



GCS News January 2014

Volume III: Issue 1 – Safety, Engine Efficiency, Fuel Savings, Regulatory Compliance

In This Issue:

- Safe, Reliable Partner
- Speed Testing with Self-Powered Tach Kits
- Fuel Saving from KRAL FCM
- Improved Turbine Response Time with Woodward Varistroke Actuator
-
- Upcoming Trade Shows

Safe, Reliable Partner. Rig Ready.

- No Lost Time Injuries in 935 consecutive days.
- GCS has not sustained a reportable injury in the field in 2038 consecutive days. (5-1/2 years)
- 'Rig Ready' workforce of 30+ engineers
- GCS is an approved provider for SafeGulf® and SafeLand®.

GCS incorporates elements of ISO 9001:2008 Quality Management System to set safety objectives, to measure our performance and to continually improve our Safety Program. Our growing 'Rig Ready' workforce of over 30 engineers are trained and certified with OSHA, SafeGulf®, SafeLand® and Helicopter Underwater Egress Training (HUET). We are an active partner in the ISNetworld safety and insurance data system.

Our customers can be confident that the engineer who services their equipment or facility is fully trained, equipped and safety conscious. The control and monitoring products we represent meet the highest industry specifications to ensure our customers' equipment is operating under the safest conditions possible.

Reliable Speed Indication with Self-Powered Tachometer Kits

GCS digital Tach Kits reliably monitor engine and turbine speed, reducing downtime, maintenance costs and potential failure. Easy to install & read, the GCS field-configurable Tach Kits provides easy, reliable speed monitoring and data logging. Digital tachometers are mounted directly on the engine or on the Woodward mechanical-hydraulic TG or PG governors used on general purpose turbines. TG and PG Tach Kits meet API Standard 611 and 612 requirements for "a manual method to safely increase the speed of the turbine over the maximum continuous speed of the governor to allow for a safe and controlled test of the independent emergency overspeed system."

Test your steam turbine using the Woodward TG611 governor with integral overspeed test device.

API 611* Compliant Woodward TG611 Governor with Overspeed Protection directly replaces TG Governors. Self-contained, mechanical-hydraulic, speed-droop governors are used on small steam turbines driving pumps, compressors, or generators. These governors are directly coupled to the steam-turbine's rotor or auxiliary shaft to sense and control turbine speed.

Designed for API-611-based turbine applications, the TG-611 governors include a special Overspeed Test Device, allowing controlled and safe turbine overspeed trip testing. Easy to use, TG-611s are field-adjustable for overspeed test speed. For updated overspeed testing, GCS can upgrade your standard TG-13 or TG-17 governor a TG-611.

**API 611 / 612 Compliance*

The American Petroleum Institute (API) establishes safety and quality standards for the oil and natural gas industry.

API STANDARD 611, Fifth Edition, March 2008, Paragraph 7.4.2.2.11 states: "Unless otherwise specified, the oil relay governor shall include a manual method to safely increase the speed of the turbine over the maximum continuous speed of the governor to allow for a safe and controlled test of the independent emergency overspeed system. This system shall be arranged that releasing of the device shall allow the turbine to return to maximum continuous speed with no further operator action. This device shall not allow the turbine to exceed the trip setting by 2%."

Energy Saving Technology from KRAL

KRAL Flowmeters are highly-accurate positive displacement meters. Real-time fuel measurement, idle to full load. Extremely accurate KRAL Fuel Consumption Measuring Systems help engine operators reduce costs and improve engine performance.

New, cost-saving products.

KRAL Volumeter® OMP

- Improved retrofit
- Robust, precise: rigid casing protects precisely manufactured spindles
- Long-life hybrid bearings for HFO applications



KRAL Volumeter® OME Compact

- Affordable high precision flow meter
- Flow direction, detection and temperature measurement combined in one sensor including a terminal connector.



Improve Turbine Response Time with Woodward VariStroke Linear Actuator

VariStroke is Woodward's line of linear electro-hydraulic valve actuators for operation of steam or hydro turbine control valves. These linear actuators utilize a low-pressure, hydraulic oil source (typically

turbine lube oil) to provide its output shaft force. Its superb accuracy and resolution make it ideal for steam valve control and related turbine speed and load control, where turbine up-time and availability is essential.

Features

- Precise and stable control for responsive performance
- Variable/configurable shaft lengths for various application requirements
- Patented dirt tolerant and self-cleaning technology for increased reliability
- High-torque valve and motor design (50 lbs chip shear)
- Fast slew rates/times (up to 10"/sec)
- Side-load tolerant for reducing potential oil leaks
- Integrated driver (4-20 mA) and 11-point linearization table
- Self-tuning adaptive control algorithm



System Cost Savings:

Special actuator filter cost savings

- No special secondary actuator filter is required
- Operates on oil filtered with 24 - 40 micron
- No filter maintenance costs (labor, replacement cartridges)

Special hydraulic power unit (HPU) cost savings

- Can use turbine lube oil for hydraulic supply

Pilot valve assembly cost savings

- Depends on turbine design
- Pilot valve, piping, feedback linkage levers, etc.

Special electrical driver cost savings

Engineering cost savings to size and mount assemblies

Spare parts cost savings to purchase and store assemblies

Aerospace Quality Performance from TDI T-56 Low Pressure Gas Turbine Starters

TDI starters provide a 4 to 5 times longer starter life, than most other brands... especially when operated on lesser quality air supply.

TDI T-56 Low Pressure Gas Turbine Air Starters



Replace Aeroderivative Starters with lower price, high reliability T-56 LPs. 5 models fit most gas turbine engines models. Excellent availability, powerful performance, and a superior clutch design create a solid value.

The 56K-LP delivers TDI's signature high torque and horsepower on just 50 max psig meaning retrofitting to TDI won't require changing out regulators, valves or flow control devices.

Stronger, More Reliable Clutch Assures Less Downtime

Clutch failure due to control malfunctions and long term wear are one of the most common sources for starter/engine failure. 56K-LP's sprag clutch virtually eliminates these problems by evenly dispersing torque to 22 separate points (see visual above).

Simple Singular Planetary Gear Design Reduces Maintenance

Fewer moving parts means less maintenance. The simplicity of the 56K-LP design reduces maintenance, part cost, repair costs, and most of all downtime.

Operating Specifications

| | |
|--------------------|-------------------------------|
| Power | 155 hp |
| Operating Pressure | 50 Max.psi |
| Supply Air | Compressed Air or Natural Gas |
| Weight | 48 lbs. (21.8 kg) |

Upcoming Trade Shows

January 21 – 23, 17th Annual LMOP Conference - Baltimore, MD

February 4 - 7, 2014 Great Lakes Waterway Conference - Baltimore, MD

March 10 - 13, 2014 Cruise Shipping Miami, Booth 1837 - Miami, FL

April 28 - May 1, 2014 Gulf South Rotating Machinery Symposium, Booth #61 - Baton Rouge, LA