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The VEGAPULS WL S 61 radar sensor is ideal for all simple applications in the water-supply and sewage sectors. Featuring a wide range of mounting options, it is an especially cost-effective radar solution, because it can be readily integrated into existing infrastructure.

Just as with the VEGAPULS WL 61, which has been available for several years with a large installed base, the new VEGAPULS WL S 61 offers a design optimised for use in the water supply and sewage sectors. Radar technology offers numerous advantages compared with ultrasonic sensors, which used to be standard in this sector; radar is independent of weather influences, strong sun, wind, fog or rain. In addition, no compensation is needed for variations in the signal transmission time due to air temperature fluctuations. With an accuracy of +/- 5 mm, the VEGAPULS WL S 61 covers a wide range of applications.

This sensor is particularly suitable for level and flow measurement in water treatment plants. Its excellent focusing enables its use in pumping stations and rainwater Overflow basins, for flow measurement in open channels, and for level monitoring.

The sensor’s robust housing is wear and maintenance-free, and its high degree of protection, IP 68 (2 bar), also makes it suitable for applications where the sensor may be temporarily submerged. The unit complies with the latest LPR standard (Level Probing Radar), and is approved for open-air use without restrictions or special attachments.

In its development of this new sensor for simple measurement tasks, VEGA drew on its many years of experience. Today, almost 40,000 VEGAPULS WL 61 sensors are being successfully used worldwide in the water-supply sector.

An entirely new feature is the Bluetooth wireless operation from a smartphone or tablet (and/or a PC with PACTware) when combined with a Bluetooth USB adapter; this makes commissioning and diagnosis even simpler. Corresponding display and signal processing units enable the display of measurements and provide the relay outputs needed, for example, to control a pump.

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In Water and Wastewater Asia September/October 2017 issue: we delve into how the Singapore District Cooling runs an underground sophisticated engineering marvel (p.14) in the city centre to bring greater efficiency and energy savings for its customers. We review how FESTO’s quarter turn actuator DFPD-HD is an ideal for automation of large ball valves (p.53) and why the Ultivo is the most innovative, cost-efficient and smallest Triple Quadrupole LC/MS that Agilent has ever produced (p.52).

With the global water and wastewater treatment market anticipated to grow to US$138.08 billion by 2022, especially in Asia Pacific which is to be the fastest growing region due to the rise in population, we spoke to Okay Barutçu, group senior vice president & regional managing director of Grundfos, to find out what are some of the biggest issues water utilities leaders are facing in Asia and how Grundfos is working together with them to provide long-term solutions (p.48).

For the curious readers, we have Black & Veatch sharing with us on how to turn flood challenges into opportunities (p.36) as well as Tom O’Donnell from Neptune Chemical Pump to guide us in choosing the right chemical metering pump for treatment plant systems (p.40).

Finally, we have Veolia demonstrating their ability in odour management and solving space limitation issues with turnkey solutions for Associated British Foods in Thailand (p.18).

On behalf of the editorial team, I would like to thank you for your continued support of Water and Wastewater Asia, and invite you to stay abreast on the latest developments in the water and wastewater industry at www.waterwastewaterasia.com.
Keppel Infrastructure and PUB break ground with Singapore’s very first dual-mode desalination plant

The groundbreaking ceremony at Marina Barrage saw the unveiling of the innovative design of the Keppel Marina East Desalination Plant, Singapore’s fourth desalination plant, which was a joint partnership between Keppel Infrastructure Holdings Pte Ltd (Keppel Infrastructure) and PUB, Singapore’s national water agency.

The ceremony was officiated by Guest of Honour, minister for the Environment and Water Resources, Mr Masagos Zulkifi; chairman of Keppel Corporation, Dr Lee Boon Yang; permanent secretary of Ministry of the Environment and Water Resources, Mr Choi Shing Kwok; chairman of PUB, Mr Chiang Chie Foo; CEO of Keppel Corporation Limited, Mr Loh Chin Hua; CE of PUB, Mr Ng Joo Hee; and CEO of Keppel Infrastructure, Dr Ong Tiong Guan.

The first of its kind in Singapore, the Keppel Marina East Desalination Plant will be a large-scale dual-mode desalination plant in Singapore that can treat both seawater and freshwater. Depending on wet or dry weather conditions, water is channelled either from the Marina Reservoir or the sea to the plant, where it will be treated.

The plant also achieves multiple uses of land, with underground treatment facilities and 20,000 square metres (sqm) of open green space on the rooftop for community recreation.

Slated for completion by 2020, the Keppel Marina East Desalination Plant will feature a sleek modern design that breaks away from that of conventional water treatment plants. Against the backdrop of Singapore’s CBD skyline, the plant is set along the Eastern Coastal Park Connector Network that bridges East Coast Park and Gardens by the Bay East. All of the plant’s water treatment equipment will be located underground, topped off by a gently sloping green lawn as its roof.

The desalination plant will also incorporate environmentally friendly features such as rainwater harvesting. Rainwater collected will be used to irrigate the green roof and support the facility’s water features and landscaping needs.

“Over the years, we have been making investments in desalination plants to bolster our water security. As a source independent of weather, desalinated water is capable of strengthening our water supply resilience, especially against prolonged dry spells and droughts. We aim to triple its capacity to meet up to 30 per cent of our water needs by 2060,” said Mr Ng.

Desalinated water is a key pillar of Singapore’s water supply, in addition to water from local catchments, imported water and NEWater (ultra-clean, high-grade reclaimed water). There are currently two desalination plants with a total capacity of 100 mgd, and another three plants in the pipeline. The Keppel Marina East Desalination Plant is one of them.

Dr Ong commented, “We are pleased to unveil the design of the Keppel Marina East Desalination Plant and mark another first in Singapore. Not only is this the first desalination plant in Singapore capable of treating both seawater and freshwater, the plant’s design also blends seamlessly into the environment, allowing the public to enjoy the green space above the plant along with the surrounding greenery.”

“By challenging conventional ideas of a desalination plant and re-imagining how an infrastructure facility should look and function, Keppel Infrastructure aims to demonstrate that engineering and design excellence can go hand-in-hand as we push for sustainable urbanisation.”

Keppel Infrastructure, through its wholly-owned subsidiary, Marina East Water Pte. Ltd., signed the 25-year Water Purchase Agreement with PUB for the Keppel Marina East Desalination Plant on 20 January 2017. The plant will be constructed under the Design, Build, Own and Operate (DBOO) model and will produce 137,000 cubic metres (about 30 million gallons) of fresh drinking water per day.

The abovementioned transaction is not expected to have a material impact on the net tangible assets or earnings per share of Keppel Corporation Limited for the current financial year. WWA
Danfoss announces new CEO

Before Kim Fausing became Danfoss’ new CEO, he had served the company as COO for nine years, where he worked closely with former CEO of Danfoss, Niels B. Christiansen to create a high-performing organisation, growth, strong financial results, and bring about a digital transformation. In his new role, he will continue with Danfoss’ strategy to focus on growth and digitalisation.

“I have felt at home in Danfoss from day one, and I look very much forward to continuing the journey as CEO. In the management team, we have defined the strategy and future direction for Danfoss, and we will continue to follow the plans we’ve made,” Fausing said. “We have a good momentum, and we make significant investments in growth and digital transformation in order to stay ahead of competition and serve our customers in the best possible way. I am looking forward to the new tasks, which I will pursue with great respect. And I look forward to continuing the development of Danfoss together with the strong Danfoss team and the Board of Directors.”

“I am pleased that we have such a highly competent successor in Kim Fausing, who for the past nine years has also played an important part in driving the positive development,” said Jørgen M. Clausen, chairman of the Board. “Danfoss can continue the positive development, with good growth, investing in digitisation and reaping constant improvements from the engine room.” WWA
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Royal HaskoningDHV signs major wastewater contract

Recently, Royal HaskoningDHV in Vietnam signed a €9.5 million contract with the Ba Ria Vung Tau Urban Sewerage and Development Company (BUSADCO) in order to implement a complete wastewater solution for more than 175,000 residents of Phu My New Urban near Ho Chi Minh City.

The project will deliver sanitation for residents and industries whose wastewater is currently discharged untreated, resulting in high levels of environmental pollution. The Dutch Government is financing the project as part of its Facility for Infrastructure Development (ORIO programme) in developing countries.

Expected to be completed by December 2019, the wastewater solution is the third ORIO funded project in Vietnam that Royal HaskoningDHV will implement. Altogether, Royal HaskoningDHV’s three projects will improve the living conditions of some 400,000 citizens.

The project also adds to the company’s growing number of environmental improvement schemes in Vietnam, where ten projects are ongoing.

The sewage plant will use Royal HaskoningDHV’s Carrousel® technology – a proven, cost-effective, reliable and highly efficient system that has already been applied in some 1,500 wastewater treatment plants across the globe – for the biological treatment of municipal and industrial wastewater. The new plant will have a treatment capacity of almost 30,000cbm per day.

The project also includes the construction of four pumping stations, over 100 kilometres of pipeline network and the connection of 15,000 households and over 1,000 small-and medium-sized enterprises (SMEs). During the operation and maintenance phase, the team will also provide technical assistance and staff training.

“The construction of a complete wastewater collection and treatment system for Phu My New Urban Area has become an urgent issue and the first priority for economic and social development of Ba Ria Vung Tau Province,” Dr. Hoang Duc Thao, the Chairman cum General Director of BUSADCO said.

“We are proud to have been awarded this prestigious contract. Since we started to define the needs for proper sanitation in this area, all stakeholders have been focussed on making this project happen. We have worked closely with BUSADCO, the People’s Committee of Ba Ria Vung Tau and the Dutch Government to define, design and now to implement this much-needed solution,” Doan Manh Thang, Royal HaskoningDHV’s Director Water Vietnam said.

“The environmental benefits will be visible in a significantly improved water quality in the area’s lakes, canals and Thi Vai River and will result in better living conditions for residents. It will also help small and medium enterprises to protect the quality of the environment around their businesses.” WWA
Grundfos teams up with ADRA and releases a study on flood controls in Southeast Asia

Bringing clean water to 1.5 million people
International humanitarian organisation, ADRA International, and Grundfos recently partnered in an initiative that will offer access to clean water to approximately 1.5 million people in Africa, Asia, Central and South Africa, and the South Pacific over the next five years.

The goal of the partnership is to improve and save lives by putting renewable energy and water innovation technologies to pivotal roles in order to provide more efficient and sustainable water access rather than more traditional methods.

Malaysia industry leaders call for proactive approach to flood management
In a study that surveyed 417 sustainability industry leaders across southeast Asia (Malaysia, Indonesia, Singapore, the Philippines, Thailand and Vietnam), it revealed that nearly 70 per cent of them predicted that their home country will continue to face extreme weather events over the next decade, taking a significant toll on local economies and infrastructure. The majority of respondents believe average temperatures have become higher and monsoon seasons have become more unpredictable.

Released by Grundfos and sustainability-focused social enterprise, Eco-Business Research, titled ‘Flood controls in Southeast Asia’, the predictions are particularly worrying for a country like Malaysia with the Organisation for Economic Co-operation and Development already estimating that by 2070, the country’s most exposed cities could lose up to US$84 billion in combined assets due to severe weather events.

Tim Hill, research director for Eco-Business Research, said, “It was a wake-up call to hear that the majority of people surveyed believed flooding was going to get worse and how much damage that could cause to livelihoods in the region. While countries across Southeast Asia are at various implementation stages of their water management and flood control systems, looking ahead there is opportunity to adopt a more coordinated approach both at a national and regional level.”

Although Malaysia has not suffered as many severe floods as some of its neighbours in recent years, incidences - such as in January and May this year - can cause devastation and massive disruption to livelihoods. Unfortunately, the situation is predicted to get worse, with more intense rain predicted in the coming decades.

The study also calls for a regional approach to flood management, urging governments to communicate their best practice initiatives and establish frameworks for prevention and protection. Malaysia respondents were also less likely to agree that their country was working adequately with neighbours to address the issue, although other countries also shared the same concern.

With Grundfos’ solar-power technology, ADRA has developed an innovative water kiosk model where customers can get clean water, buy hygiene supplies as well as other basic household requirements from a menu, and learn more about numerous hygiene topics through a range of displayed videos, among others. The kiosks will not only offer services to the community, but also generate revenue for the entrepreneurs who own them, as well as create jobs.

Kim Nøhr Skibsted, Grundfos’ group vice president, for Communication, Public Affairs & Engagement and member of Grundfos Group Management, said, “We are dedicated to improving how people access water and ensuring that the supply remains sustainable for years to come. With a trusted global partner like ADRA, we are certain that our combined efforts will create new opportunities and foster greater prosperity among many vulnerable people.”

Panelists discuss the future of flood control in Malaysia. Photo credit: Grundfos
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Agilent Technologies to expand its manufacturing and research capabilities in the next five years with S$85 million investment

Recently, Agilent Technologies announced that it will increase its already-impressive applied research and development capabilities in Singapore with investments and business expenditures of S$85 million over the next half decade.

These investments and expenditures will allow the facility in Singapore to offer complete end-to-end manufacturing, test, and supply chain management, as well as equip the facility with state-of-the-art automated systems.

Additionally, the investment will allow Agilent to add another 30,000sq ft within its current sprawling facility and create approximately a hundred new jobs in R&D, advanced manufacturing, service and sales over the next five years.

“Singapore is a strategic location for Agilent,” said Mike McMullen, president and CEO of Agilent. “We appreciate the environment of innovation Singapore has created, as well as the important investments it is making in growing areas such as medical technology and biopharma.”

“The expansion of Agilent’s manufacturing facility is a testament to Singapore’s leadership position in the medical technology field,” Yeoh Keat Chuan, managing director of Singapore Economic Development Board, said. “Agilent will deepen its research capabilities and increase the value of its products and its manufacturing output through the design and development of new instruments and solutions for global markets. This is an excellent example of how leading life science tools companies look to Singapore as a home base in Asia for manufacturing, commercial functions, as well as R&D to support their future growth.”

“The expansion will leverage advanced manufacturing systems and automated production technologies to support the production of a broader range of high-end analytical instruments, especially our mass-spec products,” Chow Woai Sheng, vice president and country general manager of Agilent Singapore, added. “Our recently launched breakthrough mass spectrometry instrument, Ultivo, is a great example of a product designed in collaboration by engineers in the US and Singapore that will be manufactured here in Singapore.”

Agilent’s scientific instruments are used in markets such as environmental, chemical and energy; pharmaceutical, food testing and clinical laboratories around the world. Ultivo is the latest in Agilent’s portfolio of liquid-chromatography or mass-spectrometry instruments, and can be used to address food and environmental testing needs, including testing the quality of air and water. Launched in June, it is 70 per cent smaller than its predecessor, but delivers an equal or better performance compared to much larger instruments. This allows customers to increase their analytical throughput without having to increase the size of their laboratories. WWA

From left to right: Chow Woai Sheng, Mike McMullen and Yeoh Keat Chuan - Unveiling of plaque.

Photo credit: Agilent Technologies

Agilent’s expanded facility in Singapore.

Photo credit: Agilent Technologies
Siemens looks to enhancing relationship with users in Southeast Asia

The biannual Siemens Process Automation Conference & Exhibition (SPACe) Innovation Tour 2017 will visit five countries in Southeast Asia. The show, focusing on automation and technology, among others, began in Vietnam in June, and will continue to countries such as Singapore, Thailand, Philippines and Malaysia in August and September. More than 500 visitors from all over the region are expected to attend the SPACe ASEAN Innovation Tour 2017.

Themed “Driving the Digital Enterprise in Process Industries of Southeast Asia”, conference sessions are made of customised topics based on specific country and industry requirements, including process automation and safety, industrial communication, and emerging industry trends much like digitalisation, among others. Additionally, this would also allow Siemens users to engage with experts and other users in the region.

These activities will also allow the user community as well as potential users to share and exchange knowledge with industry peers, discover more about Siemens and its various technologies, and network with fellow users as well as Siemens technical experts, thus enabling them to learn from each other while also gaining first-hand knowledge about new technologies and their applications.

“Based on the feedback and support from the user community, we have evolved SPACe to cover more markets this year in order to reach out to and engage with the wider user community,” Dr. Friedhelm Geiger, head of Siemens PD PA ASEAN Solution Business, Siemens Thailand and SPACe Siemens Advisory Board Chairman, ASEAN, said. “Since the inception of SPACe in 2010, we have had very successful sessions with participants, and we look forward to continuing this outreach by showcasing our expertise in the Process Industries space, and at the same time discussing opportunities available in each of the Southeast Asia markets.”

WWA
Convergence on Belt and Road Infrastructure Projects

Despite their differences, China and Vietnam have much to gain under the ambitious Belt and Road Initiative. Despite having achieved remarkable economic progress in recent years, Vietnam’s weak infrastructure is seen as a hindrance to future development. In particular, major network upgrades to its transport, power and technology systems are desperately needed if it is to deliver smooth and cost-effective trade flow, seen as vital for the region’s increasingly connected markets.

Proponents of China’s ambitious Belt and Road Initiative believe the Initiative could benefit Vietnam enormously. Under the terms of the Initiative, China will help fund and construct a world-class network of high-speed railways, motorways, pipelines and ports across South Asia and Southeast Asia, with Vietnam seen as a key component for economic revitalisation.

Vietnam’s strategic location and ease of access to its ASEAN neighbours give it a pivotal role in the Belt and Road strategy. Indeed, its cooperation is required if China is to make good on its promise to deliver a series of trade routes running from the mainland’s Fujian Province, passing through Southeast and South Asia, and onwards to Europe.
A particular focus is the planned upgrade of North Vietnam’s Hai Phong port, a development seen as a priority under terms of the Initiative. The US$1.2-billion project has been divided into two distinct phases. The first is actual construction work on the port to be managed by the Vietnam Marine Administration. The second phase is a joint venture between several Vietnamese and Japanese enterprises involving construction of two wharves with a total length of 750 metres, giving the port the capacity to service 100,000-tonne container ships.

Despite the two-way economic benefits of enhancing Vietnam’s infrastructure and its connectivity to China, a number of sensitive issues remain. Apart from the ongoing territorial dispute on the South China Sea, Vietnam has also expressed concerns about the quality of the construction work, the sustainability of the project, and about possible environmental damage.

Highlighting this, a statement from OBOR Watch, a self-appointed monitor of the progress of the Initiative, said, “China’s business practices have excited local protests in several countries where state-owned enterprises have constructed energy and infrastructure installations. Indeed, a number of Chinese firms have been accused of cutting corners, ignoring safety standards, and using second-hand or low-quality materials and equipment.”

Despite such concerns, Chinese investment in Belt and Road-related projects is still being officially welcomed in Vietnam. During a September 2016 summit in Beijing, Vietnamese Prime Minister Nguyen Xuan Phuc and Chinese Premier Li Keqiang publicly reaffirmed their commitment to the Initiative and to the investments that have already been agreed. These include the China Export-Import Bank’s 2013 financing of the Ninh Binh coal-based fertiliser plant and, in the same year, the China Development Bank’s investment in Phase One of the Vung Ang Power Plant.

China is also playing a significant role in the development of Vietnam’s railway infrastructure. To this end, China Railway Sixth Group Company has been awarded the contract to construct the Cat Linh-Ha Dong urban railway project in Hanoi. China has provided most of the US$550 million funding for the project through preferential credit loans of about Rmb1.2 billion ($169 million), as well as through another $250 million in concessional loans.

Another cornerstone project high on the agenda at the Beijing summit was a standard gauge upgrade to the rail link between Lao Cai on the border with China’s Yunnan Province and Hanoi and Hai Phong. Once completed, this will allow greater trade volumes to be carried along the line, a necessity given the expanded capacity of Hai Phong’s port capabilities once its own upgrade has been completed.

The article was originally published by the HKTDC Hong Kong MeansBusiness.
Cooling the city centre

By Andrew Ang & Tan Yingzhi

The district cooling system is owned and managed by Singapore District Cooling (SDC), a subsidiary of SP Group.
With the completion of a major expansion project, Singapore District Cooling operates the world’s largest underground district cooling network, bringing various benefits to users and the environment.

The shimmering, metallic curtain façade of a low-rise building adjacent to Marina Bay Sands gives little hint of the sophisticated engineering marvel five storeys below ground. It houses the district cooling system owned and managed by Singapore District Cooling (SDC), a subsidiary of SP Group. SDC provides cooling services to developments in the area such as the Marina Bay Sands Integrated Resort, Marina Bay Financial Centre, and Gardens by the Bay.

With the commissioning of its plant operations and the completion of a major expansion project, SDC runs the world’s largest underground district cooling network and is among the world’s largest in cooling capacity.

**Deep chills**
District cooling is the centralised production of chilled water that is piped to buildings for air-conditioning. As a communal utility, it services buildings close to one another within a district.

SDC has three plants at Marina Bay producing chilled water, which is subsequently piped to buildings in the network to feed into their air-conditioning systems. Warm water is then returned to the plants to be re-chilled and re-distributed.

The three plants, with a total installed capacity of 217MW, currently serve 1.7 million square metres of Gross Floor Area (GFA), across over a dozen buildings in the district. Featuring the world’s largest dual evaporator chiller and located 20 to 25 metres underground, the network is the deepest in the world, and is serviced by 5km of pipelines.

“With the completion of the third phase of expansion, we would have built most of the district cooling capacities required for this zone of the Marina Bay district,” said SDC Chairman Wong Chit Sieng.

At the commissioning, Guest of Honour Mr Lawrence Wong, minister of National Development, lauded the facility. “This really is an engineering feat, one which is developed in Singapore, made in Singapore, and operated by our very own homegrown company SP Group and Singapore District Cooling,” he remarked.

**Savings and Sustainability**
SDC’s customers enjoy greater efficiency and energy savings of more than 40 per cent as compared to traditional cooling methods.

SP Group CEO Wong Kim Yin, said, “SDC provides an efficient, reliable and sustainable solution that translates to significant energy savings for customers. Through SDC, Singapore has another world-class solution that can contribute to meeting the world’s need for a sustainable future.” The energy saved could power 24,000 3-room HDB units. “SDC spearheads SP Group’s contribution to sustainability in support of Singapore’s effort to meet the global accord COP21!” added the Group CEO.

“This really is an engineering feat, one which is developed in Singapore, made in Singapore, and operated by our very own homegrown company SP Group and Singapore District Cooling.”

Minister Lawrence Wong
Asia Square, one of SDC’s existing customers, has reaped the benefits of this system. Mr Philip Chan, Asia Square’s sustainability manager said, “As one of Singapore’s finest developments in the heart of the city, environmental sustainability is an important feature for Asia Square. With Singapore District Cooling’s energy-efficient cooling system, we are very happy with both the energy and cost savings that we have been able to achieve.”

More customers are expected to benefit from SDC’s network. On 3 March 2016, SDC signed a new supply agreement with the mixed-use Marina One development at Marina South.

A spectacular skyline
With the network located underground, approximately 16,000sqm of usable GFA has been freed up. The rooftop experience is now very different, as the rooftops of buildings are available for other uses.

In place of unsightly cooling towers, the developments in Marina Bay district have rooftop gardens. In the case of Marina Bay Sands, this has made way for the world’s largest infinity pool that has fast become a Singapore icon.

SDC has also achieved 99.99 per cent reliability, with multiple back-up systems, so that customers can have uninterrupted supply of cool air. SDC has recorded zero safety incidents since the start of operations in 2006.

A success story many years in the making
The Singapore government initiated the district project as an integral infrastructure for the Marina Bay area transformation in 1995. SDC commenced commercial operation in May 2006, with One Raffles Quay the first development to host a cooling plant and receive chilled water supplies from the DCS. In May 2010, SDC commissioned its second district cooling plant at Marina Bay Sands, which also serves One Raffles Quay, The Sail @ Marina Bay and Marina Bay Financial Centre. On 3 March 2016, SDC signed a new supply agreement with the mixed-use Marina One development at Marina South.

Mr Ng Lang, CEO of Urban Redevelopment Authority, said, “Developing a centralised district cooling network to serve the Marina Bay precinct is a bold idea many years in the making. Today, we reap the benefits from early planning and thoughtful design, from freeing up space and saving costs to reducing carbon emissions. We are delighted to have worked with SP Group and many other partners to realise this vision for a vibrant and sustainable Marina Bay, one that is supported by world-class infrastructure.”

During the plant tour with Chief Executives of the Energy Market Authority and Urban Redevelopment Authority, Minister Lawrence Wong held up the district cooling system as a success story, with more developments choosing to use the system on a voluntary basis, compared to the mandatory initial phase. “The expertise has even gone beyond Singapore’s shores. SDC has built and is operating an advanced energy-efficient cooling system in Chongqing city as well,” added Minister Wong.

Said SDC Managing Director Jimmy Khoo, “These achievements are the outcome of investment in, and development of in-house engineering depth and breadth. This in-house expertise is critical for us to have a deep understanding of the equipment and to extract the best performance from the team.”

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In Veolia, ABF found a partner that is both ambitious and flexible

Associated British Foods, better known as ABF, is one of the world’s global leaders in food production and manufacturing, behind world-renowned brands such as Ovaltine, AB World Foods, and Twinings. But in their manufacturing plant in Thailand, they found that Veolia was the best option to mitigate their environmental challenges.

With an extensive history in Thailand where Ovaltine is a much-loved libation, ABF, one of the largest food manufacturers in the world, owns and operates a facility to produce the malted drink in the nation. But with water one of the necessary components of manufacturing the drink and water scarcity a global affliction, ABF started to look at wastewater solutions that suited their wastewater needs.

But their solution for a wastewater treatment plant required a solution of its own: With limited free space available on the ABF site and with the facility situated close to the residential area in Samutprakarn, Bangkok, Thailand’s capital city, there were a number of constraints to consider, with odour management and space limitations among them.

With the plant fully optimised and automated, only one operator per shift is needed.
After considering their options, they turned to Veolia Water Technologies, a subsidiary of Veolia, to provide them with the turnkey solutions they needed for their wastewater treatment plant.

Now, the wastewater plant allows ABF to handle its wastewater treatment needs on its own premise, and the plant’s capacity is catered to both existing, as well as future flow requirements.

“Veolia was very flexible, and were able to accommodate and follow ABF’s requirements, as well as to raise the bar,” Rolf Haas, the Regional Engineering Manager for ABF, explained. “But in terms of the compactness of the plant, Veolia had the most attractive proposal, because they were also flexible enough to say, ‘Okay, we’ll try harder.’”

Resourcing the world
Passionate about the environment and sustainability, Veolia lives and breathes their philosophy, “Resourcing the world.”

And with more than a thousand clients in the Asia Pacific region alone and an army of 9,500 staff servicing clients all over the world, Veolia Water Technologies is able to touch many with their zest for the health of the planet and the people.

Founded in 1853 in France, Veolia has never faltered in their quest to continue developing technology to better treat wastewater and recycle water. Now, they offer clients their unique global expertise, gathered through a century and a half of experience in the water industry alongside key equipment that comes with turnkey solutions.

Additionally, having maintained a presence in Thailand for over three decades, Veolia was the company ABF consulted for a customised solution regarding their plant.

The plant
Water treatment plants are usually sprawled affairs. But situated on a space which is 30 metres by 26 metres, ABF’s water treatment plant in Bangkok is one of the most compact facility for its water treatment capacity.

“I can confidently say that this is the most compact wastewater treatment plant in all of Thailand,” Michael Poonpipat, the Business Development Director at Veolia Water Technologies in Thailand, stated.

But because of its size and the fact that they have to minimise the odour of the plant due to its location, they needed a unique turnkey solution to a specific problem.

“The plant is partly surrounded by commercial buildings and residential areas,” he continued. “Using Veolia’s technologies, we were able to contain majority of the odour successfully.”

Although small, compact, and built upwards instead of outwards, the ABF wastewater treatment plant does not compromise on the...
quality of the wastewater treatment process. Additionally, the efficient plant can even generate bioenergy in the form of biogas. But the plant does have its limitations. “Height restrictions was something we had to consider in our engineering design,” Poonpipat added.

Optimising the plant

“The technologies we used are not only space-saving, but they also come with very low operating costs, so it’s the best of both worlds,” Poonpipat said.

For instance, using biogas as an alternative energy was one of the aspects of the project, due to the anaerobic treatment which enables the bacteria to consume the waste in the wastewater and produce biogas. “In this case, we saw that the biogas production was quite high, and it made sense to be reused in the boiler, which was modified to take liquefied petroleum gas (LPG) and biogas,” he revealed. “We have a biogas treatment solution to remove the hydrogen sulphide (H₂S), and to purify the biogas, resulting in methane purity of around 80 per cent before the biogas is sent to the boiler’s burner.”

The customised solution for biogas, however, goes further than that. “One of the benefits is reduced sludge production, which is an operating cost because you have to pay a third party to take and dispose of your sludge,” he continued. “So the more sludge you have, the higher your disposal costs. So we implemented the Biothane UASB anaerobic treatment that reduces sludge production more effectively when compared to more conventional aerobic activated sludge systems, and as less electricity is required for anaerobic treatment, we also had an overall electrical consumption reduction.”

Another example of the ways in which the plant was optimised was as a request from ABF to Veolia. “ABF wanted the plant to be fully optimised and automated for one operator per shift to control overall operational costs,” Poonpipat disclosed. “So we designed the system to be fully automated, and we optimised the system to be one of the state-of-the-art plants in Thailand, enabling remote monitoring and support.”

The technology

“To accommodate the limited land area, we incorporated space-saving technologies from Veolia,” Poonpipat said. “Compact and effective wastewater technologies have become more popular in recent years as countries continue to tackle land constraint challenges, and we are noticing that this is happening in Thailand as well.”

The solutions Veolia delivered to ABF were customised and turnkey, specifically designed for the plant. While the technologies used in the facility are not new, they were integrated into something unique...
ABF’s wastewater will pass through the flocculation tank before entering the DAF system – and were streamlined into one process line instead of many.

“We are not reinventing the wheel. These are treatment systems we are familiar with, but this project came with a special set of challenges,” he stated.

The plant’s large buffer tank, allows it to treat quite a large flow, and there is also a conditioning tank – part of the anaerobic treatment’s design – to condition the wastewater before letting it flow to the anaerobic digester, the Biothane UASB technology, where the bulk of COD is removed and converted into Biogas.

The wastewater then flows into the aerobic system, the Moving Bed Biofilm Reactor (MBBR), and is followed by a small aeration to remove the residual COD and BOD, before ending up in one of the plant’s two Dissolved Air Flotation (DAF) units. From the DAF unit – where the biological suspended solids are clarified and collected for disposal – the water will then flow into the Hydrotech Drumfilter as a final filtration prior to discharge in the canal “right next door”.

Additionally, the plant boasts a safety feature that ensures that if the effluent quality levels are not met, the water would flow back into the buffer tank.

“Part of the technology selection that was integrated into the design in the beginning was knowing our capabilities and knowing that our equipment was able to allow for a small footprint without compromise on performance, and also the reliability and operability,” he added. “In general, all the technologies used are space-saving, and we pride ourselves on our compact design with a small footprint.”

Necessity and innovation

With the various constraints surrounding the building, including existing regulations that limit the plant to a height of 8 meters, the treatment facility Veolia designed and constructed for ABF has become a study in innovation.

To follow the client’s requirements and taking into account that the space was limited and located in a residential area, Veolia proposed stacking its technologies in the plant one on top of the other, though within the height limitations.

“The DAF is on top of the equalisation tank to allow for gravity flow,” he explained. “As a result of this design, we also reduced the number of pumps to keep the electrical consumption low.”

But using gravity was not the only innovative solution Veolia had in store for ABF: The cleaning-in-place (CIP) tank in the plant was also one of Veolia’s innovations, brought about when ABF mentioned that they were experiencing issues with temperatures and high load during their CIPs.

“So we developed a CIP tank, which will allow temperature exchange to take place before slowly discharging the high COD water to the wastewater treatment plant, which is one of the keys for a successful wastewater treatment plant,” Poonpipat stated.

The benefits

With the construction and design of the wastewater treatment plant for ABF, Veolia continues to consolidate its place as one of the leaders in the water industry with a reputation for customising and optimising solutions for their clients according to their unique requirements.

“One of the things we have also managed is to help reduce the risk of this investment for ABF as we have used proven Veolia technologies, and we also saw this as a very good opportunity to showcase our equipment and advantages that our equipment offers,” Poonpipat concluded.

At the end, ABF was a very happy client as well.

“Our expectations were high, but Veolia was ready to take on this challenge, so we agreed to do this project together,” Haas added. “Additionally, Veolia is also very strongly represented in Thailand, and they do not need to fly an expert in if something does go wrong with the plant.”

All images are credited to Associated British Foods (Thailand)
Moleaer was founded in 2016 with the mission to reshape the aeration industry. The company’s flagship product, the Moleaer XTB Nanobubble Generator, is unlike conventional aeration systems that typically demonstrate very poor gas transfer efficiencies and are ineffective at maintaining optimal gas saturation levels.

Moleaer’s XTB Nanobubble Generator is unique in that it produces trillions of nanobubbles at near perfect gas transfer efficiency. Moleaer’s nanobubbles have minimal buoyancy and can disperse throughout a body of liquid and remain submerged for prolonged periods of time, thereby providing a stable battery reserve of gas. The longevity of the nanobubbles in liquids, combined with a larger interfacial surface area, significantly increases their gas transfer capacity well beyond traditional aeration systems.
Issue: straining the city’s aeration system

Ideal for wastewater treatment, the Moleaer XTB Generator was recently installed at the Village of Warrens municipal treatment plant in the U.S.. The Village of Warrens treats its municipal wastewater through a 3-ring oxidation ditch system which was aerated with three 7.5 HP surface disk aerators. Historically, these aerators provided sufficient air to meet the oxygen demand of the treatment process. However, in 2016 a new cranberry juice processing plant was commissioned just three miles away from the Warrens treatment facility. The high strength effluent generated by the juice processing plant placed a heavy strain on the city’s existing aeration system, rendering the treatment facility unable to supply enough oxygen into the oxidation ditches. At one point, the Warrens treatment plant became overwhelmed when a heavy wash-down made it impossible to raise the oxygen levels above 0 ppm in any of the ditches, resulting in improper treatment for over a month. The plant operator needed a system that could simply and cost effectively integrate into the existing design with minimal retrofitting and operational maintenance.

Delivering extraordinary results

On November 10, 2016, the Village of Warrens installed the Moleaer model 200 XTB Nanobubble Generator into the outer ditch of its 3-ring system. Depending on oxygen demand, the new generator was able to inject between six to 20 pounds of O2 per hour, significantly increasing the dissolved oxygen right through to the center ditch. Table 1 shows the plant’s DO levels before and after the installation of the Moleaer 200 XTB.

Table 1: Dissolved Oxygen Levels at Village of Warrens Treatment Plant

<table>
<thead>
<tr>
<th></th>
<th>Before 200 XTB Installation</th>
<th>After 200 XTB Installation</th>
</tr>
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<tbody>
<tr>
<td>Outer Ditch</td>
<td>0.11 ppm</td>
<td>3.6 ppm</td>
</tr>
<tr>
<td>Middle Ditch</td>
<td>1.2 ppm</td>
<td>7 ppm</td>
</tr>
<tr>
<td>Center Ditch</td>
<td>4 ppm</td>
<td>10 ppm</td>
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</table>

According to plant operators, the most favourable factor of the Moleaer system was the ability to install it within a few hours without the need to hire an external engineering firm. This is especially appealing for small-to-medium sized treatment plants who cannot afford extended and costly disruptions that can sometimes last a few days. For the Village of Warrens, the Moleaer 200 XTB has outperformed their expectations, often delivering more oxygen than needed and enabling operators to easily switch between pure oxygen and air. This feature is especially critical for the Warrens plant when a batch of high-strength BOD waste water is anticipated - operators simply switch the gas feed over to the oxygen, quickly buffering the ditches with more oxygen to compensate for the higher demand.

The 200 XTB Generator can run non-stop and the extremely small bubbles have produced no adverse effects to the settleability of the sludge. Sampling has demonstrated that the addition of nanobubbles to the sludge prevents it from turning septic even after aeration has stopped. Plant operators have noted that there appears to be a latent oxygen transfer from the nanobubbles which they expect to have a positive effect on reducing sludge volumes.

The Moleaer XTB aeration system has proven to be great value for small plants, like Warrens, that need to increase capacity but can’t afford expensive capital upgrades.

How the Moleaer XTB Nanobubble Generator works

The Moleaer XTB Nanobubble Generator is a novel, patent-pending method of injecting oxygen into water so as to enhance the biological treatment process, reduce off-gassing and lower treatment costs. A highly efficient, proprietary 2-phase gas transfer process saturates wastewater with dissolved oxygen and trillions of ~100nm-sized bubbles that provide a prolonged transfer of oxygen for days after the point of aeration. Nanobubbles exhibit unique characteristics; due to their minute size and high internal pressure, they can remain stable in water for prolonged periods of time. Unlike micro bubbles that rise and burst quickly on the surface, nanobubbles have minimal buoyancy and can disperse throughout a body of water due to the principals of Brownian motion (see Figure 1).

The longevity of the nanobubbles in water, combined with a larger interfacial surface area, significantly increases their oxygen transfer capacity well beyond traditional aeration systems. Moleaer’s nanobubbles can be injected at any depth and oxygenate the entire column of water including the bottom sludge layer that requires oxygen to support aerobic breakdown and conversion of nutrients.

Moleaer nanobubble generators have the potential to provide the lowest OPEX aeration solution.
As opposed to traditional aeration which relies on large HP blowers with diffusers or surface aerators to transfer oxygen into wastewater, Moleaer's nanobubble generators can be installed in-line utilising existing pumps to inject nanobubbles into passing water, or they can operate with their own dedicated pumps. In-line use means existing aeration systems can increase oxygen delivery without additional energy consumption. Traditional aerators consume considerable amounts of energy yet their oxygen transfer efficiency is very low. They also generate turbulent and fast-rising bubbles that strip unwanted gases from wastewater and inhibit optimal aerobic digestion. Moleaer's nanobubble injection method creates a low turbulent, oxygen-rich environment which enables aerobic bacteria to function more efficiently.

Moleaer's nanobubble generators can be installed quickly with minimal retrofitting, meaning there is no disruption to daily operations. They have a proven track record of reliability, are rated for more than a decade of continuous operations, and require minimal maintenance. The units are self-cleaning and do not foul or plug like traditional diffusers. They can be mounted on the outside of a tank or on the bank of a lagoon, thus giving operators easy access and control of the unit. The generators can alternate between air and high purity oxygen depending on the given oxygen demand of the treatment system, and they can also be turned on and off to conserve energy when required.

In addition to aeration basins, Moleaer Nanobubble Generators have been installed in a variety of wastewater applications such as activated sludge tanks, aerobic digesters, stabilization ponds, lagoons and lift stations. WWA
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If the 1.5 million motorbikes that cram the streets of Ho Chi Minh City everyday queued one behind the other, they would still cover less than one tenth of the local water distribution network, which serves more than eight million residents and stretches around 33,000 kilometres.

In just 50 years, Ho Chi Minh City has transformed from a simple economy based on fishing into the economic heart of Vietnam and the country’s largest city. In the 1960s only five per cent of the Vietnamese population lived in cities - the number has grown to 33 per cent today, as people are attracted by higher quality living conditions and job opportunities. It is a trend that sees the Ho Chi Minh City’s boundaries expand by four per cent each year.

Such significant growth brings wealth for the entire country, but it also threatens the rapidly aging urban infrastructure, including the city’s water network. Ho Chi Minh City lost nearly 30 per cent of its clean water in 2016 through leaking and damaged pipes. Many sections of the water distribution infrastructure are old. Some sections were built more than 30 years ago, while others even date back to the colonial era. More than 150 million cubic meters of water went to waste last year. For perspective, most developed cities have a water loss rate of five to seven per cent.

Keeping up with growth
In order to keep up with the rapid pace of urbanisation and meet the target of reducing the water leakage to only 10 per cent by 2020, the local utility Saigon Water Corporation (SAWACO) recently undertook a major renovation of the city’s water distribution network. Expansion of the current network capacity, integration of more isolated sections, reduction of water leakage, and real-time control and monitoring of the network conditions to prevent major disruptions are all part of the project scope.

To meet this complex target, a strategic ABB Ability™ Symphony® Plus SCADA system has been designed. The ABB system integrates a sophisticated leakage detection and management system from the water network management company TaKaDu. The project will deploy several data collection points, such as sensors and meters for flow and pressure monitoring, to the water network and allow SAWACO...
to digitally monitor the network conditions in “nearly real time”. The utility will be able to continually detect, analyse and manage network events transforming that information into immediate actions to reduce the water losses.

ABB Ability Symphony® Plus is a distributed control system (DCS) especially tailored for the water and power industries. Part of the ABB Ability™ portfolio of digital offerings, this control system adds value for customers by carefully collecting, analysing and providing actionable insights on plant and engineering data in their systems, ultimately allowing them to lower project risk, reduce cost and throughput times and improve asset performance and profitability.

ABB’s scope of supply for this critical project includes field instrumentation and sensors that are critical components to deliver high quality data to the control system.

Projects like Ho Chi Minh City water network show the full potential of advanced automation for all municipalities dealing with rapid expansions or aging infrastructures,” commented Kevin Kosisko, managing director of ABB’s Power Generation & Water business. “Furthermore, the smart collection of digital data from the field will offer real-time insights on the network status, allowing for increased revenues”.

A fruitful outcome
Thanks to the digitalisation of its network, the real-time knowledge of network conditions and the accurate detection of leaks, SAWACO will be able to increase the amount of water delivered to households and industries. In doing so, it will minimise the estimated 500,000 cubic meters of non-revenue water lost per day, roughly the daily capacity of a medium-sized water plant in the city.

Since its launch in 2011, ABB Ability™ Symphony® Plus has achieved more than 6,800 new installations, on top of the thousands of plants that have chosen to upgrade to this DCS. Symphony Plus is the DCS of choice for other projects in Vietnam such as the original commissioning and further extension of the Vinh Tan 4 supercritical power plant, located 250 kilometres east of Ho Chi Minh City. Upon completion, the complex will provide an additional 5,600 megawatts of electricity to the Vietnamese national grid.
Why Australia must rethink water systems design

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Legionella is a lingering, ever-present bacterium which, in the right breeding conditions, poses a significant health risk.

The disease-causing bacteria found in potable water supplies is spread when people inhale in a mist or vapour – from air conditioners, showers and heated water systems. Left undetected, Legionnaires’ disease can lead to severe illness and potentially death, particularly for people in high risk categories, such as the elderly or those suffering with cancer, diabetes or a chronic lung disease who often have a weakened immune system.

Hospitals are one of the highest risk environments for Legionella as they have large and complex water systems coupled with the vulnerability of those using it, and therefore detailed water management is crucial to avoiding outbreaks.

But preventing an outbreak is an ongoing and complex process. Although routine maintenance, record keeping and risk management plans are already required as part of the relevant Codes of Practice, Public Health Acts, and Australian Standards for each State, system design and fixture choice can significantly impact prevention control.

Recent occurrences of Legionella in hospitals
Outbreaks of Legionnaires’ disease have raised national and worldwide public concern, particularly because of the ease at which an outbreak can occur and its insidious mode of transmission.

As recently as February 2015 in New York, a Legionnaires’ outbreak resulted in the death of 12 people and left at least 100 others infected when the disease made its way into hotel cooling towers.

Closer to home, this event reminds us of one of Australia’s biggest outbreaks in 2013, when contaminated warm water drawn through hospital taps at Brisbane’s Wesley Hospital resulted in the death of a patient and left another critically ill in intensive care. It was reported that a State Government energy efficiency programme may have increased the risk of Legionella bacteria growing in water supplies. Temperature controls in place at the hospital meant water could not reach a temperature higher than 45°C. This created an optimum birthplace for bacteria growth as Legionella flourishes at temperatures between 25°C and 45°C.

Australian guidelines
The Plumbing Code of Australia (NCC Volume 3 – 2015) requires heated water be stored and delivered under conditions which avoid the likelihood of the growth of Legionella bacteria. The National Plumbing and Drainage Code stipulate hot water be stored at no less than 60°C to help prevent the growth of Legionella.

However these temperatures can cause scalding, so water temperature is required to be controlled in accordance with AS/NZS3500.4. This standard currently states that in healthcare facilities, the only solution deemed satisfying is through the use of thermostatic mixing valves set to a maximum temperature of 45°C. However, some State health departments have created their own Policy Directives which have allowed buildings to centralise their distribution of warm water.
despite these systems having no current recognition or clear design guidelines within the Plumbing Codes in force in Australia.

Stagnation is another key breeding factor that will exacerbate Legionella growth in water systems. When water is used infrequently, or where there are significant dead legs in pipework, the risk of contamination is increased. It is both good design practice and the requirement of various State Health guidelines to reduce the length of warm water pipework in order to minimise dead legs, and in some circumstances to remove them completely as well as ensuring systems are flushed on a weekly basis when taps have not been in use (Guidelines for the control of Legionella SA 2013).

In the case of Brisbane’s Wesley Hospital managing the outbreak was not easy. A full scale Public Health unit investigation into the hospital’s cooling and water systems, as well as independent sampling and investigations found the source of contamination was the heated water system. Contributory factors to the harbourage of Legionella were identified in the presence of dead legs, and a lack of awareness regarding the need for regular and on-going maintenance of plumbing fittings.

Following the incident, Queensland Health asked almost 250 state and private hospitals to test their water systems for Legionella. The results indicated the extent of Legionella in water systems, with at least a quarter of all hospitals tested returning a positive result.

Is Australia falling behind the rest of the world?
If we are well aware of the risks associated with water temperatures and current hydraulic designs, then why is so little being done about it?

Warm water lines have become an ingrained and accepted element of hydraulic design in Australia. However, with most warm water circulating at temperatures between 40ºC and 50ºC, Legionella is being given the best possible chance to thrive. In the long and complex piping systems of hospitals, dead-legs are especially prevalent and contamination can easily occur.

Whilst internal water systems in Australia have traditionally been designed with issues such as Legionella control in mind, minimal design guidelines and inconsistency between States and other various bodies who have regulatory ownership in this space allow conflicts to occur! Additionally, views on effective water treatment processes also vastly differ. Disinfection systems using UV (Ultra Violet), chemical dosing and thermal disinfection have shown to have limited effectiveness. When combined with a lack of design regulation and consistency facility owners and managers are being left with expensive and confusing processes to ensure healthy water quality compliance is attained.

Australia’s slow response and inconsistent views on the issue of Legionella control in water systems is in high contrast to aligned markets such as the UK and major parts of Europe such as Germany. UK and Europe are leading the way in the management of Legionella in hospitals, with the UK Department of Health providing comprehensive advice and guidance in a code of practice for the control of Legionella in health water systems. Critical practices stated include:

- Temperature must be maintained within the hot water circulating system. The minimum temperature of water leaving the heater must be 60 ºC, and 55 ºC at the supply to the furthest most draw-off point in the circulating system
- In non-recirculating systems, the minimum 55 ºC should be maintained by electric trace heating
- Dead-leg lengths should be as short as practicable, and electric trace heating (if used) should be taken up to the mixing device
- These practices are focused around keeping water hot at all times. Keeping water hot at all times requires a device for safe delivery and avoiding potential scalding is of serious concern.

For safe delivery, thermostatic mixing valves which mix hot and cold water at the point of use ensuring the water can be kept hot for as long as possible, without the risk of scalding.

It is preferable that thermostatic mixing devices are either fitted directly to the outlet, or integrated with it, and be the method of temperature and flow control. WWA
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For basic pressure management or more advanced modulating pressure management, water suppliers create a network of District Metered Areas (DMAs) or smaller, more manageable pressure zones. The DMA or pressure zone gives the ability to measure flow and control pressure when a pressure reducing valve (PRV) or automatic control valve (ACV) is installed at the takeoff of the DMA from the Main Distribution line. Here are five of the top 10 considerations when choosing the correct valves to optimise the functionality and performance of the DMA.

1. Correct sizing of the pressure reducing valve

One of the most common mistakes made in respect to sizing ACV’s or PRV’s in DMAs, is to simply review the pipe sizing in the location and have the valve match the pipe size. However, the most important factor in size selection is to review the “Maximum Flow Rate”. Manufacturers of PRV provide sizing charts and programmes to determine the right PRV for the maximum flow rate. If a PRV is oversized, the valve can be very unstable at low flows; many PRV manufacturers suggest their valves are most stable when operating in the 20 to 80 per cent stroke range. If the valve has been oversized then it may only be slightly open at maximum flow, resulting in hunting (instability) and seat chatter. If you are able to measure the position of the valve, you may notice it is not constant as the inner valve is unstable, which can make it noisy. This typically results in more maintenance and service issues.

An engineer should evaluate, not only current maximum flow, but should also account for future expansion and future maximum flows. Not only should potable water use be considered but also
fire flow requirements. If a valve was installed in a pipe line of 8" (200 mm) you may find that the maximum flow dictates, by way of the sizing charts, that a 6" (150 mm) full port will easily handle the maximum flow. The valve would then be one size smaller than the nominal pipe size it is being installed on. This means that with lower flows, the valve will be operating more mid-range instead of working just off the seat, which result in less maintenance concerns and potential failures.

Many manufacturers offer a reduced port version of their ACV’s for exactly the reasons stated above. While the Flanges match the nominal pipe size, the seat area of the valve is designed to be one size smaller than the nominal pipe size. So you have a choice of a full port valve or reduced port valve.

By sizing and selecting your PRV’s according to maximum flow rather than nominal pipe size requirements, you will greatly reduce maintenance and extend the life of your ACV’s. Most applications will call for a PRV that is at least one size smaller than line size (or reduced port version) as compared to the nominal pipe size that the valve is installed on. Never oversize your valves, always consider maximum flow as your primary determining factor.

2. High flow and low flow capabilities

When selecting a control valve, particularly a pressure reducing valve for a pressure management zone, it’s important to clearly understand the flow range recommended on any given size of valve. Most manufacturers offer their maximum flow range but not all will offer their minimum flow range recommended. Many diaphragm valve manufacturers can be challenged to handle lower flow ranges as the valves can become very unstable at low flows resulting in seat chatter, hunting and even minor surges into the downstream piping. This can be detrimental to the valve and downstream piping, hence, resulting in additional maintenance or reduced life. In most water utility systems, you have a maximum flow rate (often daytime, breakfast/dinner) and you have extreme low flow periods (middle of the night) so changing flow rates from high to low are normal in most pressure zones or DMA’s.

Because of changing flow rates many engineers will specify a main PRV with a smaller PRV located on the bypass. The smaller PRV always has a slightly higher pressure setting than the larger PRV, so that when flow demand is large, the flow is handled by the large valve. When flow demand is lower (middle of the night) then the larger PRV would close and the lower flow would be handled by the smaller PRV that has a lower recommended flow rate than the larger valve. This system works well, with the only major concern being increased costs and the size of the chamber required to accommodate the additional bypass valve.

Because of changing flow rates many engineers will specify a main PRV with a smaller PRV located on the bypass. The smaller PRV always has a slightly higher pressure setting than the larger PRV, so that when flow demand is large, the flow is handled by the large valve. When flow demand is lower (middle of the night) then the larger PRV would close and the lower flow would be handled by the smaller PRV that has a lower recommended flow rate than the larger valve. This system works well, with the only major concern being increased costs and the size of the chamber required to accommodate the additional bypass valve.
concern being increased costs and the size of the chamber required to accommodate the additional bypass valve.

Another method of handling lower flows is through the diaphragm technology called Single Rolling Diaphragm (SRD). Most manufacturers utilise Flat Diaphragm technology which can be unstable at lower flows and require the use of the smaller bypass PRV’s. With the SRD technology, you would not require the secondary smaller PRV for flow stability as the SRD will handle the full range of flows from extremely low to as high as any manufacturer offers. You may still choose to include a bypass for maintenance reasons should you need to service your main control valve but you would not necessarily require the second PRV in this case.

3. Ability to add features to ensure additional benefits
Having the ability to add additional features to the valve in the future is important to get the maximum benefit from your valve. Ensure the valve is top serviceable and is not an inline valve that requires removal from the pipe to service. Most top serviceable brands allow you to add features that can interface with your stem so as to show position indication or limit switches if electronic. The position indicator becomes very important when you have more than one pressure reducing valve into one DMA or pressure zone, as it allows you to see that all valves are opening and you are not creating a dead end or stagnant water. Valves that are incorporated using SCADA or advanced electronics may require an electronic position indicator or limit switch that can be added initially or retrofitted.

Ensuring that the valve has threaded body taps on both sides, provides the user with a number of options. Better manufacturers provide unused body taps on the opposite side of the PRV. This allows you to move the pilot system to the alternate side if you do not have room to work in the chamber or to add additional features, like electronics, sensors or gages if required in the future. It is always recommended to have pressure gages installed, typically one or two pipe diameters away from the valve for best measurement.

4. Top serviceable
Most ACV’s are top serviceable where the stem is 90 degrees to the horizontal. This allows both the bonnet and the inner valve to be lifted vertically for quick and easy maintenance. This way you can avoid having to remove the valve completely (In line style ACV’s) to provide internal service. There are...
some manufacturers that supply Y style PRV's where the stem is not vertical and the inner valve and bonnet cannot be removed by lifting straight up. The problem becomes greater as the valve size increases and re-aligning the inner valve components and bonnet for re-assembly become very difficult and time consuming. In fact, many Y style manufacturers use special stands to prop up the valve when assembling at the factory in order to get the stem orientated in a vertical position.

5. Specify key component materials
As ACV materials vary between manufacturers it's important to specify superior materials for the key components in order to maximise the life of your valve and minimize the maintenance.

A few key examples are as follow:
- Insist on a 316 stainless steel seat. 316 stainless is superior on wetted components and is almost twice as strong as 304 stainless steel. Some manufacturers use yellow metals (bronze or brass) that wear very quickly while others use lower grades of stainless steel, but only specify stainless steel in their specifications.
- Use 18/8 stainless steel fasteners. Some manufacturers will use plated fasteners which rust very quickly. If the fasteners rust in place you may have to use a cutting tool to cut the fasteners off instead of a wrench when performing maintenance.
- Specify Ductile Iron on the main valve and bonnets as there are still manufacturers that use cast iron in some regions. Ductile iron has more elasticity and will stretch more than ductile iron which is important in colder climates and earthquake regions.

Always check with the manufacturers and make sure you are getting the best materials for your application.
Sustainable water supply: Turning Asia’s flood challenges into opportunities

By James Currie, Prabha Kumar and Andy Kwok, Black & Veatch

Utilities throughout the Asia Pacific region are steadily investing in advanced stormwater management strategies to improve water resource resilience and overall sustainability.

The changing dynamics of weather patterns, urbanisation, population, and the economic and social environments are prompting the region’s utilities to enhance investments in advanced stormwater management strategies.

This urgency is underlined by increased urban development in Asia that is putting pressure on available land, and by rising seawater levels and increased frequency of intense rainfall events.

Utilities in the region are analysing climate change impacts on existing resources, key risks and opportunities, and the steps they can take to ensure water portfolio resilience while mitigating risks. Through such proactive efforts, they understand that diverse infrastructure and management strategies are necessary to holistically manage wet weather events, land use and the changing economic or social environments.

For example, findings from a 2016 Black & Veatch survey of stormwater utilities in the United States show that regulatory compliance, flood control, safety, and community expectations are the key drivers of stormwater infrastructure investments (Figure 1).
Adequate and dedicated stormwater funding is critical to comprehensively addressing the operational and capital needs of stormwater management. In the absence of distinct stormwater service tariffs in the Asia Pacific region, funding and prioritising stormwater infrastructure and management strategies remain challenging. However, advances in asset management as well as the emergence of stormwater fees are facilitating change.

Asia Pacific is exploring advanced underground solutions

Rather than digging deeper drains, interception and temporary storage facilities can function as the stormwater system’s release valve. Solutions being built today are integrating more responsive storage schemes.

Drainage Services Department (DSD) of the Government of the Hong Kong Special Administrative Region’s award-winning Happy Valley Underground Stormwater Storage Scheme (HVUSSS) project reflects how cities facing greater impermeable areas and more land reclamation are rethinking the way they plan and manage intense rainfall in crowded urban spaces.

The objective of the HVUSSS, which won the 2012 International Water Association’s (IWA) Project Innovation Awards in the Planning Category, is to provide off-line flood retention in the Happy Valley catchment during a 1-in-50 year rainfall event.

Major components include an inlet structure, twin cells diversion box culvert with overflow side weir system, an underground storage tank of 60,000m³ and a pump house with a pumping rate of 5,400m³/hr.

A movable crest weir system, Supervisory Control and Data Acquisition (SCADA) real-time monitoring of water and tidal levels and intelligent data feedback are critical components ensuring that the volume of water within the storage tank is monitored and adjusted to prevent either pre-mature or late overspill of stormwater.

The adoption of this movable overflow weir system ensures the storage tank is filled at the most optimal time, avoiding premature or late overspill. As a result, the design capacity of the storage tank can be reduced by as much as 30 per cent. The environmentally-friendly design also minimised the amount of excavation and the volume of materials required for construction. This shortened the total construction time and reduced costs considerably.
The HK$1 billion (US$128 million) project was implemented through two contracts. The advanced contract commenced construction in October 2011, whereas the main contract composing the major components as mentioned above commenced in September 2012. The latter was carried out in two phases with the first phase completed in March 2015.

Following the completion of the second phase in March 2017, the scheme has since been fully commissioned. New technologies used at HVUSSS are now being considered for the optimisation of the existing Tai Hang Tung Stormwater Storage Scheme (THTSSS), Hong Kong’s first large-scale underground storage scheme, which has helped alleviate flooding for the central Kowloon area.

Singapore’s national water agency Public Utilities Board (PUB) is evaluating the feasibility of an integrated Underground Drainage and Reservoir System (UDRS). The study looks into the possibilities of constructing an underground stormwater conveyance and storage system to mitigate the impact of climate change and flood risks.

With highly urbanised tropical cities often facing the challenge of having too much or too little water, the study is looking into leveraging existing technologies in new ways to meet multiple requirements – flood mitigation, storing water for other possible uses and generating power. The objective is to build tunnels to convey excess stormwater into underground reservoir caverns for storage. Water stored underground could then be circulated within the system to generate power. The study is ongoing and is scheduled for completion in 2018.

PUB has adopted a holistic stormwater management approach since 2012 to introduce flexibility and adaptability to the nation’s drainage system. It went beyond implementing pathway solutions (e.g., drain capacity improvements, new diversion canals and centralised detention tanks) to work with developers to install source solutions (e.g., decentralised detention tanks and retention ponds) and receptor solutions (e.g., flood barriers, minimum platform and reclamation levels) in order to better manage stormwater runoff and protect developments from floods.

### Mitigating increased risks from aging water infrastructure

Recognising that proper maintenance would be necessary as embankments could collapse and cause more severe flooding downstream, Melbourne, Australia, has started investing in retarding basin upgrades.

Utility provider Melbourne Water, which maintains these retarding basins, views them as essential features of the city’s drainage system that help to reduce flooding. They are designed to catch heavy rainfall and hold it in the basin, a reserved low lying area of land. The basins are critical in built-up areas because pavement, driveways and other hard surfaces restrict infiltration and create more stormwater runoff.

### Enhancing the value of drainage assets

Regional governments are optimising their physical infrastructure to enhance cost benefits while achieving multi-benefit outcomes.

In Melbourne, retarding basins not only help manage stormwater but also serve the community as recreational areas.

Singapore launched the Active, Beautiful, Clean Waters Programme (ABC Waters) in 2006 to enhance its water infrastructure. The aim of the program is to integrate its pervasive network of waterways and waterbodies with the surrounding environment to enhance the recreational aspects of streams, rivers and lakes for the community.
to enjoy so that they, in turn, help keep the waters clean.

For the HVUSSS project in Hong Kong, DSD included the re-provisioning of sports pitches with a state-of-the-art turfing surface as well as developing other community amenities aimed to enhance quality of living.

**Optimising stormwater reuse**

In the HVUSSS project, the storage system facilitates collection of a considerable amount of runoff, irrigation water and groundwater via the sub-soil drainage system. This water is reused, aligning with the overall water management strategy of Hong Kong.

In Australia, utility provider South East Water is collaborating with a property developer to create Aquarevo, a residential development in Melbourne where homes will feature a range of water-saving features. Aquarevo homes will be supplied with three types of water: drinking, recycled and rainwater. According to South East Water, each water type has been specifically chosen to reduce reliance on drinking water. The homes will include a high-tech rain-to-hot water system for bathing and showering that includes screening, filtering, treatment and temperature sensing devices. The system connects to a pressure sewer system that pumps wastewater to a local water recycling plant, treats the water to the appropriate standard and sends it back to each home for use in the garden, toilet or washing machine.

In China, the State Council issued a guideline in October 2015 on building “sponge cities,” which would enable buildings, streets and wetlands in cities to absorb, store and release rainwater to better serve the country’s urban development.

Under this guideline, cities in China will collect and use 70 per cent of rainwater, with 20 per cent of urban areas meeting the target by 2020. The proportion will increase to 80 per cent by 2030.

“The aim of constructing such cities is to flexibly control the rainwater, address waterlogging in cities, thus achieving a city development mode during which the rainwater can be naturally stored, permeated and purified,” a State Council water leader explained.

**Moving forward**

The trends in the Asia Pacific region clearly point to a stormwater management opportunity leveraging integrated water resources as a key driver for institutional reform. These efforts serve to manage water resources in a cooperative manner that encourages sustainability. By better coordination of land and water use, surface water and groundwater, water quantity and quality, upstream and downstream use, and freshwater and coastal waters, water leaders in this region can acknowledge the interconnections between each factor in planning for use of alternative sources of water.

This article was first published in the 2017 Black & Veatch Strategic Directions: Water Industry Report.

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**Six Stormwater Management Strategies to Keep Asia Dry**

Possible strategies for stormwater management in Asia Pacific include:

1. Expansion and improvement on existing drainage systems (pipe and/or river system) to increase the flow capacity and facilitate more effective collection of surface runoff.

2. Interception and diversion of storm flows from upland catchments (e.g., tunneling works) for direct discharge into the sea, thus avoiding the storm flows from overloading the downstream drainage system.

3. Creation of stormwater storage facilities to temporarily retain storm flows from upland catchments to attenuate the peak runoff loading on the downstream drainage system.

4. Stormwater pumping schemes to pump storm flows from flood prone areas directly to the sea.

5. Village flood protection schemes comprising a protective bund to stop storm flows from entering into low-lying villages and stormwater pumping stations to pump away storm flow collected within the villages.

6. Creating stormwater tariffs that reflect the true costs utilities incur in providing stormwater services.

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**James Currie** is Director of Black & Veatch in Australia. He has over 30 years of experience in planning, studies, design, construction, supervision and project management of diverse multi-disciplinary water resources, water supply, water treatment, wastewater management, environmental and infrastructure projects in Australia, Singapore, Southeast Asia and the U.K.

**Prabha Kumar** is Director for Black & Veatch management consulting. She leads the water, wastewater, and stormwater utilities offering within the Advisory & Planning group. Kumar specialises in stormwater utility feasibility studies, utility development, and implementation and helping utilities with both internal stakeholder education and engagement and external public education and outreach.

**Andy Kwok** is Director of Black & Veatch Hong Kong. He has 23 years of experience in civil engineering including planning, feasibility studies, design and contract administration of infrastructure projects for government and private sectors. His expertise encompasses hydrology, hydraulics and drainage works design. Kwok is also an accredited New Engineering Contract (NEC) Engineering and Construction Contract Project Manager.
Choosing the right chemical metering pump for treatment-plant systems

Faced with a wide array of chemicals that need to be used, wastewater-treatment plant operators can optimise operations by identifying and selecting the proper metering pump technology; be it hydraulic diaphragm, mechanical diaphragm, electronic diaphragm or peristaltic design.

By Tom O’Donnell, Senior Product Specialist, Neptune Chemical Pump Co.
A few of the more commonly used chemicals in wastewater-treatment applications, and their characteristics, include:

- **Sodium hypochlorite**: Known throughout the world as bleach, this liquid is most commonly used for disinfection at the treatment plant. It is one of the most difficult chemicals to handle as most metals will corrode when come into contact with it, and it cannot be mixed or stored with ammonia and other acids, organics and reducing agents that might be used at the plant. It’s also difficult for metering pumps because of its tendency to off gas, which can cause metering pumps to become gas bound. Special vent valves are available for diaphragm pumps to prevent this from occurring. Also, peristaltic pumps can be used, which does not allow this phenomenon to occur.

- **Sulfuric Acid**: Used for pH adjustment, it is provided either as a concentrate or dilute with concentrated solutions being less corrosive than dilute solutions. Concentrated solutions can be handled in many situations with cast iron, steel materials or Alloy 20 while dilute solutions require plastics such as PVC or Kynar.

- **Sodium Hydroxide**: Used for pH adjustment, it is often provided in solution strengths from 25 to 50 per cent. Special care is required for metering-pump elastomers, such as Viton® (often a material used for O-ring seals within a metering pump), which is not compatible. Also, especially when provided in higher solution strengths, this chemical has a tendency to gel in the pump if the pump is idle for a period of time. Flush valves or special pump heads can assist with this issue.

- **Sodium bisulfite**: One of the most commonly used dechlorinating agents at treatment plants. A mixer is commonly required to keep this chemical in solution in the metering-pump supply tank. Both plastics such as PVC and Kynar, as well as metals such as 316 stainless steel are suitable materials for this chemical.

- **Emulsion Polymer**: Fed as a coagulant to assist the dewatering equipment within a wastewater treatment facility, this chemical is often extremely viscous and is shear-sensitive, once hydrated. Diaphragm pumps with high-viscosity head designs or peristaltic pumps are often required.

Faced with the myriad chemicals that can be used in wastewater-treatment systems, and knowing that each one contains unique handling and implementation characteristics that must be followed to the letter, plant operators must be certain that they have selected the proper metering pump technology for their dosing applications.

With that in mind, they must be made aware that there is no “one size fits all” solution to the metering pump selection. In fact, creating the most efficient, effective and – most importantly – safe chemical-handling operations in wastewater treatment will most likely require the use of different types of pump technologies, all of which bring their own set of benefits to the operation.

Here’s a look at four pump technologies that can play a key role in an optimised wastewater-treatment operation if implemented properly:

**Mechanical diaphragm metering pumps**
Mechanically actuated diaphragm metering pumps offer an ease of operation and start-up that makes them an attractive alternative for many applications. They normally...
offer a lower initial cost than other motor-driven metering pump designs, especially at higher flow rates, but can have higher operating costs.

These pumps offer excellent suction-lift capabilities and also provide the ability to handle liquids that off gas, such as sodium hypochlorite, and more viscous chemicals since the diaphragm is attached to the piston for a positive return usually aided by a spring. They are somewhat limited in discharge pressure capabilities with many being around 100 to 150 psi (7 to 10 bar) max. Repeatable accuracy is normally about +/-2 per cent. They are generally not offered with an on-board relief valve, so an external relief valve is usually required to prevent damage to the pump in an over-pressurised situation.

**Hydraulic diaphragm metering pumps**

Hydraulically actuated diaphragm metering pumps are ideal for operation in the harshest chemical-handling conditions as they are a low-maintenance pump that is designed for 20 years of service. This longevity and low maintenance is largely due to most of their moving part being submerged in a bath of hydraulic fluid coupled with fact that the diaphragm is hydraulically balanced. Hydraulically balanced means that the hydraulic fluid is on the oil side of the diaphragm while the chemical being pumped is on the other side (wetted or process side) of the diaphragm. The piston, internal to the pump, pushes oil against the diaphragm but never comes in direct contact with it. These pumps are capable of pumping against extremely high pressures, if need be, so long discharge lines are not a problem.

Hydraulic diaphragm pumps are equipped with an adjustable internal relief valve that prevents an over-pressurized situation from happening and damaging the pump. They also offer a repeatable dosing accuracy of +/-1 per cent.

**Solenoid diaphragm metering pumps**

Solenoid actuated, or electronic, metering pumps are a viable economical option in wastewater treatment operations for low-flow/low-pressure chemical-dosing applications. They are generally available to a maximum of 20 gph (76 L/hr) and at those capacities maximum pressures are normally about 30 psi (2 bar). The lower and medium capacities are compatible with pressures of 100 to 150 psi with low flows (less than 1gph) to over 200 psi (14 bar). They offer a repeatable dosing accuracy of +/-3 per cent. They are normally provided with an on-board relief valve to prevent pump damage from over-pressurization.

**Peristaltic pumps**

This pump technology, simplistic in its design, is perfect for handling viscous and abrasive chemicals. Because the design features a rotor with shoes or rollers that squeeze the hose or tube and force the liquid to the discharge port, peristaltic pumps are able to run dry, a feature that competitive technologies like progressive cavity pumps can’t provide because their rotors and stators will be damaged in run-dry conditions. Peristaltic pumps also do not have valves that can become clogged. This is an important consideration when the pump needs to be shut down during a product run; the lack of valves in the peristaltic pump eliminates
any clogging issues, especially when handling viscous liquids or those that will solidify or become gelatinous when resting. This also makes the peristaltic pump ideal for the handling of abrasive or corrosive chemicals.

While all of these pump technologies can provide an unquestioned list of benefits for the wastewater-treatment plant operator, it is still a challenge to know exactly which pump is best for which chemical-metering application. This is where the pump manufacturer can lend a hand. Many pump manufacturers also design and manufacture many of the components that are included in a complete chemical-feed system, i.e. relief and back-pressure valves, calibration columns, tanks, mixers, injection quills and control panels. Some even offer the complete chemical-feed systems as an option and possess the capability to build a system that meets the specific needs of the treatment plant.

Who better to provide the system than the manufacturer of its components? So, while the task of properly outfitting a treatment facility may be overwhelming, the manufacturers of the various components that will be used to optimise the system, or the manufacturer of a complete system, can be a significant source of assistance in determining how to best outfit the plant.

**Conclusion**

Ensuring that communities have the cleanest water possible for cooking, cleaning, drinking, bathing and recreational activities like fishing and boating places a great amount of pressure on water and wastewater-treatment facilities to perform their jobs as effectively, efficiently and safely as possible. The number and type of chemicals that may be required in the various treatment processes only help to increase the risk for the plant operator. Therefore, the operator can only be certain that the operation reaches the pinnacle of proper performance if the best pump technology is chosen for each of the many critical chemical-metering processes that must take place every day.

With so many varying flow rates, viscosities, compatibility issues, pH levels and handling characteristics to consider, a varying array of pump types must be employed to guarantee optimised operation. When it comes to chemical handling, mechanical, hydraulic and solenoid metering pumps, along with peristaltic pumps, have been proven to offer the best operational capabilities. When used in the proper application, these technologies can help overcome any concerns the plant operator can have— and the pump manufacturers themselves stand ready to lend a hand in order to ensure that the treatment system will reliably operate at the highest level. WWA

**Neptune hydraulic-diaphragm Custom Chem feed system:** Because many pump manufacturers also design the other components that make up a complete chemical-feed system, they can be a significant source of assistance, or even a provider of comprehensive turnkey systems, for wastewater-handling operations.

**Neptune electronic diaphragm skid:** Solenoid-actuated diaphragm metering pumps are a viable choice in chemical-dosing applications at wastewater-treatment facilities because they offer highly reliable dosing accuracy, even when working with extremely low flow rates and operating pressures.

**About the author:**

Tom O’Donnell is Director of Business Development for Neptune™ Chemical Pump Company and PSG®. Based in North Wales, PA, USA, Neptune is a leading manufacturer of chemical metering and peristaltic (hose) pumps, chemical feed systems, chemical injection accessories, make-down systems and industrial mixers.
Twenty-seven participants attended the technical visit to Lumileds LED manufacturing plant on 30 June, organised by SWA. Being recognised for its continuous improvement on sustainability management and performance over the years, Lumileds Singapore has been recognised for its water efficiency:

- PUB “Water Efficient Building” GOLD award (since 2013)
- PUB “Water Mark” award (2013)
- SS 577: 2012 Water Efficiency Management System Certification (since 2013)

Participants got to visit and understand Lumileds’ water conservation efforts in:
- Monitoring of water consumption system through metering
- Monitoring of potential water leakage through water leak detection system
- Recycling of production waste water
- Reducing of water consumption by upgrading less efficient DI system to more efficient system
- Monitoring of plant water consumption or waste water generation to identify potential areas for water conservation
SWA BUSINESS MISSION TO JAKARTA, INDONESIA
11 - 13 July 2017, Jakarta, Indonesia

For the first time, SWA organised a business mission to Jakarta on 11-13 July 2017 to enable Singapore companies to build contacts and tap on business opportunities in the Indonesian market.

Led by SWA Vice-President (General Affairs) and Chairman for Communications & International Relations, Mr Tan Ngo Chiaw, the 10 delegates from eight Singapore companies met Indonesian government officials from BKPM (Indonesia Investment Coordinating Board) and BPPSPAM (Ministry of Public Works and Housing, Indonesia) to better understand the Indonesian market and regulations. A networking dinner with invited guests from PT Bakrie Indo Infrastructure, PT Aetra Air Jakarta, PERPAMS, PT Tirta Sukses Perkasa and Jababeka was also organised.

On the second day, the delegates toured the PT Aetra Air plant to learn on how they process, distribute and manage the water supply in the eastern part of Jakarta. Thereafter, a briefing by Angeline Suparto Law Corporation (ASLC) on legal advices in setting up companies in Indonesia as well as market induction for water industry in Indonesia was held.

Individual business meetings with Indonesian water companies were matched based on the delegates’ specific areas of interest for discussion on partnerships concluded the three-day mission.

INDOWATER 2017
12 - 14 July 2017, Jakarta, Indonesia

Coming back for the eighth time, Indowater 2017 which held alternately in Jakarta (odd year) and Surabaya (even year) was held successfully at Indonesia’s capital city from 12 to 14 July 2017. With the good experience over the years, Singapore Pavilion again gathered a total of 16 water and related companies occupying 204sqm in the exhibition. It was a good opportunity for the companies to showcase their water expertise and solutions, trade with solution providers and share best practices as well as stay up-to-date with the latest global trends for our local exhibitors during these three days. One of the exhibitors, Kuraray Asia Pacific took the opportunity to sign a Distribution Agreement with Memiontec to distribute Kuragel - a MBBR media for advanced biological treatment in Indonesia and to form part of their specialized system.

The SWA Networking Reception was well-received by the Singapore exhibitors, government officials as well as other distinguished guests from water companies on the second day of the show.
SINGAPORE WATER ASSOCIATION GOLF 2017 @ SIWW
17 July 2017, Sentosa Golf Club

The SWA Golf Tournament was back on 17 July 2017 Serapong Course, Sentosa Golf Club which is ranked among the Top 100 Greatest Golf Clubs worldwide and is one of Singapore’s most prestigious golf clubs. Traditionally held in conjunction with SIWW, the SWA Golf 2017 is yet again the perfect social gathering for business networking with water utility leaders and global water professionals.

Graced by Mr Masagos Zulkifli, Minister for the Environment & Water Resources, the SWA Golf welcomed H.E. Ek Sonn Chan, Secretary of State for Cambodian Minister of Industry and Handicrafts together with 120 SWA members and SIWW Spotlight delegates who have enjoyed the golf game and forged new connections and partnerships. The success of the tournament was a testament of the support received and belief in SWA’s mission in developing a vibrant and dynamic Singapore Water Industry.

SEMINAR ON DOING WATER BUSINESS IN MYANMAR
4 Aug 2017, Waterhub

SWA organised a business seminar on Doing Water Business in Myanmar to share with Singapore companies and industry leaders on how to emerge in Myanmar. Attended by over 40 participants, the invited speakers briefed on economic, legal and accounting & tax aspect of doing business in Myanmar. The next Business Seminar on Doing Business in Africa will be held on 23 August.
UPCOMING SWA ACTIVITIES

TRAINING COURSES IN 2017

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For information on training courses, please contact SWA office: Ms Cecilia Tan via email: cecilia@swa.org.sg or tel: (65) 6515 0812.

SINGAPORE PAVILIONS AT OVERSEAS TRADE SHOWS IN 2017

With support from IE Singapore under the iMAP Grant of up to 50% off participating fee for:

WATER MALAYSIA 2017
11-13 September, Kuala Lumpur, Malaysia
Water Malaysia 2017 Exhibition is held concurrently with the 7th IWA – ASPIRE Conference, which will host more than 600 international and local delegates and attract over 200 technology and solution providers.

Policy makers, decision makers and water professions from the public and private sectors will converge in Kuala Lumpur to share their experiences, learn from international experts, and bring home actionable plans, solutions to help governments and industries overcome the challenges that the global water industry is currently facing. Kindly refer to http://www.watermalaysia.com/ for more information.

VIETWATER 2017
8-10 November, Ho Chi Minh City, Vietnam
Vietwater will set its 9th edition from 8 to 10 November 2017 in Ho Chi Minh City, Vietnam. It is set to welcome more than 450 exhibitors from 38 countries and regions, with 14,000 trade visitors from all over the world.

Apart from the exhibition, visitors are able to attend the technical seminars and conferences which provide profound insights into water management, wastewater treatment, sanitation and purification sectors. Kindly refer to http://www.vietwater.com/ for more information.

MYANWATER 2017
23-25 November, Yangon, Myanmar
Myanwater Expo will be held from 23 to 25 November 2017 at the Mida Ground Exhibition Hall in Yangon and is your most comprehensive platform to showcase your business to the Myanmar market.

Myanwater 2017 is expected to have participation with over 260 exhibiting companies and an attendance of over 6,000 trade visitors all over the country, and is your number one platform to meet key buyers in the industry. Kindly refer to https://www.myanwater.org/ for more information.

For booth participation under the Singapore pavilion, please contact the Event Secretariat: Ms Joanne Tan via email: joannetan@epc.com.sg or tel: (65) 6377 6619.

SWA WELCOMES NEW MEMBERS

ORDINARY MEMBER
• Trident Water Systems Pte Ltd

ASSOCIATE MEMBERS
• JFE Engineering (S) Pte Ltd
• Nippon Shokubai (Asia) Pte Ltd

Interested to join SWA?
Calling ALL Professionals, lecturers, supervisors and technicians. Your company may be a corporate member of SWA, but as a professional, you can benefit and join as an Individual Member to interact with like-minded professionals and practitioners.

All this for only $10 a month.

PUBLISH YOUR ANNOUNCEMENTS

Members, who have any press releases or corporate announcements to share with the public, can contact the SWA secretariat at enquiry@swa.org.sg. SWA reserves the right to edit the submitted text.
Q  What is one of the biggest issues water utility leaders and city planners are facing to ensure greater water sustainability?

OB  Water authorities around the world have an extremely challenging job in many ways, especially in Asia where the urban population is rising up fast. When urbanisation grows so rapidly, infrastructure usually starts to fall behind. In many cities around the world, due to neglect, complacency or lack of funding, water networks are getting so old, they are unable to meet the demand of the existing population, let alone be ready to provide clean water and sanitation for the new inhabitants who are coming in increasingly fast. I believe as a manufacturer of pumping solutions and technology, we are able to help the authorities to meet the challenge with some of the solutions and advanced technology that we already have and are developing.

Q  And what are some ways Grundfos is helping?

OB  Of course, first and foremost, we are a pump manufacturer, producing the essential tool to move water around. We have been doing that successfully for more than 70 years. Grundfos has, in fact, invented some of the very specialised pumps you see commonly in the market today. Furthermore, we built a deep knowledge base in pumping solutions and have one of the most experienced teams in the world. We are always happy to share that knowledge and expertise with the local authorities whenever we can. Today’s increasingly challenging issues go well beyond simple pumping and require tailor-made solutions for the specific needs of individual local authorities where we collaborate with them.

Q  We have also heard of intelligent solutions such as Demand Driven Distribution, what is it and how
Fronting a digital future

At this year’s SIWW (Singapore International Water Week) Spotlight, we sat down with Okay Barutçu, group senior vice president & regional managing director of Grundfos Asia Pacific region, to discuss some of the biggest issues water utilities leaders are facing and how Grundfos is working together with them to provide long-term solutions.

will it lead to sustainability outcome?

Depending on the country and city, up to 70 per cent of the clean water pumped to cities today may be lost before the water reaches the users. There are many causes for this so-called Non-Revenue Water for water authorities. The most common one is “leakage” in the pipes due to aging or broken piping, burst pipes, badly planned and installed networks and outright theft through unauthorised tapping. Unless you have the technology to monitor your network closely, you will continue pumping water blindly that may be going into the ground rather than to the users. Demand driven distribution, in short Grundfos DDD, offers the perfect solution.
In the traditional way, you place a number of big pumps in the reservoir and along the pipeline, and continuously pump to build up enough pressure in the network to bring the water to all outlets in the pipeline. However, in this way, the pressure becomes too high in parts of the network resulting in frequent bursts and leakages and too low in parts because water is consumed or wasted before that point.

The first step to solve that problem is to install pressure sensors on the line and start and stop the pump(s) at certain low and high-pressure levels in the pipeline according to how many users are using the taps on that particular time of the day – there may be 10,000 users using it at one point and 2,000 an hour later. That solves the problem partially but not all because of the relatively crude on/off mode. You need more to manage a relatively constant pressure on an ongoing basis.

The next step is to modulate the pumps to work faster or slower depending on the needed pressure. That requires what is known as a variable frequency drive (VFD) to control the speed of the pump – in fact its electric motor. Not only does this ensure a more stable water pressure during changes in usage throughout the day but also saves on electrical power. You can simply add an external electronic VFD to an existing or old pump, or build the electronics into your motor for ease of installation as well as better power and speed control. In Grundfos, we make our own motors and the electronics in it to control the speed of the motor thus offering an optimised speed and power control.

In the ultimate step, Demand Driven Distribution comes into play. The DDD concept learns and adapts its behaviour to changes in the demand to operate the pumps at their optimal duty point. It is the control system with a bespoke, sophisticated algorithm that sits on top of the speed control and the frequency drive that makes DDD unique.

The system also learns the users' habits on the network and estimates when the demand peaks. This helps authorities to control and maintain a good level of pressure on their network to provide users with comfortable water pressure when they turn on their taps. We place several sensors on the network to monitor and collect data. By analysing this data, our controller can respond much better and faster. For instance, when a pipe bursts, the pressure drops. In a traditional way, you would start pumping faster into that pipeline, but that would mean losing even more water. However, when your system knows the high and low usage limits for that particular segment of the distribution network, it will quickly detect the unusual surge and inform the operator. This level of intelligence makes authorities both very responsive as well as proactive towards potential problems.

I mentioned our close collaboration with authorities to find solutions together earlier on. On that front, we are testing a few different business models for authorities to implement DDD without the worry for the comparatively higher investment required for the extra sensing and control products needed. Some authorities do not have that level of investment available yet, at least not upfront.

The model that we are testing is, we upgrade the system to DDD, help save on energy and maintenance, thereby the total operating costs as well as reduce NRW. We make the upfront investment for the authorities, and they pay us back through those savings over a predetermined period. In other words “we put our money where our mouth is” and not just make claims. That is quite a new way of approaching this problem and we hope that this will be adapted by many authorities as a simpler and straight forward way of upgrading their networks and systems. We offer a true partnership here - more than product supply, more than solutions and more than tailored solutions.

Q: Do you think smart pumps technology has advanced tremendously or are we still in the early stages?

OB: Basic pump technology has probably not changed for the last 100 years. It is essentially still the same mechanical push theory that pushes the water into the network albeit with incremental gains realised in mechanical as well as electrical efficiency through advanced design over the years. We continue pushing the limits of the design but big data or digitalisation is really where the disruptive technological change is bound to happen next to improve the ways we control and manage the pumps and networks.

With all the advanced sensor technology, electronic controls and unprecedented operating data extracted from the pump and the system, we have the ability to design, manage and expand the systems more effectively. The authorities will know much more about their network, their users’ behaviour, their future needs through trends and they can fix problems before they happen or plan next steps to improve their networks before bottlenecks are hit. Through big data, they will be able to know where they need to invest next, what part of their distribution network is growing rapidly or aging, where water quality is poor and what they need to do there. They can simply break the system down into smaller optimised parts rather than having huge inefficient pumps pushing water for long distances consuming
excessive power and delivering suboptimal user experience.

How we look at these systems and solutions and how we manage them is where the advanced technology comes in. Are we ready for it? I think we are ready for it and the world is also ready for it. We all have one of these super computers called smartphones in our pockets. We use big data and advanced technology in our daily life without even noticing it, why not use this technology for our essential need, water?

Are the authorities ready for it? Some yes, some not yet. Some have been moving with the times, some have been left a little behind and now trying to catch up. But the problem is with water scarcity and high energy costs which all authorities have to find solutions for. Each city and each authority has different sets of issues to solve and though developed nations may have a certain advantage here, developing nations have shown that much can be achieved with limited funding but forward thinking.

If you take Cambodia as an example, the Minister of Industry & Handicraft attending the SIWW this week had previously received the prestigious Stockholm Industry Water Award in 2010 as the Head of Phnom Penh Water Supply Authority for “its world class performance in water supply and self-sufficiency”. Within a period of less than 15 years, they managed to reduce water losses from 72 per cent to 6 per cent and deliver a much better service to all inhabitants of Phnom Penh. A huge achievement which is the envy of even developed nations.

A great service of events like SIWW is that more people get to share these success stories and inspire each other with the different ways of solving some of the rather common and upcoming problems. And as a key technology and solution provider to the industry, we try to play our part and work very closely with local authorities to find responsible solutions to some of the issues facing our urban life style.
Ultivo is a transformative Triple Quadrupole LC/MS Liquid Chromatography and the newest member of Agilent’s Triple Quadrupole family. It is composed of an LC front-end, triple quadrupole MS, consumables and associated supplies.

What is so innovative about Ultivo?
Ultivo is the most innovative, cost-efficient and smallest Triple Quadrupole LC/MS that Agilent has ever produced. It features the following transformational innovations:

1. Reduced Footprint
The Ultivo footprint is significantly smaller than the average Triple Quadrupole/LC, but encompasses the same power, so labs can increase productivity without increasing lab space.

2. Rapid Maintenance & Operation
Ultivo’s new VacShield vacuum provides robust, vent-less ion injector exchange capabilities that reduce wear and tear, and facilitate rapid front-end maintenance while increasing efficiency and uptime.

In addition, it includes improved, intelligent diagnostics that use intuitive readbacks to quickly identify issues.

3. Superior Technology & Results
This machine’s patented Cyclone Ion Guide ensures greater on transmission efficiency which provides optimised sensitivity and reproducible results.

The Ultivo’s Innovative Vortex Collision Cell also delivers consistent mass fragmentation, which allows higher ion transmission efficiencies and improved clearance.

What is the benefit of Ultivo for operators?
Reducing costs and maximising lab space are always a priority for many lab managers in all research areas including the food and environmental markets. Another key pain point for lab managers is ensuring that analysis is correct the first time, minimising the need to re-analyse and maximising lab productivity.

Ultivo addresses these pain points through:

- Intuitive operational design that follows the customer’s workflow, minimising the potential for errors and ensures that users obtain the correct results;
- Its small size through which lab managers see strong price performance/per-square-foot leading to reduced costs;
- Reproducible, reliable assays that result in complex sample matrices, 24 hours, seven days a week;
- And smart, self-aware diagnostics that ensure optimum uptime.

What is the benefit of Ultivo for lab managers?
Reducing costs and maximising lab space are always a priority for many lab managers in all research areas including the food and environmental markets. Another key pain point for lab managers is ensuring that analysis is correct the first time, minimising the need to re-analyse and maximising lab productivity.
Designed in accordance with the scotch-yoke principle, the quarter turn actuator DFPD-HD is exceptionally reliable. With torque ratings of 9,000 to 32,000 Nm, it guarantees reliable control of high-volume media flows. The heavy-duty quarter turn actuator DFPD-HD is also ideal for the automation of large ball valves, butterfly valves and air dampers used in power plants and the chemical industry. It provides rapid and reliable control of, for example, large volumes of supply and exhaust air or clear and wastewater.

**Powerful performer**

Robust, flexible, powerful - the heavy-duty quarter turn actuator DFPD-HD from Festo provides reliable control of high-volume media flows. These include, for example, large volumes of supply and exhaust air or clear and wastewater.

DFPD-HD will release the media flow if a malfunction occurs. This new high performer from Festo is also available in a double-acting version for even greater flexibility. The quarter turn actuator can be used in applications, where the Safety Integrity Level up to SIL3 is required.

**High performance, high level of safety**

This modular system offers powerful solutions for various applications in process automation. Available in three versions of maximum: 9,000, 18,000 and 32,000 Nm respectively, the quarter turn actuator DFPD-HD fits flexibly to applications. The single actuator’s standard clockwise rotating direction provides a high level of safety by ensuring that the media flow is interrupted automatically in case of a malfunction. The direction it rotates in can also be configured in anticlockwise, in which case the DFPD-HD will release the media flow if a malfunction occurs. This new high performer from Festo is also available in a double-acting version for even greater flexibility. The quarter turn actuator can be used in applications, where the Safety Integrity Level up to SIL3 is required.

**Practical design**

Thanks to its standard VDI/VDE 3845 interfaces, the quarter turn actuator DFPD-HD allows assembling of wide range external devices, such as sensor boxes or positioners. The DFPD-HD can be used at any ambient temperature between -20 and 80°C. Its spring force can be adapted for different applications by configuring various spring cartridges. A mechanical or hydraulic manual override provides additional safety. This allows the actuators to be operated manually in the case of a power breakdown.
The ninth edition of Vietnam’s leading international water supply, sanitation, water resources and purification event - VIETWATER 2017 - will open its door in November to over 450 participating companies from 38 countries. Organised by UBM Asia, the event is the annual water trade exhibition, which showcases a rich variety of solutions, technologies and products from across all segments of the water industry.

As an integrated business platform, VIETWATER 2017 will cover a wide aspect of the water and wastewater industry, such as blowers, boilers, coatings, drill systems, filters, fittings, mixers, pumps, pipes, tanks, water supply equipment, wastewater treatment equipment & chemicals, water meters, and other services related to desalination, dewatering, sewerage, and purification.

According to UBM Asia, more than 95 per cent of booth spaces have been taken up by leading players in the water supply, wastewater treatment, sewage, purification and sanitation industry. Some leading international brands to be seen at the show include Bueno, CL Waterware, Ebara, Dow, Haus, Hydro-Vacuum S.A. Grudziadz, Manila Water, METAWATER, ProMinent, JFE Engineering Corporation, Sereco, Swing, Tabuchi, Tecomen, TSK, Tsurumi, VAF, Veolia and WAMGROUP.

In addition, VIETWATER 2017 also welcomes some local big players, such as Binh Minh, Hoa Sen, Nhat Anh, Quang Minh, Son Ha, Vucico and more.

This year, visitors can expect to see 13 international pavilions at VIETWATER - Australia, Belgium, China, Europe, France, Finland, German, Japan, Korea, Taiwan, Thailand, Singapore and the UK. During the three-day event, participants will also have the opportunity to learn, exchange and discuss the latest international trends and market updates.

More than an exhibition, both visitors and exhibitors will be treated to a leading water forum at the exhibition where insights into Vietnam’s water operation and management will be provided, as well as water-related information and trends from around the world. With the theme “Improving the quality of water supply and sanitation services through innovation, upgraded technologies and effective utility management”, the exhibition promises the presence of well-known local and international speakers too.

Online pre-registration for VIETWATER is currently open for visitors to register in advance. 

WWA
Harnessing the potential of Myanmar’s water and wastewater market

As one of Myanmar’s leading international water supply, sanitation, water resources, industrial wastewater treatment and purification events, MyanmarWater 2017 is returning with more compelling seminars and interesting exhibitors.

The highly focused event is set to see about 180 exhibiting water and wastewater companies from across 20 countries, over 5,000 trade visitors and seven international pavilions – China, Germany, Israel, Japan, Malaysia, Singapore, Taiwan and Thailand.

Visitors can also expect to attend the conference and technology seminars for free and leverage on the opportunity to explore the booming water market of Myanmar. Additionally, the show serves as the top platform to source for new products and technologies, collect market information and new ideas, and to seek franchisees and principals.

In addition, as one of Myanmar’s biggest water trade show, exhibitors at the show will be able to generate high profile and quality lead sales while leaving long-term branding impressions in Myanmar’s market.

The highly specialised event promises to be an outstanding show for both visitors and exhibitors to expand their network, foster strong business partnerships and source for valuable information on the latest advanced technologies.

MyanmarWater 2017 will be held from 26 to 28 October 2017 at the Tatmadaw Exhibition Hall in Yangon. The event is highly acknowledged by the government through the Ministry of Natural Resources and Environmental Conservation (MoNREC) of Myanmar and is strongly supported by Myanmar’s key professional associations including the Myanmar Engineering Society (MES) and Yangon City Development Committee (YCDC).
With a focus on global emerging economies, the IWA WDCE 2017 is at the forefront in bringing water solutions providers and seekers of water solutions together. The show is set to see global water congress delegates from about 80 countries coming together.

The exhibition is also expected to attract about 2,000 regional and international trade visitors who are key decision maker as well as range from

- Utility management and practitioners
- Government officials
- Consultants
- Contractors
- International organisations or NGO’s
- Academics
- And financial institutes

The presence and quality of these participants are guaranteed due to the unique partnership IWA WDCE2017 have with

- International Water Association (IWA)
- Argentina’s Ministry of Internal Affairs, Public Works and Housing - Secretary of Water Resources, through AySA
- Inter-American Development Bank (IDB)

With the theme ‘Global Emerging Economics’, IWA WDCE2017 will focus on:

- Adaptation to policy makers in the region.
- Sustainable development goals (SDGs): how to reflect the commitment and contribution of governments, companies and institutions to the achievement of SDGs.
- Integrated management models to respond to all stakeholders related to the organisation (users, employees, suppliers and society as a whole) and ensure the continuity of results in the long term.
- Inclusion as central factor of development: flexible modalities and innovation to address socio-economic problems and reach the universalisation of services.
- Environmental management challenges: innovation in the disposal of waste or “by-products” of wastewater treatment.
- Valorisation programmes and care of resources.
- Water as a determinant factor in the culture and identity of population.

Both exhibitors and visitors are also treated to opportunities from AySA, one of the main partners of the event. AySA is responsible for the project with the framework of the National Water Plan, which sees AySA carrying out the Metropolitan Area Plan, one of the most important water and sanitation programmes currently being implemented in the world.

With the magnitude of the project, the required investment (about US$12.5 million) offers vast opportunities for Israeli institutions and companies.

In fact, besides a focus on Argentina, the Latin American market will be also a focus at the IWA WDCE 2017 while still representing a global outlook for the show.

IWA WDCE 2017: A focus on emerging economies around the world

The IWA WDCE2017 will take place from 13 to 16 November 2017 at Buenos Aires in Argentina.
The unique platform of LANKAWATER gathered key decision makers and international visitors together while showcasing the latest technology and products in the water and wastewater industry.

Nestled in the heart of Colombo city was Sri Lanka’s premier international water and wastewater industry exhibition, which took place from 10 to 12 August 2017 at the Sri Lanka Exhibition & Convention Centre (SLECC). Concurrently, were four other expos too: LANKAWATER 2017, LANKABUILD 2017, LANKAENERGY 2017 and SIVAR 2017.

A three-day event, the opening ceremony was officiated by Hon. Rauff Hakeem, minister of City Planning and Water Supply, and was attended by senior government officials, business leaders and international participants.

Hosted by the Major Constructors of Sri Lanka (MCSL) with support from National Water Supply and Drainage Board; Ceylon Electricity Board; Water Resources Board; Institute of Town Planners; and the Central Engineering Consultancy Bureau, the event was a gateway for architects, developers, contractors, facility managers, M&E engineers, water consultants or engineers, manufacturers, HVAC engineers, agents, and distributors to source for new ideas, learn about new technology and find new solutions all under one roof.

On display, too, were the latest water treatment and filtration equipment including pipes, valves, meters and pumps from major companies such as Maxies, Puritas, Enviromec International, Aqua Masters and Tecofi among many others.

LANKAWATER 2017 served as a platform for trade visitors to meet some of the top industry players while discovering innovative solutions for their water management needs. In addition, there were also pavilions from the Singapore Water Association, Taiwan Drinking Water Association and China Water Association.

To close the loop, the business-to-business exhibition was also the platform to promote business partnerships and investment opportunities between Sri Lankan businessmen and international participants.

The LANKAWATER 2017 was organised by AMB Tarsus Events Group, a leading trade show organiser in the region for more than two decades with shows in Laos, Cambodia, Myanmar, Vietnam, and the Philippines, with a focus on key industries including building and construction, food and beverage, hospitality, automotive parts and accessories, livestock and agriculture, water and energy, and many more.
Shaping the future of the water industry

From 17 to 19 July 2017, more than 200 water utility leaders and professionals gathered at Shangri-La’s Rasa Sentosa Singapore to optimise utility performance with their influential thinking.

Day one and two: Connecting and strengthening collaborations

The first day of the event kickstarted with a round of golf at Sentosa Golf Club, valuable insights of Singapore’s integrated water resource management with site visits to PUB’s key facilities, and welcome drinks at Shangri-La’s Rasa Sentosa.

The opening of the seminar-event on the second day was officiated by Mr Masagos Zulkifli, Minister for the Environment and Water Resources of Singapore, where he talked about how good quality water cannot be taken for granted, the need to price water correctly, and how Singapore can function as a global platform to bring utilities together.

“The Singapore water industry is a vibrant one, with more than 180 local and international companies and over 20 public and private research institutions spanning the entire water value-chain,” said Mr Zulkifli.

“As a global hydrohub, we want to be a key node to bring the global water industry together to co-create innovative water solutions and build capabilities to solve urban water challenges,” he added.

The second day also commenced with profound sessions on managing all water as one and improving network performance.

In the first session – Circular Water – Managing All Water as One – presentations were given by H.E. Eng Ali Al-Hazmi, governor of Saline Water Conversion Corporation, on water management transformation in the Kingdom of Saudi Arabia (where he addressed the need for strong investment and privatisation to achieve high quality water to meet the growing demand in Saudi Arabia), and Mr Ma Weizhong, director of Water Resources, Shanghai Water Authority on Shanghai’s sponge city plans to tackle water scarcity, flooding and quality issues (as Shanghai has poor water hydraulic conditions, the city is prone to flooding, hence, the need to build strong water networks and robust drainage system).

The first session also saw a group of panelists – H.E. Eng Ali Al-Hazmi; Mr Ma; Mr Adam Lovell, executive director, Water Services Association of Australia; Dr.ir. Gerhard M. van den Top, chairman, Amsterdam Regional Water Authority; and Mr Peter Joo Hee Ng, chief executive of PUB, Singapore’s National Water Agency – providing global perspectives on water sustainability and effective water management.

The first half of the session concluded with two MOUs signed with PUB - with Saline Water Conversion Corporation (SWCC) and Water Corporation of Western Australia, as well as saw the launch of Kurita’s R&D Centre in Singapore, the first in Asia outside of Japan.

In the second session on Cutting Losses – Improving Network Performance, H.E. Ek Sonn Chan, Secretary of State, Ministry of Industry & Handicraft of Cambodia, and Mr Nobuyuki Kawagoe, director of Water Supply Section, East Area Second Branch Office, Bureau of Waterworks, Tokyo Metropolitan Government, shared how Phnom Penh and Tokyo have improved network efficiency in
Panel discussion at SIWW Spotlight 2017. Photo credit: Singapore International Water Week

their respective cities.

The panel discussion with H.E. Ek Sonn Chan; Mr Kawagoe; Mr Charles Kiely, assistant general manager of Customer Care & Operations, DC Water, USA; Dr Konstantinos Vafeiadis, executive member of Board Athens Water Supply and Sewerage Company (EYDAY), Greece; and Mr Steve Leung, senior vice president and president of Emerging Markets, Xylem Inc. looked into strategies to reduce non-revenue water, build trust with customers as well as the benefits of using smart solutions.

Networking sessions were also arranged across all three days to connect and strengthen collaborations among water utility leaders and professionals.

Day three: Ending with a bang

Starting the day with a delectable spread of breakfast sponsored by Echologics, the conversation continued to cover pressing utility issues. The third session touched on Entirely Wholesome – Guaranteeing Quality in Every Drop where Dr Joan Rose, Homer Nowlin Chair in Water Research, Michigan State University and winner of the 2016 Stockholm Water Prize covered lessons from Flint Water Crisis, while Mr Jonathan Clement, chief executive officer of PWNT, delved on leveraging technology to safeguard water from the Rhine River Delta.

The panelists – Dr Rose, Mr Clement, Mr Bernie Sheridan, manager (Treatment) of Sydney Water; Dr Mong Hoo Lim, chief specialist (Water Quality) of PUB; Mr Geoff Aitkenhead, chairman of Scottish Water International; and Mr Kim Seong-Han, vice president and chief research officer of K-water – also brought their thoughts and insights onto the stage to provide the audience with a global perspective on the water quality front.

The fourth session - Never Lost – Recycling and Reusing Wastewater - was a line-up of impressive speakers too with Mr Pierre van Rensburg, strategic executive, Department of Infrastructure, Water and Technical Services, City of Windhoek, speaking about direct potable reuse in Windhoek, and Mr Harry Seah, chief engineering and technology officer of PUB, on the multiplier effect of recycling and reuse.

The panel session focused on increasing awareness for wastewater as a valuable resource among the international community, and panelists such as Mr Seah; Mr van Rensburg; Mr Bruce Gordon, coordinator of Water, Sanitation, Hygiene and Health, World Health Organisation (WHO); Mr Michael P. Wehner, assistant general manager, Orange County Water District, USA; and Mr Peter Nicol, senior vice president and Global Director - Water of CH2M brought the topic alive with valuable debates and discussions.

The closing session - Steering towards Greater Resilience and Sustainability - wrapped up the insights and discussions with some of the world’s leading practitioners and utility leaders: Mr Csaba Haranghy, chief executive officer, Budapest Waterworks, Hungary; Mr Ferdinand M. Dela Cruz, president and chief executive officer, Manila Water, Philippines; H.E. Henk Ovink, special envoy for International Water Affairs Netherlands; and Ms Sue Murphy, chief executive officer, Water Corporation of Western Australia.

Taking the stage was the launch of the World Health Organization’s (WHO) “Potable Reuse: Guidance for Producing Safe Drinking-Water” document, which provides guidance on how to apply appropriate management systems to produce safe drinking-water from municipal wastewater. In fact, the launch was graced with a speech by Mr Gordon, who emphasised the importance of it and a presentation by Dr Lim who gave an overview.

The three-day programme ended on a high note with dinner at Barnacles by the Sea, which overlooks the South China Sea. The dinner was also sponsored by PWNT and graced by Minister Zulkifi.

With over 200 water utility leaders and professionals coming together at SIWW Spotlight 2017, these strategic conversations to share and co-create innovative water solutions will continue to shape the future of the water industry.

In turn, these conversations will shape the content and programme for the Singapore International Water Week 2018, from 8 to 12 July next year at the Sands Expo & Convention Centre. WWA
Nestled in the heart of Jakarta in Indonesia, Indo Water 2017 was greeted with much hustle and bustle on the first day.

The three-day event – from 12 to 14 July – held at Jakarta Convention Center, was co-located with Indo Waste, Indo Renergy, Indo Security, Indo Firex and IISMEX 2017. The exhibition also saw 670 exhibiting companies from across 33 countries and a slew of international pavilions including China, Europe, Taiwan, Singapore and South Korea.

Proving to be the preferred event for water industry professionals, Indo Water 2017 saw more than 10,000 trade visitors attending the show to get the latest trends and developments in the water and wastewater industry as well as to source for new products and to network.

The grand opening ceremony of the event was officiated by Police Inspector General Drs. Setyo Wasisto, S.H., chief of Public Relation Division, Indonesian National Police, on behalf of Chief of Indonesian National Police, Indonesian National Police.

In addition, other influential industry players who also graced the opening ceremony are:

- Police Inspector General Drs. Unggung Cahyono, assistant for Logistic of Chief of Indonesian National Police, Indonesian National Police
- Drs. Dodi Riyadmadji, MM., on behalf of Minister of Home Affairs of The Republic of Indonesia, Ministry of Home Affairs of The Republic of Indonesia
- Ir. Sri Hartoyo, Dipl.SE,M.E., directorate General of Human Settlements, on behalf of Minister of Public Works and Housing of The Republic of Indonesia, Ministry of Public Works and Housing of The Republic of Indonesia
- Dr. Ir. Ilyas Asaad MP., M.H., senior advisor to The Minister
of Environment and Forestry on Central and Regional Institutional Relation, on behalf of Minister of Environment and Forestry of The Republic of Indonesia, Ministry of Environment and Forestry of The Republic of Indonesia

- Dian Ekowati, head of Communication, Informatics, and Statistics Department Jakarta Provincial Government, on behalf of the Governor of Jakarta Capital City, Jakarta Capital City Government

Throughout the three days, a string of seminars and workshops were organised to provide in-depth insights into the industry and to prompt discussions of ideas and solutions for the market. These seminars include

- “Investing in Indonesian Water & Sanitation & The Future of Private Participation”, “Innovation in Water Purification Technology and Smart IT System for Water and Wastewater Utilities” and “Business Opportunities in Wastewater Management”, which was organised by PERPAMSI
- “Circular Economy Forum” by Yayasan Greeneration Indonesia
- “USAID IUWASH PLUS PROGRAM” workshop organised by IUWASH
- As well as a business matchmaking event with PDAM facilitated by PERPAMSI, and business matchmaking seminar on water environment technology

The Indo Water 2017 Expo & Forum and its co-located events were supported by the Ministry of Home Affairs of The Republic of Indonesia, Ministry of Public Works and Housing of the Republic Indonesia, Ministry of Trade of the Republic Indonesia, J akarta Capital City Government, Building Engineer Association, Indonesian Water Association, Indonesian Water Supply Association, Korea Environmental Preservation Association, Singapore Water Association, Taiwan Drinking Water Equipment Association, Taiwan Excellence, Waste 4 Change and Indonesia Exhibition Companies Association.

Indo Water 2018 Expo & Forum will be held from 27 to 29 J une at the Grand City Convex in Surabaya, Indonesia.

Indo Water is a small show, as far as water exhibitions go. But Nijhuis is a regular at IndoWater, and we have seen the show improve over the years. We will definitely be coming back next year.

Dr Loh Siaw Ee, Nijhuis Industries, General Manager, Asia Pacific, Singapore

Ekoval is a regular at IndoWater. We came here looking for a new partner and distributor for the Indonesian market to sell our products at high quantities, and there are many opportunities here. We have not found a partner yet, but we are optimistic. We will be in Surabaya next year, and in the near future, we are looking forward to sharing our booth with our partner!

Caner Delitay, International Trade & Sales Specialist, Ekoval, Turkey

It is our first time for IndoWater, and we had actually organised meetings with contacts beforehand, so it was more for our networking, and it is one of the best platforms in the region for that. We might not be coming back next year, but look for us in 2019! EDPNC will definitely be back with different companies in the future.

Glenn Jackman, Senior International Trade Manager, Economic Development Partnership of North Carolina, U.S.A.

This is definitely not our first time in IndoWater, and we have seen the show improve over the years, and it is the biggest edition we have seen in terms of size and visitors. We will be back next year!

Haryono, Brand Manager, Ebara

We only attend one exhibition a year – IndoWater. It has improved immensely over the years, and the number of visitors have increased. We came looking for customers and clients, and we got them. We will definitely be back next year, so look for us at Surabaya!

Suherdi Cherron, Section Head of Promotions and Communications, Indobara
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<td><a href="http://www.myanwater.org">http://www.myanwater.org</a></td>
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<td>14 to 16</td>
<td>INTERAQUA TOKYO 2018</td>
<td>Tokyo, Japan</td>
<td><a href="http://www.interaqua.jp">http://www.interaqua.jp</a></td>
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<td>15 to 18</td>
<td>INTERNATIONAL WATER SUMMIT</td>
<td>Abu Dhabi, UAE</td>
<td><a href="http://www.internationalwatersummit.com">http://www.internationalwatersummit.com</a></td>
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<td>18 to 23</td>
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<td><a href="http://www.worldwatercouncil.org/forum/brasilia-2018">http://www.worldwatercouncil.org/forum/brasilia-2018</a></td>
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<td>WATER KOREA 2018</td>
<td>Goyang City, Korea</td>
<td><a href="http://www.waterkorea.kr/about/item">http://www.waterkorea.kr/about/item</a></td>
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<td>ASIAWATER 2018</td>
<td>Kuala Lumpur, Malaysia</td>
<td><a href="http://www.asiawater.org">http://www.asiawater.org</a></td>
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<td>Paris, France</td>
<td><a href="http://www.watermeetsmoney.com">http://www.watermeetsmoney.com</a></td>
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<td>Munich, Germany</td>
<td><a href="http://www.ifat.de/index-2.html">http://www.ifat.de/index-2.html</a></td>
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<td>AQUATECH CHINA 2018</td>
<td>Shanghai, China</td>
<td><a href="http://www.aquatechtrade.com/china">http://www.aquatechtrade.com/china</a></td>
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<td>ACHEMA 2018</td>
<td>Frankfurt am Main, Germany</td>
<td><a href="http://www.achema.de/en/home.html">http://www.achema.de/en/home.html</a></td>
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<td>27 to 28</td>
<td>ASIAN UTILITY WEEK</td>
<td>Bangkok, Thailand</td>
<td><a href="http://www.asian-utility-week.com">http://www.asian-utility-week.com</a></td>
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<td>Surabaya, Indonesia</td>
<td><a href="http://www.indowater.com">http://www.indowater.com</a></td>
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<td>JULY</td>
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<td><a href="https://www.eu-gateway.eu/business-missions/missions-calender/environment-water-technologies-korea-0">https://www.eu-gateway.eu/business-missions/missions-calender/environment-water-technologies-korea-0</a></td>
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<td><a href="http://www.iwa-network.org/event/world-water-congress-exhibition-2016">http://www.iwa-network.org/event/world-water-congress-exhibition-2016</a></td>
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Calendar is accurate at time of print. Subject to change.
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<td>Vontron Technology Co., Ltd.</td>
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JIS PVC-U Fittings

China Lesso Group Holdings Limited (HKEx, stock name: China Lesso, stock code: 2128) is a large industrial group of home building materials in China. China Lesso's products and services cover plumbing products, sanitary ware, holistic kitchen, PVC profile doors and windows, decorative plates, fire-fighting equipment, hygiene materials, ocean aquaculture cages, environmental protection, home furnishing and building material one-stop O2O services, etc. The sales revenue had broken through 2.5 billion dollars in 2016.

With the rapid global development of its businesses, China Lesso has more than 50 holding subsidiaries and more than 22 production bases distributed in 16 provinces of Mainland China, US, Canada, India, Indonesia and Uganda. China Lesso has continually perfected its strategic layout and broadened its sales network and market, to provide products and services to customers in a timely and efficient way.

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(Hong Kong Listed Stock Code: 2128)

GUANGDONG LESSO TECHNOLOGY INDUSTRIAL CO., LTD.
Production Base:
Lesso Industrial Estate, Longjiang Town, Shunde District, Foshan City,
Guangdong Province 528318, China

Sales Tel: (86) 757-29223015  (86) 757-29220500
Fax: (86) 757 23378980
E-mail: oversea@lesso.com  www.lesso.com