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WOODWARD’s INDUSTRIAL TURBOMACHINERY eZINE

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CPC-II Product Line

In response to market demand for faster, more robust and dirt-tolerant steam turbine actuators, Woodward created the CPC-II pressure converter product line. This line, released in 2008, is now operating successfully in more than 1,000 steam turbine actuators globally, with users experiencing the benefits of more responsive, stable and reliable steam turbine control. CPC* users who desire these improvements are encouraged to transition to the new, improved CPC-II product line.

- Powers through 40 μm sized dirt, reducing or eliminating filter / filter servicing
- Clears silt build-up without disrupting operation integrity
- Utilizes industry-leading stability and bumpless precision throttle valve control
- Configuration flexibility meets your system needs
- Easily upgrade existing CPC* or Voith E360 I/H
- Utilizes the same mounting and hydraulic connections as the CPC, making it an easy replacement for most applications
- Compared to conventional I/H converter systems, the CPC-II output is quiet and stable

Mounting and oil interface manifolds remain in the same locations for ease of upgrade (see CPC-II Product Spec 03352 for exact dimension details). Woodward offers an adapter kit sold separately for upgrading Voith E360 I/H throttle control units (ADAPTOR KIT PN: 8928-7240).

To begin your upgrade project, contact your local Woodward representative today.

www.woodward.com/servoCPC2

CPC-II Product Specification

*CPC is no longer available after July, 2012. Recommended replacement is CPC-II. CPC-II is a direct replacement for the CPC.
Electric Rotary Control Valve

Many industrial applications require a cost effective yet highly reliable and repeatable valve for processing a wide range of fluids. Woodward heard the message and produced the Rotary Valve Platform (RVP) 200 product family - for those applications requiring precise position control with 100% duty cycle, the ability to operate in extreme temperature ranges and a price comparable to base pneumatic valves. The RVP 200 is perfect for applications where pneumatic actuators just don’t have the performance required by the process.

The RVP 200 is electrically actuated, with a (user-configurable!) slew rate between four and seventy seconds (+/- 10%). It’s available in 3, 4, and 6 inch (300# and 600#) valve bodies. It has an operating pressure differential of 250PSID.

- Shutoff: 400PSIG, 400F (Fuel Gas); 250PSIA, (800F Air)
- Seat Leakage: Class IV metal to metal seats (Bi-directional)
- Ambient Temp: -20 to 180F
- Fail-safe Spring to Open or Close
- On-Board Driver and electric actuator for use in high temperature applications

MicroNet Platform is SIL-1, 2 & 3 Certified!

Because safety is a major concern of rotating equipment owners and operators, it’s a major concern of Woodwards’. To meet your safety needs, our MicroNet-Plus and MicroNet TMR platforms have been updated with enhanced safety capabilities including safety certified hardware and software, as well as production and engineering processes.

MicroNet-Plus and MicroNet TMR platforms are now certified for use in the International Electrotechnical Commission’s (IECs) 61508 safety integrity level (SIL) 1, 2 and 3 applications. In accordance with the IEC61508 functional safety standard, TÜV Rheinland has approved both MicroNet-Plus and MicroNet-TMR to be integrated into SIL-3 based safety systems.

The MicroNet digital control platform reliably controls and protects steam and gas turbines and compressor trains used in system-critical applications where stringent safety measures are required. Its fast scan rates enable the system to react instantly to plant, turbine or compressor safety conditions. (Key parameters are scanned more than 40 times per second. We’ve not identified another system operating with a faster scan rate.)

The ProTech™ platform meets all API-612 and API-670 specifications. Woodward’s IEC61508 SIL-3 certified ProTech safety and machinery protection platform ranges from simplex (ProTech-SX) to full TMR based control (ProTech TPS). ProTech TPS (Woodward’s triple modular, redundant unit) monitors up to 30 analog or discrete inputs per module. This architecture and programmability allow the ProTech to function as a safety programmable logic controller (PLC) in multiple industries including (but not limited to): chemical, oil and gas, refining, pulp and paper, food and beverage, mining and metals, pharmaceutical, biotechnology, waste and waste water, and cement and glass.
Sonic Flow Valves

Gas Fuel Control Valve
multiple sizes now available*

Reduced installed cost. Extended valve life. Enhanced performance. If these benefits interest you, you should consider replacing hydraulic valves with electrically actuated versions. Woodward now offers electrically actuated versions of our highly reliable SonicFlo valve product to meet these needs.

The LESV (Large Electric Sonic Valve) utilizes sonic technology to operate as a choked valve at pressure ratios up to .92 (P2/P1). The Class IV gas control valve (valve sizes 2”, 3”, 4” and 6”**) with electric actuation provides precise position control for high accuracy and reliability. Utilizes Woodward DVP (Digital Valve Positioner) off-board electronics. The LESV offers continuous duty cycle with ambient temperatures of 93°C (200°F) and 232°C (450°F) fuel temperatures.

- 350 ms and 700 ms stroke times (depending on valve size)
- Fail-safe return spring
- 90 – 140 VDC power supply (DVP input power)
- ID Module – “plug and play” integration with Woodward DVP

*Multiple sizes available in different time frames. Contact your local Woodward representative for availability of specific sizes.

Liquid Fuel Metering Valve LQ50

The LQ50 Liquid Fuel Metering Valve provides all the features and functionality of its predecessor, the LQ25, but with larger flow capacity – up to 50 MW.

This 3-way Liquid Fuel Metering Valve has a 42,000 lb/hr maximum flow capacity (supports 50MW GT), and optional PIV and SOV. The operating temp range is –29 C to +93 C (–20 to +200 F). The DVP Input Voltage is 90-140 VDC; while the SOV Solenoid Voltage is 24 VDC, 125 VDC or 250 VAC. The maximum slew time is 0.100 s. The fuel supply pressure range is 3450 to 12400 kPa (34.5 to 124 bar/500 to 1800 psig). Has internal bypass regulator for applications with positive displacement pumps. Integral Shutoff Valve option eliminates the need for external stop valves to maintain system safety level. Built in shutoff valve reduces installation costs.

- Feedback Device: frameless resolver (three speed)
- Off-Board Driver (Digital Valve Positioner - DVP)

GS16DR Offboard DVP Driver

Woodward extends its GS product family with the GS16DR; a dual resolver (DR) with valve positioner (DVP) for increased reliability and availability. Has dual resolver feedback. Available in conduit and connector versions.

- Redundant Feedback Device: Frameless Resolver (three speed)
- 90 – 140 VDC Power Supply (DVP input power)
- ID Module – “Plug and Play” integration with Woodward DVP
- Ambient temp range: 40 to +93 C (–40 to +200 F)
- Fuel temperature: – 40 to +177 C (–40 to +350 F)
- Operating inlet fuel pressure range: 690 to 5171 kPa (6.9 to 62 bar, 100 to 900 psig)
Woodward satisfies South American customers with successful control, safety and actuation.

MAN 50MW Steam Turbines

Woodward upgraded two MAN 50MW steam turbines for one of the largest power generation utilities in Brazil. Old, mechanical controls were replaced with Woodward’s Atlas-II steam turbine generator control and TG Actuator. The customer is experiencing increased capability and availability of their generator. Commissioning was completed on schedule, in 2011.

CPC is “Sweet King”

In Brazil’s sugar production market, Woodward’s CPC and CPC-II current-to-pressure converters are the popular “kings” of actuation. Woodward sells an average of one hundred new units and upgrades each year to original equipment manufacturers (OEMs) in Brazil, including TGM, Siemens and NG. These OEMs apply the CPC converter in their actuation systems. Benefits end-users are experiencing include:

- Shorter outage for installation and less complex – due to use of a simple hydraulic system
- Lower maintenance costs – fewer moving parts – mean storage of fewer spares, fewer repairs required (compared to other converters on the market)
- Lower maintenance costs and less downtime for maintenance – because the CPC family of converters virtually eliminates control filter servicing

Control Upgrade

Woodward recently upgraded the control of an AEG-Kanis steam turbine and Hitachi compressor for petrochemical plant, Companhia Petroquímica do Nordeste (COPENOR), in Brazil’s Bahia region. The existing mechanical controls and compressor surge control valve were replaced with Woodward’s integrated turbine and compressor (ITCC) control system, the 505CC2.

“Woodward has increased reliability on the compressor train which is the heart of our plant.”

Woodward has increased reliability on the compressor train which is the heart of our plant,” said Mr. Josué Archangelo Neto, Maintenance Coordinator for COPENOR’s Bahia facilities.

“We have decreased surge events, we have fewer shutdowns due to trips, and our operators now have enhanced machine start up, due to access to data visible through the HMI. Now (our operators) can make quicker, better decisions, so they can maintain production.” Commissioning was completed in 2011.
ENEOS Sendai refinery, the only oil production facility in the Tohoku district of Japan, suffered severe damage from the large earthquake, fire and Tsunami disasters in Japan in March, 2011. When their control room was completely destroyed, ENEOS took immediate action to develop a restoration plan for initiating repairs so as to deliver power to the stricken area as soon as possible. Woodward joined several other suppliers in responding quickly, including MHI, Elliott Ebara and other OEMs. Woodward supplied two MicroNet™ Plus turbine control systems and one 505 digital steam turbine control system on highest priority. ENEOS was able to get back up and running on their extremely short schedule. They expressed appreciation to Woodward and the other suppliers, for enabling them to deliver on their mission to their community to provide a steady supply of petroleum product.

Woodward’s 5009FT fault-tolerant steam turbine control selected to control FPSO’s core compressor units on Brazil’s coastline.

A floating production, storage and off-loading (FPSO) system will go into operation in 2014 in the BM-S-11 area of the Brazilian coastline, enabling the export of natural gas extracted from South American oil fields. When this Tupi BV*-operated unit comes online, six of Woodward’s 5009FT fault-tolerant steam turbine systems will be controlling its on-board compressor packages.

The triple modular redundant (TMR), API612 compliant 5009FT control system’s fault-tolerant design allows operation with any single point of failure without shutting down the turbine, while its TMR design and hot-swap module capability allow for easy system repairs while the turbine set is online.

*The Tupi B.V. consortium is comprised of Petróleo Brasileiro (PETROBRAS), BG E&P Brasil Ltda. and PETROGRAL Brasil Ltda., holders respectively of 65%, 25% and 10% of the undivided rights. The Guara B.V consortium is comprised of Petróleo Brasileiro (PETROBRAS), BG E&P Brasil Ltda. and REPSOL YPF Brasil Ltda., holders respectively of 45%, 30% and 25%, of the undivided rights.

www.woodward.com/IndustrialTurbineSolutions
Project #1

Woodward is providing MicroNet™ Plus compressor control and protection for 16 compressor trains which enable a natural gas liquid (NGL) recovery plant to extract NGL components from more than 2,000 MM std. cubic ft/day (MMSCFD) of gas. Woodward is also providing marshalling terminals as well as engineering workstations with Woodward engineering tools on this project.

This NGL recovery plant’s operation will meet energy demands in this region from 2014 onward. The NGL fractionation facility is to support the energy supplier’s strategy to maximize revenues by processing the additional ethane plus (C2+) natural gas liquid (NGL) generated from the NGL recovery facilities. The facilities will also satisfy regional demand for petrochemical feedstock. Commissioning to be completed in 2013.

Project #2

Woodward is supplying MicroNet Plus controllers on five NGL compressor trains for an onshore processing facility which will process more than two billion standard cubic feet per day (SCFD) of gas.

This project provides facilities for gas sweetening, dehydration, sulphur recovery, handling and storage, sales gas delivery, electrical and non-electrical utilities, and industrial support. These facilities will process 2,500 million SCFD of gas, which is expected to produce 1,750 MMSCFD of sales gas and 4,200 metric tons per day (MTD) of sulphur.

Commissioning to be completed in 2013.

Woodward is partnering with a very large, global oil company based in the Middle East, on two major petrochemical projects.
“We’ve relied on Woodward solutions for years. But even we didn’t know they did all this, too.”

Yeah, we get that a lot. Our fantastic reputation for delivering reliable mechanical solutions dates back to the origins of the company in 1870. And while that’s great, we find lots of people just don’t know about the many other products and solutions Woodward offers the gas turbine, steam turbine, compressor and safety markets.

Take compressor control and safety. Woodward has an installed base of over 700 field-proven, integrated control, safety, and surge detection solutions in the global market … with more being developed every day. These solutions enable reliable, efficient compressor operation, while protecting against costly surge damage.

**Advanced Incipient Surge Detection**

In the case of advanced incipient surge detection tools, Woodward’s algorithms are based on over 25 years of leveraging its field proven petrochemical and pipeline compressor control and protection experience. These algorithms allow compressor trains to operate at peak efficiency, while protecting each stage of a compressor from potentially catastrophic surge events.

Field proven decoupling methods safely and reliably sequence parallel process compressors on or off line, or manage series compressors during normal plant operation and unexpected transient conditions.

Woodward’s patented rate control and surge prevention logic differentiate its compressor control and anti-surge protection from that of other solution providers. These algorithms have long been used and qualified by compressor OEMs such as MHI, Siemens and GE.

Woodward’s incipient surge detection algorithms utilize the following seven basic levels of protection to anticipate and protect equipment from surge events:

1. **Stage to Stage Decoupling**
Decouples the interaction of a compressor stage in case of surge, preventing the affected stage from affecting the other stages of the compressor train.
2. Speed/IGV to Stage Emergency Decoupling
Anticipates a surge event by opening the recycling valve upon a sudden load change (speed/IGV) that could bring the compressor operating point too close to the surge line.

3. Rate PID Controller
During fast surge events, this incipient controller uses the location, direction, and derivative of the compressor control point to modulate the recycle valve. This keeps the compressor control point away from its surge line/area.

4. Surge Control Line PID Controller
During slow surge events, this controller manages the position of the loop recycle valve, ensuring the compressor control point stays a pre-determined margin away from the surge line/area.

5. Boost Function
This anticipation function is the last line of defense against surge. It steps the recycle valve open to a pre-set margin, moving the compressor far enough to avoid a surge condition, while not moving it far enough to negatively impact the production process.

6. Max Discharge Pressure Function
An incipient protection function which opens and modulates the recycle valve. This enables the compressor to move away from a surge condition or unacceptable running condition.

7. Min Suction Pressure
An incipient protection function which opens and modulates the recycle valve if minimum suction pressure occurs. This enables the compressor to move away from a surge condition or unacceptable running condition.

Learn more:
Advanced Incipient Surge Detection Brochure
Woodward’s Compressor Control & Safety Arsenal

In addition to advanced incipient surge detection, Woodward’s Industrial Turbomachinery Systems business provides the following products and solutions in support of compressor control and safety:

505CC-2
A steam and compressor control designed for single or two-valve steam turbines driving a one- or two-loop dynamic compressor. Programmable controller’s software logic and inputs/outputs can be customized to meet specific application requirements. Provides reliable, deterministic performance for key prime mover control.

Learn more:
505CC-2 Atlas-II Steam Turbine & Compressor Control Manual #26542V3

Vertex Pro
An anti-surge controller, controls and protects industrial-sized, motor-driven axial and centrifugal compressors. Available in standard/off-the-shelf and in custom models. OEM-qualified algorithms ensure proper start sequences are followed, proper and accurate compressor load calculations are used, and proper protection and recovery actions are performed. Built on Woodward’s field-proven MicroNet™ platform, and is available in simplex or dual-redundant models.

Learn more:
Vertex Pro Motor-Driven Compressor Control Product Specification #03364

ProTech® TPS Total Protection System
A SIL 3 system for any size steam, gas, or hydro turbine, compressor or plant process equipment. This safety PLC’s fast (12 millisecond) response time, 0.5 to 32 000 rpm speed range, and integrated overspeed and acceleration detection/protection functionality make it ideal for application on critical, high-speed rotating motors, compressors, turbines or engines. IEC61508 SIL-3 Certified and API670 & API612 Compliant.

Learn more:
ProTechTPS Product Specification #03371

ProTech-SX (“ProTech Simplex”)
A safety PLC with integrated overspeed protection which safely shuts down any plant process equipment, engine, or steam, gas, or hydro turbine upon sensing a safety event. This stand-alone safety system protects high-speed rotating equipment in system-critical applications, with a total response time of less than 12 milliseconds. Designed for harsh environments when installed within an enclosure, this device has an ingress protection rating of IP56 (protected against dust and completely protected against jets of water of similar force to heavy seas).

Learn more:
ProTech-SX Safety System with Integrated Overspeed Protection Product Specification #03372

Have a topic you’d like to see featured in the technology section? Fill out the survey on the last page of this eZINE to propose a topic...
Steam Turbine and Compressor Safety Highlighted at Conference in Middle East

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RASTANURA - Woodward’s Industrial Turbomachinery Systems business recently held its annual user group conference [for Saudi Aramco (SA)] at SA’s Ras Tanura Refinery. The theme for this year’s conference was “Control and Safety Solutions for Steam Turbines and Compressors.”

The conference was hosted by the Woodward team, composed of members of Woodward’s regional office in Abu Dhabi as well as experts from their United States and Netherlands locations. The team was also represented by Woodward partners Turner Engine Controls and local business partners Kanoo Power and Industrial Projects.

The event was attended by Saudi Aramco (SA) personnel from various plants, including SA’s Dhahran facility.

The conference was opened with a keynote address by Woodward vice president Scott McWhorter, who focused on the global energy demand and driving changes in the mix of energy sources in the coming decades. The role of Woodward in this energy scenario was highlighted not only for steam compressor and safety solutions, but also for (Woodward’s) electrical power systems and engine systems business groups.

McWhorter emphasized the localization efforts of Woodward, (announcing) the establishment of an independent Woodward entity in the Kingdom (which will soon) address the needs of large-end users such as Saudi Aramco.
Technical Training on “Power Generation & Management” and “Turbine & Compressor Basics” Well Received in Southern U.S.

Woodward’s Energy businesses gathered in New Orleans recently (New Orleans, Louisiana, U.S.A., 18-19 April) to teach interested customers the basics of power generation and management (Day #1) as well as the basics of turbine and compressor control and safety (Day #2).

Attendees could earn up to seven Professional Development Hours or .7 continuing education unit (CEU) credits per day.

Attendees suggested that gaining a better understanding of how their system works, more/better knowledge of synchronization and load sharing basics, information on configuring multiple bus segments, droop and PID discussions – and many more specific content areas – were some of the most beneficial.

Requests for improvements included the desire for more hands-on (less lecture) training, to hold these seminars in more locations, and to add more Woodward product details (versus basics). Woodward’s Energy businesses are hard at work, improving future for-credit technology seminars based on this attendee feedback!

Focus on People – Woodward Engineering Services

Global Systems and Service Capability
Woodward’s global service organizations support you by anticipating your needs and delivering powerful, integrated systems and services. Woodward understands your need for global availability of problem-solving resources. We are known for designing robust, high quality, innovative solutions and services that enable improved reliability and productivity.

We provide solutions to your engineering needs, focusing on return on your rotating equipment operation, control and safety system investment.

To address needs globally, our Industrial Turbomachinery Systems business has resources on every continent, including offices in Brazil, China, the Netherlands, Poland, Russia, Japan, India, Abu Dhabi, and the US. Another office is slated to open in late 2012 in Saudi Arabia.

We partner with you, our customers, to understand your needs and expectations. Your success is key to our success. So we listen, learn from you and then we deliver results – it’s really that simple! We offer:

Systems design, modeling and optimization
• Design and evaluation of control system architecture
• Design of aero derivative and industrial fuel systems
  - Integration and optimization of fuel system control
  - Design and integration of fuel modules

www.woodward.com/IndustrialTurbineSolutions
System modeling, performance trending and analysis, and failure investigation
- Product lifecycle management
  - Integration of newly developed hardware into new or existing systems
  - Integration of 3rd party and Woodward hardware

Auxiliary system evaluation and specification
- Engine performance evaluation
- Steady state and transient data analysis
  - Engine monitoring and data analysis

Engineered Systems
Our proven experience and expertise ensure successful integration of your systems, including:
- System optimization = design, development, manufacturing, installation and commissioning
- GAP™ software code architecture and development
- Modeling and simulation services via NetSim™
- Matlab/Simulink Interface
- Feasibility and trade studies
- Education and training
- Fuel system design, manufacture and analysis
- Control panel design, procurement, assembly, testing and installation
- Human machine interface (HMI)
- Legacy system migration
- Field engineering
  - Field service and on-site engineering
  - Maintenance and service contracts
  - Technical assistance and consultation (including 24/7 phone support)

Woodward Services Suite
Woodward addresses reactive and preventive service needs through execution of the following options:
- Expert personnel to supplement your operations and maintenance staff
- Spare parts and additional services provided through one, on-site resource
- Start-up and commissioning assistance
- Periodic inspections and preventive maintenance
- 24x7/365 emergency troubleshooting and problem resolution
- System modernization and upgrade services, including hardware replacement and software updates

Online Services – Woodward remotely monitors, collects and analyzes data from your installed systems, allowing early identification and quick resolution of issues.

Repair, Overhaul and Upgrade
Woodward fully protects your investment with extended warranty contracts for mechanical and control platforms. These contracts address parts and labor for any size installation. Our repair and replacement/exchange programs enable you to:
- Obtain replacement parts quickly and easily without separate purchase orders or administrative burden
- Reduce liability for equipment malfunction or failure
- Reduce duration of unscheduled downtime
- Reduce overall maintenance expenses
- Reduce Mean Time to Repair (MTTR)

To learn more about Woodward’s Engineering Services:
Send an email to: cofieldserv@woodward.com. For product technical support, call: +1970-482-5811 (choose option 7), or send an email to: TurbineHelpDesk@woodward.com.

For general information on Woodward products or to download manuals and other documentation visit:
www.woodward.com/turbine.
Woodward’s Industrial Turbomachinery Systems (ITS) Group Enhances Team

Woodward’s Industrial Turbomachinery Systems (ITS) business group addresses customers’ energy production and rotating equipment operation and safety issues. We do this by developing and delivering effective, reliable solutions for industrial compressor and turbine control and safety applications.

By growing and enhancing our sales and marketing management teams, we improve our responses to the market by:

- Addressing more of our customer base, including end-users in power generation, oil and gas and other markets, as well as engineering, procurement and construction (EPC) enterprises, distributed control system (DCS) providers and of course, original equipment manufacturers (OEMs) and their customers
- Forming a more “globally local” structure that enables quick, effective response to market needs, regardless of the customer’s physical location
- Improving delivery time of engineering services, products and solutions

“We continue to evolve and to invest in our organization to support a changing and challenging energy market,” said Jim Rudolph, Woodward’s President, Industrial Turbomachinery Systems. “Focusing on high value solutions and responsiveness is essential to enhancing our customers’ competitiveness in today’s market.”

Introducing Woodward’s Industrial Turbomachinery Systems Sales and Marketing Management Team Members

**Alex Benim**
Marketing Manager, Compressors
Alex develops and executes marketing strategies designed to grow our compressor control business. He comes to Woodward with several years of experience with Dresser-Rand in control systems design and many years of experience with CCC in various functional roles including product marketing and product management.

**Eric Friehauf**
Aftermarket Marketing Manager
Eric develops and executes aftermarket strategies designed to improve customer satisfaction. Eric comes to Woodward with several years’ experience in sales and marketing management, during which time he has led strategic planning and developed product road maps to support the aftermarket.

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Conni Hinkel  
Marketing Communications Manager  
Conni develops and executes marketing communications (marcom) strategies and deliverables. Her focus is on promotion of Woodward’s ITS business as a whole, as well as new product introductions and project management of events, sales tool (collateral) design and production and editorial and advertising initiatives. Prior to her work in communications, Conni held multiple roles in graphic design and production. 

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Rich Kamphaus  
Marketing Manager, Steam Turbines and Safety  
Rich has been the cornerstone of Woodward’s industrial turbomachinery systems’ marketing for many years. He continues to develop and execute strategies in the growing and evolving energy market. Prior to joining the marketing team, Rich spent many years at Woodward successfully addressing customer needs relative to servicing, commissioning and designing steam turbine controls and associated actuators. 

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Scott McWhorter  
Vice President of Sales, Services and Marketing for Steam Turbines, Compressors and Safety  
Scott leads the steam turbines, compressors and safety team, focusing on growth and development in key global regions and markets. In his 22+ years at Woodward Scott has held many different roles, but his roots are in the compressor business. “The compressor and safety markets require unique strategies, channels, and personnel” says Scott. “My goal is to expand and build our global team so that we have the resources required to obtain a leading position in these markets.” 

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Ron Platz  
OEM Sales Director, Steam Turbines, Compressors and Safety (SCS)  
Ron held several sales and marketing management positions with Woodward prior to taking a 12-year break from the turbomachinery industry. Fortunately Woodward was his company of choice upon his return to this industry. He leads the global OEM account management team; driving continued growth and development of new OEM relationships. 

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Rick Seifert  
Sales Director, GE Gas Turbines  
Rick’s extensive aircraft and industrial experience with GE prior to joining Woodward serve him well in his current role as leader of the global sales team supporting all GE Energy businesses. During his 18 years with Woodward, he has moved in to progressively more responsible leadership roles in aftermarket sales and service, engineering and OEM account management. 

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Craig Stiffler  
Global Gas Turbine Sales Director  
Craig leads Woodward’s global account management team responsible for gas turbine related components, systems and services. He and his team serve heavy frame, aeroderivative and small industrial gas turbine OEMs and packagers. He joined Woodward just over a year ago, having previously held sales leadership and general management positions in multiple fossil power generation businesses. 

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Mike van der Jagt  
Global Strategic Sales Director  
A leader and key contributor to Woodward’s steam turbines, compressors and safety team for many years, Mike is responsible for leading and developing a global team focused on enhancing Woodward’s relationships with engineering procurement and construction (EPC) firms, distributed control system (DCS) companies, and end users. A key focus area of Mike’s is development of channels in the compressor market. A recent success of his is strong growth of Woodward’s presence in the Middle East and in Russia. 

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Feedback

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What did you find helpful, informative, worth your time to read in this first issue of the updated News Brief?

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Please share details if you like: _______________________________________________________________

Project News
Please share details if you like: _______________________________________________________________

Technology Focus
Please share details if you like: _______________________________________________________________

Woodward News
Please share details if you like: _______________________________________________________________

Where do we need improvement/change?

Product News
Please share details if you like: _______________________________________________________________

Project News
Please share details if you like: _______________________________________________________________

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