APPLICATION

Invensys
TRICONEX

Algerian turbomachinery first for Invensys

LNG LIQUEFACTION

Invensys Triconex has just completed the upgrade of the turbomachinery controls of the first of six trains at the Sonatrach GL2Z natural gas liquefaction plant in Bethioua, Algeria.

OBJECTIVE

Throughout the history of this LNG plant, the operation has been plagued by a shortage of steam. This steam shortage led to premature boiler failures, steam deposits in the steam turbines and operating difficulties such as nuisance trips. New boiler have twice been purchased, but to solve this problem the customer needed to find a way to reduce consumption. The steam turbines that drive the compressors consume about 85% of the steam produced by the boilers, so these became the target of an energy savings study.

A review of the operations of the compressors showed that even at full load, one of the anti-surge recycle valves on the propane compressor was open about 20% and the fuel gas compressor's recycle valve was open 35%. If these valve could be closed, the savings in steam would amount to over 200,000 tons per year. Sonatrach was also faced with an obsolescence issue on their existing steam turbine governors, so it was decided to upgrade to an integrated system to control the turbines and compressors and to add process performance control.

"Triconex already has a good reputation with Sonatrach following the supply of an emergency shutdown system and burner management systems at the same site.

"This is a very important opportunity for the future and is our first integrated turbomachinery application for an LNG site. It is also a key project in line with our plan to develop business in Algeria in this strategic area."

However, we had no track record with integrated turbomachinery control at any LNG site before this," noted Ian Govan, Invensys Power and Turbomachinery Director. "Our site survey and analysis of the existing compressor control showed that Triconex technology would also solve the company's ongoing problems with excessive anti-surge recycle," he added.

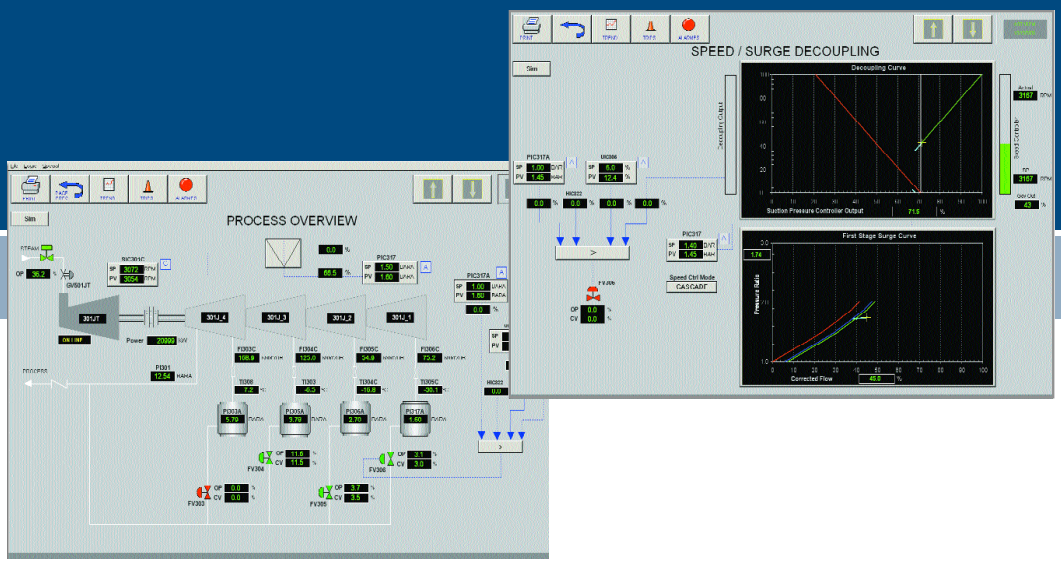
Sonatrach is realizing the benefits of the the new system on one of their six trains. They can now operate the plant at loads less than 90% with all the compressor recycle valves closed. This means a significant reduction in steam consumption.

Plantwide operational control has been improved and made more flexible. The automated control of the suction pressure on the Propane Refrigeration Compressor and the Fuel Gas Compressor give the operators assurance that under any plant operating conditions or upsets, those machines will continue to be managed and protected by the new control system. Even if the process trips, the controls will keep the suction pressure of the Propane compressor constant without any operator intervention. This keeps the chillers cold and ready to accept a load as soon as the process is restarted.

The old system used a suction throttle valve to control the throughput of the fuel gas compressor. The new controls manage the suction pressure by coordinating the turbine speed and recycle valve position. This not only saves steam, it reduces flaring. The improved stabiliy of the suction pressure control also helps assure the product purity.

According to Govan, one of Invensys' key advantages over the competition is its unique ability to use the same Tricon hardware for all required functionalities, whether they are steam turbine speed control, compressor control, process performance control or machinery protection.

LNG Train, Bethioua, Algeria



Sonatrach started this project with the intent of reducing their steam consumption. They realized this objective and in the process gained a number of other improvements:

- Eliminated governor obsolescense
- Improved process stability
- Reduced operator load during upsets
- Shortened startup times
- Improved troubleshooting
- Improved control system reliability
- Provided operators with new tools for understanding controls
- Improved operator training with closed-loop simulator

ABOUT TRICONEX

Triconex, an operating unit of Invensys plc, is a global leader in the supply of products, systems and services for safety, critical control and turbomachinery applications. Since its inception in 1983, the company has installed thousands of safety systems and critical control solutions in a wide variety of industries and applications worldwide. Today, Triconex products operate globally in more than 7,000 installations. Triconex is the preferred Critical Control and Safety System of the InFusion Enterprise Control System.

invensys®
TRICONEX™

For a list of our worldwide office locations please visit:
www.triconex.com/contact

If you would like to speak to a product specialist please write to:
info@triconex.com