



Minnesota Natural Gas Distribution Profile

Introduction

Minnesota's natural gas distribution pipeline system is a network of more than 30,000 miles of pipe that supply homes, businesses, and communities with energy. Repairing aging and leak prone natural gas pipelines has the potential to create and support quality, family-sustaining jobs and drive investment toward a more resilient pipeline system.

As part of an education and outreach project sponsored by the Pipeline and Hazardous Materials Safety Administration (PHMSA), the Minnesota BlueGreen Alliance convened a series of stakeholder meetings engaging frontline gas workers, community and environmental groups, and additional engaged stakeholders throughout 2014 to identify challenges and opportunities facing the network of natural gas distribution pipelines in the Twin Cities metro.

The metro is in many ways is at the forefront of efforts underway by gas providers to upgrade aging pipe infrastructure. These improvements are critical in reducing methane emissions—a potent greenhouse gas that is estimated to have at least 20 times the climate change impact versus carbon dioxide on a pound for pound basis over a 100-year timeframe. The series of meetings has identified best practices highlighting how far along the utilities and workers have come in advancing distribution pipeline repair, replacement and detection, which may be a model for other utilities around the nation

Distribution Pipelines in Minnesota: Summary

There are 47 operators of natural gas distribution pipelines that serve the state of Minnesota; cumulatively they operate a total of 30,450 miles of networked pipeline that runs out from a gate station, and 1,483,509 services—lines directly to homes and businesses. The two largest distribution pipeline operators are CenterPoint Energy, which operates 13,425 miles of pipeline (44 percent of total miles), and Xcel/Northern States Power, which operate 8,917 miles (29 percent).

Each operator in Minnesota has an operator ID that is used to track their reported data. Operators are responsible for maintenance and reporting on their pipelines and are subject to inspections and audits, as well as penalties if requirements are not met. Operators report to the PHMSA at the federal level and to the Minnesota Office of Pipeline Safety—a Division of the Minnesota Department of Public Safety—at the state level. Each operator is required to report annually on the mileage of their pipelines, materials, leaks, incidents, and other topics.¹ Additionally, the Minnesota Office of Pipeline Safety conducts yearly audits of operators.

As of 2012, the Minnesota had 512 miles of distribution pipelines made from leak prone materials: 430 miles of bare steel pipeline, 53 coated unprotected steel, and 30 cast/wrought iron. In 2012 there were 646 leaks reported in the state of Minnesota. Causes of the leaks were reported as the following:

Cause of Leaks	# of Leaks	% of Total Leaks
Equipment	213	33%
Excavation Damage	205	32%
Corrosion	67	10%
Natural Forces	58	9%
Material or Welds	55	9%
Other	23	4%
Other Outside Force or Damage	13	2%
Incorrect Operations	12	2%
Total	646	100%

For a more detailed summary of natural gas distribution pipeline reported data reported in 2012, see the visualization [Summary of Minnesota Natural Gas Distribution Pipeline Systems](#).

Best Practices: Lessons from Minnesota

While recent legislation in Massachusetts and Illinois are now moving those states forward in addressing pipeline leaks, utilities in Minnesota have been ahead of the curve on this issue and are in a good position to share lessons learned with other states. At a stakeholder meeting in July 2014, workers from CenterPoint Energy shared ongoing initiatives to address this issue along with other opportunities and challenges.

CenterPoint Energy: Replacement Efforts

CenterPoint Energy has been actively replacing pipelines made from leak-prone materials; as a result, cast iron pipelines are almost entirely gone. CenterPoint is systematically improving and modernizing pipelines by doubling capital investments to \$140 million annually from \$70 million and upgrading to current technologies for inspection.ⁱⁱ They also report energy savings benefits from their efficiency initiatives, which they have participated in since 1992. The company reports a reduced carbon footprint savings of nearly 2 billion cubic feet through the conservation improvement program, part of Minnesota's legislative energy efficiency standards.ⁱⁱⁱ



PROTECT, PRODUCE & PROSPER

The CenterPoint 2013 Annual Report states that “In 2013 we continued to replace remaining cast iron and bare steel pipe across our entire gas distribution system. In Minneapolis, we completed the first phase of a 72-mile pipeline rehabilitation project. This project, which includes pipe replacement and refurbishment, is part of our Minnesota distribution system.”^{iv}

CenterPoint Energy: Leak Detection

CenterPoint recently piloted new leak detection equipment in Minnesota, now planned for company-wide implementation in Minnesota and five other states as well.^v

A 2014 paper, [Beyond compliance: Creating a new norm in gas pipeline leak management](#), describes CenterPoint’s implementation as a case study, cautioning that while “advanced leak detection is three orders of magnitude more sensitive than current methods”, deploying this advanced technology “presents challenges that may inhibit utilities from reaping significant benefits and achieving a step-change improvement in pipeline safety. Adoption is far from ‘plug and play’ — process redesign, systems integration, and change management are required.” The table below indicates benefits of the potential advantages of the technology, compared to processes in other markets:

Advanced leak detection pilot results	Texas	Minnesota
Increase in leak survey find rate	5.7x	5.7x
Estimated reduction in unfound leaks	89%	90%
Total leak management cost reduction	13%	14%
Leak survey productivity improvement	18%	26%
Estimated reduction in customer calls	21%	26%

An additional benefit of better leak detection is that leaks are detected earlier, when they can be smaller and less hazardous.

An issue raised at a July 2014 stakeholder was that better leak detection could be expected to result in an increase in leaks detected, not because there are more but because smaller leaks previously undetected are now detectable.

The paper linked above addresses this issue thusly: success in overcoming the transition bubble and achieving the new norm in leak management will depend on cultivating a culture of safety vigilance, revamping systems and processes, and working with regulators on cost recovery for incremental leak repairs. They should also educate customers, regulators and the public at large on a key message: “More leaks are not necessarily bad. The ability to proactively find and fix more leaks defines leaders in pipeline safety.”

Xcel Energy/Northern States Power Company: Improvements Underway

- Replacement of a 11.5-mile transmission segment in Roseville and St. Paul that serving 100,000-plus residential and business customers. The design and construction of the new pipeline will also provide the ability to use advanced detection techniques to assess the physical condition of the line in future years. Work was completed in 2013 on the Roseville segment and will continue through 2016 in St. Paul. Planned 2015 activities will be conducted from Rose Avenue and Park Street to Pleasant Avenue and St. Albans Street.
- Using advanced technology to inspect more than seven miles of transmission pipeline in St. Cloud, South St. Paul, Inver Grove Heights, Maplewood and North St. Paul to facilitate and expedite repairs.
- Installing state-of-the-art valves on transmission and distribution pipelines to provide the ability to shut down natural gas flow automatically or remotely if necessary.

Xcel has proposed modest rate adjustments to carry forward these activities, estimated to cost customers no more than \$2 per month. According to Northern State Power Co. President Dave Sparby, “We are proposing significant investments now—while natural gas prices are at historically low levels—which will moderate the impact on customers’ bills. Projects like these also have beneficial economic impacts on local communities, including providing jobs.”

Additional Opportunities/Challenges

Workforce Considerations:

Utility and installation workers represent a well-trained, quality workforce, with their expertise being highly sought, and in turn well-compensated. Pipe workers on average make 40 percent more than the typical worker in the economy (\$31.17 per hour versus \$22.33 for the average worker).^{vi} Also, pipe trades experience much lower unemployment than the typical overall workforce – 2.3 percent versus 6.2 percent for the general economy.^{vii} However, it is increasingly challenging to find workers to do the work. Reflecting broader economic trends, baby boomers are retiring faster than apprentices are being turned out, and a fifth of pipe trade workers are over the age of 55.^{viii} The Center for Energy Workforce Development states, in their [Gaps in the Energy Workforce Pipeline](#) report: “Electric and natural gas companies could face a worker shortage earlier than other segments of the economy., over 60 percent of the workers in areas such as electric and gas utilities are likely to retire or leave the industry within a decade.”



At the regional level and at individual utilities, this dynamic can be more pronounced. From the Utility Workers Union of America (UWUA) statement [Short Staffing, Aging Workforce, Threaten Safety and Reliability of MI Grid](#): “Regarding the “aging” of the workforce, preliminary results of the UWUA investigation show, for example, that in 2011 at one major Michigan utility, which has a union workforce in excess of 2,000 people, 87 percent of the employees are over 40 years old, an astonishing 67 percent are over 50, 50 percent are age 55 and older, and 13 percent of the workforce is age 60 or older.”

An assessment of trends in the Minnesota employment market could indicate similar workforce characteristics, and help in developing approaches to ensure trained, qualified workers are available to counter attrition of an aging workforce.

Pipe trades can be lucrative, well-paying, family-supporting careers. The Minnesota Pipe Trades Association and associated unions have several successful programs in place to attract and train the next generation of pipe workers:

- St. Paul Pipefitters Joint Apprenticeship Training:
<http://www.local455jatc.com/JATC%20Program.htm>
- Minnesota Pipe Trades Association Training and Apprenticeship:
<http://www.mnpipetrades.com/join.php>

The United Association Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States, Canada and Australia (UA) also maintains a robust program to help military veterans transition into pipe trades careers upon separation: <http://www.uavip.org/>

Additionally, the Minnesota Department of Veterans Affairs offers resources for on-the-job training and apprenticeship programs: <http://mn.gov/mdva/resources/employment/ojtapprnticeship.jsp>

These resources were identified through the BlueGreen Alliance stakeholder engagement process as appropriate and successful ways to direct potential pipe trades workers into the sector and abide their proficiency and qualifications, especially at the entry and mid-career level. However, utility workers recommended additional measures to increase the viability of pipe trades professions over the long run:

- Engaging students prior to secondary school, to increase visibility and demonstrate the merits of pipe trade professions. This would be enhanced by community and educational interaction, preferably through hands-on, visual representations of pipe and energy career activities.
- Improving technical/applied skill development at all levels of education – primary, middle and high school.
- Encouraging a shift in cultural perspectives to convey that pipe trade careers are as competitive and compensated as other professional tracks.



Additional pipe/energy workforce resources

U.S. Department of Labor: [Identifying and Addressing Workforce Challenges in America's Energy Industry](#)

Interstate Natural Gas Association of America: [Securing Our Future: Developing the Next Workforce - An Analysis of Risk and Recommended Strategies For the Natural Gas Pipeline Industry](#)

Congressional Research Service: [Keeping America's Pipelines Safe and Secure: Key Issues for Congress](#)

Endnotes:

ⁱ To see details on what is reported each year, visit the PHMA website and download Distribution Annual Data

ⁱⁱ Center PointEnergy, Pipeline Replacement Project. Accessed September 2014. Found at:

<http://www.CenterPointenergy.com/staticfiles/CNP/Common/SiteAssets/doc/MN%20Pipeline%20Replacement%20Project%20Fact%20Sheet.pdf>

ⁱⁱⁱ CenterPoint Energy, Conservation Improvement Program. Accessed September 2014. Found at:

http://www.CenterPointenergy.com/staticfiles/CNP/Common/SiteAssets/doc/CIP_Keynote_Berreman_FINAL.pdf

^{iv} CenterPoint 2013 Annual Report. Accessed September 2014. Found at:

<http://www.CenterPointenergy.com/annualreports/2013/html/natural-gas-distribution.html>

^v Pricewaterhouse Coopers LLP, 2014. Accessed September 2014. Found at: <http://www.naturalgasintel.com/articles/98556-pipeline-leak-detection-must-step-up-report-says>

^{vi} U.S. Bureau of Labor Statistics. Accessed September 2014. Found at: <http://www.bls.gov/iag/tgs/iag22.htm#earnings>

^{vii} U.S. Bureau of Labor Statistics. Accessed September 2014. Found at <http://www.bls.gov/iag/tgs/iag22.htm#workforce>

^{viii} Economic Modeling, *Data Spotlight: More Than 1 in 5 Utility Workers Are Retirement-Aged*. Accessed September 2014. Found at: <http://www.economicmodeling.com/2010/06/29/data-spotlight-more-than-1-in-5-utility-workers-are-retirement-aged/>