

Newer, simpler fixes restore corroded pipelines

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Researchers are taking the guesswork out of repairing corroded oil and gas pipelines with two recent studies that appeared in the journal *Experimental Techniques*.

Historically, engineers repairing corroded pipeline segments have not had much guidance in regard to measuring the effectiveness of their choice of repair materials. This is especially true in the case of repair materials for internal defects, which have been difficult to assess. Researcher J.L.F. Freire of the Catholic University of Rio de Janeiro and his colleagues are easing in quantifying the effectiveness of the repair systems with a new approach that models and measures pipes' strength.

They applied the fiberglass-composite repairs to pipeline tubes with machined defects made to resemble natural corrosion. Using strain gages, they measured the strength of the repairs while pumping pressurized water through the pipes. Their study revealed wide variation in the repair materials' quality. While one system proved stronger than an unblemished pipe, another was only 25 percent as strong.

“We can use these models and tests to establish standards for repair systems,” Freire said, “and to compare different ones.”

In the second study, researchers found that thin, precurved, steel lamina effectively repair external corrosion without compromising pipes' elasticity or strength. Lead researcher M.A. Perez Rosas and colleagues at the Department of Mechanical Engineering, PUC-Rio, tested the new

steel sheaths on scaled-down piping segments that were pressurized to simulate the flow of oil. Four layers of low-carbon steel or two layers of stronger steel both made the treated pipe segment stronger than the original.

“I would expect the lamina to work well in the field,” Rosas said.
“They’re thin, easy to manage, and they eliminate the need for welding.”

Source: Blackwell Publishing Ltd.

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