

A Decade into DIMP, Pipe Replacement Still Keeps Workforce Busy

By **Michael Reed**, Editor

While systematic evaluation of natural gas pipelines has been going on for decades, the impetus for much of the work that is currently underway comes from the Distribution Integrity Management Program (DIMP), a federal regulation that went into effect in December 2009.

Under the Pipeline and Hazardous Materials Safety Administration (PHMSA) guideline, identification of threats, along

with prioritization and mitigation of risks, must be reported by companies.

Chief among the concerns that ushered in the era of DIMP was that cast-iron and uncoated steel pipelines, and the early vintage polymer (Aldyl-A) pipes, which were widely used in the 1970s and early 1980s, were aging and prone to cracks.

As a result, operators were given 18 months from the date of the guideline's issuance to develop and implement a written plan.

With so many companies involved in natural gas distribution (*P&GJ* reported on 200 of such companies, ranging in size from nearly 6 million to 6,400 customers in the *Annual 500 Report* in November), this summary of ongoing infrastructure replacement projects is intended as overview of current activity and is not an all-inclusive summary.

A decade after the advent of DIMP, much progress has been. Among the companies at the forefront of the effort is CenterPoint company Vectren, which has replaced more than 700 miles of pipe since its program began in 2008.

"To ensure the continued reliability of our natural gas pipeline systems and service, Vectren continues our program to replace essentially all of our bare steel and cast-iron pipeline infrastructure in Indiana and Ohio," said Richard Leger, vice president of Natural Gas Distribution, Indiana and Ohio. "These infrastructure enhancements are vital to meeting federal requirements and ensuring safe delivery of natural gas service to our customers for decades to come."

In addition, Vectren has replaced more than 430 miles of pipe in Ohio and has about 720 miles of bare steel and cast iron pipe left to address in its system. The company plans to be completed in 2024.

The company expects to replace 140 miles of pipe in 2019 at a total investment of \$108 million in 47 cities, according to data from the Business Social Compliance Initiative (BSCI).

Washington Gas is another company that has made great strides in its replacement efforts. As of Dec. 31, 2018, the company had replaced 227 miles of mains and 56,000 services, of which 113 miles was mechanically coupled pipe, 63 miles was unprotected steel pipe, and 38 miles was cast iron pipe.

Washington Gas estimates there are 394 miles of unprotected steel, 681 miles of targeted mechanically coupled, and 478 miles of cast iron pipe remaining in its system.

"Washington Gas' accelerated replace-



Much of Integrys' replacement work has taken place on the crowded streets of Chicago.
(Photo: Integrys)

ment programs enhance safety and improve the reliability of our system by replacing targeted infrastructure at an accelerated rate and implementing new innovative features such as excess flow valves and thermal safety valves,” said Tracy Townsend, vice president, Construction, Compliance and Safety. “We have also added enhancements to strengthen our damage prevention efforts, including installing modern facility-locating equipment and updated mapping records to ensure more accuracy and efficiency.”

The company estimates its programs will have the total equivalent effect of removing 442,300 cars from the road over the duration of the programs.

DOT Estimates

The federal Department of Transportation (DOT) estimated 30,000 miles of cast-iron pipe still carried gas in the United States, with the highest percentage of these mains located in older eastern cities such as New

York City, Philadelphia, Boston, Baltimore and Washington.

Further DOT data indicate that replacement work, while steady, is far from complete. In 2017, there were still 26,060 miles of wrought- and cast-iron gas distribution lines in service in the U.S., down from 39,342 miles since 2005, a decrease of about one-third.

About 97% of natural gas distribution pipelines in the U.S. were made of plastic or steel at the end of 2017, according to the DOT. The remaining 3% is mostly iron pipe. Additionally, DOT data showed that during the period 2004-13, distribution companies replaced 17,000 miles of bare-steel mains, leaving about 56,000 miles of bare steel still in operation.

The extensive 2017 American Gas Association (AGA) Playbook reported during the past decade local distribution companies (LDCs) have installed updated plastic piping at a rate exceeding 30,000 miles per year.

The AGA data shows that of the more

than \$21 billion of gas utility construction for 2015, \$11.6 billion or about 55%, went toward gas distribution assets. Since 2010, AGA estimates, local distribution operators have replaced over 20,000 miles of cast-iron and bare-steel pipeline, and about 900,000 miles of cast-iron and bare-steel services.

With that in mind, these summaries show there is still a large volume of work to be done for decades to come through multibillion-dollar infrastructure replacement programs, many now underway nationwide, with more destined to follow.

East

Baltimore Gas & Electric (BGE) replaced about 45 miles of gas mains in 2017 and plans to complete a similar amount of replacements this year. BGE has addressed nearly 12,000 service pipes and risers during the past two years of its program.

BGE accelerated the pace of replacement following passage of Maryland’s



A portion of the work being done as part of the Washington Gas replacement effort. Photo: Washington Gas

STRIDE law in 2013 and the Maryland Public Service Commission's approval of BGE's accelerated plan in March 2014. STRIDE allows gas utilities to recover some of the costs of pipeline modernization as work is being done, making it possible to replace more aging infrastructure sooner. BGE invested about \$55 million in 2014, with a projected investment of \$115 million a year going forward.

Con Edison continues to replace an average of 65 miles of cast-iron and unprotected steel gas mains each year and looks to continue at that rate for at least another 20 years. In fact, the company has proposed bumping its goal up to 100 miles a year.

The plan calls for continuation of Con Ed's monthly patrols of its gas-delivery system, which began in 2016, as well as pilot programs testing residential methane detectors. The company maintains about 4,000 miles of gas mains and service lines in Manhattan, the Bronx, and portions of Queens and Westchester County, about half of which are targeted for replacement.

PSE&G, which has more cast-iron pipes in its system than any other utility in the nation, remained busy in 2019. Of the system's 18,000 miles, about 3,900 miles of mains are cast-iron, according to company records. The utility is on pace to replace 500 miles of aging cast-iron and unprotected steel gas lines by the end of the year under a program approved in 2015 by the New Jersey Board of Public Utilities. Completing the entire job is expected to take about 25 years.

National Grid is nearing completion of a two-year program to replace about 100 miles of aging steel and cast-iron mains across eastern and central New York state at a cost the company places at about \$1 million per mile.

National Grid's overall effort will likely

take another 20 years as the company removes pipe, some of it dating back to the 1800s, replacing it with high-density plastic pipe. About 1,000 feet of pipeline can be replaced in four or five days, the company said, with directional drilling frequently used to install pipe beneath sidewalks and roads.

PECO Energy, which serves 524,000 gas customers in southeastern Pennsylvania, about 90% of whom are residential, increased its main replacement pace from 15 miles to 30 miles per year in 2019 and has carried on at that pace.

PECO's long-term infrastructure improvement plan was approved by the state's PUC in May 2013, with the 10-year initiative boosting its projected capital investment in the modernization effort by \$20 million a year. PECO plans to have all cast-iron and bare-steel mains replaced by 2035.

UGI Utilities, which has 642,000 customers primarily in eastern and central Pennsylvania, has 90% of its 12,000 miles of pipeline constructed of modern contemporary material. That leaves about 1,000 miles of bare steel and 300 miles of cast-iron infrastructure to replace.

The company is on pace to have all cast-iron gone by February 2027 with all bare-steel pipe replaced by 2041. The \$1.2 billion program, which began in February 2012, expects to replace 70 miles of pipeline in 2019.

West

Avista Utilities, headquartered in Spokane, Wash., serves 354,000 customers in eastern Washington, northern Idaho and portions of southern and eastern Oregon. As with most of the newer systems of the western states, Avista has never had cast-iron in its system but still maintains a 20-year pro-

gram to replace 700 miles of plastic main piping and install transition tubing at about 16,000 steel tees. The ongoing project cost for replacing pre-1987 plastic pipe cost is about \$20 million per year.

Pacific Gas and Electric Company (PG&E), which serves 4,495,000, mostly in the northern two-thirds of California, eliminated all system-wide cast-iron pipeline ahead of its 2014 year-end goal. Since then, it has focused on replacing pre-1940 steel pipe, replacing about 30 miles a year.

South

Alagasco, north and central Alabama's largest natural gas utility with 384,000 residential and retail customers, invests an average of \$24 million each year to replace gas mains. As of early 2016, the company had about 1,250 miles of cast-iron and bare-steel mains still to replace.

CenterPoint Energy estimated it would spend over \$2 billion on replacement and further upgrades to its system by the end of 2019 in northwest Louisiana alone. At the time, CenterPoint had 118 miles of cast-iron and 408 miles of bare-steel pipelines remaining in Louisiana and planned to remove over 1,700 miles of cast-iron pipes – 90% of its entire system – and 2,116 miles of bare steel over the course of 30 years.

Memphis Light, Gas and Water (MLGW), which is the largest three-service provider in the United States, serves customers throughout Shelby County, Tenn. The company began replacing its 330 miles of cast-iron mains in 1992 as part of a \$100 million program. MLGW expects to have removed all cast-iron from its system by 2021. Along with cast-iron replacement, the company plans to eliminate all the wrought iron and PVC gas pipes from its gas distribution

systems by 2021.

TECO Peoples Gas is actively replacing all cast-iron and bare-steel distribution pipe in the Tampa area under a program it began in 2012. The company is spending about \$8 million a year to accelerate its 10-year program, which replaces an average of 15 miles of cast-iron and 40 miles of bare-steel pipe each year.

Midwest

Columbia Gas of Ohio began replacing lines in the city's downtown area in June 2016 as part of a larger program to improve over 20,000 miles of its system during a 25-year period. In 2016, the company invested over \$25 million in Columbus, benefiting 4,500 customers.

DTE Energy, based in Detroit, is four years into a five-year, \$2.5 billion gas and electric infrastructure upgrade, in which it plans to spend \$1.4 billion for natural gas pipeline infrastructure that spans 20,000 square miles spread across the state. The company began a small pilot replacement project in 2007, covering 33 miles, then ramped up consider-

ably four years later.

Integrus Energy Group continues to replace what will be a total of 2,000 miles of cast-iron mains within its Peoples Gas Distribution system, with a large portion of the work taking place within Chicago. In addition to the pipe, 300,000 service pipes and related meters will be installed.

The effort began in 2011 and the company expects half of its system to be updated within 20 years. Cast-iron pipes, some of which went into service in the late-1800s, are being replaced with polyethylene plastic pipes, ranging from 2-18 inches, depending on whether the location is a residential or arterial street. Protected steel pipe, generally 24 inches but in some cases up to 42 inches, is also being installed.

Ameren Illinois, a subsidiary of St. Louis-based Ameren Corp., which serves 900,000 natural gas customers in central and Southern Illinois, replaced all cast-iron and ductile iron piping in the distribution system. However, the company will be replacing about 60 miles of mechanically coupled steel pipe in the

next three years.

Spire (formerly Laclede Group) spends \$135 million on pipeline replacement for its three utilities in the St. Louis and Kansas City areas and in Alabama, replacing about 235 total miles of pipe. The company expects to continue at that pace.

In St. Louis, the company is replacing a low-pressure, cast-iron piping system that is decades old. Many of the residential gas meters were installed inside basements, so the program also involves moving about 100,000 meters outside of homes to provide easier access for inspections.

Metropolitan Utilities District of Omaha (Nebraska) continues to replace its cast-iron natural gas mains. The effort coincides with replacement of the city's water mains. The district expects to have abandoned its remaining 387 miles of cast-iron gas mains by 2027. Over coming decades, the Omaha MUD will also abandon or rehabilitate over 1,200 miles of cast-iron water mains. The size of the pipe being replaced varies, but most are smaller-diameter mains, measuring 3-8 inches. *PEGJ*