

## Compressor and Turbine Control Management can save more than the day



Many of the controls in use today have outlived their designed capabilities. Most of them are old systems, very basic and energy inefficient. It is commonly accepted that while mechanical turbomachinery parts are overhauled on a regular basis, the control system seldom receives the equivalent required attention. Its deficiencies are often overlooked even though in almost all cases an upgrade will guarantee good return on investment and can be obtained in a short timeframe. Control upgrades bring with them benefits such as: compressor and process throughput enhancements, remote equipment condition connectivity, increased fault tolerance and minimised maintenance.

### **Expand the Operating Range, Save Energy, Improve Operation and Maintenance**

Turbomachinery represents a major capital investment and is an important part of the successful operation of a plant/pipeline. Excessive compressor and turbine downtime for maintenance can have a staggering effect on production. Turbomachinery, if not properly managed, can consume a significant amount of your company's profits, resulting in excessive energy consumption and high maintenance costs.

The upgrade of the compressor/turbine controls can expand the compressor's operating range, save energy and significantly improve system availability, reduce the cost of maintenance and improve the operator interface data. More specifically an upgrade can help in the following ways:

#### **Energy savings:**

Controlling the compressor/turbine up to safe, but minimal distance from operating/equipment constraints (surge points, temperature and pressure limits, etc.) maximises the operating window and reduces energy consumption.

#### **Increased performance:**

Dynamic decoupling, energy consumption-based load sharing and advanced process adaptation optimises overall compressor train performance.

#### **System availability:**

Fault tolerant configuration and hardware ensures uninterrupted control and minimises/eliminates the effect of hardware and transmitter failure. Incipient surge control override provides additional security by sensing and controlling fluidic oscillations before the compressor reaches the actual surge point.



#### Flexibility:

Pre-configured firmware with a large library of configurable functions allows for successful adaptation to existing process and piping conditions (there is no custom programming required). Compressors and turbines are part of dynamic processes and therefore require continuous multi-loop interactive control with the capability of practical unlimited modification capability.

#### Simplified compressor operation:

Automatic line-up, auto start-up and shutdown, auto load sharing/optimisation, alarm management, fall-back transfer, etc, minimise operator interaction requirements and simplify operation.

#### Longer compressor life:

Minimising surge spikes during process upsets and during compressor start-up and shutdown will increase compressor life. Also, the fast response and look-ahead features of the controls provide reliable surge spike detection and prevention.

#### Improved operator interface:

P/PC integrated compressor and turbine control allows operations, maintenance and engineering to view and analyse all compressor data. This provides useful information regarding incidents and disturbances during process upsets and during start-up and shutdown conditions.

#### Where does one start?

If your recent project work has not focused on the needs of the control system for your turbine or compressor, it is best to start with some expert advice. Look out for companies that offer a range of solutions that will be able to work to your requirements.

As a standard, fully scalable solution providers have control products that are flexible as well as of the latest technology. Such modern controllers can handle centrifugal and axial compressor control applications ranging from a single-stage compressor to up to four independent stages, making it a completely integrated compressor control system. This adaptability/scalability reduces overall system complexity and cost.

Experts in turbomachinery control will also be able to provide you with a bespoke solution using universal hardware architecture and control strategy. This flexibility permits configurations from anti-surge to complete performance (capacity, load-sharing, decoupling, start-up/shutdown) and turbine control as required by each application. Control optimisation results in energy savings, operation simplicity and high reliability. The ideal approach to improving your turbomachinery control normally is to let your chosen experts study the entire application, from the compressor to the driver to the surrounding process. Each solution should be adapted to the specific application requirement to ensure precise and efficient operation.

Last of all; don't forget the importance of maintenance. Service contracts can be good value for money. Your turbomachinery control can be improved at all stages, from design to maintenance, by having a periodic expert review the complete system. This will not only result in ongoing efficient compressor or turbine operation but will also provide improved process and pipeline control and eliminate instability during any process upset periods.

**Protect your investment by investing in your turbomachinery control!**

ICS Triplex technologies and services are available worldwide. Regional Headquarters:

#### Americas:

Tel: +1 713 353 2400

Fax: +1 713 353 2401

Email:sales@icstriplex.com

#### Europe, ME & Africa:

Tel: +44 1621 854444

Fax: +44 1621 851531

Email:sales@icstriplex.com

#### Asia Pacific:

Tel: +61 89 314 7787

Fax: +61 89 314 7786

Email:sales@icstriplex.com

[www.icstriplex.com](http://www.icstriplex.com)

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