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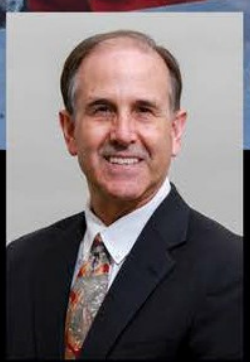

P&GJ Pipeline Opportunities Conference

JUST ANNOUNCED

2017 Pipeline Opportunities Conference
Keynote Speaker: Tom Hutchins, The INGAA Foundation 2017 Chairman, Vice President, Kinder Morgan

Industry Works to Conquer Methane Leaks in Pipelines and Wellheads

Special to Pipeline & Gas Journal

While reliable gas transmission, distribution and gath- ering networks are critical to the nation's growth, such infrastructure is being threatened by a failing pipeline network that leaks methane.

Corrosion, along with the age of the system, plus the materials used decades ago, has caused the pipe systems to fail, sometimes with catastrophic results. Replacement of the aging gas infrastructure is accelerating with more than 38 states having fast-tracked replacement programs as reported by the American Gas Association (AGA).

"The goal of reducing methane emissions is a high-profile issue in the discussion over climate change and a priority of the Obama administration along with many in Congress," said Eben Wyman of Wyman Associates, a Washington, D.C.-based legislative lobbing firm that monitors and analyzes legislation, regulations and policy trends.

"The administration points to the aging distribution infrastructure as a com- mon source of methane leaks. Repair and replacement of these pipelines with leak-resistant piping made with polyethylene, polyamide, and spoolable composites can provide considerable relief," he said.

According to the White House Climate Action Plan, *Strategy to Reduce Methane Emissions*, issued in March 2014, methane represents 9% of domestic greenhouse gas emissions, but put- ting methane to use can support local economies with a source of clean energy that generates revenue, spurs investment, improves safety, and leads to cleaner air.

Industry and government studies show at least half of the methane leakage from natural gas comes from drilling sites and processing plants – upstream emissions – while the rest comes from pipelines and storage systems. Aging, leaky cast-iron and bare-steel pipelines can be upgraded or replaced with polyeth- ylene, polyamide or composite piping that have a proven track record for virtually leak-proof transportation of oil and natural gas.

The Plastics Pipe Institute, Inc. (PPI), the major trade asso- ciation representing all segments of the plastic pipe industry, supports a policy that encourages the expansion of pipeline capacity with reduced methane emissions.

"Drilling site emissions can be better mitigated, starting with reducing venting and flaring of natural gas at the wellhead," said association President Tony Radoszewski. "While flaring systems serve a variety of safety purposes, intentional flaring of natural gas is all too common in certain shale plays in order to access crude oil, which enjoys higher market value."

The Bakken Shale, for example, lacks sufficient gas-gather- ing systems to trans- port and process gas from the well, incen- tivizing developers to flare a large vol- ume of gas at their well sites, he point- ed out. Conversely, Pennsylvania and Ohio are much far- ther along in build- ing pipeline infra- structure in the Marcellus Shale that can handle high vol- umes of natural gas.

"Expanding the gas-gathering pipe- line capacity helps decrease the need for long-term flaring," Radoszewski said.

To create a 3-mile fracking water transfer line in the Marcellus Formation of rural north-central Pennsylvania, a composite-structured pipe that could operate at 1,500 psi was used. Because the pipe could be put on spools, the 16,000 feet of pipe was installed in just three weeks with minimal joints and minimal effect on the land, which is part of a 400-acre wildlife management area.

The 8-inch pipe from Houston-based FlexSteel Pipeline Technologies, a member company of PPI, contains a corrosion-resistant inner liner and an abrasion-resistant outer layer made from an advanced grade of high-density polyethylene with a helically wrapped steel reinforcement in the middle. The 3-plus-mile run of 8-inch inside diameter (ID), flexible, steel- reinforced polyethylene pipeline was designed and qualified in accordance with API SPEC 17J and API RP 15S to provide years of failure-free performance.

"With a required operating pressure of 1,500 psi, typically steel pipe would have been specified," according to Randy Knapp, director of engineering for PPI's Energy Piping Systems Division. "But because of FlexSteel's composite steel-rein- forced product design and the use of PE4710 for the internal liner and the external sheath, it was able to meet that require- ment."

In addition, the pipe was delivered to the rugged job site spooled in 600-foot lengths on 13.5-foot reels, which was not

possible with steel pipe. This saved transportation costs and further reduced the impact on the land. The long, continuous lengths that required minimal connections also greatly increased the integrity of the pipeline, provided cost savings and made it possible for it to be installed in a narrow trench in about one-third the time required by steel pipe.

According to a study by the National Association of Corrosion Engineers (NACE), there are over 480,000 miles of gas and liquids transmission pipelines of which 328,000 are natural gas lines with 60% of these lines over 40 years old. The economic impact to control and repair corrosion in gas and liquids transmission pipelines amounts to $7 billion a year.

Polyethylene (PE) and polyamide (PA) cannot corrode since they are non-conductors and are immune to the electrochemical-based corrosion process induced by electrolytes such as salts, acids and bases. Protective coatings or cathodic protection are needed only for the metallic components in plastic gas system, not the entire pipeline. Local cathodic protection and corrosion-resistant wraps are used for the steel fittings which join the typical 1- or 2-mile lengths of reinforced pipe.

As part of the recently passed PIPES Act 2016, PPI is participating in a study by the Government Accountability Office (GAO) to examine what pipeline materi- als and corrosion-prevention technolo- gies are available to transport hazardous liquids and natural gas, and what are the strengths and limitations of these materi- als and technologies.

"It is also important to note the important role gas system components play as part of a reliable system that helps mitigate methane release," Knapp said. "One product, an anode-less riser avail- able from one of our member companies, R.W. Lyall, enables a PE plastic pipe system to remain seamless underground by connecting to a steel pipe aboveground. By keeping the connection aboveground there is no need for an anode to protect the steel pipe."

According to Wyman, research shows older cast-iron distribution lines propa- gate more sources of leaks and are being aggressively replaced. Polyethylene pipe is 95% of the product being used for new distribution lines today.

"There's a reason for that – it's a superior pipe. It doesn't leak. It doesn't rust. It's safer, more environmentally sound and cost-effective," he said. "Expanding pipeline capacity at the wellhead will help end flaring and venting. That's good energy that needs to be captured, piped and brought to market instead of being burned off and wasted."

The administration's goal of reducing methane emissions by 45% by 2025 underscores the need for consideration of environmentally sound gas pipeline infrastructure, suggested PPI's Radoszewski.

"Using polyethylene, polyamide and spoolable composite piping in distribution pipeline replacement plans, as well as in construction of gas-gathering pipelines, will help mitigate methane escapes, reduce the wasteful practice of large-scale flaring, and create jobs," he said. ***P&GJ***

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