

Trenchless TECHNOLOGY™



Complicated Gas Main Projects Untangled by PSE&G & PPM Team

By Leanne Butkovic

The Public Service Electric and Gas Co. (PSE&G), the largest of three subsidiaries of the Public Service Enterprise Group (PSEG), delivers its services to the greater part of New Jersey. Since 1992, PSE&G has been working to repair the 100-year-old cast-iron and early 20th century steel pipes using lining technology to prevent any possible gas leaks and improve system reliability at an economic cost.

From 1992 through 2009, more than 21,000 ft of the mains have been relined, saving over \$5.3 million in efficiency costs. 2010 posed new problems for the service company because many of the easy jobs had been “cherry picked,” according to George Ragula, distribution technology manager for PSE&G.

“When you’re looking at replacement main work, there is a natural tendency to select the simpler jobs because they’re easier to do and you get a better cost per foot,” Ragula said. “So nobody really wants to do the harder or more costly stuff if they can help it. But after a certain point, all the easy jobs are cherry picked, and what you’re left with is a lot of difficult work. That’s kind of where we’re at with this replacement work this year combined with a larger than usual replacement program for 2010 based on footage.”

Many of the gas mains cross under parkways, bridges, highways and railroad crossings. Accessibility was limited, ground and traffic disturbance needed to be kept to a minimum and costs would be excessive using conventional replacement techniques: ideal conditions for lining, Ragula said.

Enter Progressive Pipeline Management (PPM), one of few contractors with the technology specifically tailored for this kind of work for the gas industry. PPM, located in New Jersey, is the sole North American licensee of the Starline technology, which was originally developed in Berlin, Germany, by Karl Weiss. The difficulty of the crossing was a perfect match for PPM and its capabilities.

"For us, it was common work," said PPM executive vice president Mario Carbone. "This kind of work puts us first for difficult jobs. When conventional excavation becomes costly, they come for our help."

With so few contractors around that could reline complicated gas mains with such ease, Ragula saw PPM as the "only game in town."

"Their product has gone through extensive testing for gas usage, has passed a number of tests and even has the appropriate ASTM approval," he said. "So gas companies tend to feel very comfortable with using that process."

PPM's high marks have led to almost 10,000 ft of PSE&G's New Jersey gas mains, ranging from 4 to 16 in. and operating at various pressures up to 60 psig, to be relined over a dozen jobs since April 2010. A majority of the pipes came in the 12-in. diameter and the real challenge came from lining those in long sections with abnormal geometries, including 45- and 90-degree bends. Rather than cured-in-place pipe (CIPP) technology a sewer would normally use and install using water pressure, Starline is a cured-in-place lining (CIPL) system where the liner is installed by inversion using air pressure. One side of the liner is a seamless polyester woven hose with the gas carrier made of non-permeable polyethylene, making the liner a gas-tight barrier. Several camera inspections are interlaced throughout the process to ensure unknown protrusions or anomalies are not present and make the job as fail-proof as possible. Once the liner is in place, the adhesive can be cured directly to the host pipe with ultra-violet light in just a few hours, putting the gas mains back in service as rapidly as they were fixed. Conventional ambient cures can also be used to cure the material overnight where no gas services are present. For Ragula, the quick reinstating time was crucial as a concern of customer focus was the second-most difficult challenge to overcome behind the nature of the lines themselves.

"From a gas point of view, you basically need to take the customer out of service, and that requires scheduling and planning," Ragula said. "Then you need to reinstate the service and you need to try and do that within a normal workday, and that's where UV cure liners become extremely beneficial. You can't keep a customer out for 24 hours."

The other time benefit with lining comes directly from the application itself. Not only would conventional renewal take egregious amounts of time waiting for the appropriate permits allowing you to even excavate, it would also cost a pretty penny. According to Ragula, a railroad permit that would take six to eight months to even obtain would cost anywhere from \$20,000 to \$25,000, and then the main would need to be jack and bored, which is no cheap fare. Easily accessing pipes under bridges and highways is also question begging, as removing them would be quite a difficult and expensive feat.

"The traffic situation with county roads and the like, it's not economical to open up streets in those environments," Ragula said. "Traffic control, cost of permits, cost of restoration — it just lends itself to lining applications."

The 10,000-ft of lining at various locations will be completed in October 2010, as gas utilities mark this as their

season change from summer to winter, according to Carbone. So unless the work is an emergency, especially in the northern part of the United States where the switch is most relevant, it won't be completed.

The Potential for a Booming Industry

The gas relining industry is a grossly underused, underappreciated and overlooked entity. At the same time, the technology has expanded greatly, and an increasing number of utilities are putting their knowledge to use. According to Carbone, PPM has now lined in multiple states all across the United States, including Texas, West Virginia and Alabama. Ragula has seen an explosion of utilities relining instead of replacing. Starting with a handful in 1992 when gas relining technology hit the market, he now points to 15 or 20 utilities lining at PSE&G's same magnitude. With several hundred utilities in the United States, there's quite a bit of expansion left to be done, but with an optimistic future.

The relining process of gas mains is quite similar to sewer relining, but there are relevant reasons for the tough scrutiny about which relining technology to use. The technology is still very new, and the amount of knowledge that exists in the sewer relining industry is far more extensive than that in gas.

"From a gas industry perspective, a pipe is not a pipe is not a pipe," Ragula said. "Gas by virtue of the very nature of its product makes the industry very conservative and extremely safety conscious. If you get a water leak, OK, so you got a water leak. Big deal. But if you have a gas leak, you could potentially have an explosion, so we have to be very conservative and rely on a lot of testing of products before we actually utilize them."

Many utilities still see relining as a boutique market, costing more than conventional renewal or relay technologies. Carbone can quickly change the minds of people who think that way with simple facts.

"Relining has the same lifespan — 50 years of life," Carbone said. "We are the same or equal to a new installation." Not only can customers see the same results, they can get it less expensively than conventional reinstalls.

"Rehabilitation costs are far less than normal installation costs," he said. "The trick is getting utilities to branch out and say, 'They are equals,' and, 'Let's compare one technology with another or the cost of one technology to another.' Until that gets done, it's going to remain in the niche market."

Building a competitive gas main relining market may not be as popular as sewer relining yet, but the hype machine is gaining more steam. Soon enough the underground boutique job could turn into an industry powerhouse.

Leanne Butkovic is an editorial assistant for *Trenchless Technology*.

