Letter from CEO

Dear Valued Partner,

For more than 30 years, Orbital has maintained its growth by providing an unrivalled level of excellence in innovative gas solutions, while developing a wide portfolio of products with a proven track record of safe and successful delivery. Our portfolio of solutions offers a diverse range of customized liquid engineering solutions across multiple industries with a global reach.

The pioneer of innovative gas solutions GasPT® and VE Technology®, our vision is to be the global leader in gas solutions to the energy, power and processing sectors by continuing the pursuit of engineering excellence, product innovation and service integration. Our Mission is to achieve this while upholding ethical work practices for the benefit of our business partners, employees and our environment.

Orbital is growing, innovating and focused, and we are not only providing the most accurate sampling and analysis on the market, but also delivering customized integrated solutions for various applications, driven by clients’ needs. Our team looks forward to serving you.

Sincerely,

William J Clough
Since its formation in 1984, Orbital Gas Systems has provided unparalleled solutions to the global energy, power and processing markets, becoming the leader in engineering, design, installation and commissioning of industrial gas sampling, measurement and delivery systems. Operating globally, Orbital manufactures and delivers a broad range of applications including gas metering, process control, telemetry, gas sampling, environmental monitoring and BioMethane systems.

Orbital is committed to fulfilling the requirements of its clients and the marketplace through innovation, experience and the intelligent application of new technologies. Our intent is to supply products and services that exceed the highest quality standards, represent the cutting edge of design and offer value beyond cost.

Orbital is Innovating Gas Solutions for Focused Accuracy - providing immediate access to critical information when you need it.

**Orbital services a wide range of industries with a diverse range of applications:**

- Metering Skids
- LNG Terminals
- Fuel/Fuel Gas Delivery Systems
- Odorization
- Catalyst Prototype System
- H₂S Storage and Delivery
- Special Industrial Gas Storage and Delivery
- Fiscal, Metering and Compliance Systems
- Continuous Emission Monitoring Systems
- Fuel/Biofuel Storage and Delivery

*For patent information for all Orbital technology, please visit www.orbitalgas.com/patents*
With more than 30 years of experience delivering sampling solutions, Orbital’s proprietary VE Technology is the superior method for fast and accurate sampling such as trace element sampling, moisture sampling and mercury sampling for varied applications, supplying standard and custom-built solutions to a wide range of industries.

VE Technology allows sampling from any and every application and connection to almost every analyzer on the market. From the simple sample probe that eliminates the need for wake frequency calculations through to a complete, integrated sampling and analysis system, VE Technology® delivers world leading, patented solutions to the complexities involved in representative sampling.

Of utmost importance, VE Technology ensures a representative sample is delivered to your analyzer of choice in the fastest and most accurate manner while exceeding standards such as ISO 10715, GPA 2166 and API 14.1. Orbital is able to combat the battles associated with sampling high pressure, high velocity, particulate and droplet-contaminated process streams without corrupting the subsequent samples.

Maintaining sample identity:

1. Orbital’s dynamic filtration rejects particulates and droplets, keeping your sample pathway clean, without collecting contamination on filters or membranes.

2. By eliminating the regular vortex shedding, the vortex induced vibration (VIV) is no longer a concern. Where conventional probes are hindered by VIV, VE Technology® probes can be inserted into the central 1/3 for truly representative sampling.

3. Joule-Thomson cooling during pressure reduction has the ability to change the phase of the sample; therefore Orbital ensures to look after the molecules rather than masking the problem.

4. Dead spaces, dead legs, cross sectional changes, poor surface finishes and threads are eliminated.

5. Sampling system volume is minimized to expedite response, reduce emissions and energy consumption.

Orbital’s sampling system applications:

- Natural gas sampling
- Trace element sampling
- Moisture sampling
- Mercury sampling
- Oil sampling
- Chemical sampling
- Continuous automated and manual sample systems
- LNG sample systems
- Bespoke sample conditioning units
- VE sampling technology
- Full integrated sample and analysis systems
- High velocity, high pressure processes
The VE Thermowell has a radical patented design, included in all VE Technology sample probes, to provide best-ever safety and performance. Orbital machines a helical strake into the body of the probes, producing a design that has been meticulously researched and calculated to eliminate all vortex induced vibration.

Extensive wake calculations are no longer needed to be confident your equipment is safe from vortex induced vibrations, and concerns about VIV thermowell failure or a major pipeline failure caused by poor thermowell design are eliminated. Because the helical strake eliminates the regular vortex shedding effect, we can reduce the wall thickness of our thermowells. This means there is less thermal mass in Orbital’s thermowells, which results in a much faster and more accurate temperature response. VE Thermowells are also machined with an aerodynamic tip, which minimizes flow disturbance, improves temperature response and eliminates tip vortices. The elimination of VIV helps future proof your installation against process changes, increased throughput or incorrect calculations due to missing or erroneous data.
For many years, the industry has believed that compositional analysis by chromatography was the most effective manner to determine the physical properties of natural gas. With Orbital’s online transducer, GasPT, this is no longer the case. GasPT provides all the physical properties required without the traditional problems, costs, processing time and complexities of gas chromatography.

Similar to a pressure or temperature transmitter, GasPT is intrinsically safe, fast, small and rugged and can be installed directly on the pipeline.

GasPT measures a number of easily monitored physical properties of a sample of gas from which it infers a composition. From the inferred composition, GasPT uses ISO6976 to calculate:

- Calorific Value (CV) / British Thermal Unit (BTU)
- Wobbe Index (WI)
- Relative Density (RD)
- Compression Factor (Z)
- Methane Number (MN)
- Total Air Requirement (TAR)

**GasPT benefits:**
- 2-8 second analysis time for all properties
- No utility gas required (e.g. carrier gas)
- High accuracy
- No calibration required
- Virtually no maintenance required
- No configuration or set-up required (‘Plug & Play’)
- Low initial and installation cost
- Low operational cost

**Orbital’s gas analysis applications:**
- Natural gas quality
- LNG
- Gas properties
- Gas composition
- Natural gas hydrocarbon dew point
- Liquid analysis (e.g. LPG and liquid propane)
- Total Sulphur, H2S, Mercaptan analysis
- Moisture analysis
- Oxygen analysis
- Mercury Analysis
- Hydrogen analysis
- CO2 analysis
- Petrochemical applications
- Process and monitoring applications

**Devices used by Orbital:**
- Chromatography
- Electrolytical devices
- Infra-red devices
- TDLs
- Ultrasonic devices
- GasPT

**Suppliers of analyzers we can offer:**
- Yokagawa
- Siemens
- ABB
- Emerson
- SICK
- Endress & Hauser
- Azbil
Combining two patented gas technologies - GasPT® and VE Technology® - Orbital’s integrated GasPTi solution provides gas sampling and analysis through continuous measurement, requiring no carrier or calibration gases or maintenance.

Orbital’s VE Technology uses specialized probes that eliminate vortex shedding to take smaller, more representative samples that reach the analyzer faster. The probe’s dynamic filtration removes contamination which delivers a cleaner sample which allows reduced volume that improves response, enhances accuracy, decreases costs and reduces waste.

GasPT technology measures and analyzes the VE gathered samples giving you the Calorific Value (BTU) and other properties of the gas needed to control your system.

**Orbital’s gas analysis applications:**
- Natural gas quality
- Fiscal metering
- LNG
- Gas properties/composition
- Natural gas hydrocarbon dew point
  - Liquid analysis (e.g. LPG and liquid propane)
- Sulphur/Mercaptan analysis
- Moisture analysis
- Oxygen analysis
- Hydrogen analysis
- CO₂ analysis
- Ethylene manufacture
- Drying process enhancement
- Mercury measurement
- Trace contaminant measurement
- Petrochemical applications
- Process and monitoring applications
- Safety applications

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- ABB
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- SICK
- Endress & Hauser
- Ametek
Orbital’s IRIS is a remote telemetry unit (RTU) that empowers the user with data. The IRIS system, once utilized, provides control, monitoring and detailed information relating to each physical device linked to it.

IRIS comprises two main elements:

- **Hardware**: The IRIS rack is fully dual redundant and has a PLC control system with various modules sized to the required I/O of the site/process, for both safe and hazardous areas – connecting the real world to IRIS' virtual world. A number of hardware solutions can be provided on which to host the IRIS-RTU software depending upon budget and/or the functionality required.

- **Software**: The IRIS software is unique, in that it is non-licensed, web-based software for interrogation and communication to the IRIS hardware.

IRIS is specifically designed to offer improvement in efficiency, reduce operating costs, enhance stability, heighten security and most importantly, improve the interface between sites, control rooms and operatives at all levels and locations.

**Key features:**

- Easy to use app driven software
- License-free web based software
- Redundant hardware and operating system
- Low maintenance
- Faulty operating parts can be hot swapped with zero set up
- Extensive diagnostic tools
- Large storage capacity of data for equipment connected to IRIS and of the site/process (e.g. manuals, data sheets, drawings can be accessed via IRIS)
- Highly secure
- Secure log in with user permissions
- Users can access any of their IRIS systems remotely and globally via the web

**Where to use IRIS?**

**Oil & gas pipelines:**
- Monitor and control flow, pressure, gas properties
- Perform emergency shutdowns, monitor remote exploration and storage sites

**Water and wastewater:**
- Improve distribution system or collection system operations
- Optimize treatment plants, water treatment (chemical and energy savings), and landfill sites

**Electric power distribution:**
- Controlling load break switchgear, and IEDs (intelligent electronic devices) at substations or pad

**Communication network monitoring and control:**
- Remote monitoring of critical equipment such as power systems, environmental control systems, tower lights, etc.
Orbital’s BioMethane systems comply with all the required network entry standards, such as the UK’s Ofgem and GS(M)R 1996. Within Orbital’s BioMethane systems, we offer any of the following features:

- Energy measurement
- Gas Quality measurements
- Fiscal Metering system
- Pressure control including slam-shut valve
- Interface control rack / flow computation rack
- Gas odorization system
- BioMethane recirculation facility
- Reject gas pressure control
- Orbital liquid propane injection system

Orbital, who continues to lead the market in technology and quality to producers across the globe, provides a full BioMethane solution from gas analysis to data configuration, export to RTU system and finally communication with your system.

In addition to our work in the BioMethane market, Orbital has been involved with gas measurement, fiscal metering and gas odorization for many years, all of which are vital activities to allow BioMethane to enter a natural gas network.
Orbital delivers standardized or custom-built supervisory control and automation equipment for various applications. Our solutions provide for monitoring a small process, automating part of a plant or complex DCS systems. To complement our software capabilities, we have manufacturing facilities able to produce supervisory racks for all hardware requirements.

Our team of engineers and service employees have the experience and the knowledge to provide a customized solution, whatever your supervisory and control needs. This can include a supervisory system to complement one of our own solutions, or a system not supplied by Orbital.

With integration, fabrication and testing facilities in the UK and in the US Orbital is well situated and equipped to meet your analytical needs.

Orbital’s supervisory and control applications:

- Hazardous area
- Small process monitoring systems
- Automation
- Complex PLC and HMI systems
- Data acquisition
- Data logging systems
- Metering and flow computer applications
- Analytical control and supervisory systems
- DCS / SCADA applications
- RTU

Metering Systems

Orbital delivers metering systems that range from 2 in. to more than 48 in. size, and also provides analysis, sampling (see VE Sample Systems and VE Thermowells) and supervisory and control.

Orbital is specialized in producing metering systems that are comprehensive, durable and highly accurate – from small upgrades on existing metering systems to large national and global projects.

Orbital’s metering systems applications:

- Onshore fiscal metering
- Offshore fiscal metering
- Liquid metering (e.g. LPG, Liquid Probe, LNG)
- Gas metering (e.g. natural gas and other fluids)
- Process control
- Safe and hazardous areas
Orbital’s Value Statement pledges a commitment to acknowledge and honor our core values of Innovation, Safety, Service and Environment by developing and maintaining a culture that embraces these values.

Innovation – We intend to be at the leading edge of gas technology and challenge ourselves to develop and evolve gas solutions.

Safety – We place safety at the forefront of everything we do.

Service - We are committed to serving with the highest level of respect and integrity in the pursuit of building long-term relationships.

Environment – We value the environment and are committed to uphold, comply with and exceed industry regulations.

We are committed to all aspects of project delivery operating in a manner that minimizes any potential risk, promotes a positive HSE culture and protects our clients’ personnel and capital assets.

Environmental protection and sustainability is a core value at Orbital and is central to our everyday operations. We understand the nature of our work could have an impact on the environment; therefore our designs are such to minimize waste, recycle waste, reduce environmental impact, decrease travel and optimize logistics.