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Pump Centre

PUMP ACTION

THE OFFICIAL NEWSLETTER OF THE PUMP CENTRE

AUTUMN 2016

IN THIS ISSUE:

PUMP CENTRE CONFERENCE AND EXHIBITION

11TH MAY 2017
SEE P7 AND P13 FOR MORE DETAILS

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SPERONI PUMPS 2 YEAR GUARANTEE

- ✔ 1.5KW TO 37KW FROM UK STOCK
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- ✔ MADE IN ITALY
- ✔ LIQUID TEMP UP TO 90°C
- ✔ IP55 MOTOR
- ✔ COUNTER FLANGES INCLUDED

Model	kW	HP	flow (lpm)	head (mtrs)	list price (£)
CS 32					
CS 32-160 C	1.5	2	500	26	£490
CS 32-160 B	2.2	3	600	29	£499
CS 32-160 A	3	4	600	37	£520
CS 32-200 C	4	5.5	600	40	£655
CS 32-200 B	5.5	7.5	600	55	£862
CS 32-200 A	7.5	10	600	60	£894
CS 32-250 C	9.2	12.5	670	70	£1,104
CS 32-250 B	11	15	700	80	£1,160
CS 32-250 A	15	20	700	88	£1,595
CS 40					
CS 40-160 B	3	4	900	32	£615
CS 40-160 A	4	5.5	970	34	£635
CS 40-200 B	5.5	7.5	1200	46	£868
CS 40-200 A	7.5	10	1230	57	£897
CS 40-250 B	11	15	1000	72	£1,143
CS 40-250 A	15	20	1050	90	£1,628
CS 50					
CS 50-160 D	3	4	1200	25	£615
CS 50-160 C	4	5.5	1000	30	£638
CS 50-160 B	5.5	7.5	1600	37	£865
CS 50-160 A	7.5	10	1600	40	£907
CS 50-200 C	9.2	12.5	1500	48	£1,054
CS 50-200 B	11	15	1500	52	£1,110
CS 50-200 A	15	20	1500	65	£1,527
CS 50-250 C	15	20	1400	70	£1,596
CS 50-250B	18.5	25	1400	80	£1,747
CS 50-250 A	22.5	30	1400	90	£1,930

Model	kW	HP	flow (lpm)	head (mtrs)	list price (£)
CS 60					
CS 65-160 E	5.5	7.5	2000	25	£892
CS 65-160 D	7.5	10	2200	29	£940
CS 65-160 C	9.2	12.5	2200	33	£1,055
CS 65-160 B	11	15	2200	36	£1,110
CS 65-160 A	15	20	2200	40	£1,515
CS 65-200 C	15	20	2400	48	£1,537
CS 65-200 B	18.5	25	2400	53	£1,717
CS 65-200 A	22.5	30	2400	61	£1,871
CS 65-250 B	30	40	2400	79	£4,140
CS 65-250 A	37	50	2600	89	£4,443
CS 80					
CS 80-160 D	11	15	3500	28	£1,170
CS 80-160 C	15	20	4000	30	£1,595
CS 80-160 B	18.5	25	4000	37	£1,706
CS 80-160 A	22.5	30	4350	39	£1,953
CS 80-200 B	30	40	4550	53	£3,837
CS 80-200 A	37	50	5000	57	£4,140

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LOTS OF NEW AND USEFUL CONTENT

Members of BPMA Pump Centre

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Contents

Editor's Column

Knowledge is Power

At this time in the calendar we begin to focus our thoughts on the training courses for the coming year. 2016 has been a transitional year for our training programme with new venues, courses and trainers coming on board. We are hoping that in 2017 we will be able to consolidate all of these changes and offer the industry a great selection of practical courses to help and support engineers in the workplace.

Today the pressure on the working engineer to deliver is greater than

ever before – fewer engineers on the ground means that their workload is increasing and the modern communications technology means that immediate responses are expected. The range and complexity of equipment in the workplace is expanding and the days of a specialist operator being able looking after a specific piece of kit are becoming rare. Sub-contracting in specialist skill is a solution, but it is important that the in-house knowledge is sufficient to assess the quality of the external support provided.

It is impossible for every engineer to have an intimate knowledge of all equipment and true experience can only be built up over time. However, the Pump Centre training courses are designed to help inexperience engineers learn about a topic for the first time and also to help experienced engineers who just require a refresher of a topic they have not dealt with for a while. All our technical courses are presented in a relaxed way by consultants with many years of experience in their chosen field. We try to keep delegate numbers at a level that allows everyone the chance to interact with the presenter. Our presenters will always try to answer questions that are relevant to the subject matter being taught – even after the event. A dedicated set of course material is provided and delegates are encouraged to make notes to help clarify their own understanding.

In my opinion the main advantages with a conventional face to face training course are:

- The ability to provide extra explanation when people don't understand.
- Worked exercises – with direct help.
- Ability to discuss issues that are of direct relevance to the delegate.
- Group interaction – learn from other people's issues.
- Network with other like-minded engineers.
- Make a relationship with an expert that you can contact in the future.

In this post BREXIT world if *"UK plc"* is to remain competitive and effective in a global market it is vitally important that the skills of our experienced engineers are passed onto those that follow. The Pump Centre training courses help to do this in specific subject areas – for more details see pages 24 – 27.

John Howarth

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Complete modular solutions

Rittal manufacture a range of products that form the basis of *"Rittal - The System"* which has been designed to provide clients with a complete modular solution which can be combined to meet your exact requirements.

Our vast range of high quality, cutting edge products can be supplied individually or as complete systems or adapted to meet the most complex, rugged and diverse client needs in the infrastructure, manufacturing, engineering and IT.

Rittal Innovative Modular Enclosures, Power Distribution and Climate Control systems are rapidly becoming the industry's first choice for protecting critical equipment.

As the leading supplier for innovative enclosure and housing technologies throughout the world, our stock range and services are economical, reliable and are available to match any requirement you may have.

We aim to offer the total package. Delivering, *"Rittal – The System"* which offers you a perfectly coordinated system platform. It unites innovative productions, pioneering engineering solutions and global service to accommodate the most diverse requirements. All from a single source, all in top quality, That is what *"Rittal – The System. Faster – better – everywhere"* is all about.

www.rittal.co.uk

Modular solution gives 120 year design lifespan with improved carbon footprint

Weholite is a structured wall pipe or structural panel made from high density polyethylene (HDPE). With Weholite, raw material properties have been combined with advanced product technology to create a lightweight engineered solution with superior loading capacity that is inert to H_2S and provides a 120 year design life.

Pumping chambers made from either Global leading brands Weholite or Weholite Modular provide a bespoke, fully designed modular solution. Factory built to high precision and pressure tested for integrity they provide a plug and play system that incorporates any pump, in any configuration and fitted into any shape or size of chamber.

All the benefits of modular construction, factory built and expertly designed, we continue to deliver the luxury of improved carbon footprint, improved construction efficiency and improved performance.

www.weholite.co.uk

WEHOLITE

Selwood Pump Rental

The leading pump rental solutions company in the UK, Selwood has an outstanding reputation for exceptional customer service, backed by one of the largest fleets of quality pump products and supported with technical knowledge and genuine 24/7, 365 days-a-year service.

We are one of the few UK companies to manufacture our own pump range for both sales and rental. Flexibility, reliability and longevity have ensured the Selwood name is synonymous with quality. Our British made contractors pumps include the solids handling range, drainer models and high head pumps – available with diesel engines or electric motors –super silent options are available on most models.

Each customer and each project is unique and we are proud to deliver bespoke installation, site surveys and outstanding customer service from our nationwide rental branches. That pride comes, of course, from the manufacture of world-renowned products for the water, environmental and construction industries. When you hire a pump from us, it comes guaranteed and supported by expertise and commitment.

We have developed some of the safest ways to install both surface and non-surface based pumps into application. We have one of the largest networks of dedicated pump rental branches in the UK and some of the most highly qualified staff within our industry. We offer the complete pumping package from our extensive product range to surveys and installation, along with management and advice. We offer our services anywhere in the UK - 24 hours a day, 365 days a year.

Selwood always put safety first and have unrivaled standards and qualifications. Because of this, we are leaders in the pumping industry in terms of safety. We will advise you on the safest ways to use and install our pumping systems. We constantly examine and monitor our work activity on site ensuring the safest possible working environments.

www.selwood.co.uk/

SELWOOD
Pump Rental Solutions

Total Automation and Power (TAP) is delighted to join the Pump Centre

TAP is a formal joint venture between Cougar Automation Ltd and Technical Control Systems Ltd, has a combined workforce of over 160 people & operates from seven operating premises in the UK.

As JV-partners we have used this joint-venture delivery model (since 2003) for the majority of the UK & IE water industry. In addition each partner separately has over 25-years W&WW industry experience. We provide Electrical Panel Design & Manufacture, Process Control, Safety systems, Instrumentation, Electrical Installation, SCADA & System Integration currently on multiple UK water End-User frameworks.

Working with Total Automation and Power is just like working with a single company. Every project has a Total Automation and Power project manager who co-ordinates all the work and gives you a single point of contact.

We work closely with our customers and supply chain partners to support innovation, share best practises and ensure projects are delivered on-cost and on-time.

Technical Control Systems Limited is one of the UK's largest independent manufacturers of low voltage switchgear and control panels. Cougar Automation Limited is one of the UK's largest independent systems integrators.

http://www.tapjv.com/

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Flow Measurement

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- Easy prompt-led menu systems

Pump Control

Sludge Blanket Level Measurement

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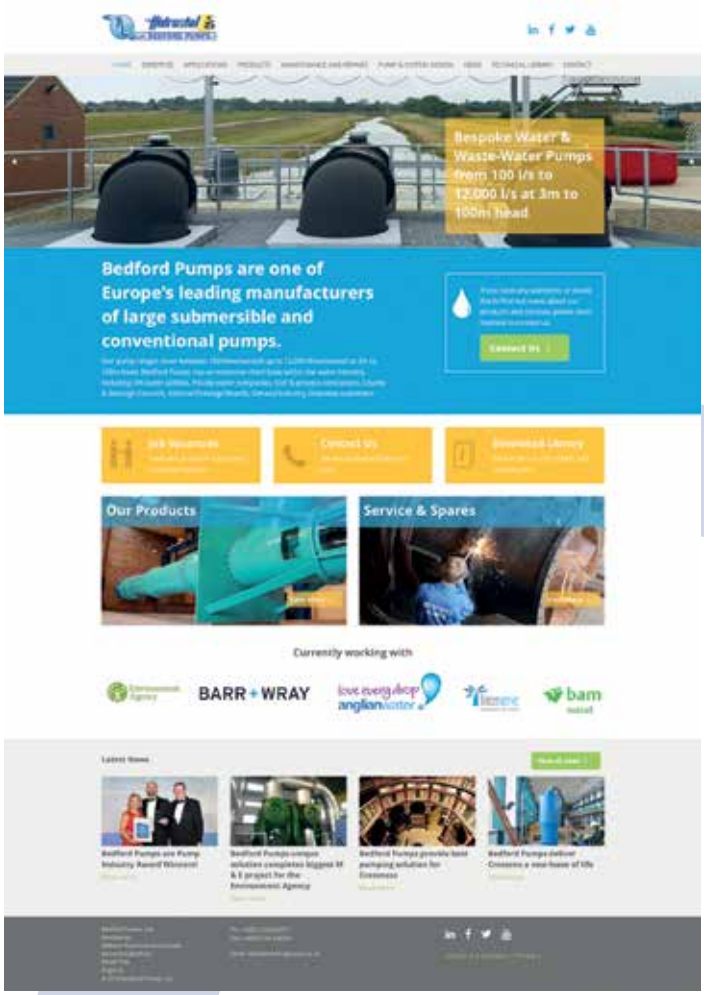
Bedford Pumps Launches New Improved Website

Bedford Pumps Ltd, one of Europe's leading manufacturers of large submersible and conventional pumps to the water and wastewater industries, is delighted to announce the launch of its brand new website.

The site provides clear navigation and functionality providing users with an enhanced browsing experience. Full information is provided on the company's range of pumps, accessories and applications, and users are able to download technical data and an array of case studies showing the pumps in operation.

Lucy Ogden, Marketing Manager for Bedford Pumps Ltd comments *"The website has been designed to provide an enhanced experience for our current and prospective clients. The new website is faster, much easier to navigate and extremely user friendly."*

To view Bedford Pump's updated website please visit www.bedfordpumps.co.uk



Ham Baker ready for new sludge market with Landia's GasMix

During a key conference session at UK AD Biogas, Ham Baker's Business Development Director, Ian Goddard won support from an industry panel about the need for water companies to embrace innovation for the opening up of the sewage sludge market – and for stating that existing frameworks should not act as a barrier to new technology.

'What challenges and opportunities does the de-regulation of the water sector hold for AD?', which was chaired by Dr Piers Clark from the Isle Group, saw presentations from Alison Fergusson, Principal Engineer of Ofwat's Water 2020 programme, Richard Laikin, UK Water Sector Leader, PricewaterhouseCoopers (PwC) and Steve Bungay from CIWEM.

For Ofwat, Alison Fergusson said that despite the short time frame for 2020, the challenge is very much to drive efficiency and how this might be achieved through new technologies, neighbouring, cross-water company treatment sites or through co-operation with local commercial waste companies. On behalf of CIWEM, Steve Bungay emphasised the need to protect farmer's fields and also to simply and consolidate legislation.

Richard Laikin (PwC) said that it was time for the industry to move forward with a better business model, whereby sludge is dealt with in terms of Value Maximisation, rather than Cost-Minimization. He stated that the opportunities to generate revenue are high up the agenda, and agreed with Ian Goddard's (Ham Baker) comments during a lively Q&A that the status quo isn't going to be the winning strategy for the future. Laikin said that Ofwat's regulatory changes will encourage innovation, commenting that there is likely to be a ramping up of technologies for the new markets that will be available to water companies.

"It was a very timely and encouraging conference session put together by ADBA (Anaerobic Digestion & Bioresources Association)," said Ian Goddard.

"Landia's GasMix (Twice Highly Commended at UK AD & Biogas Industry Awards), which is easy to retrofit, is at the forefront of improving gas yields – a system we don't make but have in our Renewables portfolio because we believe in it so much".

He added: *"It is therefore heartening to think that the water companies can be less risk adverse - embracing such a low maintenance yet highly effective technology that allows them to greatly improve revenue".*

www.hambakergroup.com

Landia's externally mounted GasMix AD digester mixing at Tullamore WWTW

Two Flow Outputs Make Pulsar's Ultimate the Perfect Small Works Flow Monitoring Solution

A discussion at one of Pulsar's Process Measurement's regular training sessions has led to an unusual application for an Ultimate Controller - measuring and logging open channel flow on a storm overflow flume at the same time as logging measurements from a magflow meter between an inlet works and Activated Sludge Process (ASP).

Environment Agency (EA) controls mean that it is more important than ever to be able to measure and accurately report flow to a watercourse. At Itchen Bank WTW, a small site near Coventry operated by Severn Trent Water, measurement on the rectangular outlet flume would be straightforward application for a Pulsar Ultra non-contacting ultrasonic unit. However, they also needed to log the output of a twenty year old magflow meter that was measuring between the inlet works and the ASP. Severn Trent Water had already specified two Pulsar Ultra units for the task when Instrumentation Engineer Kevin Currell attended a training course at Pulsar's Malvern factory. He said 'We have a great relationship with Pulsar, and we were talking about possible new ideas when I asked whether they made a unit with two milliamp outputs'.

Pulsar's touch screen Ultimate Controller, although primarily an intelligent pump controller, was perfect for the job. Ultimate Controller accepts a 4-20mA signal from the magflow meter, and uses that signal to control the inlet works penstock using its inbuilt relays. At the same time, Ultimate Controller ultrasonically measures flow in the rectangular outlet flume. With two current outputs on hand, magflow and flume measurements are supplied directly to telemetry and made available for further processing.

The large touch screen display shows the flow rate from both the magflow and the flume, along with relay positions and every other parameter of the operation. As Kevin Currell said, 'It was a real Bingo moment for me, I could immediately see how we could do the job without having all the hassle, cost and inconvenience of installing and programming two separate units. We find the Ultimate Controller a very user-friendly product - touch screen, easy to navigate. We have a million and one things to look after and we don't want to have to wrack our brains on site. Self-explanatory icons and a touch screen, that's what we want.'

www.pulsar-pm.com

Börger Pumps provide the perfect solution

Börger has supplied a turnkey pump and macerator installation package to a leading international hotel group at one of the company's key locations in the West Midlands.

To suit a maximum flow of 25m³/h, a classic 3.0kW Maintenance-In-Place Börger PL200 pump has been introduced to handle raw sewage at the busy hotel, replacing an unreliable unit that was also difficult to service.

The wastewater equipment package from Börger, who also provided a fully automated control system with level controls and alarms, includes a 2.2kW Multichopper Macerator to reduce particle sizes. Furthermore, Börger took responsibility for all pipework and connection to the main sewer discharge line.

David Brown, Börger UK's Managing Director said: *"The hotel group has a very firm commitment to reducing its impact on the environment, so this sustainable, low-maintenance solution has provided the perfect answer"*.

www.boerger.com

More Pumps, Renewables and Personnel for Ham Baker

Ham Baker Group has strengthened its Pumps and Renewables division by introducing two new Area Sales Managers.

Bob Dimmock, who has been with Ham Baker for the past nine years, switches over from his previous sales role in penstocks, screens, scraper bridges, valves and pipes, whilst Tobin Gardner joins the company after five years at Hidrostal where he managed the framework agreement for United Utilities.

Ian Goddard, Group Business Development Director for Ham Baker Group, who heads up Pumps and Renewables, commented:

"Although we are one of the newer Ham Baker divisions, we've already reached a point where we needed to add experienced personnel to our team. We are busy on both fronts, with an encouraging amount of good quality leads for hydro, as well as pumps solutions for the quality manufacturers we represent such as Landia (for their GasMix AD digester mixing system) SPP and Netzsch".

As well as Ham Baker, Bob Dimmock has also worked for Baylis Automotive, whilst Tobin Gardner was previously with Taylor & Goodman, who specialise in electro-mechanical repairs.

Ham Baker's Pumps and Renewables portfolio includes a highly innovative Pump as Turbine (PaT) solution, which provides micro-hydro technology at one third to one half the cost of complicated traditional systems, offering major reductions in maintenance time and spares. Ham Baker also offer a Screw Generator system made with a low-cost reinforced plastic screw for existing outfalls (1m to 4m head) with flow rates of up to 900 litres per second and the potential to generate up to 30 kW.

Ham Baker provides complete design of pumping systems, as well as supplying new pumps and ancillary equipment. This is complemented by extensive technical support and after sales service packages.

www.hambakergroup.com

Ham Baker's Bob Dimmock

Ham Baker's Tobin Gardner

New Börger Pumps appointment in Ireland

Tim Whittle - new Sales Manager for Börger Ireland

Tim Whittle is the new Sales Manager for Börger Ireland, the acclaimed manufacturer of Maintenance-In-Place (MIP) pumps and macerators.

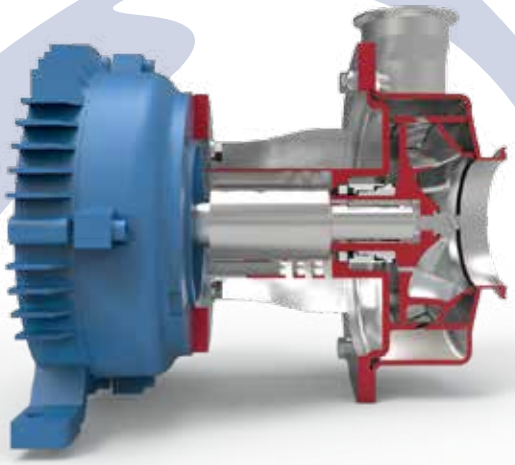
Based in Belfast, Tim has extensive experience in Ireland with BM Heat Services, Pegler & Louden and Saint-Gobain Pipelines, working in Business Development and Contracts roles.

Throughout Ireland, Tim will look to strengthen Börger's market share of pumps and macerators in wastewater, industrial effluent, agriculture and anaerobic digestion (AD) applications, in which it has built up a strong reputation for reliability, as well as drastically reducing maintenance costs due to the designed-in MIP accessibility.

Originally from South Africa, Tim has also worked for Lever Brothers and the James Walker Group.

www.boerger.com

High Shear Pump series SFP2 and SFP3



Additionally, they are carried out according to the Packo Pumps philosophy:

- Hygienic design thanks to among other things electro-polishing as final surface treatment.
- Use of standard components such as mechanical seals according to EN 12756 and IEC motors
- A monobloc construction that guarantees a large ease of installation and maintenance

Packo Pumps offers four types of which the range goes to maximum 200 m³/h, 5 bar, 1000 cP and 45 kW:

- SFP2/32-160&40-160: with open impeller, shear up to 30.000 s-1
- SFP3/80-160: with closed impeller, shear up to 30.000 s-1
- SFP3/100-200: with closed impeller, shear up to 40.000 s-1

www.packopumps.com

Packo Pumps set new standards for inline dispersing, mixing and homogenizing

The spectrum of Packo shear pumps SFP2 and SFP3 is designed in collaboration with the process industry. The innovative stator (patent pending) provides an efficiency improvement between 70 and 100% compared to current technologies available.

Moreover, one single system is sufficient for the in-line mixing, dispersing and homogenizing, as well as for pumping the final product. By this Packo Pumps pushes out the frontiers and once again sets a new standard in the market.

Typical applications are among other things the mixing of two liquids having a large different specific gravity and/or viscosity as well as dispersing of solids in liquids.

The shear pumps owe their incomparable efficiency to a stator, specially designed with the help of the most sophisticated computer programs. This allows the pumps to operate very quietly and it makes them highly energy efficient!

Pulsar's Ultrasonic Success with Super-light Fumed Silica Measurement

Fumed Silica has a bulk density of around 30g/l, and a surface area of sometimes hundreds of square metres per gram. It is used as a thickening agent in everything from gel batteries to non-drip paint, as a light-scattering agent in cosmetics and a toothpaste abrasive. However, a material as light as this presents significant difficulties in bulk measurement. After a number of failed attempts, including a leading radar system, Cabot Carbon in Barry turned to Pulsar's non-contacting ultrasonic technology to monitor level in an 11m high silo.

For Cabot Carbon, accurate measurement of the level of the finished Fumed Silica product in the silo is very important for stock control and to check for tanker loads. They had tried a number of approaches to measure the contents, including radar, but all had failed because of the lightness and absorbency of the product. All non-contacting measurement methods rely on being able to bounce a signal back from a material surface and measure the time taken for it to reach a transducer. Whether that signal is a microwave or an acoustic pulse, the challenge is to supply a signal with enough energy, then discriminate that signal against a background of competing noise.

Pulsar's approach was to supply their highest power transducer, the dB50, along with an Ultra 5 ultrasonic control unit. The dB50 is designed to measure up to 50 metres, so was putting a great deal of ultrasound energy into the measurement. Even so, the signal that returns to the transducer from the very absorbent silica is very small. Pulsar's latest generation DATEM echo processing software identifies and dynamically tracks the material level, maintaining a link to the true material level even as it changes and other signals from the internal features of the vessel compete.

Jason Jones, Cabot Carbon's Electrical Engineer, said, *"The Pulsar equipment has cured a headache for us. We were really struggling to find something that worked and was cost-effective, and Pulsar's kit ticks both boxes."*

www.pulsar-pm.com

Pump Centre Young Engineer Awards 2017 – Nominations

The prestigious awards are open to Young Engineers who have made a significant contribution to their company in the area of pumps and systems. Their contribution could be in any of the following areas:

- Design
- Specification
- Project management
- Technical support
- Maintenance
- Operations

All engineers (mechanical, electrical, hydraulic etc.) are eligible. The award is aimed at the whole supply chain from Pump Users, Consultants, Contractors, Manufacturers and Component & Service Suppliers.

Nominations will be accepted between 10th October and 25th November 2016.

If you would like more details contact John Howarth (john.howarth@arcadis.com).

Pump Centre Conference 2017 - Call for Papers

We are looking for five 30 minute presentations on the main conference theme. Alongside the presentation we require an 800+ word paper for inclusion in the Conference Proceedings.

Theme: TOTEX: Pumping System Efficiency, Reliability & Optimisation

"The Water Industry's focus on TOTEX came into effect with AMP 6 and created a move away from the traditional operational and capital expenditure model. One of the main drivers was to remove the perceived bias towards capital expenditure. TOTEX offers the best solution because it is the lowest total cost over the whole life of an asset. For pumped systems TOTEX can be reduced by improvements in both efficiency and reliability and by optimisation of the process. TOTEX encompasses both CAPEX and OPEX solutions."

Presentation topics could include:

- New approaches to system/station design.
- Advances in system control and optimisation.
- The use of SMART technology to improve efficiency & reliability.
- Renewable energy generation.
- Better data collection and analysis.
- Application of Building Information Modelling (BIM) to pumping systems.
- Reducing costs using innovative products and / or solutions
- Innovative ways of reducing planned and reactive maintenance.
- TOTEX reduction – case studies.
- New standards/changes to existing that will impact pumps/ system design and/or operation.

If you are interested in presenting at the 2017 conference, please contact John Howarth (john.howarth@arcadis.com) and he will send you a submission form.

Completed submissions must be received by Friday 4th November 2016. An independent technical panel will decide on the final conference programme.

Atlas Copco bolsters large screw compressor range with new VSD models offering improved flow and energy savings

Atlas Copco has added three new models to its range of oil-injected rotary screw compressors to give larger industrial air users a 20% average improvement in free air delivery and energy savings of up to 35%. Complementing the existing fixed speed GA160+-315 range, the new VSD additions comprise the GA200VSD, GA250VSD and an upgraded version of the GA315VSD, with three different pressure variants from 8.5 to 14 bar developed to match operators' needs.

The adoption of smart design principles has improved airflow, measured as free air delivered (FAD). Operators can now select smaller compressors for the same applications, thus saving money and energy. Atlas Copco's progressive improvements and engineering breakthroughs – such as the new generation asymmetric compression element incorporated in these machines – has increased FAD by an average of 20% across the range.

With the use of variable speed drive technology, energy savings of up to 35% are achievable by automatically adjusting the motor speed to match the air demand. Additionally, the optional energy recovery system can recoup up to 75% of the compressor's shaft power as hot water, which can be re-used for process operations or premises heating applications.

Specific Energy Requirement (SER) is a measure of how efficiently electrical power is used to produce compressed air. The new compressors' combination of a high efficiency IP55 motor and optimised, gear-driven transmission system contributes to increased energy efficiency and results in an overall improvement in SER of 11% against comparable compressors.

The compressors are available in a standard pack or as full feature, air-cooled or water-cooled versions. They are designed for standard operating conditions of up to 46°C/115°F. With an integrated dryer, the full feature GA FF models provide dry, compressed air at a pressure dew point of +3°C/37°F while ensuring low pressure drop and minimal installation costs.

The new range has been designed from the outset for easy installation and serviceability. The compact design, now with a 5% smaller footprint than previous models, includes internal piping, coolers, motors, lubrication and a control system supplied as a ready-to-use, plug and run package. To help reduce service costs to a minimum, all components and consumables offer a long operational lifetime of up to 8,000 hours and are easily and safely accessible via large opening doors.

All models incorporate the Elektronikon Mk5 Graphic Plus controller for total operational control and remote online monitoring through a simple Ethernet connection. This enables internet-based visualisation via the compressor's user-friendly 5.7 inch colour display, and also helps to provide full system protection with service scheduling and built-in safety alarms. The controller connects to SmartLink, Atlas Copco's compressor data monitoring programme, which intelligently gathers, compares and analyses data to help compressed air users increase maintenance and service efficiency.

Two in one filter introduced to fit the GA160+-315 range

In parallel with the new GA range launch is the introduction of a larger version of Atlas Copco's UD+ coalescing filter. The UD+ replaces conventional two-stage oil aerosol and solid particles filters by incorporating innovative Nautilus two-in-one filter technology, which provides higher energy efficiency without compromising on performance or reliability.

In classic filter construction pleated media are used to reduce pressure drop, but this method increases the risk of cracking and oil carry-over; resulting in poor air quality. The Nautilus filter technology incorporated into the UD+ eliminates the risk of cracks in the filter media because they are wrapped around the filter's stainless steel core. The less dense filter media used in Nautilus technology ensures much easier passage of the air, leading to a significant pressure drop reduction that is 40% lower than a combination of conventional two stage oil aerosol and solid particles filters; but with the same level of filtration efficiency.

The net effect is increased energy efficiency with lower running costs. The two-in-one filtration concept reduces installation space and complexity, making UD+ filters particularly suitable for applications where space is at a premium.

www.atlascopco.co.uk/compressorsuk

SEEPEX pumps reduce operating costs for Thames Water

Thames Water is the UK's largest water and sewage treatment company, providing wastewater services to 15 million customers through 305 sewage treatment works (STW). SEEPEX progressive cavity (PC) pumps have delivered process improvements at their Reading STW by reducing onward sludge transport costs, as well as reducing operating costs associated piston pumps.

Thames Water replaced the piston pumps, which transferred de-watered digested sludge from the energy generation plant to storage silos, with SEEPEX progressive cavity pumps. Thames engineers identified that if they increased the ds content of the dewatered sludge from 22% to 25% this would deliver a large saving in disposal costs. However they needed reliable pumps to transfer the dewatered sludge over 80metres, with a static head of 30m, without increasing system costs. The piston pumps on the process were identified as a limitation due to maintenance requirements and the high pressures generated. Additionally they used 31KW of power - all adding up to a high cost of ownership for Thames Water.

SEEPEX pumps installed at Reading STW

In contrast SEEPEX supplied pumps to transfer the higher ds% sludge with lower energy consumption and at a lower pressure rating. SEEPEX were the principle project manager, working with Thames Water approved contractors to deliver a turnkey installation. The SEEPEX open hopper progressive cavity pumps deliver the higher ds% sludge with 50% reduced power consumption (15KW) and up to 75% reduced discharge pressure, enabling de-rating of pipework and valves to suit.

The pressure reduction has been achieved in 2 ways

- Progressive cavity pumps have a low pulsation action, which generates a lower in-pipe pressure than piston pumps
- A boundary layer injection system reduces friction losses in the 80m length of pipework, using a polymer injection pump linked to discharge pressure, controlled by a SEEPEX control system.

The pumps have been installed for over 12 months, requiring no maintenance interventions in this time. The SEEPEX system has delivered a hat-trick of cost reductions: lower sludge disposal costs, lower energy use and reduced maintenance costs.

www.seepex.com

Light shines on cryptosporidium treatment for Portsmouth Water at Eastergate and Westergate water treatment works

Portsmouth Water required the provision of ultraviolet (UV) treatment as a precaution against cryptosporidium contamination at these two sites, along with improved facilities to manage periods of high-source water turbidity.

UV treatment is a process which exposes the water to a controlled UV dose that inactivates the cryptosporidium oocyst.

The disinfection treatment is approved by the independent regulator of public water supplies in England and Wales, the Drinking Water Inspectorate.

Both sites consist of borehole sources, chlorine treatment and monitoring facilities, serving the east area of Portsmouth Water and the town of Bognor Regis.

Following a tender process Trant Engineering, a water engineering specialist, was engaged under a target-cost contract to design and construct the necessary works.

Each site has a licensed capacity of 22MLD and only one site can be removed from supply at a time.

At each site the three existing borehole pumps were removed and replaced with new high-efficiency Wilo K146 and 147 pumps with variable speed drives operating in duty/ assist/ standby mode. This provides a more energy efficient and flexible operating regime.

The UV treatment system is being supplied by atg, a world leader in the UV disinfection industry, using its high-output, ultra-efficient UVLW low pressure system UVLW 16800 20 UV reactors.

The reactors, which are third-party validated to US EPA UVDGM, feature atg's UV's multi-lamp, high output, ultra-efficient 800 watt Amalgam UV lamps.

UV dose is modulated to suit flow and water transmissivity (a measure of how much water can be transmitted horizontally), ensuring effective and efficient treatment.

If the UV dose, or water quality, falls out of specification the auto shut-down valve is closed and the plant shuts down, ensuring out-of-specification water is not passed into supply.

At Westergate a new high-voltage power feed and transformer is being installed along with new chlorination facilities and a new surge vessel. Surge studies were undertaken by Hydraulics Analysis.

New run-to-waste pipelines are being installed to allow the boreholes to be run to waste during periods of high turbidity.

Trant Systems Electrical is providing new motor control centres for each site along with new instrumentation, control and automation systems. Sites run unmanned, remotely monitored by Portsmouth Water.

Trant Engineering progressed the two schemes by utilising its own in-house design expertise.

Site management, construction, installation and commissioning have also been delivered directly in-house, leading to a successful integrated approach.

www.trant.co.uk

AD Plants Fed and Mixed fast and effectively with Börger's new Powerfeed DUO

Suitable for almost any AD plant, Börger's new fully automated Powerfeed DUO provides highly efficient solids feeding and mixing technology with 15 cubic metres of storage capacity.

Capable of handling the widest variety of feedstocks, the Powerfeed DUO benefits from feed rates of up to 9 tonnes per hour and storage allowing up to 11 tonnes of feed - from just one load. Feedstock is mixed by a large mixing drum and then fed to a circulation line through a dry compression zone reducing oxygen input.

The stainless steel Powerfeed DUO can be loaded constantly by walking floor or periodically loaded with a dumper or a combination of both.

Complete with an easy to operate state of the art control unit, connectivity is via Profibus & Ethernet as master or slave, which allows integration into any system. Combined with a high-capacity Börger biogas pump, the efficiency of the Powerfeed DUO in breaking down solid particles in turn reduces the amount of agitation required in the digester.

The Powerfeed DUO's auger shaft conveys the raw material to the press channel, compressing the biomass which is fed into the digester's liquid flow via an induction unit from the organic plug in the system's press channel.

An electronic display provides information about the weight of the biomass, allowing the exact dosage to be fed in. Sensors constantly monitor the fill level in the Powerfeed DUO, which will switch off automatically if pre-set limits are exceeded.

www.boerger.com

Investing in the future: Siemens UK & Ireland and United Utilities enhance technology partnership

As the water sector enters AMP6, the new capital investment period covering 2015 through to 2020, Siemens UK & Ireland has secured two new AMP6-related contracts with United Utilities. The contracts cover the sole-source supply of instrumentation and variable speed drives (VSD) automation technology at United Utilities' sites across the North West region.

These recent agreements build upon the long-standing technology partnership between Siemens and United Utilities first established in AMP3.

Instrumentation

Siemens has been selected as sole technology supplier in four major categories of instrumentation: electromagnetic flow meters, ultrasonic levels gauges, ultrasonic level switches and open channel ultrasonic flow meters. In addition, agreement has also been reached for the supply of three further instrumentation categories – radar level gauges, Coriolis flow meters and ultrasonic time-of-flight flow meters.

Drives

As well as the supply of instrumentation categories, Siemens has also been chosen as sole technology supplier for the entire United Utilities AMP6 VSD framework contract requirements, ranging in power from 0.37Kw to 2000Kw. The vast majority of drives covered by the new agreement will be manufactured within the United Utilities region at Siemens' state-of-the-art manufacturing site at Congleton, Cheshire.

Brian Holliday, Managing Director for Digital factory, Siemens UK & Ireland, commented: *"This wide-ranging agreement is recognition of the technical and commercial merits of Siemens' instrumentation and drives technology that can support operational efficiency objectives within the industrial sector. It also strongly reinforces United Utilities' overall policy of automation equipment integration.*

"Siemens has been a long-established supplier of PLCs, communications equipment, HMI and SCADA technology solutions to United Utilities since AMP3, and we're delighted that we're strengthening our work together. The agreement clearly demonstrates a strong desire by both parties to extend the control, monitoring and reporting capabilities of many existing United Utilities installations and sets a clear integration strategy for the AMP6 period and beyond, with a commitment to invest in the future."

Dave Ogden, Head of Operational Technology, from United Utilities said: *"United Utilities is one of the UK's largest water and wastewater companies supplying over 7 million customers and 200,000 businesses, so we're always looking for ways to ensure quality and efficiency across our sites. We believe the technologies available in this partnership will help us maintain our high quality service, while driving further efficiencies."*

www.siemens.com

Pump Protection

Author: Jacopa, Key Account Manager, Mick Burton

For water companies faced with the need to cut costs while maintaining high levels of service providing protection for vital pumps is a key issue. An effective solution to this problem is Jacopa's trash rake technology from renowned manufacturer Bosker® which has been adopted at a number of water and wastewater treatment plants and other installations across the country to provide a first line of defence against such damage.

Debris, either from storms or from material that has been inconsiderately dumped can cause significant damage and blockage, leading to long periods of down time while repairs are carried out. And as pumps at water and wastewater treatment works can cost upwards of £200,000 protecting them is critical.

In high capacity intakes it is not unheard of for oversized and awkward debris such as concrete blocks, bricks, timber, metalwork, car tyres, rodents and other challenging material to be found and every treatment works has its own horror stories.

All works therefore routinely employ a range of both coarse and fine screening to ensure that key downstream pumps and processes are well protected. Bar screens are common primary protection solutions, with bar spacing's of 100mm or more, but as the first line of defence they frequently clog and require regular cleaning. In the past, this meant operators had to intervene manually to remove debris, but increasingly automation has overtaken manual labour, being safer and more efficient.

An increasingly popular way to ensure that coarse screens function well is to use trash rakes, which are normally installed at a water treatment works' river intake or wastewater treatment works' deep intake. However, conventional equipment demands complex civil works with considerable space for installation and operation. Also, in operation such equipment is frequently challenged when presented with large items such as tree trunks, tyres and awkward debris such as fibrous plant material that can wrap itself round coarse screen bars.

The Bosker system combines a trash rake, overhead conveyor and debris loading system in one. This helps to cut costs and provides a turnkey solution that works together to collect, transit and dispose of all debris. The system is designed for situations where highly effective bar screen cleaning is essential and can cope efficiently with even the most challenging material.

Bosker 'Bandit'

Bosker Grab deals with difficult material

One of Jacopa's latest contracts was for an advanced water treatment plant supplying a key major urban main. Here, the Bosker system is protecting the 525 MLD centrifugal pumps that abstract water from the river and take it to a large reservoir. Like most large rivers, the urban watercourse contains significant amounts of floating detritus, so the pumps need robust and effective protection to ensure they remain operational.

The water treatment works had been using labour-intensive coarse screening methods that involved a certain amount of manual handling, and were seeking reliable, more automated protection for the vital pumps.

The project involved removing the existing platform and coarse screen in the main inlet channel, which feeds the centrifugal pumps, and replacing them with a Bosker system, a new maintenance platform, and a new bar screen.

The new solution provides the works with a fully automated cleaning system that provides protection to the expensive and critical pumps beyond, and also removes the need for manual intervention.

By installing this particular piece of machinery, the water company will be able to protect its vital pumps from damage for many years to come and will also benefit from the low running and maintenance costs.

The Bosker system combines a trash rake, overhead conveyor and debris loading system in one

Boskers have proved to be robust, effective tools that are simple to use and install. They reduce maintenance and operational costs as well as minimising the risk to downstream pumps and other vital equipment. The system is pre-programmed with differential level settings, so it can be used in any channel, whatever the depth, and can also be retrofitted into existing channels with very little modification.

The overhead monorail supports a fully automated grab unit, whose tough grippers are designed to grasp onto heavy and awkward items including the most awkward items such as balls of condensed fat and rags, which are arriving with increasing frequency at wastewater treatment works across the UK.

In action, the open grab lowers onto the bar screen, pushing debris into the gripper's jaws as it moves downwards to the bottom of the screen, where the robust jaws close. A hoist returns the grab to an overhead trolley, pausing for an optional washing cycle. The trolley and gripper then move along a monorail track that runs directly between the intake and dump areas. The Bosker can collect debris from several pick-up points along its track, and continues its cycle until the entire screening area is cleared.

As well as the popular overhead Bosker, Jacopa manufactures the mobile Bosker 'Bandit'. This low-profile unit is designed for smaller pumping stations and inlets, and is ideally suited to wider inlets as it is set on a deck-mounted travel carriage. The Bandit can rotate through 270 degrees to provide access to dumping sites in awkward locations, and like their bigger brothers, the mobile Bandits are fast and easy to install, needing very little construction work.

One high-profile example is the Bosker overhead trash raking system at Thames's Deephams wastewater treatment works in Enfield. Here, two grab units on a duty/standby basis were installed on the works' high-level inlet. This Bosker is cleaning five 11m deep by 2m wide inlets, each of which has bar screens with 100mm bar spacing's. Here, the trash rakes remove at least 8 tonnes of debris per hour and can cope with storm flows of over 7000 litres/sec.

Over 1100 of the classic Bosker trash rakes have now been installed at power stations, large pumping stations and cooling water intakes around the world.

Ofwat's change of emphasis to TOTEX means that the industry is looking for robust and effective assets that are easy to refurbish and repair, with an emphasis on 'outcomes' rather than 'outputs' that will fuel interest in equipment like the Bosker that can help meet this aim.

www.jacopa.com

The Bosker installation at Thames Water's Deephams WWT works serves several inlets

Integrated Drive Systems Made Simple for the Pumps, Compressors and Fans Industry

by Jason Peel, Head of Strategy, Integrated Drive Systems, Siemens Process Industries & Drives

There is a great deal of complex information currently available about engineering technologies and how they can help you extract the most from your processes, and make your pumping, cooling and compressor equipment more reliable, reduce your energy use and carbon footprint, and ultimately, make your plant operating systems the very best they can be – for their entire asset life.

But putting it all together in an easy to understand format is a massive challenge. Many companies operating in general and process engineering are able to answer some of the challenges – but few can answer them all, with mechanical and electrical drive components for every kind of drives application, every performance level and rating, and for serial machines as well as single plants.

Being able to provide an effective answer to all of the above engineering challenges means being a 'one-stop-shop', with perfectly interacting components throughout an integrated drive portfolio, smoothly integrated into automation and control, with software and services for all stages of the lifecycle. Understanding exactly what this means requires some explanation, although at the end of the day, it is best to think of it as 'the drive train and beyond'.

Three key aspects

What exactly does integrated drive systems (IDS) mean? We can break it down into three key areas:

- Horizontal integration
- Vertical integration
- Lifecycle integration

In horizontal integration, drive components like the motor, gear unit, coupling and converter are properly integrated all the way along the power flow – mechanically, functionally and energy efficiently. This means they will always operate better than an unintegrated system, where there is a risk of components not being compatible at some stage in the process. This applies to all pump, fan or compressor operations, wherever they are situated.

In vertical integration, the drive train and controller are integrated along the information flow, through to the manufacturing execution system (MES) IT, using Siemens' Total Integrated Automation concept (TIA). Through this system the entire drive train is seamlessly integrated into the automation environment, bringing maximum communication and operator control for effective safety as well as the best performance. This enables the customer to make informed choices as much more information is to hand about what the components are doing, how they are performing, and how they could perform better and more economically.

In lifecycle integration, the factor of time is added in, with the drive system being supplemented by software and services that support the entire lifecycle; in particular the design and operation elements. So, you extract the most from your equipment throughout its operational life; or, a shorter time to market, maximum productivity in operation, and a shorter time to profit. This contrasts with a huge amount of industrial equipment that is running inefficiently, wasting energy and assets and often risking breakdowns with significant knock-on effects. Those pumps on that faraway application or fans in that cooling tower may look insignificant, but when they stop, so does everything else. With the right set-up, they could be telling you when they have a potential problem, long before the risk of a major, unscheduled shut-down, enabling you to forward plan servicing and, where necessary, replacement.

If you have optimised your system through horizontal integration, you want to ensure the asset operates with the same level of efficiency and availability. This starts with the reduction in engineering effort up-front, so you are 'configuring' rather then 'programming', and it continues with data management, so you can use open protocols to communicate on, and you can incorporate safety into the system rather than it just being an add-on. In summary, you will have integrated engineering and safety, along with industrial data management, communications and security.

Safety first

Smart safety is a core function within IDS, using fewer components and less wiring, providing easy interfacing with safety controllers. Safety is now a vitally important part of the process – any process – whether you are pumping, ventilating, compressing or processing.

Fixed and variable speed drives

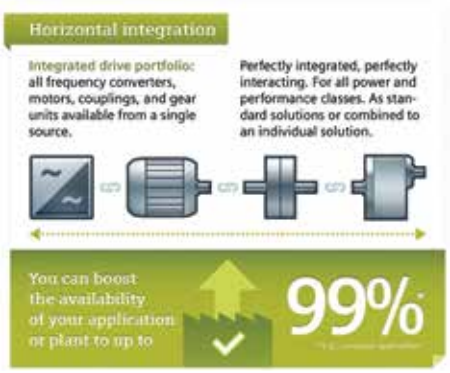
Integration covers all components of the drive train, from gear units to couplings and motors to control systems. For fixed speed drives, using cost optimised combinations of motor starter and IE3 motors with future-proof EN 50598 conformance brings low energy costs and high energy efficiency. These units will easily integrate via Profibus/Profinet into automation, with quick and safe engineering and integrated safety through Profisafe protocol. As these units already support Profienergy protocol, they are ready for energy management.

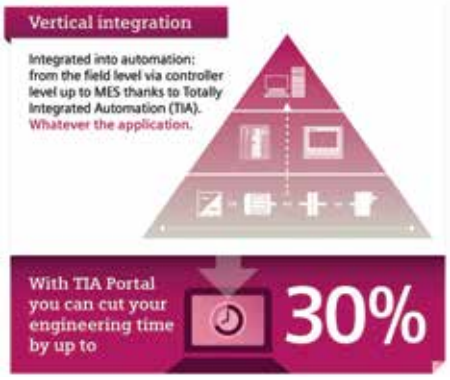
Pumps, fans and compressors

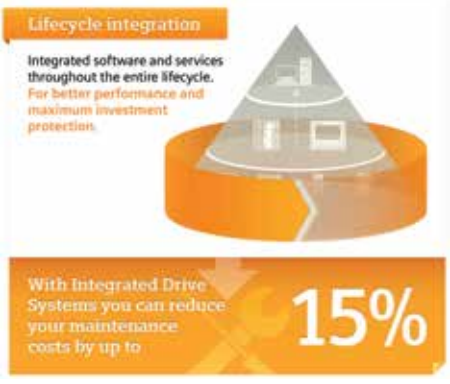
Investment costs can be reduced by up to 15 per cent by avoiding over-dimensioning in motors and converters. With optimised pulse patterns, energy efficiency can be increased and losses reduced by at least 10 per cent. Noise can also be reduced by more than 4dB, so noise protection measures can be cut. Drive train component optimisation means service intervals can be longer, and by using condition monitoring, unscheduled downtimes reduced by up to 15 per cent - vibration monitoring with SIPLUS CMS provides the most reliable method for early detection of mechanical damage. Fast and simple engineering cuts engineering time by around 30 per cent.

With the widest industrial gearbox range worldwide, the largest geared motor and coupling range in the world, worldwide local service back-up, innovative R&D and engineering know-how, the customer's risk is considerably reduced. Whether you're involved in pumping, ventilating, compressing or processing, better integration of this type will significantly benefit your business. For the long-term.

www.siemens.co.uk







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Delivering Wastewater Treatment TOTEX Solutions with ReGenerator® Technologies

The concept of sewage treatment plants as 'Energy Factories' originated in the Netherlands in the early 2000's, and concept has since grown in popularity worldwide thanks to its ability to transform wastewater treatment into a means of generating energy, as well as the recovery of bio-resources. As such, wastewater sludge is no longer seen as a problem, but as a *"fuel"*. Sweco was a founder member of the Dutch-led Energy Factory projects, and has since expanded the potential benefits through their innovative ReGenerator® Concept (RgC) methodology. With RgC, Sweco source new pan-European sustainable technologies that support clients operating in a TOTEX environment by focussing on maximising potential OPEX revenue streams, such as increasing biogas production for energy generation, reducing energy consumption, increasing water recovery, recovering nutrients and re-using surplus waste heat.

Figure 1 – SHARON® demonstration plant at Wards Island Wastewater Treatment Plant in Manhattan, New York (Image courtesy of M2T Technologies)

SHARON® and DEMON® liquor treatment plants (LTPs) are key technologies within Sweco's ReGenerator® Concept. Treating liquors prior to returning flow to the mainstream unlocks capacity in the secondary treatment stage and provides improved effluent quality. These benefits have given UK utilities companies' new options when increasing capacity or quality at wastewater treatment works.

SHARON® (Stable and High Activity Ammonia Removal Over Nitrite) is a robust, cost-effective system used for the treatment of high strength ammonia liquors. Unlike conventional nitrification/ denitrification systems, nitrite, and not nitrate, is the intermediate product of the system, resulting in significant energy savings compared to conventional processes. SHARON® installations can be found throughout the world including New York Figure1 (5,500kg/d), Geneva (1,500kg/d), Whitlingham (Anglian Water, 1,600kg/d) and Shell Green (United Utilities, 1,600kg/d).

Figure 2 – Typical inDENSE® carousel (Image courtesy of Sweco)

The DEMON® (DE-amMONification) process followed SHARON® and is a nitrification/ deammonification process in which ammonia and nitrite are simultaneously converted to nitrogen gas without the need for organic carbon. The innovative technology uses 60% less energy than conventional processes, and can typically achieve an ammonia removal efficiency of at least 85% without any pH correction or carbon dosing. The DEMON® process's patented control system utilises changes in pH; aeration causes pH to decrease, whilst the influent feed causes an increase. The system therefore reacts automatically to variations – and even interruptions – in load without the need for operator intervention. DEMON® is applicable for differing types of liquors with a wide range of ammonia concentrations, from weak (600mg/l) liquors to centrate following advanced thermal hydrolysis digestion (containing >2000mg/l).

The need for low OPEX LTPs such as DEMON® is increasing, partly due to the widespread adoption of THP. DEMON® has been successfully implemented at over 60 wastewater treatment plants around the world, and since 2009 Sweco has completed the design of 15 DEMON® installations in Europe, including Poole STW for Wessex Water. A further five projects are under construction or at design stage.

The installation of DEMON® also affords the option of installing Mainstream DEMON® at a later date, whereby surplus ammonia oxidising bacteria and deammonifying bacteria from the DEMON® process are used as a seed sludge in the mainstream ASP, allowing proven aeration energy savings of 25-30% to be realised, in addition to improved Total N effluent quality standards.

Figure 4 – The DEMON® installation at Amersfoort, NL has been operational since 2012 (Image courtesy of Sweco)

A further spin off from DEMON® is the use of the patented hydrocylcone Figure2 to promote the retention of the more dense, floc forming sludge, in the site SAS (called inDENSE®), which can be exploited at problem sites that are close to breaching consent due to a lack of final settlement tank (FST) capacity. inDENSE® is most effective at sites with an SVI of >150ml/g, as caused by seasonal variations. Initial installations of inDENSE® have shown SVI reductions in the FSTs of between 80ml/g and 100ml/g. Figure3 shows the impact of seasonal load variations on SVI and how inDENSE® improves the SVI over time.

Across a water utilities' wastewater treatment estate, the ReGenerator® Concept has been shown to have the potential to halve energy consumption, double energy generation, reduce sludge disposal volume by 25 per cent and provide useful excess heat for reuse. A DEMON® installation – incorporating its associated technologies Mainstream DEMON® and inDENSE® - can be viewed as a significant step towards establishing a wastewater treatment plant as a true 'energy factory'.

www.sweco.co.uk

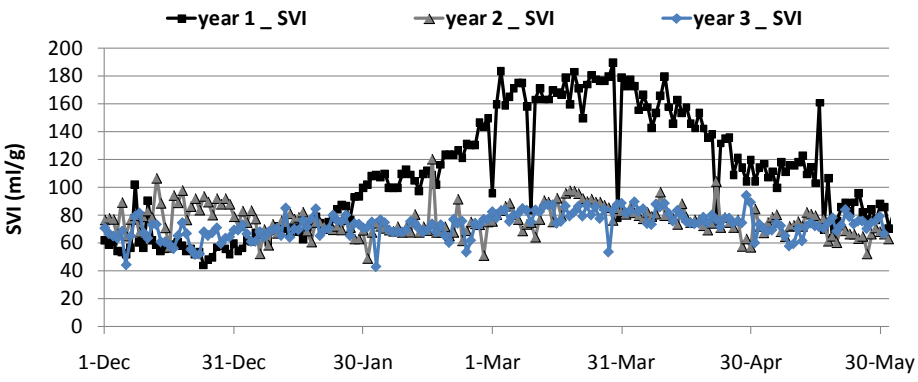

Figure 3 – SVI results before and after installing inDENSE® at Strass WwTW, Austria (Image courtesy of Sweco)

Figure 5 – The DEMON® installation at Nieuwegein, NL has a capacity of 450 kg/d (Image courtesy of Sweco)

Sustainability of Rural Pump Systems in Timor Leste

Figure 1: BESIK pump technician Luis Fernandes installing a new pump at Romoco in Lautem District.

The contents of this report detail my experience as a rural pumped water systems adviser in Timor Leste. This experience was kindly supported by the IMechE Grants and Awards Committee, from which I received the sum of £1,000.

The role was undertaken in Democratic Republic of Timor Leste, which is a sovereign state in Timor Maritime Southeast Asia. The country has a population of around 1.2 million people with 70% living in the rural areas outside of the capital city of Dili.

The country has had challenges with an occupation by Indonesia (1975-99) and subsequent civil unrest in 2006, resulting in the destruction of public infrastructure. There has since been significant investment in rural water infrastructure; however the sustainability of these services remains a challenge. The report will detail my work to improve the sustainability of pump systems in the rural areas.

The work was done as part of BESIK, an Australian Government aid programme supporting DNSA in delivering sustainable access to safe water supply, improved sanitation and hygiene to the rural communities in Timor-Leste (East Timor).

The program includes has a water services technical delivery team which delivers both new water systems and maintains/rehabilitates existing systems in the rural areas (Figure 1 shows a BESIK technician at work).

Figure 2: Farol School Hand washing facility rehabilitation.

My role included the following responsibilities:

Capital delivery of pump systems:

- Reviewing pump system design
- Construction monitoring
- BESIK staff training in system design
- Designing system rehabilitations

Sustainability of systems:

- Training of Pump technicians
- development of training materials
- System and asset management
- Pump system data analysis and reporting

New systems and rehabilitation

During my role I reviewed the designs for new pumped water systems in Suai (2), Ermera (1) and Baucau (1) municipalities and 3 rehabilitation schemes. Figure 1 shows an example of rehabilitation at a location called Romoco, where the pump motor had burned out and required replacement. From my previous experience as a pump system design engineer in the UK I was able to put these skills to the test.

Initially this was daunting as I was the "expertise" in that field, so I would make an initial assessment of the current design/issues and suggest alternatives. Fortunately I had the support of my team at Mott MacDonald in Cambridge and could easily email/call to discuss the issues as they arose.

This was particularly effective at a site called Hatuudo (Figure 1). Where there was a clear design flaw which had led to incorrect construction (the concrete tank was built 1m too high above ground and pump position above lower water level). I consulted the team in the UK, who identified a low cost solution which was put in place for $300 and the system was commissioned in October 2015 delivering water to 3000 people. It was interesting learning curve for me and I believe a good use of the local resources and network I had available to me.

Another interesting challenge was a handwashing facility rehabilitation scheme. I was involved with at Farol secondary school in the capital Dili. There were no facilities of this nature including limited water supply to the kitchen and toilets. I was tasked with designing the facility for use by 1800 pupils.

This project involved looking at the existing assets; a local borehole pumps and water collection tank. These were all disconnected at the time and the original proposition was to install a completely new system. However the budget was only $2,000. So I proposed that the existing assets could be connected with an additional pressure boosting pump and handwashing basin to supply the kitchen, handwashing and toilets. This project turned around in a month and was inaugurated by the health ministry(Figure 2).

System and Asset Management

Our team was responsible for carrying out an assessment of the rural pump systems in Timor Leste.

The initial assumptions on the pump systems were; there are around 100 systems, these are largely non-functional (~50%), served around 60 – 80,000 people and solar powered systems were more reliable than electric grid systems.

Results of the asset registration exercise completed by BESIK with local government support (June 2016) showed there are 240 rural pump systems supplying an estimated 14% (~150,000) of the population and 73% of the pump systems are currently functioning (partially or fully), (Figure 3).

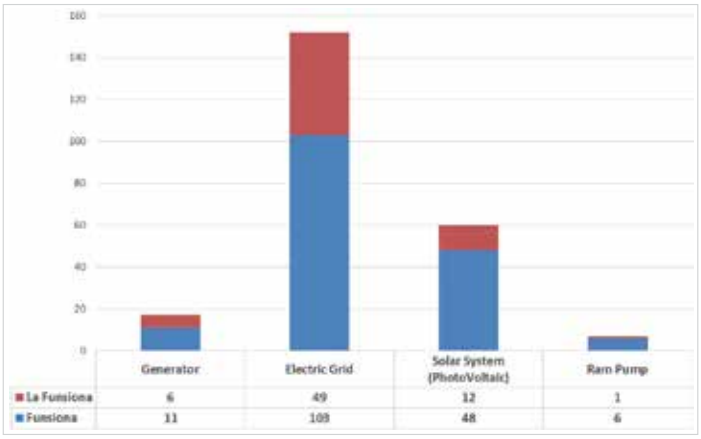

Figure 3: Summary of results from data collection on pump systems in Timor-Leste, June 2015

Further that the systems connected to the electrical grid connection were similar % functionality as the solar systems. This was an excellent example of how to challenge preconceptions in the absence of facts and how evidence can inform decisions and build confidence in systems and interventions. Through data collection and previous capital maintenance work, BESIK/DNSA now has an

understanding of where, how many and the work required to restore, upgrade and sustain pumped systems.

So with this the role I then took on was to look at how BESIK (as an external aid programme) would move away from doing the rehabilitation and new infrastructure work to DNSA (the government) taking on the challenge.

Understanding assets and planning maintenance interventions is not novel in the countries such as the UK, however for a developing country, this was the first comprehensive study of electric pump systems. The final 2 months was working on capacity building initiatives such as planning/budgeting for a pump maintenance training course and communicating to the government the levels of investment required. In April 2016 there is a training course for 10 new pump technicians (including three women), to support the existing two in the country.

Timor Leste Life

Timor Leste translates to East-East, from the Indonesian Timur and the Portuguese Leste. The local Timorese call it Timor Lorosae or East Sunrise, as sunrise is the local representation of East. It is a fascinating country with a unique language shaped by Portuguese colonial rule, military occupation and Australian intervention.

"Bondia, hau hakarek tiga manu aman" – "Hello, I would like three chickens", with Indonesian Bahasa, Portuguese and Tetum (Timorese language). I worked with a mixed international and national team that between them spoke, Indonesian, Spanish, French, Tagalog, Tetun, Makasai, Mambae & English.

The latter being the least widely spoken. So I had to do a fair bit of learning, which was very enjoyable and after six months I was very proficient at ordering 3" diameter steel piping in Tetun!

Life in Timor Leste was also really good fun, a place mostly untouched by mainstream tourism, which came with its quirks. However you always felt like an explorer when you travelled into the foho (mountains) and gazed down across Dili the capital until after a few bends it was gone. I have visited some truly magnificent places from the coffee growing districts in Ermera to the crocodile country in Suai. I feel truly blessed that I have been able to visit some beautiful places with a deep sense of culture and at the same time a country nourished by the influence of the outside.

Developing World Engineering Project Award, Jonathan Choksey.

Jonathan Choksey was one of the shortlisted finalists in the Pump Centre 'Young Engineer of the Year Award' 2016.

https://www.mottmac.com/

Pump Centre Training for 2017!

The Pump Centre has a well-established and extensive programme of scheduled and in-house training courses covering a wide variety of topics, mainly relating to pumps & pumping. Demand for the courses has been high in order to satisfy companies' requirement to have trained staff that can deal with pumps and pumping systems related issues. The new courses introduced in 2016 included:

- Pumps & Pumping Systems - Introduction, Intermediate and Advanced
- Pumps & Pumping System - Non Engineers
- Sewage Pumping Station Design
- Introduction to the Sewage Treatment Process
- Introduction to the Water Treatment Process

Such needs include ensuring those who design, specify, procure pumping systems have the right skill set to do their job and deliver cost effective and reliable installations for their business. All Pump Centre courses are delivered by lecturers with many years of experience in their field in both design and operational roles.

In 2017 we are planning to add the following technical based courses:

- Metals for Engineers
- Corrosion for Engineers

The NEW 2017 programme will be available in mid-October - so please keep an eye out for it!

For more details of these and all other Pump Centre training courses please refer to the

Pump Centre website www.pumpcentre.com or contact Jim Eaves.

Jim Eaves 07968 707753 or jim.eaves@arcadis.com

BIM Awareness Day

Thursday 3rd November 2016

International Centre, St. Quentin Gate, Telford, Shropshire, TF3 4JH

(In conjunction with the WWEM Exhibition and Conference).

Registration 10:15am – Finish 3:00pm

The objective of this event is to introduce the topic of Building Information Modelling (BIM) and to raise the level of understanding of how it will be used by different parts of the supply chain.

The aim is to give delegates an idea of what they need to do within their own company to bring themselves up to speed.

FREE EVENT
FOR MEMBERS & NON MEMBERS

Delegates must register in advance

For more information: contact jim.eaves@arcadis.com or 07968 707753

To book: contact karen.bridgeman@arcadis.com

Pumps for Non-Engineers

This one-day course provides a basic guide to pumps to those with no technical knowledge

This training course is intended for those who are not Engineers or technically minded but need to know more about pumps due to the nature of their work. Those working in the Finance department of a company dealing with pumps and / or pump spare parts, for example, who are responsible for carrying out a stock take of pump parts but are not familiar with pumps may benefit from the course. Others dealing with Engineers or Technicians who work on pumps and need to understand the terms used when scheduling their work, dealing with enquiries or ordering spare parts may also benefit from this course.

No technical knowledge or prior experience with pumps is required as the course is designed for non-technical people. Layman's language will be used at the outset to build and develop an understanding of pumps and pump components.

The day will cover the basics and provide an overview of the important properties of liquids, pressure and head, positive displacement and centrifugal pumps, pump components, pump and system curves and basic fault finding.

This course will provide those whose work brings them into contact with pumps or those who work with them, with the knowledge they need to better deal with the demands of their role.

OBJECTIVES AND BENEFITS

- Learn what pumps are and the sort of things they are used for.
- Find out how different types of liquids affect pumps.
- Become familiar with the characteristics and construction of the most popular types of pumps.
- Understand how pumps are chosen.
- Cover the most common terms used when talking about pumps and pump parts.
- Discover what sort of things affect the life of a pump.

COURSE PROGRAMME

- The material will be presented by a series of lectures and illustrations.
- The sessions will include ample time for questions and discussion.
- Course notes are provided in a bound folder.
- All delegates will receive a certificate of attendance.

WHO SHOULD ATTEND

- Anyone who has to deal with pumps as part of their work but who has no technical knowledge on the subject.
- Finance and Admin staff responsible for carrying out stock takes and who need to identify pump parts.
- Schedulers and those ordering pump spare parts or dealing with enquiries about pumps
- Engineers who need a quick refresher of the basics.
- No technical knowledge or experience is required for this course.

Pumps and Pumping Systems

- Introduction, Intermediate and Advanced

This 3 day course will comprise Introduction, Intermediate and Advanced days

The course is intended to provide those who are required to design pumping stations, approve designs submitted by others or advise on possible improvements to existing systems with the skills they need.

The course will include presentations and practical exercises to enable participants to understand the factors affecting design of efficient pumping systems and provide them with the techniques required.

The Introduction course will enable participants to understand the basics of fluids and pumping systems. The Intermediate course will deal with more advanced fluids principles, pump curves, an introduction to the Pumping Station Design Guide and basic fault finding. The Advanced course will cover topics such as designing pumping systems, sump design, cavitation, series & parallel pumping and variable speed pumping.

OBJECTIVES

Understand how fluid properties affect pump selection and performance

Become familiar with the characteristics and construction of Centrifugal & Positive Displacement pumps and how to get the best out of them.

Learn how to design pumping systems and produce system curves. Understand the interaction between pump and system including sump design and cavitation.

Understand how to design series, parallel and variable speed installations.

PROGRAMME

The material will be presented by means of a series of lectures and demonstrations, with each topic being reinforced by practical exercises

The final session will include a presentation on the optimisation of pumping stations.

WHO SHOULD ATTEND

Engineers who need to design pumping systems, whether as part of their daily work, or only occasionally.

Engineers, and others, who are called upon to assess designs submitted for approval.

No prior pumping knowledge will be assumed, but those wishing to attend only the Intermediate or

Advanced days must have a thorough knowledge and understanding of the subject matter covered in the previous day(s) courses.

Pumping in the Water Industry

Lecturer: Dennis Goodlad (Pump Centre - Principal Consultant)

This is a dedicated Water Industry Course providing 4 ½ days training, spread over 5 working days.

It is intended to give an in-depth understanding of pumps and pumping systems to engineers who are required to design pumping systems, approve designs submitted by sub-contractors, or advise clients on possible improvements to existing systems.

Using a series of demonstrations, presentations and practical exercises, the course will provide an understanding of the factors affecting pumping system design, and equip participants with a *"toolkit"* of ideas and techniques for the design of efficient pumping systems.

The course will conclude with an exercise, based on a typical situation, which brings together all the points covered and enables the trainees to use the skills learned during the week.

OBJECTIVES

- Understand how the properties of fluids affect pump selection and performance
- Understand the construction of pumps and how to get the best out of them.
- Understand the factors affecting system design and the interaction between pump and system.
- Understand the factors affecting OPEX and how to calculate OPEX for variable duty stations.

PROGRAMME

- The material will be presented by means of a series of lectures and demonstrations, with each topic being reinforced by practical exercises.
- The final session will be a group exercise, based on a real situation, which draws together all the learning points from the week.

WHO SHOULD ATTEND

- Engineers who need to design pumping systems, whether as part of their daily work, or only occasionally.
- Engineers, and others, who are called upon to assess designs submitted for approval.
- No prior pumping knowledge will be assumed, but previous attendance at the *"Pumps for Beginners"* course will be an advantage.

Principles of Electric Motors & Drives

A one-day course introducing the subject of motors and drives used on pumping applications

This one-day course is intended to give an introduction to electric motors and variable speed (VS) drives to non-electrical engineers who are required to design pumping systems, approve designs submitted by sub-contractors, or advise clients on possible improvements to existing systems.
Using a series of, presentations and practical exercises, the course will provide an overview of electric motors and the principles of VS drives, with particular reference to their application in pumping systems.
There will be discussion of the potential efficiency improvements made possible by the use of VS drives, and of some of the pitfalls and situations to be avoided, together with a discussion on the various methods of implementing savings.

OBJECTIVES AND BENEFITS

- An appreciation of basic electric motor theory and construction.
- An appreciation of basic VS drive theory and operation.
- An appreciation of the factors affecting the selection of variable speed drives; their advantages and limitations.
- An understanding of the potential problems associated with a VSD.
- An understanding of how to predict the performance of a pump-VSD combination.
- Some ideas on how to optimise pump station performance by use of a VSD.

COURSE PROGRAMME

- The material will be presented by means of a series of lectures.
- No prior electrical knowledge will be assumed.
- Trainees will be expected to have a basic knowledge of pump applications.
- For those who do not have such knowledge, attendance at the *"Pumps for Beginners"* course would be helpful.

WHO SHOULD ATTEND

- Engineers & technicians who need a basic understanding of motors.
- Also those who need to design pumping systems, whether as part of their daily work, or only occasionally.
- Engineers, and others, who are called upon to assess designs submitted for approval.

Sewage Pumping Station Design

Lecturer: Bob Went (Pump Centre – Principal Consultant)

This one day course will cover the essential requirements for designing Sewage Pumping Stations. The design of sewage pumping stations provides unique challenges in addition to those normally encountered in the water industry. Specific issues such as the nature and volume of solids content in the flow, sump design and particular operational approaches must be taken into account. By the 1st October 2016 all Water Companies must have assumed responsibility for private sewage pumping stations (PDAS regulations).

An understanding of the particular requirements for the design of sewage pumping stations will be required by all those involved in the process and/or dealing with any issues arising.

The course will begin by covering the general requirements for pumping station design including liquid properties, different types of pumps & their characteristics, system curves, selecting the right pump for the system and cavitation. All topics will have an emphasis on sewage pumping design aspects.

The course will continue to provide more detailed coverage to the requirements

for sewage pumping stations including sump design, how to mitigate solids deposition, generating system curves at site, design and operation of dry and wet wells and duty/assist/standby pumping. The course is intended to provide those who are required to design pumping stations, approve designs submitted by others or advise on possible improvements to existing systems with the skills they need.

OBJECTIVES AND BENEFITS

- Understand how liquid properties affect pump selection & performance.
- Become familiar with the characteristics and construction of Centrifugal & Positive Displacement pumps.
- Learn how to design sewage pumping stations and produce system curves.
- Learn about sump design requirements for sewage pumping stations, how to set start / stop levels keep wet wells clean.
- What to look out for when adopting a small sewage pumping station

.

PROGRAMME

- The material will be presented by means of a series of lectures, demonstrations and practical exercises.
- No prior knowledge of pumping station design is required
- The course will include a presentation on the optimisation of pumping stations.

WHO SHOULD ATTEND

- Engineers who need to design sewage pumping stations, whether as part of their daily work or only occasionally.
- Engineers and others who are called upon to assess designs submitted for approval.
- Project Managers & Procurement Professionals who need to be aware of the issues.
- Those who may become responsible for the design or operation of sewage pumping stations including those inherited as part of the PDAS regulations.

Training & Awareness Day Programme 2016

Title	Date	Full Price	Members Price
Waste Water Screening & Preliminary Treatment (Warrington)	12 Oct	£350 + VAT	£245 + VAT
Pumping in the Water Industry 4.5 days (Warrington)	17 – 21 Oct	£995 + VAT	£696 + VAT
Pumps & Pumping Systems – Introduction, Intermediates & Advanced (Reading)	1 – 3 Nov	£795 + VAT	£556 + VAT
Pumps & Pumping Systems – Introduction (Reading)	1 Nov	£350 + VAT	£245 + VAT
Pumps & Pumping Systems – Intermediates (Reading)	2 Nov	£350 + VAT	£245 + VAT
Pumps & Pumping Systems – Advanced (Reading)	3 Nov	£350 + VAT	£245 + VAT
BIM Awareness Day (International Centre, Telford)	3 Nov	FREE	FREE
Social Media (Warrington)	8 Nov	£120 + VAT	£96 + VAT
Principles of Electric Motors, and Drives (Reading)	9 Nov	£350 + VAT	£245 + VAT
Pumps & Pumping Systems for Non-Engineers (Warrington)	10 Nov	£350 + VAT	£245 + VAT
Introduction to the Water Treatment Process (Reading)	30 Nov	£350 + VAT	£245 + VAT
Introduction to the Sewage Treatment Process (Reading)	1 Dec	£350 + VAT	£245 + VAT
Introduction to Valves (Warrington)	6 Dec	£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

All courses (unless indicated) will be held at:

- Reading courses will be held at:
  Best Western Calcot Hotel, Reading RG31 7QN
- Warrington courses will be held at:
  The Lymm Hotel, Warrington, Cheshire WA13 9AQ

The majority of our training courses can be run *"In-House"* at a venue selected by the Client. In-house courses become cost effective when clients have 8 or more members of staff to be trained. Please contact the Pump Centre for a quote.

To discuss your training requirements contact:
Jim Eaves: 07968 707753 or email jim.eaves@arcadis.com

To reserve your places contact:
Karen Bridgeman: 01925 843512 or email karen.bridgeman@arcadis.com

For more training information visit www.pumpcentre.com

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