

SUPPORTING OPERATORS AS THEY IMPLEMENT THE PIPES ACT OF 2020

By: Bob Wilson, Northeast Gas Association



Bob Wilson, Vice President Special Projects, Northeast Gas Association (NGA) works closely with pipeline operators on safety management system implementation including emissions mitigation. NGA facilitates collaborative learning and education through its committee structure to facilitate long term strategies that reduce pipeline safety risk including emissions mitigation. The 2020 PIPES ACT incorporates new regulatory requirements that formalize and amplify emission reduction as a component of pipeline safety. In this article, Bob shares tools, technology and practices to consider as operators integrate the mandates into their day-to-day operations.

In my 38 years serving the gas pipeline and distribution industry and with NGA, public safety and gas system reliability has always been top priority. Gas distribution operators have been actively pursuing methane emission reductions from a public safety perspective especially after the introduction of the EPA Natural Gas Star Program in 1993. For over 25 years, the gas industry has voluntarily participated in technology transfer and emissions reduction strategies from wellhead to burner tip. See: www.epa.gov/natural-gas-star-program-historical-accomplishments.

The science is clear. Emissions from pipeline operations are recognized as a potential safety related hazard and an environmental risk. Although many were doing a lot of work voluntarily, the PIPES Act of 2020 includes legislation that mandates operators to look at their procedures, document plans and engage in emissions risk mitigation projects proactively. The pipeline safety regulatory component aims to minimize public safety impacts and environmental risk while ensuring system reliability.

The Northeast Gas Association formed a committee to specifically assess emission mitigation reduction opportunities and

technologies. The Methane Emissions Reductions Committee (MERC) is a collaborative group within the Northeast region that's evaluating technologies, practices, methods, construction and maintenance practices that help achieve zero methane emissions.

We intentionally ensured that the committee included all sizes and scales of operators. They are looking at leak prone pipe replacement strategies, operations and maintenance emissions control techniques and pipeline rehabilitation strategies associated with distribution pipeline systems to reduce emissions. NGA's role is to help members address current emission mitigation goals while pursuing longer term asset utilization de-carbonization visions. This unique collaborative process allows for subject matter experts from across the region to share leading practices through an open exchange of ideas and experiences. Sharing leading practices and experiences has extraordinary value in helping shape safety culture. We don't call them best practices because that can lead to a competitive mindset of 'Is our idea better than others?' In sharing leading practices, we set the ego aside. We talk about the challenges our members face and how they're working to solve them.

PIPES ACT OF 2020 PROTECTING OUR INFRASTRUCTURE OF PIPELINES AND ENHANCING SAFETY ACT SECTION 114

Mandate to Update Inspection and Maintenance Plans to Address Eliminating Hazardous Leaks and Minimizing Releases of Natural Gas from Pipeline Facilities.

Excerpts:

"... operators are to update their inspection and maintenance plans to address the replacement or remediation of pipelines that are known to leak due to their material (including cast iron, unprotected steel, wrought iron, and historic plastics with known issues), design, or past operating and maintenance history."

"inspection and maintenance plans (are) to address the elimination of hazardous leaks and minimization of releases of natural gas (including, and not limited to, intentional venting during normal operations)."

"implement technologies to prevent and minimize both unintentional, fugitive emissions as well as intentional, vented emissions."



TOOLS AND TECHNOLOGIES FOR REDUCING & ELIMINATING EMISSIONS

There's no one size fits all solution. A toolbox of fit-for-purpose solutions is key to maximize emissions mitigation success over a broad range of assets and operations. Our members are exploring a host of activities for emissions control and mitigation such as venting controls during purging and depressurizing pipelines for performing operations and maintenance activities. A key strategy is maximizing recovery of gas back into the pipeline system versus releasing it into the atmosphere. Tools to recompress gas and recover gas from blow down operations are being considered and implemented on a broader scale. Simply put, Operators are looking at technology and equipment that can recover gas instead of bleeding gas into the atmosphere. Advanced control technologies help minimize release of any gasses during a normal operation or emergency venting operations.

The committee is reviewing gas main isolation procedures and stop off tools, including low-dig technologies that can be used to isolate sections of main more effectively so we can reduce the extent of the main segment involved in an isolating procedure. Minimizing the extent of main segment isolation also reduces pressure reduction venting once they are isolated to enable conducting work on them safely.

Technology has evolved tremendously over the last couple of decades from understanding the methods of quantifying emissions to broader application of trenchless technologies and pipeline rehabilitation techniques. For example, there's recognition and refocus on the strategic implementation of trenchless rehabilitation strategies using Cured-In-Place-Lining (CIPL) as an emissions risk mitigation tool in lieu of open trench pipe replacement. Utilization of state-of-the-art robotic tools to seal legacy cast iron pipe joints is yet another trenchless technology technique that is being explored on a broader scale. We encourage operators to consider the overall carbon footprint of implementing leak prone pipe mitigation strategies and not just fugitive emissions

when evaluating replacement versus rehabilitation. A strategic balance of pipe replacement and pipe rehabilitation will get us to the ultimate goal of minimizing emissions in our industry-wide glidepath to maximizing de-carbonization of assets.

There is a shift and refocus happening that requires significant operational change. Emissions risk mitigation needs to be part of the DNA of safety culture long term. To effectively implement new practices and technology, there must be operational ownership and recognition of emissions mitigation as an integral component of pipeline safety at the grassroots level, with the technicians who are on the front line in day-to-day operations. Operational ownership centered on safety and emissions risk requires upfront work including answering questions such as "Why are we doing this?"

SUSTAINABLE CULTURE CHANGE BEGINS WITH UNDERSTANDING THE "WHY"

When implementing operational changes, questions emerge that need to be answered. Our members recognize, like with other safety and environmental management system implementation components, employee engagement from both a top-down / bottom-up approach is key to success. We are big believers in a structured approach to management of change and going into the field and educating employees so they understand why things are changing. A big part of ensuring sustainable change is explaining the "why" in a way that employees can relate to in their role as an emissions mitigation contributor. Field staff are at the forefront of decision making and actions in safety and emissions mitigation day to day. Instead of telling them what to do, help them understand the 'why.' Arming them with the tools, education and the understanding, leads to sustainable changes. The willingness to listen to employees and understand their point of view and ideas unleashes tremendous potential. Ideas that technicians in the field have come up with are some of the technologies being implemented successfully today.



PLAN, THEN IMPLEMENT

The first step to compliance with section 114 of the PIPES ACT, begins with reviewing operation and maintenance plans to ensure emissions mitigation considerations are integrated in routine operations and maintenance procedures. There is an Advisory Bulletin and checklist developed by PHMSA for state jurisdictional regulators authorized through PHMSA to conduct inspections. Operators need to provide a summary of how they meet the requirements in their plans and ensure that procedures are addressing emissions risk and mitigation.

See: <https://www.phmsa.dot.gov/news/phmsa-advisory-bulletin-pipeline-industry-must-take-actions-address-methane-leaks-pipelines>.

The next step is implementation, or simply, walking the talk. Operators will develop and conduct internal QA/QC inspection protocols, audits and eventually, will be subject to regulatory audits to ensure what is written is practiced in the field. Field inspections will continue to ensure operators are conducting operations in accordance with their procedures.

At NGA, our members have recognized the necessity to integrate emissions risk considerations as part of our evolving safety culture. As such, we embedded emissions mitigation considerations into pipeline safety management system practices; both from a strategic and tactical perspective. Emissions mitigation considerations are now part of pipeline safety management system implementation Tactical Guides. These practical operations focused guides help operators focus and integrate the principles of plan-do-check-act into routine operations including emissions mitigation.

Our fall operations conference in October had sessions to help educate operators on the “how to” piece of emissions risk mitigation. It’s not somebody coming in and lecturing operators on what to do, it’s our membership sharing leading practices with each other in the spirit of continuous improvement and true learning. Education and training helps, but leaders who walk the talk and engage employees until they realize that this challenge is theirs, get the best results. Leadership engagement has extraordinary value in helping shape safety culture.

All of the operating trade organizations across the country, and around the world, are focused on doing whatever they can do to help reduce emissions and control emissions risk. We work closely with AGA, SGA, APGA, and other organizations to further our joint understanding of leading practices. Research organizations such as

NYSEARCH, the research arm of NGA as well as GTI Energy and others continue to provide the industry with innovative technology solutions in achieving our common goal of emissions mitigation.

It is a very interesting time in the industry with the converging of advances in technology, innovations, public awareness and policy changes happening simultaneously. Emissions control and risk mitigation is in the DNA of our day-to-day business, and will continue long into the future.

The Northeast Gas Association (NGA) is the nation’s largest regional energy trade association serving more than 35 companies across 9 states in the northeast region of the U.S. that serve over 14 million gas customers. Members include natural gas utilities, local distribution companies (LDCs) serving New England, New York, New Jersey and Pennsylvania, interstate pipeline companies and LNG/CNG importers and suppliers. †

ABOUT THE AUTHOR:



Bob Wilson is Vice President Special Projects, for the Northeast Gas Association (NGA). Bob served 38 years in the natural gas industry including 32 years with

National Grid and its predecessor companies before retiring and taking a position at the Northeast Gas Association in 2017. He holds a B.S. in Chemical Engineering. His experience spans LNG/SNG Operations, Gas Quality & Interchangeability, Forensic Analysis of Gases, RNG/Landfill Gas Recovery Operations, Pressure Regulation & Control, Compressor Station Operations, Gas Codes & Standards, Environmental Operations. Prior to retiring from National Grid, he held the position of Director of Pipeline Safety for US Operations. He leads an NGA membership collaborative regarding Pipeline Safety Management System (PSMS) implementation with a focus on operationalization of strategy.

CURED-IN-PLACE-LINING (CIPL) FOR LEAK PRONE PIPE

By: Mario Carbone, Progressive Pipeline Management (PPM)

Cured-In-Place-Lining (CIPL) is a proven and viable solution for gas operators to eliminate leaks and minimize emissions in compliance with the PIPES Act. Progressive Pipeline Management (PPM) has been working with gas companies utilizing Starline® Cured-In-Place-Lining (CIPL) for twenty years. The technology is being integrated into gas operators’ long-term strategy to manage leaking infrastructure. Many of the big leaks and gas main needs are in inner cities in the Northeast and metropolitan areas such as Chicago where cast iron pipes can be 60-100 years old.

The regulation identifies areas where Congress believes additional oversight, research, or regulations may be needed to protect the infrastructure of pipelines and enhance safety. Included within this act are new mandates for PHMSA requiring operators to update, as needed, their existing distribution integrity management plans, and O&M plans. PHMSA will also require that leak repair programs consider the environment and the use of advance leak detection practices and technologies.

CIPL allows gas operators to use advanced leak repair technology to



permanently eliminate leaks and minimize methane emissions, while reducing the carbon footprint compared to traditional pipe replacement programs.

LEADERSHIP ENGAGEMENT HAS EXTRAORDINARY VALUE IN HELPING SHAPE SAFETY CULTURE. CIPL ALLOWS GAS OPERATORS TO USE ADVANCED LEAK REPAIR TECHNOLOGY TO PERMANENTLY ELIMINATE LEAKS AND MINIMIZE METHANE EMISSIONS

EMISSION MITIGATION CASE STUDY 2005: BROOKLYN 8-INCH CIPL

Scope: line 7000 feet of 6-inch and 8-inch cast iron gas mains were lined

There was an underground oil spill under the Greenpoint Section of Brooklyn. The oil companies were addressing an oil spill near the area where there were gas lines. This leak prone area had methane emissions detected. The gas operator worked with PPM to use CIPL to line their gas mains to within the area of the plume to eliminate methane emissions from their system. It was done proactively to demonstrate that the methane readings were not coming from the gas mains. The pipelines were inspected annually and they remain methane and leak free today.

PPM's CIPL process and materials all fall within the strict confines of ASTM F2207 as well as ASTM D543. The cost savings and reduced carbon footprint compared to traditional "rip and replace" is significant. CIPL minimizes the impact of excavations, reduces traffic congestion and is proven to extend the life of renewed pipelines by 100 years. A lined pipe is considered a composite pipe, with leaks sealed and future leaks prevented.

LINING MYTHS

As effective as the technology is, there are still misperceptions that impede adoption. One myth is that the epoxy used in the liner is "glue." PPM uses a two-part epoxy resin to structurally bond the liner to the host pipe, not at all glue. PPM's epoxy cures, hardens, and fills up any gaps, cracks, or fissures. "Glue" has no such characteristics. Excessive "glue" impairs its ability to bond, and the objects won't adhere properly. In contrast, PPM's epoxy is moldable, and fills in surface irregularities and holes or deep cracks.

The excellent adhesive properties of PPM's epoxy resin are due to the attractive forces between the epoxy resin and the surface of the substrate. These forces create a permanent bond that forms between the reactive sites in the resin and the surface of the substrate. The final product is a precise thermoset plastic, which is resistant to high operating temperatures, corrosion, UV exposure, and aggressive chemicals, oils and fluids. PPM's epoxy's structural permanent bond lasts as long as the bonded objects exist after the adhesive is fully cured and hardened. †

ABOUT THE AUTHOR:



Mario Carbone is COO of Progressive Pipeline Management. Ingenuity and perseverance define his leadership. Mario's decades of experience enable PPM to design, develop and test new technologies and robotics while complying with required industry standards. He spent thirty-two years in design, maintenance and construction with Brooklyn Union Gas/



Leaking 42-inch cast iron gas main repaired using Starline® Cured-In-Place-Lining (CIPL)

KeySpan Energy and ten years as the senior manager for gas research and development with KeySpan Energy. Mario holds three gas pipeline industry patents for new technologies in gas pipeline purging, live gas polychlorinated biphenyls (PCBs) pipeline sampling, and live service pipeline transfer without interruption. In addition to his expertise in Starline CIPL, engineering and managing field operations, Mario is versed in current regulations for corrosion and pipeline environmental procedures. His inventiveness to overcome challenges led PPM to win the Trenchless Technology Project of the Year multiple times.