

# PUMP ACTION

THE OFFICIAL NEWSLETTER OF THE PUMP CENTRE

SPRING 2015

**Conference Preview**  
14th May 2015  
The International Centre, Telford  
See inside for details

**Issue 2015**

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## Editor's Column

Dear Reader

Once we get into January our focus on the Pump Centre Conference and Exhibition becomes much clearer. This year the Conference is back to its mid-May date at the International Centre, Telford.

- Conference Dinner - Wednesday 13th May 2015.
- Technical Conference and Exhibition – Thursday 14th May 2015.



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The main conference theme is "PUMPING BEST PRACTICE FOR 2020" and the centre four pages of this newsletter provide a preview of what will be happening on the day. The conference is targeted predominantly, but not exclusively, at the Water Industry. However, most of the breakout sessions deliver more generic technical and engineering information.

The main aim of the Conference is education and training. We know how difficult it is to justify allowing employees the time to attend exhibitions and we feel it is vital for an event to offer great value! That is why the Pump Centre Conference 2015 should be at the top of your list of events because it is one of the few high quality conferences that is FREE to attend. The only thing you have to do is pre-register and get yourself to the venue.

All delegates have the opportunity to attend a wide range of technical and training presentations which will help to raise their general understanding of pumps and pumping. It is also a great place to meet key industry contacts in a very relaxed environment under one roof.

The exhibition has grown significantly over the past few years and now includes pumps, systems and associated mechanical and electrical equipment. It has become the main UK exhibition for pumps and pumping - so please don't miss out and pencil the date into your diary!

For up to date information about the Conference go to [www.pumpcentre.com](http://www.pumpcentre.com)

One of the special features at this year's conference will be the Pump Centre Pump Project of the Year area. The Pump Centre selects one worthy project every year and helps to produce a featured display.

This year's selected project is:

Littleton Raw Water Pumping Station – Pump Station Upgrade from 1925 to 2015

The project was born out of a collaboration between Thames Water and Boulting Group's (Pump Management team) to upgrade the performance to make it the most cost-effective and reliable river abstraction system along the River Thames, whilst retaining its original character.

More details about this project can be found on pages 8 & 9

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 Pump Centre Manager

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# Annual Conference and Exhibition

Thursday, 14th May 2015

Exhibition stands still available Free to members

## Pump Centre

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## All the best – Bob

Bob Went, Group Consultant at Xylem Water Solutions announced at the Pump Centre Council meeting in October that he would be leaving Xylem on the 31st December 2014 and he would be standing down from his role on the Council. After over 50 years involved in the Water Industry he said that the time was right for him to reduce his workload and spend more time with his family.



Bob Went (Former Pump Centre Chairman)

Bob's long and successful association with the Pump Centre began in the early 1990's. While working for Thames Water he played a key role in the launch of the Centre and as Pump Centre Chairman from 1992 to 2004 he was a strong advocate for its development and growth. Bob was also a member of the original Water Industry Mechanical & Electrical Specification (WIMES) steering group who developed the concept of common specifications for the Water Industry.

Bob's hard work and support was recognised by the Pump Centre in 2008 when he became the first person to receive the title of "Honorary Member of the Pump Centre". Having been a Council Member for over 20 years his strong presence will be sadly missed at the forthcoming meetings.

All those involved with the Pump Centre would like to thank Bob for his hard work and support over the last 22 years and would like to wish him all the best in his future endeavours.

## Atlas Copco Compressors appoints Heather Gallagher as Competence & Development Manager

Atlas Copco Compressors has appointed Heather Gallagher as Competence & Development Manager in the UK. In her new role, Heather will be responsible for overseeing the training and personal development of 250 employees in the UK and Ireland; in addition to helping the company continue to attract young apprentices and graduates.

Heather said: "My vision is for the training and career options offered for many years by Atlas Copco to be recognised as the best in the compressed air industry. I believe that by continuing to develop our workforce, we will be able to further improve our business and meet future challenges. I am passionate about assisting people in their personal and organisational development to enable them to be the best that they can be."

In her new role Heather will be responsible for collating the various training materials and courses offered by Atlas Copco's in-house technical team into an easy to use learning catalogue. Alongside this, Heather will support team leaders and managers, both directly employed and via Atlas Copco's distributor network, to identify training needs within their teams and to create development plans for talented individuals to progress to their next roles.

As a former apprentice, Heather understands the crucial role of engineering apprenticeships in addressing the UK skills shortage. She plans to expand upon

Atlas Copco's policy of working closely with local schools and colleges to improve the understanding of what an exciting career in the compressed air industry looks like in reality. She will also be responsible for overseeing Atlas Copco's apprenticeship and graduate schemes, which seek to attract and retain talented young people by providing tailored training and personal development programmes.

Commenting on the importance of apprenticeships, Heather said: "At Atlas Copco, we believe in sustainable productivity, and that applies just as much to our workforce as our products. What better way to ensure sustainability than to nurture young talent?"

Prior to joining Atlas Copco in 2012, Heather held a number of technical and operational positions and gained extensive experience in the automatic and industrial door and docking industry. Since 2004, she has been actively involved in providing training for engineers and apprentices and is a certified Chartered Institute of Environmental Health Professional Trainer. In addition, Heather holds a BA (Hons) in Business Management and both an NVQ 3 & ONC in Mechanical Engineering and an HNC in Electrical Engineering.

[www.atlascopco.co.uk](http://www.atlascopco.co.uk)

The FLYGT logo is positioned in the top left corner, featuring the word 'FLYGT' in a bold, sans-serif font next to a stylized white arrow pointing to the right.

Come and find out more  
on Stand S12 at the Pump  
Centre Conference and  
Exhibition 2015

A large white circular graphic is centered on the page, containing the main headline text. The background of the entire advertisement is a blue-toned image of a large industrial pipe with several pumps attached. At the top of the pipe, two men in work clothes are visible. The pumps are highlighted with yellow digital-style overlays, including data points and grid patterns. One pump has the text 'NP 3153.181-EX' and 'SmartRun' visible on it.

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# Bedford Pumps & Hidrostral Ltd

## Stronger Together

Bedford Pumps has been a member of the group of companies owned by the Swiss based manufacturer Hidrostral since 2002, but it is only this year that their parent company, Hidrostral Holding AG, has increased its shareholding to 100% of the business.

This development brings Bedford Pumps and Hidrostral Ltd, the UK based division of Hidrostral, firmly united as sister companies with an extended range of complementary products.



Hidrostral are renowned manufacturers of pumps and associated products, predominantly for the waste water market but also for clean water, environmental and industry applications. The Hidrostral product range is built around the screw centrifugal impeller which was created by

their founder, Martin Stähle more than 50 years ago. This has led to a family of pumps being developed with variations of the screw centrifugal impeller to solve specific pumping problems.

Hidrostral are a family organisation with a huge market base, expanded to include distributors in 58 countries. Hidrostral Ltd was founded in the UK over 30 years ago and has been at the forefront of designing and delivering innovative pump solutions to the United Kingdom and Middle East markets.

Bedford Pumps are manufacturers of large submersible and conventional pumps for the water and waste water industry and considered to be the UK's market leader of pumps for the Land Drainage and Flood Defence industries. They are unlimited in their market scope



and have fulfilled a host of installations worldwide including wastewater in Brazil, water treatment in Hong Kong and drought alleviation in Australia.

Bedford Pumps was formed in 1987 by former members of the Pump Department at NEI (W H Allen) after the company closed their pump manufacturing facility within the town. W H Allen was founded in London in 1880 and moved to Bedford in 1894 and as Allen Gwynne Pumps established a worldwide reputation for delivering high quality pumping plant to the world market. The fledgling company originally called The Bedford Pump Company started with no order book and within 6 years had raised their turnover to £7.5m. They became Bedford Pumps Ltd in 2002 after they were acquired by Hidrostral AG and to this day are a flexible, highly experienced British manufacturer of robust, pumping plant for the water and waste water industry.

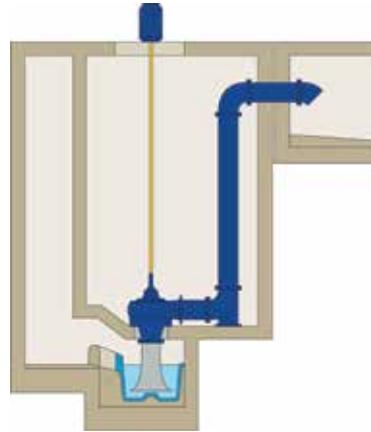
### Pumping Capabilities

The complementary products offered by Hidrostral and Bedford Pumps now extend the companies pumping range from 0 to 12,000 litres per second. From standard off the shelf products to complex bespoke design solutions, the combined specialist engineering knowledge from the 88 staff across the UK sites ensure that any pumping need within the water, wastewater and industrial markets can be fulfilled.

### Reliability

Hidrostral are renowned for delivering reliability to their installations. The simplicity of the original screw centrifugal impeller design brings longevity to many systems. Hidrostral have recently revisited a 40 year old installation at Troqueer WWTW for Scottish Water which still operates successfully and is running maintenance free.

The pumps were installed in 1974 when Dumfries & Galloway Regional Council required inlet pumps to handle raw sewage across a range of flows. These pumps were originally chosen as they presented a solution that could achieve flow matching from the same size of pumps through hydraulically induced turndowns. The natural and sustainable hydraulic solution uses Hidrostral Screw Centrifugal



Pumps installed in harmony with unique Hidrostral Prerostal Basins. The pumps were installed in a vertical dry well configuration above the shallow wet well basins with suction bellmouths installed into the wet well area below. The pumps are shaft driven by Brook Crompton 37 kW, 8 pole motors and each is capable of delivering 350 litres per second at 6m head. Lower flows can also be achieved through prerotation turndowns at lower sump levels.

The benefit of this system to Scottish Water was that fewer models of fixed speed pumps were

required to achieve a wide range of flow turndowns, together with first class hydraulic self-cleaning. In addition a Prerostal system requires a much smaller installation footprint, particularly when compared to a conventional Archimedes screw pump, which significantly reduces the construction costs.

Scottish Water confirmed that the pumps have been outstanding in their performance. Tam Kearney, Senior Operator at Troqueer WWTW stated *"The inlet pumps have handled everything thrown at them. I have never seen a blockage in my 30 years of working on this site. I would say that they have been the most reliable piece of mechanical equipment at Troqueer."*

### Innovation

Bedford Pumps strength lies in their design capability and engineering knowledge. They specialise in bespoke engineered solutions which, through early contractor



involvement, save the customer time, money and greatly reduce Whole Life Costs.

A prime example of this approach is the installation Bedford Pumps undertook for the Environment Agency at Altmouth P.S. The ageing Pumping Station was flagged for investment as the original pumps had come to the end of their design life. Each of the four original storm pumps were driven by 1800 hp diesel engines which were to be replaced with electric pumps.

A number of different pumping configurations were considered during the outline design stage including replacing the existing Vickers pumps with three storm pumps operating at 15m<sup>3</sup>/s each at approximately 4.7m head. Bedford Pumps made a significant contribution to the station design by suggesting, and going on to supply, four pumps instead of the three, thus reducing the total head from 4.7m to 4m and subsequently saving 600kW on the installed power. The addition of a fourth pump would reduce the required flow per pump to 11.25m<sup>3</sup>/s.

Bedford Pumps proposal, which was subsequently accepted, was for canister units instead of conventional lineshaft units, which reduced the capital cost, improved health and safety conditions, increased efficiency and gave more available floor space. Bedford Pumps designed and manufactured a revolutionary variant to a standard submersible. These pumps were bespoke and highly unique, driven by 620 kW 3.3kv motors and incorporating an integral IP68 planetary gearbox within the unit, thus enabling the motors to be a six-pole rather than a much larger 26-pole motor that would have been required for a direct drive pumpset.

John Hunt, Regional MEICA Engineer for the Environment Agency, said "We chose Bedford Pumps because they were able to retrofit the new plant into the existing civil structure, provided plant that can be installed and removed readily, and could use the existing station overhead crane. The pumps that Bedford offered were very different to the ones that were previously installed but were significantly more efficient."

"Bedford Pumps were innovative with the pump design. They took a lot of design elements of various pumps and combined them into one unit which was very cost effective. It also allowed us to pump the water within the limitations of the power supply that was available at the site."

## Joint Vision

Bedford Pumps and Hidrostal share a joint vision for the future. The key strengths of each of the two companies will contribute to bring them closer to the integration aims of the Hidrostal Group. Eddie McClagish, Managing Director of Bedford Pumps states "Being a wholly owned subsidiary within the stronger group and having access to their sales network can only improve our exposure to the wider world and promote our own growth. The complementary ranges or products from both organisations will significantly increase our markets both in the UK and abroad."

Neil Langdown, Managing Director of Hidrostal Ltd agrees "Bedford Pumps Ltd and Hidrostal Ltd will continue to exist as separate operating companies but at the same time will work closer together to offer our customers the benefits of the extended product range".

[www.bedfordpumps.co.uk](http://www.bedfordpumps.co.uk)  
[www.hidrostal.co.uk](http://www.hidrostal.co.uk)

# SEEPEx pumps installed at Stonehenge visitors centre

Stonehenge is probably the most important ancient monument in Britain attracting visitors from around the world, it is over 3500 years old and the scale of the monument has awed visitors for generations. The new Visitors centre provides an insight into the history and construction of Stonehenge and has been



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sensitively designed to preserve and enhance the surroundings of the ancient stones.

In contrast SEEPEx Smart Conveying Technology (SCT) is the newest innovation in Progressive Cavity pump design and we are proud to have supplied these as part of the recent upgrade of waste water treatment at the Stonehenge Visitors centre.

The Centre is likely to welcome over one million visitors a year and improved facilities were essential to cope with the increase in effluent from these visitors.

The new system, incorporating a Membrane Bio Reactor, was installed as a turnkey package by Nijhuis H2OK to achieve demanding discharge consent levels and to enable recycling of the final effluent for non-potable uses where possible. The plant has been identified as 'state of the art' technology which will reduce the Visitors centre's environmental footprint.

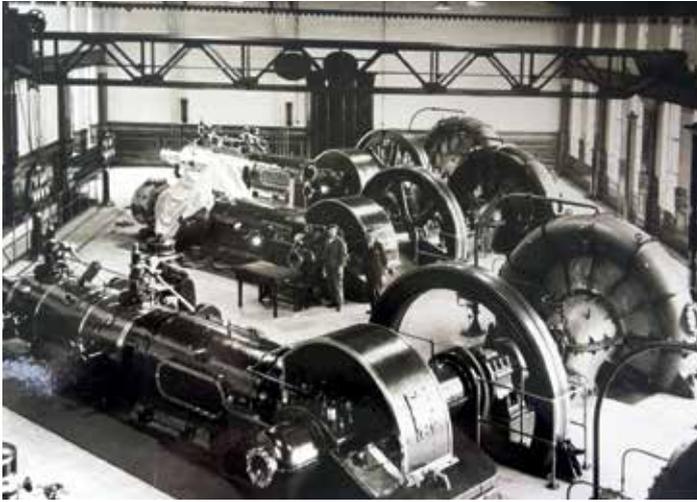
The duty and standby pumps recirculate the bioreactor sludge which is then mixed with screenings from separation before being disposed of. SEEPEx pumps can handle products with high viscosity and those containing solids enabling reduction of vehicle movements removing the final sludge from site and improving the environmental performance further.

Some of the challenges faced were a restricted available footprint, short installation timescale and low noise demands. To overcome these a compact containerised plant which was prefabricated off-site. SEEPEx SCT pumps are ideal for restricted spaces since maintenance can be done without removing pipework, thus reducing the space needed for installation. The adjustable nature of Smart Conveying Technology gives an extended service life, resulting in lower operating costs and reduced environmental impact from spare parts replacement.

Smart Conveying Technology is a state of the art product protecting the nation's heritage, a case of the new looking after the old!

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

# Advanced Engineering Efficiency from 90 Year-old Pump Station



Thames Water is the UK's largest water and wastewater services company, supplying around 2,600 million litres of tap water to about nine million customers across London and the Thames Valley. One of Thames Water's biggest abstraction facilities is the Littleton Raw Water Pump Station (RWPS) in Surrey.

Built between 1923 and 1925, the station preserves much of its original character. In an initiative to make Littleton the most cost-effective and reliable river abstraction system along the Thames, while retaining the site's authentic personality, Thames Water collaborated with its longstanding partner, the Pump Management team of Boulting Group.

The Littleton pumping station was originally fitted with four 900mm discharge horizontal double suction axially split case pumps. Each individual pump had a capacity of 340 Megalitres per day. In the 1950s, three pumps were modified to electric motor drives and have been operating using this arrangement since.

The pump station is responsible for maintaining the water supply to one of the largest raw water reservoirs in the UK, providing fresh water to London and some neighbouring counties. It covers 707 acres and lies 13m above the surrounding area.

Despite its successful history and charming character, the Littleton RWPS wasn't operating at optimum efficiency. Improvements could be made to reduce loss of pump priming, minimise cavitation, simplify start up, maintenance and control procedures, reduce energy usage and therefore, operational costs.

## Requirements

After four years of successful projects with the Boulting Group, Thames Water invited the company to propose an upgrade to the Littleton RWPS, which would



increase the performance of the site, while also making it more flexible, reliable and energy efficient. Thames Water was also keen to increase the average capacity from 400 to 750 Megalitres per day.

In addition, Thames Water wanted to implement an automated system with remote control function, which would allow a faster and more efficient pump start up procedure, while also making monitoring easier. In the existing system, operators had to go to the site and work for three to four hours to start up a pump, making the operation time-consuming and costly.

The final requirement was providing dual electrical power supply from the National Grid and up to 1.5MW of power supply from a photovoltaic (PV) system located in an adjacent field.

## Solution

To address these requirements, the Boulting Group completed an holistic, objective site testing and evaluation process of the entire system, including Front End Engineering and Design (FEED). This resulted in a set of recommendations, including the upgrade of assets like switchgear, motors, drives and control systems.

Although the Boulting Group report had no further contractual obligations attached and Thames Water was free to commission a different contractor to implement any improvements, the deep-rooted collaboration with Pump Management and previous successful projects prompted the water giant to assign the engineering, design, procurement and implementation contracts to the Boulting Group.

In addition to fulfilling the client requirements, an unexpected benefit of working with the Boulting Group was the pump management teams' enthusiasm for keeping the pump station's original aesthetics and character. After a close collaboration with Thames Water, Boulting slightly altered the initial scope of the project to minimise the loss of original aesthetics and to preserve the pump room character.



## Hydraulic redesign of impellers

The original impellers were limited in efficiency to around 80 per cent. To improve the hydraulic performance and the priming process, Boulting Pump Management suggested a pump upgrade, including a complete redesign and manufacture of the pump impellers to help improve the net positive suction head (NPSH) characteristic and pump efficiency.

The specific design Boulting created for this project allows an improvement to 87 per cent pump efficiency and increased reliability during start up and operation. Another benefit of the new design was the minimisation of cavitation and its damaging effects on the pump components.

## Improved priming process

Poor priming also made the old system difficult to manage, time-consuming and expensive. To resolve the issue, the Boulting Group suggested the installation of



a new and automated priming system that uses motive air vacuum ejectors and continuous water level monitoring.

To further increase priming reliability, the Boulting Group replaced the old packed glands with mechanical seals. This reduced leakage to virtually zero, making the system more reliable and adding an extra two per cent to overall system efficiency.

### Increased energy efficiency

The pump upgrade and refurbishing also meant an improvement in overall energy efficiency. In the new installation, the pumps, motors, drives and channel level will be automatically controlled to optimise the Specific Energy Consumption (SEC) of the system. Each component will be controlled individually and automated using Boulting PSoP (Pump System Optimisation), installed within SCADA managed Programmable Logic Controllers (PLCs).



The PSoP software was developed by Boulting Pump Management and has been used extensively in pump systems for Thames Water. It is able to continuously monitor and analyse the pump system, taking into account the known characteristics of each component in terms of performance. The system automatically identifies the speed the pump needs to operate at to achieve optimum efficiency. It also automatically detects how many pumps need to be running at any given time to ensure the lowest specific energy consumption.

In addition, the remote control feature of the Boulting PSoP software meant even further cost savings for the Littleton system. Whereas in the past, operators had to go on site and manually start the pumps – a time-consuming and often unreliable operation – the new system reduces pump start up time by up to 96 per cent.

### Dual power supply

Another interesting feature of this project was the need to integrate dual power supply from the National Grid as well as a separate solar power photovoltaic system. Relying on its expertise as an established solutions provider, the Boulting Group installed a High Voltage Switchboard that enables the pump station to use PV power when available and supplement it with grid power when necessary.

### Aesthetic considerations

The unique character of the Littleton pump station comes from the beautifully designed pump room, created in the mid 1920s. To preserve the personality and historical character of the space, the Boulting Group suggested changing the layout of the system. This meant removing some equipment installed in the 1950s and several add-on pieces such as air ducts, as well as installing modern inverters, panels, transformers and control system in an adjacent room.

The original pumps are connected to new high performance motors and gearboxes, close to the oldest static steam driven pump, which will be kept as a museum piece.

After the most recent upgrade, the pump room will actually look more like the 1920s original, although the system will see a huge boost in reliability, flexibility and energy efficiency.

### Conclusion

Thames Water originally estimated the upgrade would take at least two years, but by working closely with the Boulting Group, the project is expected to take only half that time, including the design, delivery and installation of the new system. The Littleton RWPS project is expected to be completed and fully operational by June 2015.

By improving efficiency, reliability and performance and by integrating a renewable energy source, the new system will be highly energy-efficient. The upgrade aims to make the Littleton abstraction station one of the most modern and innovative in the UK.

The project will provide significant and sustainable benefits to Thames Water for decades to come. The annual energy savings resulting from this project are predicted to exceed 4.9 million kilowatt hours with an energy cost reduction close to £0.5 million.

It is hoped that while retaining its original character and proven robustness, it will use this foundation to create the highly advanced system performance provided by Boulting Pump Management.

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# The PUMP CENTRE CONFERENCE & EXHIBITION

Organised by the Pump Centre, **Thursday, 14th May 2015**  
The International Centre, Telford

The Pump Centre Conference is the UK's leading conference and exhibition for those involved with pumps and pumping. The event is bigger than ever before with more exhibitors, a full conference programme, back to basics breakout sessions and new products zone.

This year's technical theme is "Pumping Best Practice for 2020" and many key presenters from across pump industry have already been signed up.

The Conference is looking forward five years to where pumps and pumping will be by 2020. There are a number of significant issues that will impact the industry during this period and it is important for innovation and technical development to help to control TOTEX in a more difficult and more demanding working environment.

Visitors to the Pump Centre Conference 2015 will be able to:

- Meet over 90 of the UK's major manufacturers and suppliers.
- Network with industry experts and key players from across the supply chain.
- See the latest products and technology.

- Improve their technical knowledge at the engineering breakout sessions.
- Keep abreast of "Collaboration" within the supply chain via the conference programme.
- Discover new solutions to their pumping issues.
- Visit the "New Products Zone".

## REGISTER NOW!

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Or email: [pumpcentre@esrtechnology.com](mailto:pumpcentre@esrtechnology.com) and the link to the registration form will be emailed by return.



## Main Conference Theme

# “Pumping Best Practice for 2020”

This year's Conference is looking forward five years to where pumps and pumping will be by 2020. There are a number of significant issues that will impact the industry during this period and it is important for innovation and technical development to help to control total expenditure (TOTEX) in a more difficult and more demanding working environment.

**The technical programme is in the process of being finalised and is expected to include topics, such as:**

- Ways to achieve and maintain optimum performance.
- The use of innovation to control maintenance and operational costs.
- The impact of legislation  
e.g. the Adoption of Private Drains and Sewers (PDAS), Energy Savings Opportunity Scheme (ESOS).
- The whole life costing approach.
- Lessons to be learnt and mistakes to avoid.
- The correct application of new developments and innovation  
e.g. smart/intelligent pumping.



# & Exhibition 2015

Thursday, 14th May 2015 The International Centre, Telford

## What people say about the Conference



*"We have been exhibiting at the Pump Centre exhibition for the past 6 years and have watched the event grow to become one of the largest UK Water and Waste Water exhibitions. This event attracts the right calibre of people and focuses on the right topics affecting the pumping industry. Because of the popularity of this exhibition we have decided to become a main sponsor".*



*"The Pump Centre event gave the opportunity for customers to see all of their suppliers in the large exhibition hall, and to see demonstrated the high level of collaboration in the supply chain who are working on behalf of the UK water industry".*



*"We were one of the original members of Pump Centre and we're very pleased to see that it's grown to be the UK's recognised number one".*



*"The Pump Centre Conference is the one time of the year when the whole water industry comes together. You can be guaranteed to see everybody you want to see in one place, on one day, and I think that's what makes it really strong".*



*"The conference today has been brilliant. We've met quite a few of the water company representatives – some that we haven't had any contact with before".*



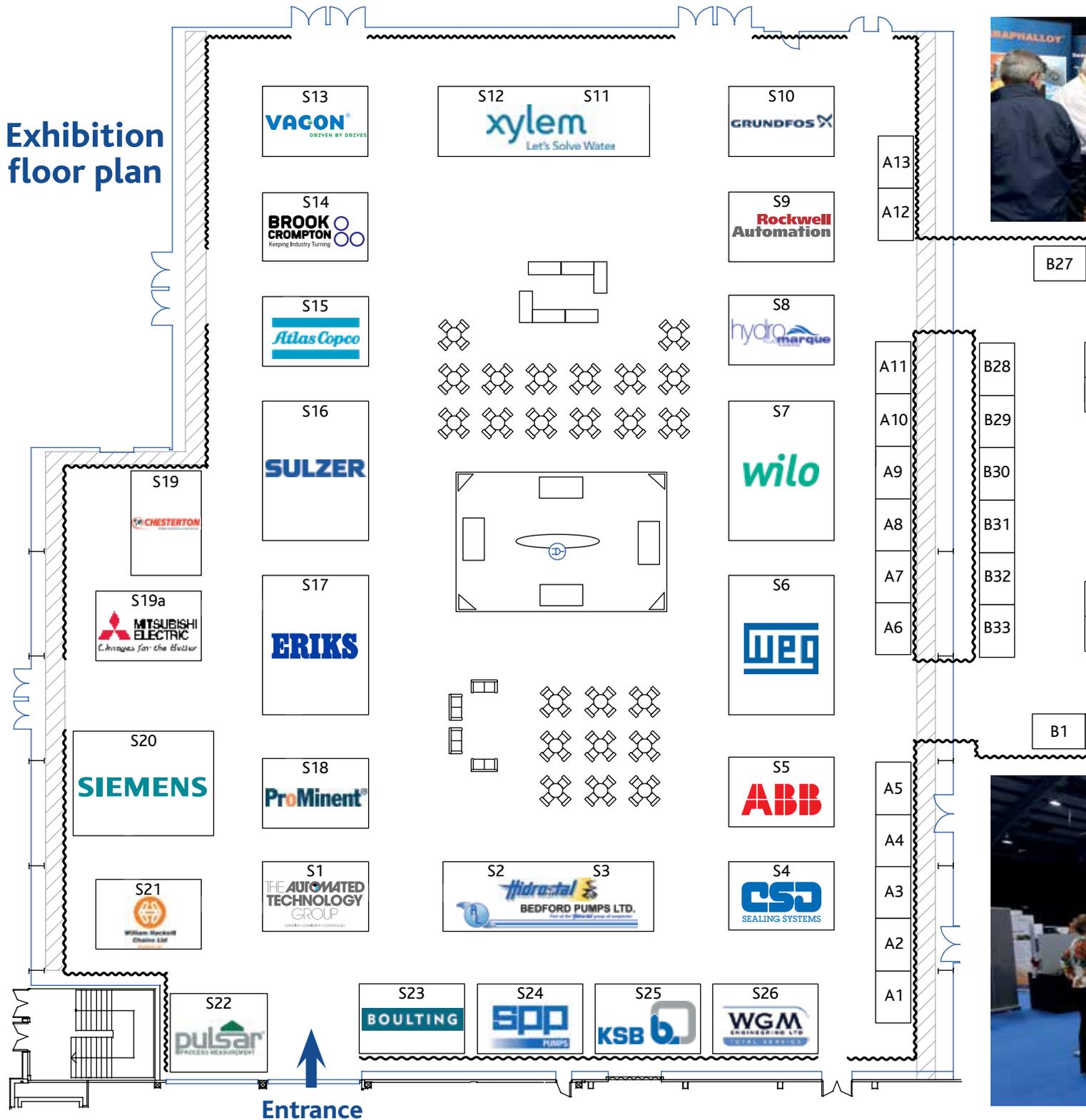
*"It's the only conference that we do attend because the people coming to the conference are engineers and the services we provide are directed back to the engineers".*



**If you are interested in exhibiting!  
Contact: Jim Eaves on 07968 707753**

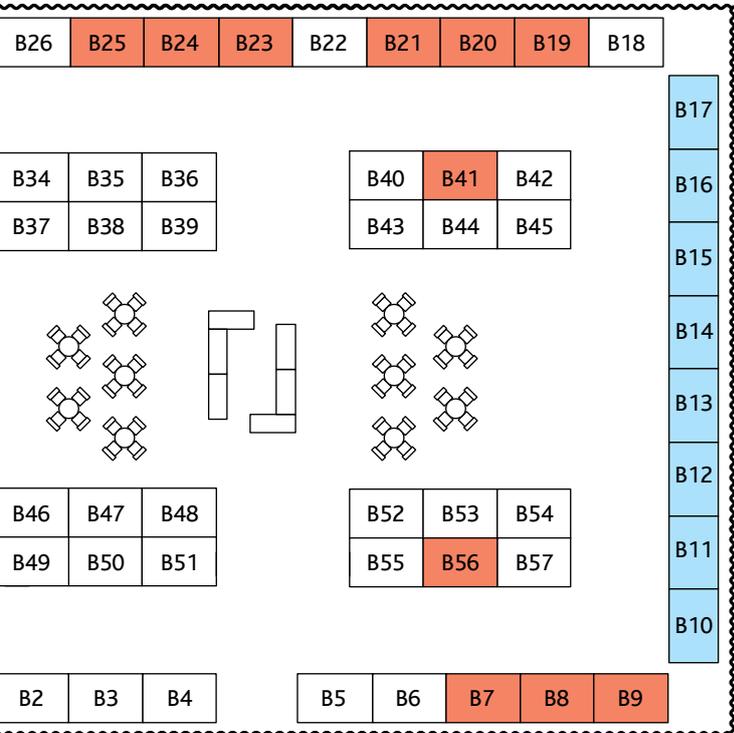
**More details available at [www.pumpcentre.com](http://www.pumpcentre.com)**

# Exhibition floor plan



# Exhibitor List

AUTOMATED TECHNOLOGY GROUP	S1	CHESTERTON	S19	DERITEND	A8	Reserved	B11
BEDFORD PUMPS/HIDROSTAL	S2 & S3	MITSUBISHI	S19A	VOGELSANG	A9	Reserved	B12
CDS SEALING SYSTEMS	S4	SIEMENS	S20	DANFOSS	A10	Reserved	B13
ABB	S5	WH CHAINS	S21	INDUSTRIAL PUMPS	A11	Reserved	B14
WEG	S6	PULSAR	S22	AERZEN MACHINES	A12	Reserved	B15
WILO	S7	BOULTING	S23	TECHNICAL CONTROL SYSTEMS	A13	Reserved	B16
HYDROMARQUE	S8	SPP	S24	VERDER	B1	Reserved	B17
ROCKWELL AUTOMATION	S9	KSB	S25	BUSCH	B2	CLEARWATER CONTROLS	B18
GRUNDFOS	S10	WGM ENGINEERING	S26	PUMP SUPPLY & REPAIR GROUP	B3	Still Available	B19
XYLEM	S11 & S12	CEMA	A1	GRAPHITE METALLIZING	B4	Still Available	B20
VAGON	S13	CEMA	A2	SMITH & LOVELESS	B5	Still Available	B21
BROOK CROMPTON	S14	EXALTO	A3	SMITH & LOVELESS	B6	UTILITY VALVES	B22
ATLAS COPCO	S15	PRUFTECHNIK	A4	Still Available	B7	Still Available	B23
SULZER PUMPS	S16	PRUFTECHNIK	A5	Still Available	B8	Still Available	B24
ERIKS	S17	SKF	A6	Still Available	B9	Still Available	B25
PROMINENT	S18	SKF	A7	Still Available	B10	NETZSCH PUMPS	B26



# 2015 Conference and Exhibition

## Pumping Best Practice for 2020

To be held on Thursday, 14 May 2015 at The International Centre, Telford from 08.15-1600hrs

Last year was a record attendance and we are expecting even more visitors this time so book early to make sure you don't miss out.

The 2015 Conference will have 25% more exhibition space and approaching 1000 attendees under one roof making it the ideal venue to meet industry experts and key players from across the supply chain – manufacturers, suppliers and users of pumps and ancillary equipment, services etc.

- Full conference programme and 12 breakout sessions to choose from**
- New product zone
  - Great networking opportunities – with more than 100 exhibitors, it is the ideal venue to meet business prospects in an informal environment
  - Free parking
  - Free lunch and refreshments

Book online today at:  
[www.pumpcentre.com](http://www.pumpcentre.com)  
 or contact Karen Bridgeman on 01925 843512  
[karen.bridgeman@esrtechnology.com](mailto:karen.bridgeman@esrtechnology.com)



QUARTZELEC LTD	B27	OVIVO	B43
GILBERT GILKES & GORDON	B28	SEPEX	B44
IMECHE	B29	EATON ELECTRIC	B45
NORD	B30	SERA ProDos	B46
NORD	B31	ARTESIS	B47
BLACKBURN STARLING	B32	ETATRON	B48
SECURE METERS	B33	SAFTRONICS	B49
TES	B34	EAGLEBURGMANN	B50
GEE & COMPANY	B35	CHEMRESIST	B51
ECS	B36	IFM	B52
LUTZ JESCO	B37	HAM BAKER ADAMS	B53
FILO FORM	B38	HAM BAKER ADAMS	B54
WATSON MARLOW GROUP	B39	BORGER PUMPS	B55
FLOWCHECK	B40	Still Available	B56
Still Available	B41	KTR COUPLINGS	B57
T ALLEN ENGINEERING	B42		



**Pump Centre, ESR Technology Ltd,**  
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 Birchwood Park, Warrington, WA3 6FW  
[pumpcentre@esrtechnology.com](mailto:pumpcentre@esrtechnology.com)  
[www.pumpcentre.com](http://www.pumpcentre.com)

# Pump Project of the Year 2016

The Pump Centre "PUMP PROJECT OF THE YEAR" was launched at last year's conference. The aim is to help promote one pump related project every year and highlight the excellent work carried out by the project team.

The successful project will need to have clear objectives, a significant pump/pumping element and interesting technical

challenges. It is important to show how the project has overcome the challenges and the level of innovation used. Feedback from the end user or customer is key to verifying that Key Performance Indicators (KPI's) and financial targets have been met and customers satisfaction has been achieved.

If you think your project deserves recognition why not put it forward for the Pump Centre Pump Project of the Year.

### The project chosen will:

- Be featured in an article in the Spring 2016 issue of the PumpAction newsletter and also on the Pump Centre website.
- Have a display area at the 2016 Pump Centre conference.
- Be a key presentation at the 2016 Pump Centre conference.

### To qualify the project must involve:

- Pumps and pumping technology.
- A Pump Centre member company, as part of the project team.

To enter please contact the Pump Centre ([john.howarth@esrtechnology.com](mailto:john.howarth@esrtechnology.com)) and request a nomination form.



## SOCIAL NETWORKING! At the Pump Centre Conference Dinner

If you want to network with your customers in a very social environment - the Pump Centre conference dinner is the ideal event for you. The dinner is being held on the evening of Wednesday 13th May 2015 in the Ironbridge Suite of the International Centre, Telford.

The evening consists of great food and entertainment. The International Centre's in-house catering team, have vast experience in quality food and have developed a special menu for the Pump Centre event. The evening entertainment is always a key feature of the dinner and for 2015 we are scouring the country for acts who will match up to last year's event.

The conference dinner has become more popular year on year with over 430 dinner guests attending last year. There will be a few surprises throughout the evening to keep everyone on their toes. The relaxed dinner is the ideal warm-up for the technical conference that takes place on the following day.

Pump Centre members who are interested in booking places at the conference dinner should contact Jim Eaves for all the details.

Email – [jim.eaves@esrtechnology.com](mailto:jim.eaves@esrtechnology.com)

Tel – 07968 707753 or 01925 843421

# Pump Centre Conference 2015 - Breakout Sessions

The breakout sessions are short technology focused presentations that are designed to appeal to young engineers who are new to the industry and older engineers who wish to refresh specific areas of their knowledge. The majority of topics will be relevant to pumps and pumping systems (mechanical, electrical and hydraulic topics), however one or two general engineering or industry specific topics will also be included.

Typical topics that have been covered in the past include:

#### Pumps basics

- Efficiency
- NPSH
- Pump Selection
- Troubleshooting

#### General Engineering

- Control panels
- Materials
- Blowers
- CBM

#### Wastewater

- Sewage pumps
- Sludge pumps
- Screening

#### Motors & Drives

- Sizing a pump motor
- The benefits of VSD's
- Innovative Motors



## The Principles of Motor Starting



## Overcoming Harmonic Issues



## Intelligent Condition Monitoring



## Positive Displacement Pumps



## Optimising Oxidation and Aeration Systems



## Real Pumping Station Problems



## Cavitation



More details available at [www.pumpcentre.com](http://www.pumpcentre.com)

# Thames Water saves £100,000 per year on energy bills and creates more resilient water infrastructure



EMEA1555 London Ring Main

## UK's largest water provider employs integrated medium-voltage drive solution from Rockwell Automation to help towards effective delivery and customer satisfaction

Every day, Thames Water, the UK's largest water and wastewater services provider, supplies 2,600 million litres of tap water to 8.8 million customers across London and the Thames Valley.

The company's 4,500 employees operate and maintain 100 water treatment works, 30 raw water reservoirs, 288 pumping stations and 235 clean water service reservoirs and carry out over 400,000 tests per year to make sure its drinking water meets stringent UK and European standards. The company also removes and treats 2,800 million litres of sewage for an area covering 14 million customers.

With such a massive customer base, Thames Water shoulders a huge responsibility and is committed to the upkeep of its network of pipes and delivery mechanisms. One of the proactive steps it is taking is to reinforce the resilience of its supply network through investment in new equipment and pipelines, in order to create redundancies within its water supply infrastructure.

In one such instance, as part of a three-site, £110 million campaign, it has deployed an impressive medium-voltage solution from Rockwell Automation to handle the pumping for a new shaft connected to the London ring main.

### Challenge:

The brand new shaft connects the Hampton site to the existing Thames Water ring main – an 80km-long pipeline that runs underneath London. The shaft itself is 50m deep and 18m in diameter – giving an idea of the scale of the installation.

The major challenge faced by Thames Water at its Hampton works was lack of space, as the demands of the required solution meant that a large footprint, medium-voltage infrastructure was needed. The company had to find a solution where both the large pumps and medium-voltage equipment could be installed without impacting on existing operations. In the end, the company was able to reutilise existing buildings, with the pumps in one and the medium-voltage equipment in another.

It also had to make sure that current water supplies were not affected as the existing pumps were still in operation – meaning a phased changeover, which had to be accomplished without any interruption. The pump units were split into high pressure and low pressure, with the low-pressure changeover being the primary concern as they were the ones connected directly to consumers and Thames

Water had no surface reservoirs in the area to fall back on.

### Solution:

The fully integrated Rockwell Automation solution comprised 10 Allen-Bradley® PowerFlex® 7000 medium-voltage drives, coupled to the pumps, each with an Allen-Bradley ControlLogix® programmable automation controller (PAC) on board. These were in turn connected to a master controller – another Allen-Bradley ControlLogix PAC – via EtherNet/IP, which itself was connected to the site's SCADA solution. Visualisation was provided using Allen-Bradley PanelView™ HMIs running FactoryTalk View™.

All of the medium-voltage drives supplied by Rockwell Automation use direct-to-drive technology, removing the need for input transformers and their active front ends mean that there are lower harmonics. With a three-wires-in/three-wires-out concept being used, the technology is also very user friendly and simpler to install.

This is somewhat of a revolutionary installation, as medium-voltage drives are normally discrete – operating independently from other systems. It is also believed to be one of the largest medium-voltage installations created for the UK



EMEA1555 Sewerage works



EMEA1555 farmoor-reservoir

water industry. In addition, these drives were some of the first off the production line from Rockwell Automation's new production facility in Poland.

### Results:

As well as providing Thames Water with a highly competent and effective medium-voltage solution, the integrated nature of the equipment also means that the company has a huge amount of real-time information to tap in to. Current information gathering covers the process control parameters, but Thames Water is looking to expand this to include operational conditioning to encompass predictive and planned maintenance.

*"The tender was an open tender, so we could not express any preference,"* explains Mark Morrison, Thames Water's Project Manager. *"We did, though, have a desire to standardise within Thames Water on one particular platform. Therefore, when the prime contractor suggested an approach using equipment from Rockwell Automation, we knew that part of our 'wish list' had been fulfilled."*

*"Using the new installation and the new connection to the ring main, we can now pump water from the Hampton site to places all over London; ready to step in should any outages occur elsewhere,"* he continues. *"Another plus is, thanks to the modern motors and the control technology within the PowerFlex 7000 drives, we are realising electricity savings greater than £100,000 per year."*

*"The reliability of the PowerFlex 7000 drives is superb,"* he concludes. *"Since the installation we have had no major issues... in fact we have hardly had to touch them at all. The same positives are true of the Rockwell Automation engineers, they have always been very professional and quick to answer any questions I may have. The personal relationship is also very good, although they are working through a prime contractor; dealing with them has been as easy as if they were working directly for us."*

Such is the success of Rockwell Automation's medium-voltage technology in the water industry, that the company is winning many new orders – including another one from Thames Water. Once again, the bid process was fully open, but with Rockwell Automation's pedigree growing on a daily basis in this industry, the company is ahead of many others and at the top of most lists for water industry installations – especially those with long-term vision who need to have faith in their equipment.

### Solutions:

A Rockwell Automation solution was installed, which included:

- Allen-Bradley PowerFlex 7000 medium voltage drives
- Allen-Bradley ControlLogix PACs
- Allen-Bradley PanelView
- FactoryTalk View

### Results:

- £100,000 annual energy saving
- Easy installation remote from the pumps using simple wiring concept
- Efficiencies associated with medium-voltage approach
- Active front end lower harmonics
- Direct-to-drive technology removes the need for input transformers

[www.rockwellautomation.co.uk](http://www.rockwellautomation.co.uk)

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**wilo**

# Giving pumps a longer, healthier lifespan

With energy accounting for 45 percent of a pump's total cost of ownership, a constant headache across all industries that use them is how this overhead can be reduced. But it's not just energy usage and money that is causing concern. A productive pump requires a high degree of maintenance, which is an issue in terms of cost, labour and even location, as pumps are often situated in hard to reach locations.

Operational failure, whether it's due to inadequate lubrication, overheating or general wear and tear has long been accepted as the downside of pump ownership. So what is currently being done to ensure both the pump and its parts run smoothly for as long as possible? And would a proactive service and solutions approach prove to be more prudent than the reactive mend and replace mentality?

The health of a pump is very much reliant on the state of its components, with bearings being key to its overall wellbeing. Installing the best bearings for the job ensures that the pump works more efficiently and can withstand higher temperatures, speeds and loads, with minimal intervention or downtime.

Ideal for small and medium pumps, and designed to hold up against even the most testing of pump conditions and workload, angular contact ball bearings (ACBBs), depending on the standard, have the capability to play a significant part in improving performance, reliability, and uptime while reducing maintenance costs, noise, vibration levels and even lubrication consumption.

But the drive for a product that keeps downtime and failure to an even lower level has resulted in double row angular contact ball bearings (DRACBB) being offered to the pump market. Energy efficient and requiring less axial space than the single row ACBBs, it's the combination of a high-functioning Polyamide cage interior filled with low-friction grease and an effective exterior where each side is capped with steel shields, that has resulted in a bearing solution that's truly fit for pump purpose. Cutting mechanical friction by around 30 percent compared with standard bearings, which in turn brings down operating temperatures by 30 degree C, the installation of DRACBBs means the pump has less chance of overheating and breaking down.

## Placing an emphasis on adequate lubrication

Bearings, of course, are just part of the story. In the world of pump operation, where more than a third of premature bearing failures occur due to inadequate or incorrect lubrication, getting this right is critical.

Regular lubrication helps to prevent deterioration of the bearing and other related components, thus reducing breakdowns. But this is more than simply oiling the wheels as and when needed.

Given that many pumps are located in awkward places, the lubrication process can be arduous and labour intensive as engineers struggle to reach these tricky corners. Installing a fully automatic lubrication system is therefore a very attractive and ultimately cost-efficient alternative that protects both the integrity of bearings while reducing overall operating costs. And far from being a 'one size fits all' solution, the lubricant can be tailored to meet specific factors, including: vertical shaft, resistance to solids and chemical aggression.

## Providing a greener alternative

It's not just components that are on the minds of pump operators; equally important is how much energy a pump expends and how this contributes to the cost of ownership. With pumping systems responsible for around 20 percent of the global demand on electricity – and on a more granular level, between 20



and 25 percent of energy usage at an industrial plant – it's no surprise that there is a real need for energy-saving solutions and processes within this environment. Nor should it come as a revelation that a raft of stringent environmental legislation has impacted on pump governance, pushing energy consumption further up the agenda.

## A holistic approach to pump protection

While a number of products such as sealing and ceramic solutions can play a role in keeping a pump going, while simultaneously helping to reduce energy consumption, there is a danger that this is similar to putting a plaster on a deep and infected wound.

A more effective solution, and one that takes into account the overall well-being of a pump rather than the individual elements, is to implement an energy monitoring service. Performed by experts in this field or by specially trained staff from within the operating team, this robust health check determines whether a pump needs modifying,

repairing or even replacing.

When adopting an environmental perspective, it is worth considering investing in an integrated pump solution. This takes into account how effectively a pumping system, especially in the food and beverage sector, disposes of potentially hazardous materials. With so much legislation surrounding the how substances are safely dispersed, working with experts that understand best practice is a far better alternative than the possibility of a product becoming contaminated.

Regardless of the diagnosis, the recommendations and outcome for the pump owner is to minimise energy consumption and expenditure, whilst maximising efficiency and productivity. But at a time when pump operators are looking at ways to reduce spending, is there a real value attached to this monitoring process? With results of a recent study showing that by making the right choice the energy efficiency of pumping systems can be improved by up to 20 percent, it would seem the answer is a yes.

It's evident that long-lasting pumps do not maintain themselves by magic. Fitting the right parts is certainly a short-term solution, but this tactic needs to be bolstered by the solutions and services that could potentially add years to the life of a pump, thus ensuring productivity continues uninterrupted.

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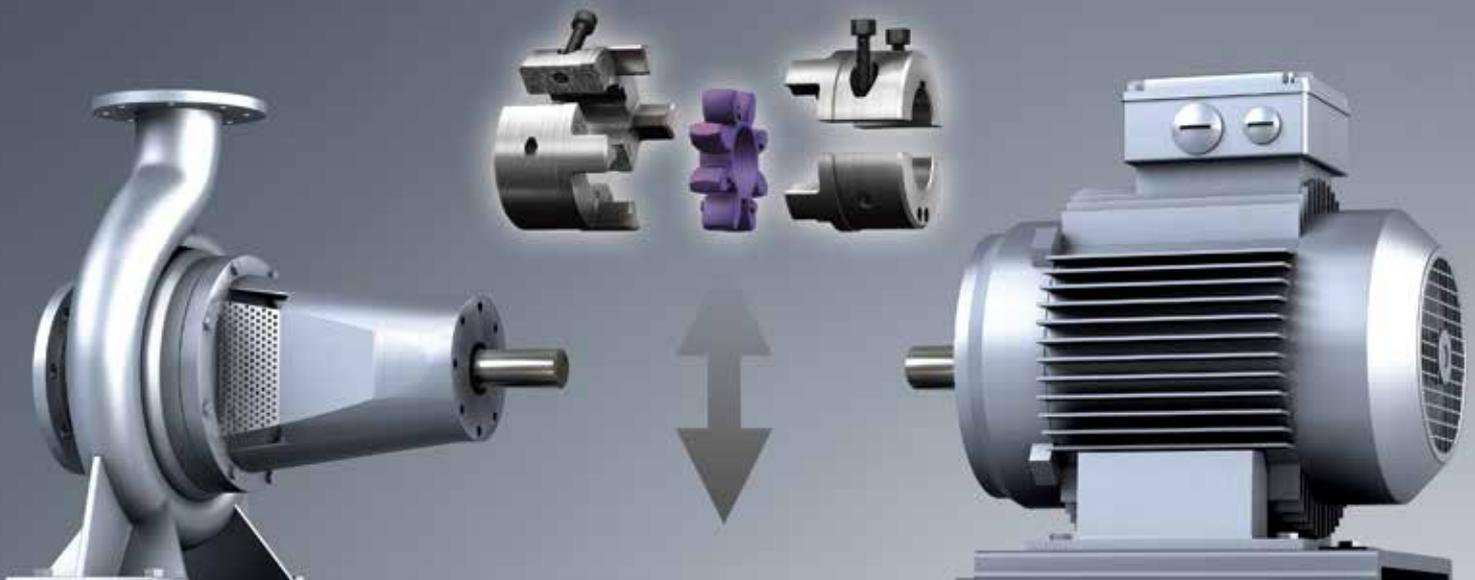
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# Salford WwTW, United Utilities

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EMS is a single source framework supplier to United Utilities with numerous successful de-sludging installations for its ram pumps. In 2007 EMS delivered a presentation to United Utilities describing the suction power and robust design of its grit dredging pumps and how they would successfully draw the grit from the detritor at Salford WwTW. Although they had experience of EMS pumps in de-sludging applications United Utilities were very sceptical of the pumps being able to self-prime and pull the huge suction lift required to draw the grit some 6-7 metres off the floor of the detritor. All previous pumps had been installed below the detritor water level, which gave them a flooded suction, but all had failed, so EMS arranged a trial unit for several months to demonstrate the pumps' capabilities.

Following a successful trial United Utilities ordered two EMS model VRMG250 dredging pumps in 2008. Apart from being built with tungsten carbide coated rams these pumps are standard. The pumps, pipe work, control panels and cabling were subsequently supplied and installed by EMS as a turnkey package.

The massive suction power of the EMS pumps allowed them to be located at ground level above the detritor instead of below the water line in the detritor where the previous pumps had been, which was a zone 2 confined space. This was a big bonus for United Utilities health & safety.

Operating like a huge syringe these pumps cycle at 25 RPM and with each suction

stroke draw from the detritor almost 15 litres of grit slurry, which can contain up to 40% grit dry solids.

Drawing so much grit with so little water makes the grit removal system super-efficient, as with less slurry volume to move the motor sizes are smaller and the associated power consumption for the system is less.

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



Salford WwTW

# Daveyhulme WwTW, United Utilities

Having proved the concept at Salford, Bolton, Stretford and Worsley United Utilities was keen to try the same equipment at Daveyhulme WwTW.

The grit removal plant at Daveyhulme was a constant problem for United Utilities, as the existing system was removing very little grit and was constantly choked or in breakdown.



Daveyhulme constant velocity channels

EMS proposed six of its model VRMG270 grit dredging pumps each located upon a travelling bridge over the constant velocity channels, which held residual grit deposits 10 years old. EMS offered a turnkey solution of mechanical and electrical installation of all six pumps onto six travelling bridges. Again, as with Salford there were many sceptics but the proof of the pudding is shown in the photo kindly

sent to EMS by United Utilities that shows the result of a few days operation of one of the pumps. This pump had cut a trench in the 10 year old deposits of grit in the lane and sent the dredged grit onwards to the classifiers.

Once cleaned out the settlement lanes would not again see such a residual volume of grit to be removed by the pumps, which unfortunately overwhelmed the flume leading from the settlement lanes to the classifiers so the pumps had to be temporarily stopped.

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



Daveyhulme flume to classifiers



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# Measuring small pulsating volume flows of chemicals

Measuring flow rates in the pump industry, has long been a matter of huge importance for those operating equipment and maintaining production and process efficiencies. For many years the question has arisen, "Is it possible for me to measure the flow rate of a small capacity pulsating flow from a Metering Pump?" Now, writes Stephen Ellix of ProMinent Fluid Controls (UK) Ltd, at last there is a flow meter which is suitable for measuring a pulsating flow from a positive displacement metering pump in a PVDF construction and so suitable for a majority of all chemicals.

I have worked within the metering pump industry for 25 years now, and within the first weeks of my job within the internal sales department, the questions started:

Q 'Why can't you measure my metering pump output in l/h?'

A 'Because there are no flow meters on the market that can measure a pulsating flow at such small volumes accurately.'

Q 'Why can't you measure how many l/h my metering pump has pumped in a running total?'

A 'Because there are no flow meters on the market that can measure a pulsating flow at such small volumes accurately, let alone totalise the flow.'

Q 'I am trying to pump HCl AT 37% with a flow rate of 10 l/h @ 4 Bar. As this is a critical/hazardous application I need to measure my chemical consumption. Can you measure this flow rate?'

A 'No, because there are no flow meters on the market that can measure a pulsating flow at such small volumes accurately, or deal with the corrosive nature of Hydrochloric Acid.'

Q 'I am dosing Sodium Hypochlorite from a bulk storage tank with capacity of 2,000 and I want to close loop control my metering pump to enable continual adjustment in compensation to the varying suction lift conditions, is this possible?'

A 'I'm sorry, but no, because there are no flow meters in the market that can measure a pulsating flow at such small volumes accurately, let alone deal with the corrosive nature of Sodium Hypochlorite, nor be able to work in such a process-controlled methodology...'

Well, it's not that I minded the questions. In fact, I found it frustrating, as these were not stupid questions but justified common sense requirements. The longer I spent within this and the process control industry, the more I could see these issues not being a problem for pumps such as mass flow units or centrifugal pumps of any nominal flow rate and size. It was only a problem for the good old Positive Displacement, Reciprocating Diaphragm/Plunger, Volumetric Dispensing Metering Pump.



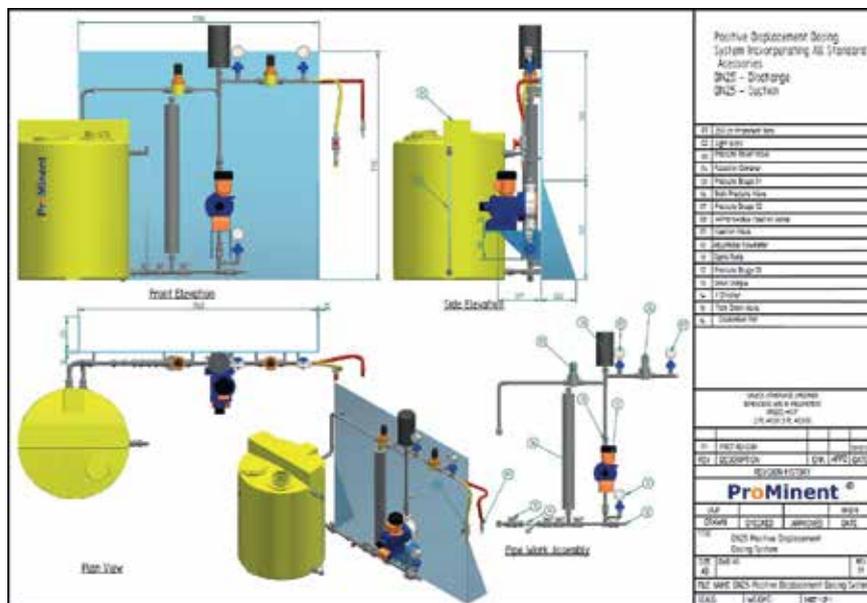
Solenoid pumps

Or, as some of our customers say, "That little Blue and Orange pumpy thing near that large chemical tank!"

Considering the duties that are covered by metering pumps, usually critical, such as potable water disinfection, waste water treatment, ingredient addition and many more, and considering the Industries they are prolifically used in, water, food and beverage, chemical, oil and gas, pharmaceutical.... I cannot blame our customers for asking for such a facility as a flow meter to suit the relevant application.

So, I hear you say, there are metering pumps in the market place that can provide a flow indication. Correct, I know, as we have one ourselves, but if I am not mistaken they all work in the same way. They calculate the output of the pump through smart electronics and motor control. They do not actually measure the flow rate, they calculate it and in that lies a reality issue. A calculation is fine, but infinitely, it is not an actual measurement and if a calculated flow rate was an acceptable process control methodology, then why would anyone buy a flow meter?

In fact, considering the accuracy of a metering pump, usually ±1-3% on repeatability, one wonders if a flow meter would be a worthy investment. So, for as many reasons and as stated in the questions/requests I have received



Positive displacement dosing system



Solenoid pump

over the years, I am glad to say that there is now a Flow Meter that measures a Positive Displacement, Reciprocating Diaphragm/Plunger, Volumetric Dispensing Metering Pump.

The vast majority of the products handled by metering pumps are usually very expensive, especially when you consider that they are pumped over long periods of time. For instance, we had a customer that had an application where a litre of his product, for a pharmaceutical process, was valued at over £16,000! I think that the pump and associated equipment that was offered for the duty, was valued at less than a fifth of the price of just one litre of that product. From a process engineering and cost point of view, I would like to be able to monitor that duty, especially if I was the customer, paying for that particular chemistry.

Every positive displacement metering pump operates on a principle of repeatable accuracy and tolerance. Metering pumps are quoted on a  $\pm\%$  of repeatability, usually 1-3% on quality pumps but worse on cheaper manufactured products. 1-3% is acceptable when you consider the accuracy of a complete system but if you look at the entire process or system that the metering pump is engineered within, then the accumulative error percentage starts to look a little different, and for the worse.

Let's take a look at some of the other influences within the system and their effects upon the overall efficiency and accuracy. As in any system there are other forms of control like flow meters, Plc's, Controllers, such as pH, Chlorine, TDS and Conductive; let alone level control or temperature control.

Usually, the process control error will account for a further 1-3% in accuracy and inefficiency. However, don't stop there – what about a variation in the pumps output due to issues like changes in discharge/back pressure, variations in suction conditions, viscosity or lack of maintenance? What about incorrect adjustment and setup, or any other number of influencing factors, like human error, or even the lack of supply of items like anti-syphon valves to prevent the flow-on of chemical when the Dosing Pump is not in operation? The overall efficiency of what is meant to be an accurate piece of equipment or system can suddenly become a little inaccurate! Even, very inaccurate!

*"But our system has pH, ORP, Amperometric.... control and so will regulate the demand of the dosing pump subject to these measured variables and so, the system does not need this expensive form of engineering", I hear you say. This is a very valid point; but again and without delving too much into the process*

control world, nearly all of these types of controllers operate under PID protocols (proportional-integral-derivative) and this type of control is designed to prevent the under and over correction of a process.

If the equipment you are controlling is not operating the way it should be, when the PID function from said controller is in operation, it will have trouble in compensating for the incorrect amount of chemical being injected, thus leading to over swings and under swings around the set values of the controller. This, once again, will cost money in the chemistry not being injected into the process as required, at the right time and at the right VOLUME. In one commercial Swimming pool we have supplied to, in recent months, the customer has reported a saving of over £3,000 within six months of operation following the approved practice and installation of a Positive Displacement Dosing System.

Ok, I accept the point of setting the system up in the correct manner as shown in the attached schematic but if I had £5 for every system I have seen that has been null and void of the required components to make up an accurate dosing system, I would be able to retire a very rich man!

If the above inaccuracies are taken into account and all is totalled up, would it be reasonable to accept a system tolerance of say  $\pm 8\%$ ? I am being generous with this percentage, as while I am contemplating this value, a system comes to mind where a customer was dosing an Oxidant into a WWTP which was in a syphon condition. The chemistry was flowing like Niagara Falls from an IBC; whether the pump was in operation or not. What would the in accuracy percentage be from such a circumstance? For sure in the 100's of %!

Anyway, ignoring such circumstances let's work with  $\pm 8\%$  and let's do a little maths, to calculate some losses due to not having an item such as a flow meter that is suitable for pulsating, small volume, variable chemistry, positive displacement metering pump application.

Let's look at a process consuming between 8-10 l/h of Sodium Hypochlorite in a 12h process that is in operation for seven (7) days a week. This should amount to, 43,800 l/yr (43.8 m<sup>3</sup>/yr) of Sodium Hypochlorite. Now there are many market prices for this Chemical and they are dependent on the amounts you purchase and where they need to be delivered to. So, if I can take an average @ £0.52/l then the calculation should be as;

10 l/h x 12 h = 120 l  
 120 l x 365 Day's = 43,800 l/yr (43.8 m<sup>3</sup>/yr)  
 43,800 x 0.52 = £ 22,776.00  
 8% Of £ 22,776.00 = £ 1,822.08  
 Average cost of dosing pump with flow meter = £1,800.00.  
 ROI = Less than 1 yr!

Now that's a simple application, with quite a cheap chemical, operating in a 12 hr process. Let's change this to a 24 h process, such as drinking water, and the ROI is less than 6 months. If you are in that process as I mentioned before with the IBC, what is the ROI going to be then? If we add this calculation to a more expensive chemistry and a larger flow rate; Well, I'm sure you can now see the value in such an item and the return it can provide??

So, what would be the benefits for having an actual real flow meter suitable for a pulsating, small volume, variable chemistry, positive displacement metering pump application? If the above indicated ROI is anything to go by the answer is obvious. And with benefits like loop control and alarms for situations like overflow or no flow, the product becomes essential.

If I add the control and alarming of situations like syphoning or tampering, then the overall benefits become even more attractive, especially if I start to add the savings of product that has been lost within the manufacturing cycle due to quality issues from such events. What would the savings be as in the pharmaceutical application where the chemical being used was valued at £16,000 per litre? I'm sure that investing in such a product as a flow meter that is suitable for a pulsating, small volume, variable chemistry, positive displacement metering pump applications becomes justifiable.

From an engineering aspect, the use of a flow meter within a process control methodology is accepted. Combine this with the setup of a correct dosing system incorporating all of the components that should be engineered within a Positive Displacement Dosing System, like Back Pressure/Pressure Relief Valves, then I think the investment becomes one of logic or even one of necessity.

Therefore, I introduce the Prominent DulcoFlow Meter. A flow meter that is suitable for a pulsating, small volume, variable chemistry, positive displacement metering pump applications.

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# Training & Awareness Day Programme 2015

Title	Date	Full Price	Members Price
Centrifugal Pump Repair Awareness Day (Grundfos Pumps, Leighton Buzzard)	3rd Feb 2015	£120 + VAT	£96 + VAT
Centrifugal Pump Repair Awareness Day (Grundfos Pumps, Sunderland)	5th Feb 2015	£120 + VAT	£96 + VAT
How Can Social Media Benefit An Engineer?	11th Feb 2015	£120 + VAT	£96 + VAT
Pumps for Beginners & Intermediates (Holiday Inn, Reading West)	3rd & 4th Mar 2015	£550 + VAT	£385 + VAT
Pumps for Beginners (Holiday Inn, Reading West)	3rd Mar 2015	£350 + VAT	£245 + VAT
Pumps for Intermediates (Holiday Inn, Reading West)	4th Mar 2015	£350 + VAT	£245 + VAT
Principles of Electric Motors, Starting Motors, & Drives	11th Mar 2015	£350 + VAT	£245 + VAT
Waste Water Screening and Preliminary Treatment	17th Mar 2015	£350 + VAT	£245 + VAT
Positive Displacement Pumps	18th Mar 2015	£350 + VAT	£245 + VAT
Centrifugal Pump Repair Awareness Day (Grundfos Pumps, Leighton Buzzard)	14th April 2015	£120 + VAT	£96 + VAT
Centrifugal Pump Repair Awareness Day (Grundfos Pumps, Sunderland)	16th April 2015	£120 + VAT	£96 + VAT
Pumps for Beginners & Intermediates	9th & 10th Jun 2015	£550 + VAT	£385 + VAT
Pumps for Beginners	9th Jun 2015	£350 + VAT	£245 + VAT
Pumps for Intermediates	10th Jun 2015	£350 + VAT	£245 + VAT
Introduction to Valves	16th Jun 2015	£350 + VAT	£245 + VAT
Rolling Element Bearings	18th Jun 2015	£350 + VAT	£245 + VAT
Contract Law for Engineers	22nd & 23rd Sept 2015	£550 + VAT	£385 + VAT
Positive Displacement Pumps (Holiday Inn, Washington)	20th Oct 2015	£350 + VAT	£245 + VAT
Improving Pump Maintenance	3rd Nov 2015	£350 + VAT	£245 + VAT
Why Mechanical Seals Fail	5th Nov 2015	£350 + VAT	£245 + VAT
Principles of Electric Motors, Starting Motors, and Drives (Holiday Inn, Reading West)	18th Nov 2015	£350 + VAT	£245 + VAT
Introduction to Compressors	1st Dec 2015	£350 + VAT	£245 + VAT

(Awareness Days are highlighted in red).

## Pump Centre members receive 30% discount off training courses and 20% discount off Awareness Days

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The Holiday Inn Runcorn (M56 J12), Wood Lane, Beechwood, Runcorn, Cheshire, WA7 3HA

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### To reserve your places contact:

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