

# PROJECT facts

U.S. DEPARTMENT OF ENERGY  
NATIONAL ENERGY TECHNOLOGY LABORATORY

Natural Gas  
Infrastructure Reliability

02/2002

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## PRIMARY PROJECT PARTNER

**Southwest Research Institute**  
San Antonio, TX

## PROJECT DURATION

**36 Months**

## COST SHARING

DOE	\$368,000
Non-DOE	\$220,000

## SCNG WEBSITE

[www.netl.doe.gov/scng](http://www.netl.doe.gov/scng)

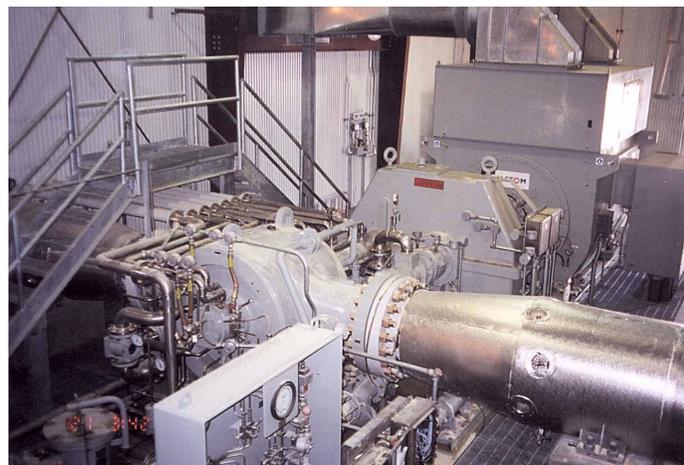
## INCREASED FLEXIBILITY OF TURBO-COMPRESSORS IN NATURAL GAS TRANSMISSION THROUGH DIRECT SURGE CONTROL

### Description

This project will produce a new method to avoid, or more safely avoid, compressor surge, expand compressor range and operation flexibility, and increase compressor efficiency. Surge occur at low flow, when the equilibrium between the pipeline and compressor flow becomes unstable. Surge causes large flow cycles of natural gas and they grow rather than decay with time. These flows cause dangerous vibrations that can damage the compressor. There is currently no way to directly predict when surge will occur, requiring indirect external measurements of flow and pressure and excess safety margins.

Southwest Research Institute (SwRI) has developed an incipient surge detector (ISD). The project will integrate direct measurement of surge proximity into surge control.

ISD will be characterized and tested in a pipeline compressor. A new control algorithm based on the ISD will be designed, built, verified, installed, and tested in an operating pipeline compressor. Siemens Energy & Automation Inc. (SEA), which plans to commercialize the technology after the project ends, will work on the project. SEA and the Gas Machinery Research Council will co-fund about 37 percent of the cost.





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## Goal

The goal of this project is to help modernize the nation's natural gas delivery system. It responds to the Secretary of Energy's message of May 2001: "By 2020, Americans will be consuming 50 percent more natural gas than today. We will need newer, cleaner, and safer pipes to move these larger quantities of natural gas." The project responds to the Natural Gas Infrastructure Reliability Program goal: to foster the technologies needed to ensure the integrity, operational reliability, and efficiency of the nation's natural gas infrastructure as it adapts to rapidly changing natural gas markets.

## CUSTOMER SERVICE

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## ADDRESS

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