

Pipelines benefit U.S. consumers in many ways and form the underpinnings of the nation’s economic infrastructure. They help ensure a plentiful supply of natural gas to heat homes and businesses and generate electricity; move gasoline and petroleum products to operate our cars and trucks; transport fuel oil to power industrial facilities; and provide jet fuel for aircraft.

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<sup>8</sup> <https://primis.phmsa.dot.gov/rd/>

Among other uses, natural gas is used in the production of fertilizers for agricultural use and plastics for the petrochemicals industry; and NGLs and oil are used to make clothing, building materials and even elements that go into renewable energy-producing equipment. America uses fossil fuels for nearly everything essential for our sustenance and for maintaining a comfortable, productive life. The ability to have more human beings lead healthy and productive lives – and keep our nation secure in the process – is dependent on these energy-produced commodities, and the efficient transportation and distribution of them to the general public, businesses and industries.

While the amount of natural gas and petroleum being used in the United States continues to increase, as noted above the industry's safety performance continuously improves and serious accidents are rare. In contrast to other forms of transportation, pipelines are the most efficient and safest method by which our industry transports vital products to meet the ever-increasing demand for energy.

Pipeline incidents can occur, but the incident rate is inherently much lower than other modes of transportation. According to a 2017 study by the respected Manhattan Institute,<sup>9</sup> 70 percent of crude oil and petroleum products are shipped by pipeline on a ton-per-mile basis. Tanker and barge traffic transports another 23 percent, with trucking accounting for 4 percent and rail the remaining 3 percent.



*Multiple federal and state agencies have varying forms of oversight responsibility for our pipelines and their safe operation.*

If incidents and damages involving oil and gas transportation were proportionate to the volume of the commodities shipped, you'd expect the vast majority of incidents would involve pipelines, but that's not the case – by far. Citing U.S. Department of Transportation

<sup>9</sup> <https://www.manhattan-institute.org/sites/default/files/R-CH-0717.pdf>

statistics, the study compared the rate of total incidents (from property damage to injuries to fatalities) between the different sectors measured by how many occurred per *Billion Ton-Miles*.<sup>10</sup> The comparative findings in relation to pipelines were impressive: 7.11 for road transport; 2.20 for rail; and an astonishing 0.73 for natural gas pipelines and 0.66 for liquids.


Don't let fear-mongering fool you. Pipelines are by far the safest mode of transportation – and Kinder Morgan pipelines are among the safest. America's energy sector moves huge quantities of fuel and natural gas around the country with miniscule impacts on society. In fact, the Tennessee Gas Pipeline was called upon by the Roosevelt Administration to build a natural gas pipeline from Texas to Appalachia to serve the war effort in 1944 when no line existed. The project took only one year to complete; opposition today can make projects drag out for years or even be scrapped entirely.

Stopping or delaying a pipeline project by organized special interest opposition is tantamount to electing to use more energy less safely to deliver the basic energy needed for the good of our citizens. It puts the environment and the public at greater risk and jeopardizes national security because more foreign energy needs to be imported at a higher cost. It denies businesses and industries the additional energy sources needed to improve the economic health of the nation. Most importantly, it limits access to a better, more productive life for all of us.

As noted above, we do better than industry average in the majority of 36 environmental, health and safety measures. This is in part due to the technologies we employ, but also the number of compliance systems we use. One of those systems tracks separate action items that we complete annually. We complete more than 99 percent of these on time, ensuring the continued safe operation of assets throughout North America.

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<sup>10</sup> One "ton-mile" = moving one ton of freight one mile.



While technology, processes and systems are key ingredients in safe operations, one factor above all others may account for Kinder Morgan's industry-leading record: our people. Our employees focus on the details of safe operations every day. And every week, the leaders of our various business units report – in front of their colleagues – on any incidents, encroachments or operational issues that may have surfaced during the preceding week. We discuss them, we resolve them and we share the learnings so they don't happen again.

This focus on safety is a key element of our success. Every week, every month, every quarter and every year, we analyze how we are performing, how we are keeping our assets, our employees and our communities safe, and how we are ensuring that we safely integrate acquisitions and safely build out projects. The public deserves nothing less.