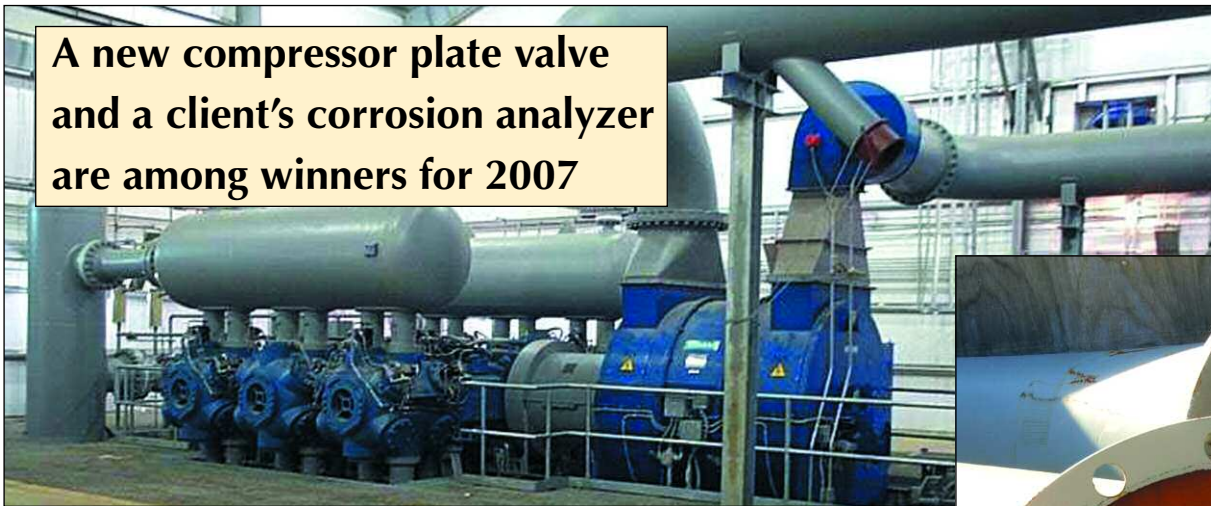


# SwRI-developed Products Win R&D 100 Awards

**A new compressor plate valve and a client's corrosion analyzer are among winners for 2007**



**A** long-life valve for reciprocating compressors and a software program for predicting corrosion earned 2007 R&D 100 Awards for Southwest Research Institute (SwRI). The annual *R&D Magazine* awards recognize the 100 most significant technological achievements of the past year.

## Semi-Active Compressor Valve

The SwRI-developed Semi-Active Compressor Valve addresses a critical need within the oil and gas industry, for which the largest single maintenance cost is in replacing compressor valves. Typically, reciprocating compressors use passive compressor valves that experience high plate impact velocities, often resulting in fatigue failure. With more than 12,000 reciprocating compressors in use in the United States alone, valve repair or replacement and the associated downtime is a significant investment for the natural gas industry.

"The SwRI-developed Semi-Active Compressor Valve increases plate life by drastically reducing impact velocities," said Dr. Klaus Brun, principal developer of the valve and manager of the Rotating Machinery and Measurement Technology Section, Mechanical and Materials Engineering Division. "Rather than springs, the design uses electromagnets to actively control impact velocities."

The new design decreases valve replacement and associated costs by more than 90 percent over conventional valves. Because the new valves also are more efficient than conventional valves, the natural gas industry can operate its compressors more efficiently, more reliably and more cost-effectively.

The valve was developed as part of the Advanced Reciprocating Compression

Technology program, conducted at SwRI and jointly funded by the Gas Machinery Research Council, BP and the U.S. Department of Energy Office of Fossil Energy-National Energy Testing Laboratory Delivery Reliability Program. Cook-Manley Co. will manufacture the valve for industrial oil and gas applications.

## Corrosion Analyzer

The Corrosion Analyzer, a product of OLI Systems Inc., is a software program that predicts the occurrence of corrosion for advanced fabricated alloys such as those used in chemical processing and similar industries. Localized corrosion, in the form of pitting and crevice corrosion, limits the life of many systems. Once initiated, pitting can propagate rapidly, leading to through-wall penetration. Pits also can be the initiation site for cracking that can result in catastrophic failure.

Under contract to the National Institute of Standards and Technology Advanced Technology Program and the Department of Energy, OLI Systems and SwRI developed theoretical models for the electrochemical parameters that dictate when and how corrosion occurs. By measuring the trends in these parameters, caused by metallurgical variations resulting from fabrication procedures in a focused series of industry-relevant environments, it is possible to predict corrosion within each of these environments.

SwRI researchers performed materials characterization and laboratory testing, which OLI Systems used to develop the predictive model and incorporate it into a software package.

"The Corrosion Analyzer allows process designers and operators to evaluate advanced materials under realistic fabrication conditions and process environments," said Darrell Dunn, manager of the Materials Performance and Characterization Section within SwRI's Mechanical and Materials Engineering Division. "Materials developers may also be able to use this software to develop process-specific materials."

In all, SwRI has won 32 R&D 100 Awards since 1971. This year's awards will be presented October 18 in Chicago.

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