# Restoring Failing Pipe Systems Is a Win-Win Decision

By Amanda Strouse

There are thousands of feet, if not, miles, of pipes surrounding you right now. These mostly hidden pipe systems are covered by other pipes, electrical conduit lines, concrete slab, drywall, wallpaper, marble floors and other objects. But just because you can't see them, doesn't mean that they're functioning to their best capacity.

When a pipe springs a leak in your building, what do you do after the water is shut off? Does someone from your team fix the leak? Do you hire someone to rip out the pipes and replace them?

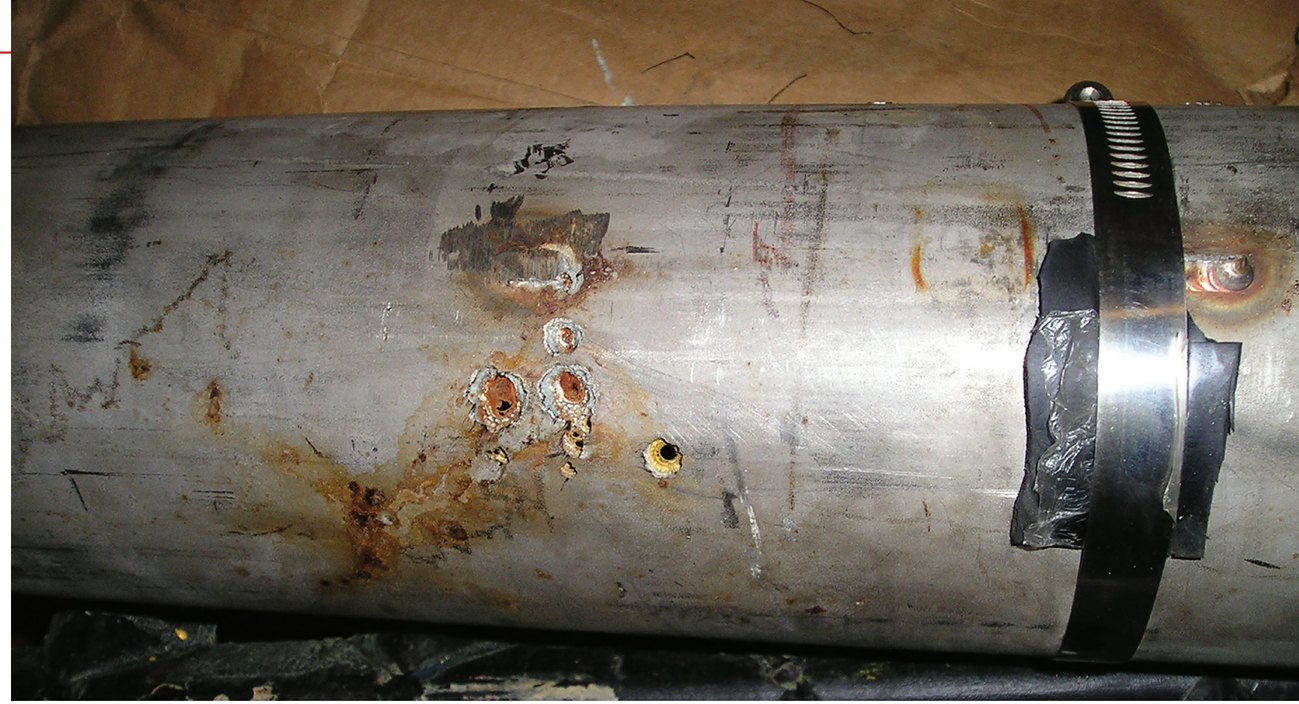
The most obvious answer doesn't always mean it's the most effective answer.

Rehabilitation techniques are not foreign to engineers. The process of taking something that is old and decaying, and then refurbishing it back to a new or better-than-new state is a remarkable, helpful feat — and a cost-effective one, at that.

That is why it should not be surprising that more and more engineers are choosing epoxy coating (also known as pipe lining) technologies to preserve, restore and renew aged and failing pipe systems. Since pipes are so embedded within our homes, buildings and all types of structures, why would someone tear out failing pipes and everything surrounding them, when there is a better way?

Epoxy coatings have been around for decades, but the technology made its prominent appearance in the United States around 20 years ago. Since then, more and more engineers are choosing pipe lining methods to rehabilitate failing pipe systems. There are several different types of pipe lining methods, with the epoxy coating being the preferred procedure to revitalize pressurized pipe systems (hot and cold water, water recirculation lines, HVAC, fire sprinkler systems, natural gas, etc.).

Each epoxy coating technology is unique, but the majority follow similar procedures: First the pipes are dried, then they are sand-blasted with an abrasive agent to clean and profile the pipes. Next, the epoxy is blown through the pipe system using compressed air and sometimes a vacuum assist, then the epoxy coating inside the pipe system is left to cure. Finally, after the curing time has passed, the epoxy has formed a thin, yet protective barrier coating inside the pipes. This barrier coating will prevent pinhole leaks, slab leaks, corrosion, buildup, rusty water and other types of failures.



*Pictured: Failing pipes with holes that caused leaks.*

The entire process is executed using existing access points, which prevents the need of destruction or business disruption to the property.

How cost-effective are epoxy coatings? How "non-disruptive" are they? An epoxy coating project installed for BP — one of the six largest oil and gas companies in the world — illustrates the many benefits of this unique process, especially when confronted with the many challenges faced on a BP deep-water production platform surrounded by miles of water.

Located 150 miles south of New Orleans, La., the *Atlantis* platform is BP's deepest moored floating platform in the Gulf of Mexico, and was the deepest moored floating platform in the world when it was originally placed there. Approximately the size of three football fields, the *Atlantis* can produce up to 200,000 barrels of oil and 180 million cubic feet of gas every day, providing approximately $10 to $15 million of revenue for BP on a daily basis.

However, the *Atlantis* started to experience frequent failings in its domestic water pipes when it was only a couple of years old. The failing pipes were located in the living quarters, which are located in the four-story section of the platform where the officers, engineers and high-level professionals sleep and shower. It also houses the 24-hour cafeteria, bathrooms, eye wash stations, the heliport, the medical staff, the control room and main offices. The stainless steel

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*The Atlantis production and drilling platforms, where pipe corrosion necessitated an ePIPE solution.*

domestic pipe system for the living quarters, ranging from ½" to 3" in diameter, was experiencing constant leaks due to premature corrosion, dissimilar metal corrosion or workmanship error.

The domestic water pipes are barely accessible. They are hidden away, throughout the ceilings in hallways, rooms, bathrooms, as well as vertical supply and return risers through the four-story building on the platform. The majority of the domestic water pipes were installed before other pipes or structures in the buildings, with electrical cabling, air lines, gas lines, explosion-proof wiring and communications lines and other obstacles in front of them. In addition, the walls could not be penetrated in order to access the pipes, because penetrations to the hull are forbidden.

Safety is paramount for the *Atlantis*. There are daily safety meetings for everyone on board. Everything is monitored and recorded. Sensors are all over the platform, sending out notifications for seemingly innocent things, such as a door not being closed soon enough.

Whenever there was a water leak, the response was instantaneous. It has to be. The water would be shut off immediately, perhaps even all of the water for an entire floor in the living quarters. A major concern was the water affecting the electrical, data, communications and other control-related wiring cables. The leaks were incredibly disruptive and posed a threat to safety. It wasn't long before BP sought a long-term solution to prevent the constant leaks.

TDT Plumbing, a full-service plumbing company located in Houston, Texas, specializing in custom-designed piping solutions, was chosen by BP for this restoration project. TDT Plumbing used ACE DuraFlo's patented ePIPE epoxy coating process to restore the failing water pipes to a better-than-new state. ePIPE's process and resin are ABS Type-approved, which makes them suitable for use on a variety of ABS-classed ships.

Due to the sensitive nature of the *Atlantis* platform, TDT Plumbing faced many obstacles during this project, but used creative problem-solving skills to overcome challenges and find a way to restore the failing domestic pipes with the ePIPE epoxy coating and process. One such obstacle was that doors are not allowed to remain open to the exterior of the production platform, so the TDT Plumbing crew had to design a way to get the compressed air from the compressors inside the building on the structure. Another challenge was that the platform had pipes and fittings in several different measuring standards.

There was an initial visit to examine the living quarters and the pipes. Then, once the TDT Plumbing crew was on the platform, the pipe system was dried and then sandblasted using compressed air. During this process, it was extremely important to capture 100 percent of the dust and debris. Next, the crew isolated the hot and cold piping on each level in the living quarters. The plan was to bypass and back-feed through alternate routes to keep the domestic water system running, so the entire living quarters building did not encounter any disruption during the project.

After hooking up the equipment to access points, the epoxy coating was blown through the pipe system using clean, compressed air. The epoxy cured to form a protective barrier coating throughout the pipes, which will prevent future pinhole leaks, corrosion and other failures. The entire epoxy coating project was of no hindrance to the other crews working on their ongoing maintenance projects for the platform.

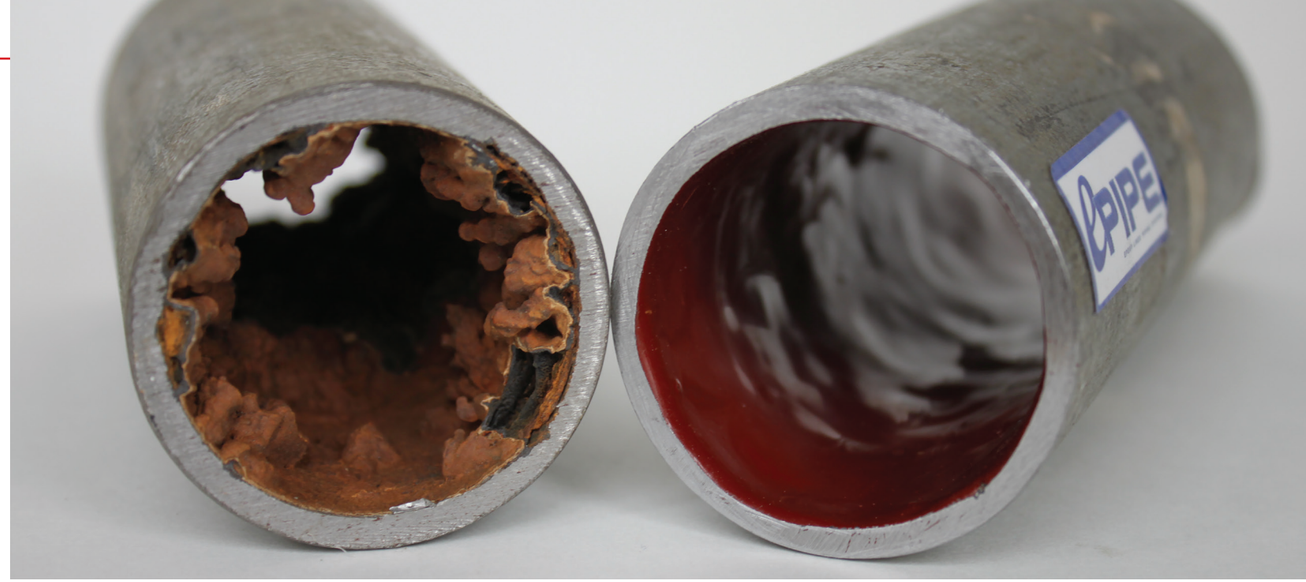
"BP picked us because of the high level of complexity for the project, our willingness to work with both onshore and offshore engineers, and that we demonstrated our skills and ability to work with the platforms constraints," TDT Plumbing CEO Gary Gould said. "We tip our hat on being able to find solutions to complex problems. And that's what we did for BP."

The epoxy project took approximately six weeks. People on board the platform were never without water or their cafeteria, and most importantly, there were not any disruptions to normal operations. The total cost of TDT Plumbing's project was over $400,000, as opposed to BP losing millions of dollars per day if the multi-billion-dollar platform had to be shut down, ripped apart and re-piped 150 miles from shore.

The *Atlantis* has not encountered a domestic water leak since the ePIPE process rehabilitation. BP was so pleased with the TDT Plumbing's work and the ePIPE epoxy coating process that it hired TDT Plumbing to do another pipe restoration project for the Atlantis and then a project for its newer platform in the Gulf of Mexico, Thunder Horse.

A pipe system restoration process, such as an epoxy coating application, is the most efficient way to prevent operations disruption and unnecessary expenses, including loss of revenue, when experiencing pipe system failures. Don't throw the baby out with the bathwater — renew the existing pipe system.






*A heavily corroded galvanized drinking water pipe (left) and the same pipe cleaned and lined with the ePIPE epoxy coating (right) galvanized pipes.*

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**About Pipe Restoration Technologies, LLC, and the Patented ePIPE Process:**

*Pipe Restoration Technologies is the parent company of the ePIPE product and worldwide group of installers that utilize the patented ePIPE process to restore pipes in-place. An alternative to a destructive repipe, this process is achieved using an application of an epoxy barrier coating, which results in a restored, epoxy lined piping system. The process provides a remedy for pinhole leaks, epoxy lining, corrosion control and prevention of lead leaching from pipes without the destruction or disruption encountered by pipe replacements. PRT and its affiliated companies have locations throughout the United States, United Kingdom, Belgium, Spain and Mexico. For more information, contact PRT at www.epipeinfo.com or (888) 775-0220.*