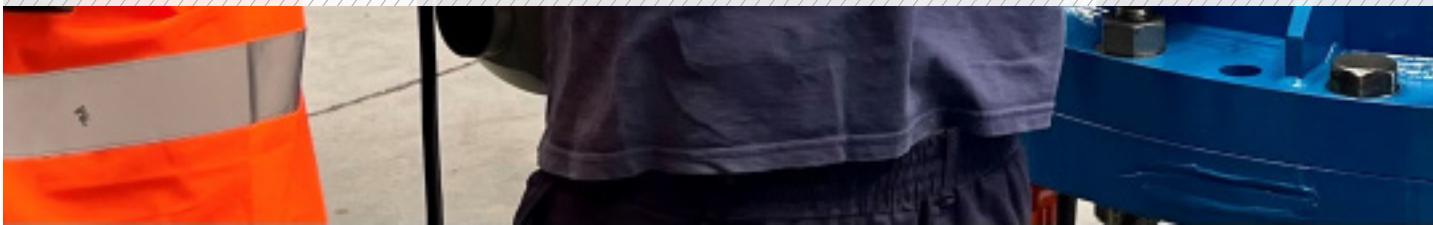




EXPECT
STORIES FROM THE
AVK WORLD

Expect... **AVR**





AVK INTERLINK NO. 64, DECEMBER 2023

Published by

AVK Holding A/S 2-3 times a year

Chief editor

Anne-Mette Kjær – amk@avk.dk

Michael Ramlau-Hansen – mrh@avk.dk

Content

Katrine K. Sørensen – kakl@avk.dk

Christina Villumsen – chrvil@avk.dk

Frontpage image

A fixed cone valve from Orbinox is being prepared for a project on the Mulungushi Power Station in Zambia. Read more about the project on pages 20-21.

Index

Niels Aage Kjær steps down as CEO of the AVK Group.....	4
AVK wins the regional EY Entrepreneur of The Year Award.....	5
The AVK Group acquires the companies Bayard and Belgicast.....	6
A wake-up call: the UK water industry is at a critical turning point.....	8
Showcasing our capabilities at the yearly water week event.....	10
Denmark and China: Navigating tomorrow's water.....	11
Creating lasting value for our customers through support and training.....	13
AVK wins ESG award at the Fenesan fair 2023 in Brazil.....	14
Atlas' integration into the AVK Group: On year in.....	16
Valve solution for new hydropower plant	

in Uganda.....	18
New education: BA degree in business and water technology.....	19
Supporting hydropower in Zambia: a century-old legacy and a new chapter.....	20
Smart wastewater solutions for UK's national overflows plan.....	22
AVK Belgium NV collaborates on state-of-the-art ethylene plant.....	23
Wouter Witzel valves and the use of geothermal energy.....	24
Saving precious resources with employee water bottle initiative.....	25
The Advanced Water Cycle Management Course 2023.....	26
Supporting Hefei's water division project.....	28
Increasing the resilience of Burnhope reservoir.....	30

DEAR READER

Dear reader,

I've said it before, and I'll gladly say it again; water infrastructure is undervalued, underfunded, and poorly maintained. Of course, the extent of this depends on where you are in the world. With the global average water loss estimated at between 30 and 40%, some countries' losses are higher than others. And you might wonder how any business can run at +30% waste without any significant effort being made to stop it? Imagine if we at AVK worked according to such principles.

A matter of will,

The reasons for water loss are many. Let me start by repeating what Paul Hubbard writes about the UK water supply on pages 8-9, which describes challenges that we see in many other countries right now. There is, generally, a lack of willingness to think in new ways and be ready to try something new. But the ideas are there: the other day, I was with an American delegation from California who was visiting Denmark to look at our water solutions. In California, there is a desire that USD 1 per consumer per year should go to research and development of the sector. A suggestion that shows understanding of the importance of a water sector that follows society's development.

... long-term perspective,

Another aspect is the economic view of water management. In general, the

importance of buying quality is not a high priority. Budgets are tight, so saving on construction costs seems more interesting than looking at the long-term benefits. What about cost of ownership? Fortunately, the European Union is beginning to look at whether longevity should be an integral part of public procurement. It is important to require that a supplier is able to document the longevity of their products or services.

... and the water tariff

A third aspect is the customer's price of water. Water is often sold much cheaper than what it actually costs to produce, transport and distribute it. However, projects that have resulted in 24/7 stable water supply with healthy, clean and safe drinking water show that consumers are willing to pay the actual price for water. This is also a much better case for the water supply, meaning they can afford to invest in the future or to patch up gaps in the distribution network.

And then there is the lack of understanding of water's impact on all the other major challenges facing our world. I miss a water sector that is stronger in bringing water to the public debate table. Decision-makers must understand the importance of water to a much greater extent. Water and health are linked; water and energy are linked; water and food production are linked; water is important for society's development. Who wants to settle in a place

without water, or start up a business where there is no water?

If you didn't already know, I use every opportunity to highlight water to politicians and decision-makers no matter where in the world they come from. The more we can highlight it, the more resources we can hope to be allocated to maintaining and re-establishing our critical water infrastructure.

Of course, I also spend a lot of energy explaining how important valves are in a well-functioning, efficient distribution network built according to district metering areas (DMA) principles. If you cannot rely on the valves, you cannot establish a reliable water balance, making it impossible to take measures to reduce water loss. It's that simple.

For all guest visits here at AVK, my welcome line is:

"Welcome to the backbone of any proper and sustainable water infrastructure".

There is still a long way to go before everyone understands the importance of water, but reading through this issue of InterLink, I am sure that we are on the right track.

Enjoy reading,
Michael Ramlau-Hansen



NIELS AAGE KJÆR STEPS DOWN AS CEO OF THE AVK GROUP

GLOBAL



The AVK Group's CEO for more than 53 years, Niels Aage Kjær, has decided to step down as CEO and becomes Chairman of the AVK Holding Board.

Niels Aage Kjær has decided to retire from the Executive Director role, and to step up and take the role as Chairman of the AVK Holding Board.

Carsten Fode, who has been the Chairman of the AVK Holding Board, will continue as a member of the AVK Holding Board. Søren Østergaard Sørensen will take on a role as Executive Advisor to the Chairman of the AVK Holding Board.

A Group Executive Board will be established with the overall responsibility for the Group. The AVK Group Executive Board will consist of

CFO, Lars Kudsk, COO, Bo Johansen, and CTO, Søren Kjær, Group Director AVK Water, Morten Sæderup Nielsen, Group Director AVK Advanced Manufacturing, Jacob Kjær, Group Director AVK Industrial Finn Langballe, Sales Excellence & Marketing Director, Anne-Mette Kjær, and Communication, Learning & Leadership Director, Pernille Kjær.

The above changes are part of a planned generational change in the top management of the AVK Group, and we are pleased that the organisational structure is in place to ensure our future positive development.

"I am confident that the new structure will enable AVK to take the next step into the future and deliver on the strategic goals set out for the coming years."

Niels Aage Kjær,
Chairman, the AVK Holding Board

The organisational changes were presented at the AVK Holding Board meeting on 28 September 2023 and will take effect on 1 October 2023.

AVK HOLDING IS APPOINTED EY ENTREPRENEUR OF THE YEAR 2023

DENMARK



We're thrilled to announce that AVK Holding and Niels Aage Kjær have been appointed Danish winner of EY Entrepreneur Of The Year 2023.



On 23 November, AVK Holding and Niels Aage Kjær were announced Danish winner of the globally recognised growth competition which took place at the event location Lokomotivværkstedet in Copenhagen.

The jury's reasoning as to why AVK Holding was appointed winner:

"This year's winner is the winner on all parameters. It is a company that is very innovative, they are truly global, and their work with ESG should also be highlighted as they make a noteworthy difference here. In short, their story is a true entrepreneurial adventure."

Søren Smedegaard Hvid, partner in EY and director for the competition, adds:

"AVK Holding is doing well in the ESG area, and is in general saturated with strong values, good spirit and propriety. Also worth mentioning is their impressive international journey. The company is truly global and has been through many phases of internationalisation."

Anne-Mette Kjær, Pernille Kjær, Jacob Kjær and Bo Johansen, who are all part of the AVK Group's Executive Board, were present in Copenhagen to receive the award.

Travelling to Monaco for Denmark

As winners of EY Entrepreneur Of The Year in Denmark, Niels Aage Kjær and AVK Holding will represent Denmark at the international finals, which will be held in Monaco in June, 2024.

AVK was established as a local machine shop in 1941 by Niels' father, Aage Valdemar Kjær. The main business area at the time was the production of compressors for refrigeration and cooling systems.

Today, AVK is a global market leader in valves, employing almost 5,000 people all over the world.

THE AVK GROUP ACQUIRES BAYARD AND BELGICAST

GLOBAL



On 9 October 2023, the AVK Group acquired 100% interest in the Bayard and Belgicast Groups of companies with businesses in Spain, France, Italy, Portugal, and China.

The acquisition includes the companies: Bayard S.A.S, Belgicast International S.L., and Talis Flow Control (Shanghai) Co. Ltd. as well as the sales companies in Italy (Belgicast Italia S.r.l.) and Portugal (Industra – Comercio de Equipamentos Industriais S.A.).

Going forward, the business will continue to trade as Bayard and Belgicast and continue to operate out of its head offices and manufacturing sites in Meyzieu near Lyon, France, Mungia and Toledo, Spain and

Shanghai, China.

Bayard and Belgicast are strong and well-established brands with a high-quality portfolio of leading water industry products with significant market positions on hydrants, gate valves, butterfly valves, pressure control and regulation valves and other accessories, primarily for the water industry.

Bayard and Belgicast will remain standalone businesses alongside AVK's widespread businesses

worldwide. The current management teams remain in place, led in Bayard by David Chambon, Renaud Dumoulin, Edouard Sollier and Marie Rives, and in Belgicast by Aitor Bernado and Joan Galtes.

Morten Sæderup Nielsen, Group Director for AVK Water, and new chairman of the companies, commented as follows:

"We are excited to welcome the Bayard and Belgicast companies into the AVK family of companies. This is an exciting acquisition with huge potential."

Morten continues: "The new companies will significantly strengthen our position in several markets and business segments, and will add comprehensive knowledge within our AVK Water sectors and in desalination technology. With a very broad product offering, optimised production facilities and a strong team of motivated people,

we look forward to working together to further support our customers and markets with quality products and solutions, securing safety in the infrastructure networks. I know that all companies will benefit from being part of the global AVK organisation, where they will be able to access further support in the key strategic areas of growth, leadership and lean. I'd like to take this opportunity on behalf of everyone in AVK to welcome the teams of the Bayard and Belgicast Groups and wish them every success."



Group photo from Bayard: Bo Johansen (COO AVK Group), Lars Kudsk (CFO AVK Group), David Chambon (MD Operations Bayard), Marie Rives (HR Director Bayard), Morten Sæderup Nielsen (Chairman AVK Water), Renaud Dumoulin (Commercial and Marketing Director Bayard) and Mark Hodgens (CEO Talis)

Bayard Group info

As a committed French industrial player since 1881, Bayard offers a wide range of products and services for the design, construction, operation, and maintenance of water networks to all involved in the water sector. Main products are fire hydrants, gate valves, control and regulation valves, check valves as well as water network accessories (from universal flanges, couplings, tapping saddles).

The company employs 220 people and generates a turnover of EUR 90 million. Bayard's manufacturing plant and headquarters are historically based in the Lyon region in France.



Group photo from Belgicast: Bo Johansen (COO AVK Group), Aitor Bernando (MD Operations Belgicast), Morten Sæderup Nielsen (Chairman AVK Water), Joan Galtes (MD Commercial Belgicast), Lars Kudsk (CFO AVK Group) and Mark Hodgens (CEO Talis)

Belgicast Group info

Since 1957, Belgicast has been one of the leading Spanish valve manufacturers focusing on the water sector cycle (from drinking water, wastewater, water distribution networks and desalination). Belgicast manufactures their own high quality, safe and long-lasting valves such as: resilient seated gate valves, centric butterfly valves, check valves as well as water network accessories (from universal flanges, couplings, tapping saddles).

With a turnover of EUR 55 million per year, Belgicast employs almost 160 people spread among Spain and their subsidiaries in Portugal and Italy. Main headquarters are based in Mungia, Vizcaya, where the main manufacturing facility for resilient seated gate valves is located too. The company also has a manufacturing facility for butterfly and check valves in Los Yébenes, Toledo, where, in addition to manufacturing, the centre of excellence for desalination projects is located.

A WAKE-UP CALL: THE UK WATER INDUSTRY IS AT A CRITICAL TURNING POINT

Recent coverage of the UK water sector in the national media has been almost universally negative; financial and commercial challenges, water leakages, dry spilling of sewage, water shortages, and more. It is my experience, however, that all stakeholders in the sector are overwhelmingly motivated by a desire to deliver a world class water network for the people of the United Kingdom.

This begs the question: what is stopping us all from achieving this?



*By Paul Hubbard,
Chairman, the AVK UK Group, and
Group Management Board member,
AVK Holding A/S*

Funding and change

Since privatisation of national water companies in 1989, the UK population has grown from 57 million to 67 million. This has put a strain on existing water resources, ageing pipe networks and treatment infrastructure. As a result, there have been calls in some quarters for higher water tariffs to fund an increase in mains replacement works and network maintenance. From my perspective, however, increasing water tariffs significantly

won't wash politically at a time of economic hardship. Furthermore, given the recent failings as outlined in my introduction, as an industry we have first to prove we are responsible guardians of the existing investment funds we receive.

Away from the bright city financial lights and media commentary, we need to refocus on our core task of collectively delivering a quality water and wastewater network that meets the needs of all customers, be they domestic or commercial. The public wants to see proof that more of their cash is being allocated to infrastructure investment and not to funding shareholder dividends.

If UK water companies embrace the knowledge, expertise and creativity

within the supply chain, adopt a more collaborative approach to engagement, and move away from the claustrophobic short-termism inherent in current tendering processes to a more strategic model, then I believe that, together, we can deliver water and wastewater networks that are fit for purpose.

At the heart of this 'brave new world' is the need for change. Change is never an easy option, as any manager knows. However, as Bill Clinton is quoted as saying: "the price of doing the same old thing is far higher than the price of change".

Experience and expertise

If one were to create a Brains Trust of water industry experience and expertise, where would the relevant manpower be found? Without question

it would be found in the water companies, consulting engineers and Tier 1 contractors; but it is also present across the UK water sector supply chain of manufacturers and service providers.

The knowledge residing in the supply chain is, in my opinion, undervalued and overlooked by the water companies. We require a sea change in the way all parties work together to unlock value and ensure we are all able to deliver the solutions required to satisfy our respective stakeholders.

Collaboration and Engagement

I first became Managing Director of a major water industry supply chain business, Biwater, back in 1990. Consequently, I have managed manufacturing businesses through every Price Review since privatisation.

It is my belief that we need to move towards a procurement model of engagement and collaboration if the UK is to retain a significant indigenous product manufacturing and service supply chain base. The traditional approach of the UK water companies is, in my experience, too little engagement with the supply chain and, whatever engagement there is, is too late to make a material difference. Seeing the supply chain as an opportunity to squeeze margins till the pips squeak without any real understanding of what suppliers have invested in for the long haul is a recipe for disaster.

If I take the portfolio of businesses I lead under the AVK UK banner as an example, we are encouraged to innovate, automate, train, develop digital solutions, deliver CSR initiatives, focus on quality and more. All vital and all admirable, but then we are expected to compete on traditional tendering scorecard, box ticking exercises. It can be exceptionally demoralising for staff

who have so much to offer to the wider industry given the opportunity, and also disincentivises businesses from innovation and sustainability.

The manufacturing supply chain needs to be given the air time, face-to-face engagement and status to share how we can, collaboratively with other parties, develop solutions to the challenges the water sector is facing. The Enterprise model advocated by Project 13 in 'From Transactions to Enterprises' is one of the approaches worthy of consideration, and I am aware that some water companies are looking to put the Project 13 principles into practice.

Solutions - not just products

Solutions is a rather over-used and hackneyed term. It is important, however, that the water industry supply chain is allowed to reclaim the term 'solutions' in its purer sense to reflect the value we can contribute to the UK water sector.

To explain what I mean, I've taken a relatively standard 'product' from the AVK UK portfolio, the AVK resilient seated gate valve. AVK manufactures exceptionally high-quality valves but, taken in isolation, the water industry has a tendency to view gate valves as a commodity and standards are not enforced.

However, the AVK gate valve can be supplied with a smart stem cap opening/closing device to assist valve positioning and a range of smart

water sensors that can measure flow, pressure, temperature, and water level. The data collected from the sensors, particularly when integrated with data from other assets such as pumps and hydrants, provides a detailed picture of the performance of the distribution network and paves the way for reduced water loss from leaks and improved workflow efficiency. These sensors can be retrofitted to existing AVK gate valves. Transactional procurement sees a commodity to be obtained at lowest cost whilst also demanding reliability, quality and resilience; an enterprise or collaborative model recognises the immediate and long-term value of the 'solution'.

A turning point

The water industry is currently on the radar of politicians and public alike. We are at a turning point. Collectively, we have to change to regain the confidence of consumers and other stakeholders.

Now is as good a time for such change as any I can recall in my forty years in the sector. As a result of Brexit, the UK is no longer subject to European legislation and constraints. This provides a legislative and operational freedom which could foster a more collaborative approach to problem solving.

Surely, one of the few positive outcomes of the pandemic is the acceptance that, with consensus and collaboration, radical change can be achieved quickly and effectively. In today's challenging times for the UK water industry, why not let the collaborative genie out of the bottle and embrace the difference suppliers can make to release long-term value, resolve operational and technical challenges, and foster greater consumer confidence.

A call to action

I can only speak for myself and the AVK businesses I lead, but we are more than ready and willing to engage with water companies and other parties in the conversations and collaborations I believe are so badly needed.

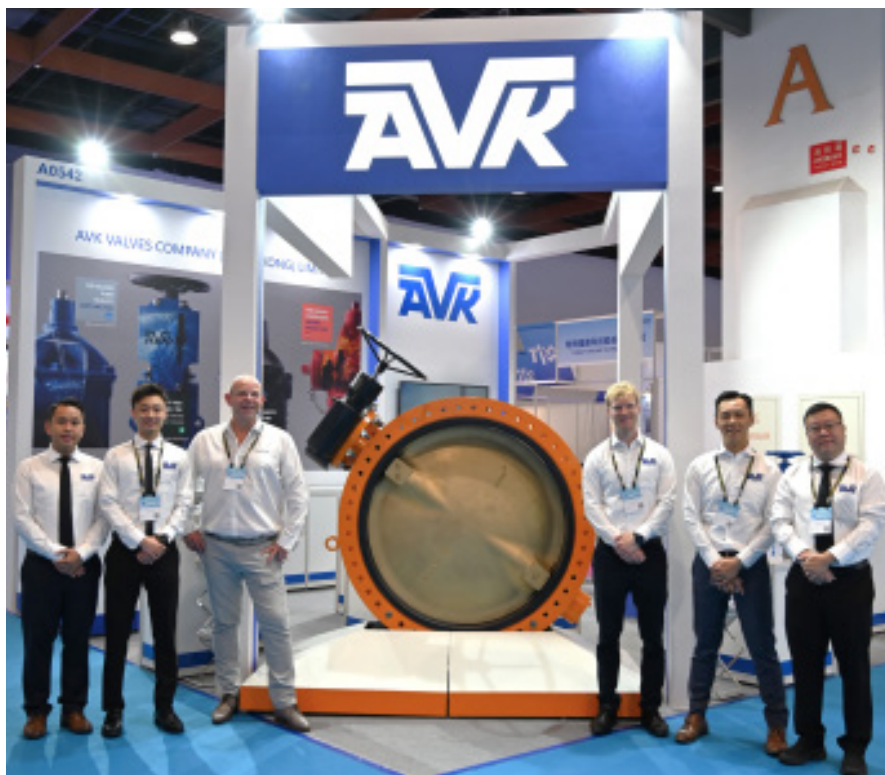


SHOWCASING OUR CAPABILITIES AT THE YEARLY WATER WEEK

HONG KONG, TAIWAN & MACAU

The Taiwan International Water Week (TIWW) is a significant event in the field of water technology and management, and was held on 20-22 September, 2023.

*By Stig Th. Bondrup,
General Manager, Hong Kong, Macau
and Taiwan,
And Head of Finance, China*



More than 110 manufacturers participated in the exhibition, displaying equipment and components such as recycled water and wastewater treatment, seawater desalination, terminal water purification, etc.

The event attracted nearly 2,500 visitors, both local and overseas, including from Vietnam, Japan, Indonesia, the Philippines, Thailand, the United States, who visited Taiwan to learn more about sustainable water resources solutions, creating a good foundation for promising international

business opportunities in the future.

The water week serves as a platform for professionals, researchers, and industry leaders to showcase the latest advancements, products and solutions related to water resources and management. Naturally, we participated from our AVK offices in Hong Kong, Taiwan and Macau, to bring forward our expertise and network with potential partners and clients.

Impressive products on display

We presented our high-quality gate valves, butterfly valves, check valves, control valves, and other components as well as water solutions. Our Wouter Witzel DN1200 butterfly valve got a lot of attention and became an instagrammable spot at the venue. The fixed liner and epoxy coating technique really impressed the visitors. We also gave an interview for USTV, one of the Taiwan Financial News Channel thus increasing more exposure. It will undoubtedly increase our potential customer's trust in our capabilities.

Taiwan's water week

Overall, the Taiwan International Water Week Exhibition serves as a prominent platform for promoting sustainable water management practices, fostering innovation, and driving advancements in the global water industry.

The exhibition focuses on addressing various water-related challenges, including water scarcity, pollution, conservation, and sustainable management, and during the exhibition, visitors can expect to explore a wide range of exhibits, including water management solutions, water conservation technologies, monitoring, control systems water purification equipment, and much more.



DENMARK AND CHINA: NAVIGATING TOMORROW'S WATER

CHINA

*By Ken Yan,
BD & Marketing Director,
AVK Shanghai*

Memorandum of Understanding (MOU) between Denmark and China

Denmark has held a distinct advantage in the field of water technology and has long been regarded as a strategic partner for China. In 2022, Denmark and China solidified their collaboration with the signing of a 'Memorandum of Understanding' on cooperation in sustainable urban development,



Article continues on the next page >



is a comprehensive enhancement of adaptability across diverse scenarios, strengthening the comprehensive lifecycle management of water system valves and facilitating the realisation of scientific and sustainable infrastructure operations.

Important collaboration

Over the following four days of the event, AVK embarked on visits to several prominent local water utility groups, accompanied by representatives from the Embassy of the Kingdom of Denmark in China, the Danish Export Association, Denmark's VCS Water Services company, and the Danish water industry.

On 14 September, Denmark's Minister of the Environment, Magnus Heunicke, arrived in Shanghai and engaged in discussions with Zhang Xiaohong, Deputy Mayor of Shanghai. Accompanying the Minister were representatives from prominent Danish companies including AVK, Grundfos, Hempel, Novozymes, and Ejlskov. On the Chinese side, the delegation included representatives from the Shanghai Water Bureau, the Foreign Affairs Office, the Ecological Environment Bureau, and the Shanghai Urban Construction Group. Both parties collectively acknowledged the robust foundation for cooperation in the realm of water utilities between Shanghai and Denmark, especially regarding the reduction of non-revenue water (NRW). The Danish companies showcased their achievements and the formidable technical support underpinning their engagement in Shanghai.

marking the beginning of a long-term, mutually beneficial partnership.

The week was kicked off with the seminar "Danish Water Supply, Wastewater Management, and Sponge Cities", which was held as part of the 18th World Water Resources Congress. The seminar was graced by the presence of Danish Minister for Environment, Mr. Magnus Heunicke, and Mr. Xing Haifeng, Director General-Level Consultant from the Ministry of Housing and Urban-Rural Development of China, who delivered insightful speeches.

AVK played an active role in showcasing Danish cutting-edge water treatment technologies and operational expertise, engaging in discussions with Chinese industry experts on innovative and sustainable water resource management technologies.

AVK solutions in China

As AVK Shanghai's Marketing Director, I provided attendees with a comprehensive overview of our operational footprint and service network, with focus on delivering holistic solutions and real-world case studies centred on urban water circulation systems. It is with great awareness that we acknowledge the evolving dynamics of demographics, economic landscapes, and technological advancements, resulting in an increased demand for water resources, encompassing both quantity and quality.

Our valve solutions, anchored in safety and resilience, will elevate the scope of valve applications through innovative, green, low-carbon, and highly efficient technologies. This integration seamlessly merges quality, functionality, application versatility, and maintenance with digital management. The outcome

AVK Valves (Shanghai) Co., Ltd. was established in 2002, dedicated to serving the continuously growing Chinese market. As representative during the gathering, Mr. Zhao Hai, Managing Director of AVK Shanghai, presented an overview of AVK's nationwide business development, and shares:

"In China, AVK has emerged as a leader in delivering high-quality and innovation-driven valve solutions, earning a sterling reputation across diverse sectors including water supply, wastewater, gas, reservoirs, dams, and industrial segment. Our contributions to Shanghai's infrastructure development and environmental sustainability fill us with immense pride. With a dedicated team and unwavering commitment to sustainability, AVK remains steadfast in our contribution to the economic and environmental aspirations of this magnificent city."

CREATING LASTING VALUE FOR OUR CUSTOMERS THROUGH SUPPORT AND TRAINING

QATAR

In our commitment to serving our customers better and providing lasting value, we have embarked on a journey of delivering training sessions aimed at fostering stronger connections with the local Operations and Maintenance (O&M) teams across the region.

*By Dias Thottan
General Manager
AVK Flow Control, Doha Qatar.
and
Anurima Roy
Regional Marketing Manager,
AVK Gulf DMCC*

One of these sessions took place in Doha, Qatar in late September this year, where we organized in-house training sessions for major O&M Contractors in Doha. The spotlight was on the operation and maintenance of Penstocks, and the participants covered engineers and operators responsible for managing sewage treatment works, sewage treatment plants, and pumping stations.

Our experts provided valuable insights during these sessions. The introduction to our extensive product range was led by one of our Projects & Technical Managers, followed by an in-depth presentation on various penstock features available in the market. Additionally, they shed light on the distinctive features of AVK ORBINOX penstocks enabling attendees to identify key features when i.e. replacing existing penstocks.

Valued knowledge and strong customer relations

With 90 participants attending in



different slots, the sessions served more than just knowledge transfer. They provided a platform for the O&M team members to openly discuss on-site challenges and issues while operating large-size equipment like penstocks. We were able to support them in identifying gaps and guide them towards effective on-site solutions.

The feedback received from contractors is overwhelmingly positive. They found the training sessions informative and highly valuable. Some even expressed a desire for more in-depth on-site training sessions on other significant valves, such as large-sized gate valves and butterfly valves.

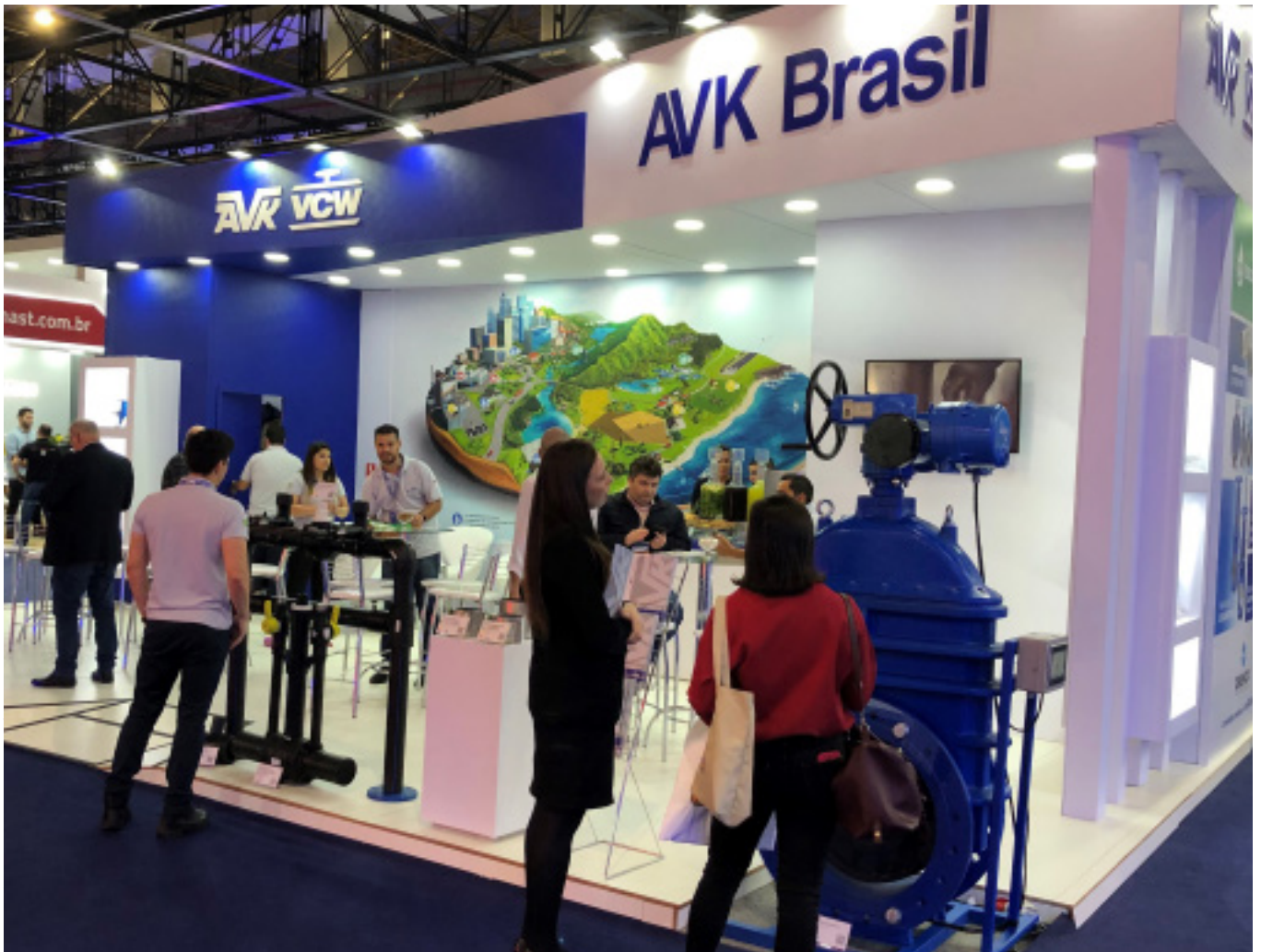


One of the O&M managers shares: "Many thanks for the training. It was very useful and informative for our team and, we will be happy to do the same in the coming months. We are looking forward to the next training".

The training initiative marks the beginning of our commitment to fostering closer collaboration with our customers. We stay focused on further enhancing our support, nurturing new connections, and continuing to provide value to our customers. As always, we work hand in hand with our customers to ensure the success of their projects and the longevity of their equipment solidifying their trust in us.

AVK WINS ESG AWARD AT THE FENASAN FAIR 2023

BRASIL



By Juliana Cristine Celestrim,
Marketing Analyst,
AVK Válvulas do Brasil

During October 3-5, more than 21,000 participants were received by more than 280 exhibitors.

The 2023 edition highlighted the importance of partnerships and synergy within the waste sector, which is especially relevant for Brazil in order to reach the goals for universalisation of sanitation.

The fair was, in combination with the AESabesp Technical meeting and São Paulo's Waste Expo Brazil,

an important space for discussion and exchange of experiences on environmental sanitation and its importance in the globalization of sustainable development.

AVK Brasil exhibited products from the AVK, VCV, AC.MO, ORBINOX, FUSION and REPICO lines, including the hands-on highlights:

- A large gate valve, which was operated by an electric actuator, allowing the visitors to open and close the valve by giving it



command on a control panel.

- A HDPE circuit, containing FUSION products demonstrating the connections installed on a pipeline.
- An AC.MO needle valve in cut, making it possible for customers to see the inside of the inside, visually explaining how the valve works and how fluid passes through.

AC.MO accompanied us at the fair, assisting our customers and demonstrating the innovation and technology of their products.

AVK Brasil Wins Award at FENASAN 2023/ Ecoeventus®

For the second year, AESabesp awarded exhibiting/investing companies that presented ESG and SDG practices in their processes. AVK Brasil was one of the winners in the environmental category. We were already awarded in 2023, and for the second year in a row, we brought home the award.

The evaluation was carried out through local and global actions, with a face-to-face interview carried out by those



responsible for the organizer AESabesp together with a person responsible for AVK Brasil. The evaluation covered our production process, local campaigns, actions carried out with employees

and what we are doing to improve our process thinking about the environment.



Products exhibited at the fair:

- AVK/VCW swing check valve, flanged, PN10/16, type 927/00
- AVK ball check valve, flanged, PN10/16, type 53/35
- AVK/VCW disc check valve, wafer, 16 bar, type 928/10
- AVK/VCW dual door swing check valve, 10/16 BAR, type 932/10
- AVK/VCW butterfly valve, wafer, PN10/16, type 931/10
- AVK/VCW double ecc. butterfly valve, flanged, AWWA short, PN10/16, type 926/00
- AVK MAGNUST™ PE ball valves, (gas MOP10/water PN16), type 85/50
- AVK gate valve, PE pipe ends, PN16, type 36/80
- AVK eccentric plug valve, EN-STD, PN10/16, type 764/01
- AVK double orifice air relief valve, PN10/16, type 851/41
- AVK gate valve, flanged, PN10/16, type 06/30
- HDPE circuit containing types: 1203/01, 1204/01, 85/30, 1206/21, 1202/01, 1200/01
- AVK needle valve, PN10/16, type 872/00
- AVK REPICO® slip type coupling, type 745/20
- AVK REPICO® hinge type repair coupling, type 747/81
- AVK repair clamp type FS10, type 748/01

ATPLAS' INTEGRATION INTO THE AVK GROUP: ONE YEAR IN UNITED KINGDOM

The Atlas investment programme delivers improved working conditions, productivity gains, and product innovation.

*By Charlotte Hopkin,
Senior Marketing Communications
Executive,
Atlantic Plastics Ltd*



In June 2022, the AVK Group announced the acquisition of TALIS UK. The business was renamed Atlantic Plastics, a name which first saw the light of day back in 1974. James Fry was appointed Managing Director of the new entity.

Atlantic Plastics, trading as Atlas, has consolidated all activities to its base in Bridgend, South Wales. This includes the manufacture, distribution and marketing of iconic water brands such as Atlas meter boxes, Talbot pushfit service fittings, and EBCO gunmetal fittings.

We interviewed Fry about Atlas' first twelve months operating as part of the global AVK Group:

“During the acquisition due diligence process, I had the opportunity to show Niels Aage Kjær (then CEO of AVK Group) around the Bridgend site. Two things really made an impression on me that day. Firstly, whilst obviously a hugely successful businessman, Niels clearly lived and breathed engineering and manufacturing. His questions focussed on process, layout and quality. Secondly, Niels emphasised that if change was needed, investment funds would be provided such that it could be done right; no half measures.

Atlas moved to its current location in 1995. In the late 1990's we became part of the Tyco Waterworks portfolio of brands and, subsequently, TALIS Group prior to being acquired by

AVK Group. Whilst we enjoyed periods of capital investment under previous owners, this investment primarily focussed on individual assets or processes. As the company developed, and the product mix and technology evolved, the business needed reinvigoration and a new focus. Site layout had started to become a constraint on manufacturing efficiencies and further growth.

Becoming part of the AVK Group has been a breath of fresh air. Niels and the management team bought into our investment plans to improve productivity and deliver sales growth. Total capital investment of EUR 6.35 millions has been sanctioned and, true to their word, Niels and Paul Hubbard,

Chairman at the AVK UK Group, have placed great emphasis on doing things right.

There have been three key drivers behind the investment programme. Firstly, we wanted to change the layout of the site and rationalise processes; Secondly, we switched to injection moulding for the manufacture of our unique Matrix Multi Meter Boundary Box, a far more sustainable manufacturing process that aligned with our sustainability goals; and, Thirdly, we wanted to improve working conditions for our workforce.

Across site we had 30 injection moulding machines (IMM) and over 300 tools. We have consolidated all these machines together in one area. This has enabled us to resite all assembly operations under one roof. The new assembly facilities are away from the noise of the IMM, and there is better lighting and visibility.

Restructuring raw material, component and finished product flows has been one our biggest challenges; particularly as we needed to maintain productivity levels throughout the changes. A building was demolished, and new areas concreted to improve external storage and material flow around site. Stock control has been made so much simpler and we have eliminated waste and double handling.

Including design and new tooling, almost EUR 2.3 million have been invested in product development alone. In terms of new machinery, the centrepiece is the new 1400t injection moulding machine which will

manufacture the revised Matrix Multi boundary box. Injection moulding the Matrix Multi boundary box has enabled us to switch to a recycled polymer with an end-of-life recyclability rate of 97% and our advanced manufacturing approach has allowed us to achieve a weight reduction of nearly 50%. Waste has been reduced through the introduction of automated sprue pickers (sprue is the waste piece on a moulding which sits in the channel through which the mould was filled) with the material fed back into process through regrind. On many IMM we have introduced automation (robotics) to extract finished products and present them at working height. This has huge positive benefits for the health and safety of our workforce.

Change of ownership inevitably brings with it uncertainty, particularly around job security. The investment has, therefore, had a huge impact on team morale. People can literally see positive change happening on a day-to-day basis. We are also investing in the wellbeing of the workforce by providing new welfare facilities: air conditioning, heating, kitchen, toilets, lockers and so on. These are simple things, but they have enabled us to show that AVK is a caring employer. Everyone takes great pride in showing visitors around the site.

AVK has given us the freedom and opportunity to adopt a holistic approach to making best use of our space. The next phase of works is projected to include a new canopy over the storage area on site, the demolition of existing offices to make space for



car parking, and the construction of new office facilities.

I must admit I hadn't appreciated how much of an impact the investment would have on the local community. There is far greater local awareness of Atplas as an organisation, and this has proved helpful in recruiting quality employees at a time when many organisations are struggling to fill vacancies.

I would like to take this opportunity to thank all our workforce for their patience and positive contributions during the upheaval caused by the changes we have implemented. Praise must go, in particular, to our engineering team which has both planned the works and ensured momentum has been maintained whilst meeting production targets.

There is no doubt in my mind that the rebranding, integration into the AVK Group and the implementation of the extensive investment programme have been greatly facilitated by both organisations sharing very similar cultures. For example, Atplas' core values of innovation, quality and know-how are a good fit with AVK's five cornerstones of quality, innovation, reliability, sustainability and customer service.

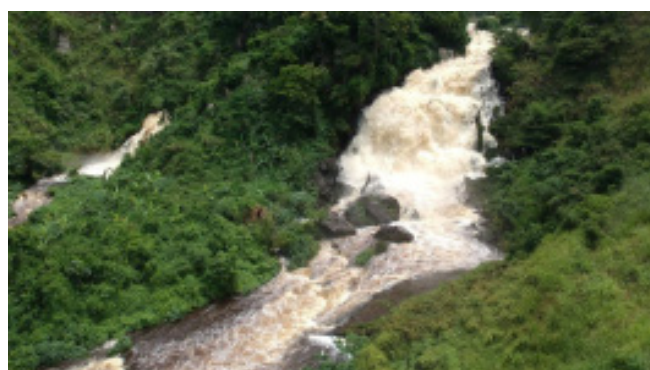
As a Managing Director, Niels' 'do the right thing' approach has been hugely refreshing. The new layout will make it far easier to take advantage of the benefits of lean thinking, another of Niels' passions. We look forward to showing Niels, and the AVK Group leadership team, what we have achieved on their next visit."



VALVE SOLUTION FOR NEW HYDROPOWER PLANT IN UGANDA

UGANDA

For a new hydropower plant, which is situated on the Nkusi River in Uganda, Orbinox have supplied the crucial valve solution. The power plant is named Kigwabya, and it will have a peak power capacity of 4,6 MW.



By Jørn Urup Nielsen,
Director,
Glenfield Middle East & Africa

Until now, The AVK Group have supplied valves and sluice gates for more than 100 dams and hydropower projects in Africa.

In Uganda, for example, this includes the Owen Falls Hydroelectric Project, now known as the Nalubaale Dam, where Glenfield Valves (member of the AVK Group) in 1954 supplied a significant number of valves and gates.

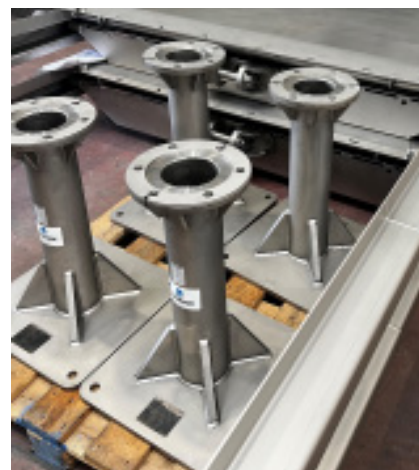
Remarkable capabilities

For the Kigwabya project, we got involved with the owner's site manager via LinkedIn in January 2023, where he had noticed our activities in the African market for dams and hydropower.

After a couple of months of framing and planning the correct product solution, we obtained the order and down-payment in March 2023, whereafter manufacturing from AVK's specialist factory for Orbinox sluice gates was completed by mid-July 2023.

Products supplied to the project:

- 4 pcs bi-directional MU wall mounted sluice gates (2000 x 2000 mm) in stainless steel fitted with hydraulic actuators, used as dam gate and intake gates.
- 1 pc bi-directional MU wall mounted sluice gate (1000 x 1000 mm) in stainless steel fitted with hydraulic actuators, used as flush gate.
- 1 pcs EXV knife gate valve (DN300) for manual operation.
- 1 pcs EXV knife gate valve (DN600) fitted with hydraulic actuator.
- 2 pcs SA stoplogs (2200 x 1600mm) in aluminium, used for tailrace channel downstream powerhouse.



The product photos are from similar projects, as the installation phase is not yet finalised.

NEW EDUCATION: BA DEGREE IN BUSINESS AND WATER TECHNOLOGY

DENMARK

The water sector is experiencing an increasing demand for sales personnel and advisors with expertise within business and the latest water technology.

Therefore, we at AVK are happy to share that Business Academy Aarhus (Erhvervsakademi Aarhus) launched a new Bachelor's Degree Programme, which was successfully kicked off in August 2023.



*By Michael Ramlau-Hansen
Public Affairs,
AVK Holding*

Water knowledge is increasingly in demand

The education is the result of a longer cooperation between AVK, Aarhus Water (water utility), Business Academy Aarhus, who have been working closely together to reach the final ministerial approval. Lars Schrøder, CEO of Aarhus Water:

"The education is a great initiative. Denmark has some of the very best know-how within distribution and treatment of water. The world is requesting better, greener water solutions, and thereby also labor. And Aarhus already has a professional and competent innovation environment regarding water, so it makes perfectly good sense to place the education here."

A need for more candidates – nationally, and abroad

For years, Michael Ramlau-Hansen and Niels-Erik Andersen from AVK Holding were discussing the need for a more business-oriented education with focus on the possibilities for business within the water sector. They were unhappy with the fact that, apparently, no one seemed to care about the many business cases surrounding water's journey throughout society. And they were longing for more young people to be interested in proper water infrastructure and in wanting to be part of creating the necessary changes for a greener and more efficient way of handling water. Luckily, savings has always been a strong motivational factor in trying to do things differently.

From a press release published by Business Academy Aarhus:

"The water sector is experiencing an increasing demand for sales personnel and advisors with expertise within business and the latest water technology. Therefore, we at AVK are happy to share that Business Academy Aarhus (Erhvervsakademi Aarhus) has launched a new Bachelor's Degree

Programme with the first students to commence in August 2023. An education that combines sales, business understanding and technical insight."

Michael Ramlau-Hansen adds:

"The Danish water industry has the technology and the products to be able to make a true difference. Therefore it is more than important that the younger generation finds this interesting, and finds it important to focus on. Young people who will understand the business in water and want to be part of developing the entire sector. All companies who are delivering into the sector needs these young and educated people. That could be i.e. embassies abroad, and water utilities in the water utilities at home".

SUPPORTING HYDROPOWER: A CENTURY-OLD LEGACY AND A NEW CHAPTER

ZAMBIA



*By Jørn Urup Nielsen,
Director,
Glenfield Middle East & Africa*

At the AVK Group, we are proud of our rich heritage, particularly through Glenfield Valves in Scotland. Glenfield has been supplying valves for hydropower projects since 1900 (at least), with its first project in South Africa over 120 years ago.

Building on this legacy, in September 2022, we were approached by WestGlen Consult (Scotland) and Scatec (Norway) in their role as consultants to Lunsemfwa Hydro Power Company (LHPC), Zambia's first independent power producer, with a project at the Mulungushi Power Station.

Located near Kabwe in Central Province, Zambia, the Mulungushi Power Station is the oldest hydropower plant in Africa. It was formally opened in 1925 and is fast approaching its centenary. The project site is the dam for the station's main reservoir.

The Mulungushi project involved an existing installation: an old needle valve in a free discharge application, connected to the end of a 130 m long tunnel through the dam with a bore of 1600 mm. The client was clear that they did not require an in-line solution. Instead, a fixed cone valve solution would be more appropriate. This would

allow them to maintain or even improve discharge levels, thereby maximising the flow range available for the downstream Mulungushi Hydropower plant.

Our recent supply of fixed cone valves to the Marovanyati Dam (2x DN900) and Lake Mutirikwi (2x DN1100) hydropower station in Zimbabwe, not far from the Zambian project location, provided regionally relevant references. Additionally, our extensive local experience, with a significant number of AVK valves installed in Zambia for various water supply applications, strengthened our position.



The above images show the Mulungushi Power station under construction. The fixed cone valve in use is from another project to show the function. Furthermore, a photo of the first ever valve delivery from Glenfield to Africa, which was a hydraulic turbine inlet valve to South Africa in the year 1900.

The project had specific requirements, including:

- Maximum operating pressure – 23m water column
- Minimum net head - 2.7m water column
- Design pressure – 60m water column
- Atmospheric discharge, hood required
- Discharge back into natural river course
- Electrical actuation for sleeve – 24V DC
- 4-20mA Position sensing required

The new valve is part of a suite of upgrades designed to optimise control and responsiveness of the Mulungushi station. These enhancements will enable the station to meet a range of demand levels, including responsiveness to peaking market opportunities.

Lunsemfwa Hydro Power Company is currently undertaking projects to increase its renewable footprint in Zambia and this upgrade will provide the potential to regulate future solar PV,

paving the way for a first solar-hydro hybrid system in the country.

Our ability to send a service engineer from AVK South Africa to supervise the valve installation in this critical application was a key factor in securing the order for a DN1600 Fixed Cone Valve from AVK's factory in Spain, Orbinox.

As we moved into the final phase of the ordering process, Orbinox introduced their project manager to the client, ensuring a smooth transition from the

sales and procurement phase to the operational execution of the order. This marked the beginning of a new chapter in our long-standing commitment to supporting hydropower projects in Africa.



SMART SOLUTIONS FOR UK'S NATIONAL OVERFLOWS PLAN

UNITED KINGDOM

In the wake of increasing public anger over wastewater discharges into rivers, Water UK has announced a “massive” transformation programme amounting to more than EUR 11 billion.

By Rob Edwards,
Smart Water Specialist,
AVK UK

Digitalisation of UK's wastewater system

The programme, also known as the National Overflows Plan, will be the largest modernisation of sewers since the Victorian era and the most ambitious programme on wastewater spills in the world, according to the UK water industry membership body.

The plan aims to cut overflow incidents by 140,000 a year by the end of the decade through a wide range of strategies, with the digitalisation of the UK's 350,000-mile sewer system a vital pathway to achieving this goal.



Monitoring with our smart air valves

As an industry-leading provider of intelligent network solutions for the wastewater industry, AVK UK is ideally placed to support companies to meet the targets set out in the National Overflows Plan.

We have the technology and expertise to address one of the plan's primary components: real-time monitoring of all 15,000 sewage overflows in England. AVK Smart Wastewater air valves and digital monitoring systems, including VIDI Level, can provide the data required for the new National Environment Data Hub, as well as alert companies to

overflow spills so they can be treated as quickly as possible, therefore reducing the impact on rivers.

We have a full package of smart solutions to help control and warn against pollution incidents. The AVK Smart Wastewater air valve can detect failure and leakage before they occur as well as providing general system health information back to our clients. Our ARISENSE smart air valve solutions can provide feedback on parameters including overflow, leakage, blockage, pressure, tampering, tilt/shock, low battery, and with the addition of an external sensor, chamber flooding.

With the communication protocols of NB-IoT and LoRa we can use existing networks and create new networks to ensure 100% coverage for sites, no matter where they are.

These smart valves have been deployed in remote locations where communication infrastructure may be limited and now manual inspections and downloads are a thing of the past. If any of the pre-set parameters are exceeded, e-mail and text messages are sent to all interested parties.

We can offer instant alerts in a wide range of sequences and priorities, and, with an open API, we can feed data directly to our customer's management systems too – and all in line with their cyber-security protocols.



AVK BELGIUM NV COLLABORATES ON STATE- OF-THE-ART ETHYLENE PLANT

Ineos Project One is a EUR 4 billion project situated in Antwerp, a city in the Flanders region of Belgium. Antwerp is the largest chemical cluster in Europe. For the investment, AVK Belgium supplies drinking water valves and hydrant solutions.

*By Margot De Schagt,
Marketing Coordinator,
AVK Belgium*

After more than three years of diligent work, AVK Belgium has been chosen to supply drinking water valves and hydrants for the INEOS project.

The main installation of the project consists of a steam cracker that



converts ethane into ethylene. This specific steam cracker has the lowest carbon footprint in Europe. Moreover, it is the largest investment in the chemical industry in Europe in the past 25 years.

The new facility contains cutting-edge technology and claims to have the smallest carbon footprint in all of Europe. The plant consists of four main components and should be operational from 2026.

An important project for the Group

The involvement of AVK Belgium is of great importance and leaves a deep mark on the entire AVK Group.

This extensive project involves many engineering offices, contractors from different countries, leading to a complex history of inquiries, specific details, changes, and additions. AVK is a full-fledged project partner, with attention and dedication to every aspect.

WOUTER WITZEL VALVES AND THE USE OF GEOTHERMAL ENERGY

THE NETHERLANDS



*By Stijn Reimert,
Account Manager,
Wouter Witzel*

Wouter Witzel supplies rubber lined butterfly valves to several companies specialised in the above-ground geothermal energy installations.

Lately, Wouter Witzel has supplied over 160 butterfly valves for the second phase of Hoogweg Paprikakwekerijen's geothermal energy activities. Hoogweg Paprikakwekerijen produce bell peppers in greenhouses.

Currently, 70% of the required heat for Hoogweg's 160 hectares of greenhouses is being provided by geothermal energy. By expanding the geothermal activities with a new



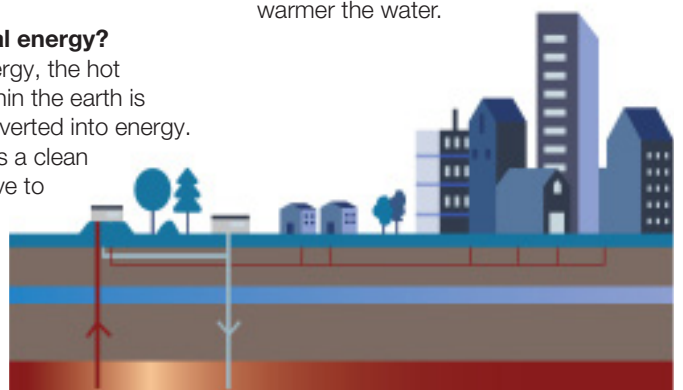
production well, Hoogweg will get even closer to its ambition of being as sustainable and environmentally friendly as possible.

What is geothermal energy?

With geothermal energy, the hot water from deep within the earth is pumped up and converted into energy. Geothermal energy is a clean and reliable alternative to natural gas.

In the Netherlands, several geothermal projects are taking place with

drilling to a depth of two or even three kilometres. In that depth, the water has a temperature of 70°C up to 100°C. The deeper the geothermal drilling, the warmer the water.



SAVING VITAL RESOURCES WITH EMPLOYEE WATER BOTTLE INITIATIVE

SAUDI

At AVK, we strongly believe in promoting sustainability and the well-being of communities. Therefore, we are happy to share our initiative: “AVK Employee Water Bottle Campaign”.



By Randa Abu Mazen,
Marketing Coordinator,
AVK Saudi Valves Manufacturing

In an effort to reduce our reliance on single-use plastic bottles, we have distributed reusable one-litre bottles to all our employees as an eco-friendlier alternative. A significant step towards a more sustainable everyday life in our offices, eliminating approximately 10,000 plastic bottles each month.

These bottles can then be refilled at water dispensers, that are located various places in our company.

The initiative has been positively received by our employees, as they don't have to run frequently to the canteen to get the small plastic

bottles. At the same time, the water is being kept cool in the new bottle, which is highly appreciated when the temperature reaches more than 40 degrees in this part of the world.

Sustainable does not always mean costly

Additionally, this initiative generates a saving of around USD 5,000 per year, as the cost of water in dispensers are lower than the price of water in single-use bottles.

At AVK, we understand that our responsibility goes beyond manufacturing top-quality valves and fittings. Our goal is to provide

communities worldwide with clean and safe water supply. Through our products, we help customers effectively manage and protect water resources by preventing waste, controlling leaks, and enhancing network performance.

The initiative emphasises our dedication to water conservation and environmental responsibility, and carrying our AVK water bottle serves as a daily reminder of the value of every drop – not just for us, but for future generations too.

By working together, we can truly make a difference.

THE ADVANCED WATER CYCLE MANAGEMENT COURSE OF 2023

DENMARK



*By Katrine K. L. Flecha,
Global Marketing &
Communications Coordinator,
AVK Holding A/S*

This year's course participants visiting our AVK Academy and Visitor Centre in Denmark.

Back in August, we held our yearly water summer school, which was yet again held at the cozy inn in Låsby, Denmark. Congratulations to the graduates, and cheers to a future with better water management!

The water summer school is a two-week, intensive course named "Advanced Water Cycle Management". It is hosted by Aarhus University and has been created in collaboration with Danish companies from the water sector, including AVK. This year, 47 participants joined from 13 different countries.

Why does the world need better knowledge about water management?

Clean water is already a scarce resource, and with rising populations and economies, the issue is only increasing. Worldwide, about 35-40% of our available clean drinking water is lost somewhere in distribution, before it reaches the end-consumer due to poor network equipment, burst pipes and insufficient maintenance. Also, the energy used to pump, clean and transport this amount of water, is therefore wasted too.

And what if wastewater, a heavy pollutant worldwide, could be seen as a resource instead of a problem? What if we can turn wastewater into renewable energy, producing electricity, biogas, district heating or -cooling, and recover other valuable resources from the sludge, e.g. phosphorus? This is already possible, and many of Denmark's wastewater utilities are net producers of green energy.

The course programme includes the three thematic tracks: groundwater resource management, water distribution, and wastewater handling.

Participants from Ukraine and sponsored seats by DANIDA

This year, three of the participants were from Ukraine, a country that will be looking into years of infrastructure reconstruction after the ongoing conflict with Russia.

One of them, water utility director Viktor, shares how the course has been a great inspiration, and how he hopes to be able to utilise his new water knowledge:

“Our local water network is still running, but it is seriously damaged. We were cut from the water source in the beginning of the war, so we could not get our fresh water from the



water intake in Kherson area. We then started to take water from the river Pivdenny Buh, where the salinity level is very high. Brackish (salty) water is, however, not good with the steel pipes, so corrosion is a big issue. Right now, 240 km of pipeline is just deteriorated, and will have to be renewed. We have a lot of leakages every day because of this. I am hoping that we can start implementing some of the new water technologies in Ukraine.

We were already interested in it before the war, but now I have a clearer overview of how it actually works, DMA structuring, hydraulic modelling and so on. Also, it was impressive to experience that all these water experts you have here in Denmark, they also have time to teach at the university – this is just excellent, and the outcome is great.”

Michael Ramlau, Public Affairs at AVK, drove to the south of Ukraine in the beginning of August to pick up the participants. In the image above, you can see one of the water facilities he visited during his trip, which are clearly marked by bombing, and where flooding has destroyed many of the important installations.

Besides the participants from Ukraine, DANIDA Fellowship Centre had



Michael in front of one of the Ukrainian water facilities. Photo: TV2 Østjylland.

sponsored 27 seats at the course to students or water professionals working at either water facilities or ministries in the project country. The course is a great opportunity for them to get updated on water technology, and their new knowledge can be a supportive element in the local development projects.

A good mix of classrooms, visits and networking

From AVK, we visited the participants during their exam work on August 24th, and even after so many days of studying, visits and networking, they were in good spirits and eager to share their experiences. One of these were Sasmitha Aulia from Indonesia, who is doing her PhD at Aarhus University, about wastewater sludge utilisation:

“There were many practical, real-life examples. Also, it is very interesting how Denmark uses their groundwater resources and how the whole water cycle is structured. The course participants was a good mix of students, professionals, and really experienced people, which has been super interesting. We can all learn and get inspired from each other. Also, it was great to go out and visit all the interesting partner companies; something that I don't think I could ever have the opportunity to do, if not on this course.”

Valves are essential

One of the key components in a sustainable water network are valves that are reliable, efficient and of high quality, to avoid the hassle of cutting off vital processes to switch out products or perform maintenance. As valve specialists, the participants should of course stop by our facilities and have a closer look at our product range.

TV2 Østjylland, the area's regional TV station, visited our premises and had a talk with the participants, to do a feature about the summer school and its importance.

The course has been created together with like-minded institutions and businesses, including: Aarhus University Centre for Water Technology (WATEC), Grundfos, Kamstrup, DHI, Skanderborg Forsyningsvirksomhed A/S, NIRAS, Aarhus University School of Engineering, AquaGlobe, I-GIS, Water Valley Denmark and Aarhus Vand. All of these will take part in the intensive, two-week tuition, contributing with their particular area of expertise.

Would you also like to upgrade your water knowledge?

Stay tuned on our website to find information about next year's water summer school here.



SUPPORTING HEFEI'S EXTENSIVE WATER DIVERSION PROJECT

CHINA

In recent years, Hefei City has placed higher demands on the security of its "lifeline" water supply. Hefei City is situated in the Anhui province, has a population of nearly ten million people, and is one of China's fastest growing cities with a regional GDP exceeding EUR 155 billions.

*By Ken Yan,
BD & Marketing Director,
AVK Shanghai*



Therefore, with strong support from the Anhui Provincial Water Resources Department, the Provincial Development and Reform Commission, Hefei City, Lu'an City, and various sectors of society, the Longhekou Diversion Project was initiated. Construction was commenced in October 2021 and is expected to be completed and put into operation by the end of 2023.

This project is a significant livelihood project aimed at creating an efficient and high-quality water supply pattern for the residents of Hefei City.

The Longhekou Diversion Project is

a major strategic interregional water transfer project jointly constructed by Hefei and Lu'an, with a total investment of over EUR 194 million. The designed water transfer capacity is 600,000 m³/d with 450,000 m³/d allocated to Hefei City and 150,000 m³/d to Shucheng County.

This water transfer route starts at Longhekou Reservoir in Shucheng County, Lu'an City, with a diversion point set 18.5 km away. The water is then transferred to Modun Reservoir in Feixi County, Hefei, for intermediate storage and transfer. After pressurisation at the Modun Pumping Station and connection

to the supporting raw water pipeline, it is introduced into two of Hefei's water plants. Ultimately, it can supply 120 million m³ of clean water to Hefei City every year, benefiting areas such as Hefei Economic and Technological Development Zone, Hefei's High-tech Zone, and Feixi County.

The water pipeline from Longhekou Reservoir to Modun Reservoir has a total length of 52.6 km and utilises a combination of gravity flow and pressurized flow in a single pipe. The upper section of the pipeline, above the booster pump station, utilises gravity-assisted pressurised water flow and spans 34.7 km. The lower section, where water is pressurised by the source water booster pump station, covers a length of 18 kilometers. The entire pipeline has a diameter of DN2400.

The project requires the installation of large-diameter flow control valves at the outlet of the gravity pipeline. These valves must possess linear flow control, pressure regulation, and energy dissipation functions at the outlet, while ensuring long-term stable operation under demanding operating conditions.

We provided a series 872 plunger valve with a large diameter of DN2200 for this project, which is the largest size plunger valve produced by AVK to date. AVK plunger valves are cast as a single integrated unit, featuring streamlined valve body design and

axially symmetrical flow channels. Through precise calculations using simulation software, they effectively prevent turbulence, ensuring that no cavitation or valve body damage occurs during operation. They also prevent vibrations and resonance, guaranteeing long-term stable operation across the entire design flow range.

Additionally, these valves exhibit an outstanding linear relationship between valve opening and flow. Data from pipeline flow meters, pressure transmitters, and inlet tank level sensors received by the computer control system allow for precise adjustment of the valve.



Over the past three years, AVK has provided a range of high-quality valve solutions for the largest individual water intake pump station in Anhui Province, the "Modun Reservoir Water Intake

Pump Station" and its associated pipeline projects. Among the delivered products are gate valves, double eccentric butterfly valves, hydraulic operated check butterfly valves, and plunger valves.

At AVK China, we strive to be an active partner in shaping our country's water agenda. Together with our partners, we help refurbish existing valves solutions and develop new water networks in growing urban areas that benefit local citizens as well as eco-systems.



INCREASING THE RESILIENCE OF BURNHOPE RESERVOIR

UNITED KINGDOM

By Greg Morris,
Business Development Manager,
Dams, Reservoirs & Hydropower,
Glenfield Invicta

Esh Stantec, a major British infrastructure consultant and contractor, contacted Glenfield Invicta to advise on the optimal valve configuration to increase draw down at the Burnhope Reservoir. Our expertise and experience was particularly valuable in designing and specifying valves that met the requirements of the reservoir within the context of a challenging construction envelope.

Design challenges and constraints

ESH Stantec engaged with Glenfield Invicta from the earliest days of the project, ensuring strong collaboration and communication throughout.



The discharge valve with the bespoke hood, which is secured to the concrete floor.

Burnhope Reservoir is operated by Northumbrian Water. It is located in the North Pennines AONB (Area of Outstanding Natural Beauty), a UNESCO Global Geopark.

At its deepest, the reservoir is 40m from surface to bed. It has a capacity of around 6.4 million cubic metres.

Engineers from ESH Stantec and Glenfield Invicta visited the site several times to gain a full understanding of the project's challenges and constraints.

When water is discharged from a reservoir at high speed it possesses high kinetic energy. If unchecked, it can cause damage to surrounding structures and natural features. This kinetic energy can be dissipated safely and effectively using a specially designed discharge valve, ensuring the risk of damage to the downstream section is greatly reduced.

For Burnhope Reservoir, flow rates of

up to 4.5m³/s must be controlled by the discharge valve; this equates to 4.5 tonnes of water passing through the valve every second.

Proposed solution

After reviewing the available options, the Glenfield Invicta engineering team specified the installation of a DN600 Series 857 free discharge valve fitted in conjunction with a bespoke hood. With the Series 857, draw down rates can be finely controlled. The bespoke hood was incorporated to limit the width of the discharge plume thereby safeguarding the structural integrity of the tailbay. Although this does reduce

the overall coefficient of discharge value, calculations were made to verify that the solution would achieve the required discharge rates specified. Remote electric actuation was specified for ease of operation.

A DN800 Series 54 reservoir-specification gate valve was also proposed to provide upstream isolation.

Critical design factors

The design of a free discharge valve is critical, and that's where our specialist knowledge allows us to make sure the valve can achieve maximum discharge



rates whilst ensuring hydraulic forces do not cause excessive vibration, regardless of the valve position. The series 857 free discharge valve should not be operated anywhere below 5% open for any period of time, except when the valve is opening or closing. Vibration is minimised through the use of multiple aerodynamic 'ribs' which are specially designed and connect the main body of the valve to the downstream cone section.

It is also imperative that the valve is correctly sized. Sizing calculations are based on the required discharge through the valve at the corresponding available pressure head. If not done correctly, this could lead to major issues with the valve itself, the overall discharge system, and the surrounding boundary surfaces. If undersized, the



valve would not be able to achieve the specified emergency drawdown.

At Burnhope Reservoir, further design calculations were required due to the requirement to incorporate a fabricated hood at the point of discharge. In particular, it was important that the relative position of the valve and hood was accurately calculated to ensure the optimal discharge flow was achieved. The hood was secured separately to the concrete floor using chemical anchor bolts.



Fixed cone valves are used to pass a controlled amount of water downstream with no damage to the immediate surroundings due to its considerable energy dissipating characteristics. These valves also offer an effective method of aeration due to atmospheric dispersion.

The valve body is designed to operate with minimum vibration over its full stroke and uses multiple, specially shaped aerodynamically designed ribs leading to a downstream cone.

The outlet cone ensures that discharge is in the form of a hollow expanding jet, which is ideal for energy dissipation as the water is spread over a rapidly increasing surface area, thus permitting effective atmospheric cushioning. If partial or controlled containment of the jet is desired (such as for Burnhope Reservoir), a hood can be installed downstream of the valve.

Installation and commissioning

Throughout the project, from design through to commissioning, weekly Teams meetings were held with the key stakeholders in the delivery of the project.

A degree of time flexibility in terms of installing and commissioning the valves was factored into the project due to the remote, rural location of the reservoir and to allow for potentially inclement weather.

A challenging and rewarding project

Greg Morris was the Glenfield Invicta lead on the Burnhope project:

"This was both a challenging and rewarding project to be a part of. The close collaboration across all stakeholders played a key role in the successful outcome. I would also like to highlight the professionalism of our engineering team and the excellent support received from installation partners Franklyn Yates. From a personal perspective, it is extremely satisfying to know that I have helped in some part in ensuring this historic asset can continue to be used safely and effectively for years to come."

Steve Boyd was the Esh Stantec Project Manager for the Burnhope project:

"Burnhope Reservoir was an interesting project to work on with Greg and the Glenfield Invicta engineering team. Not only do they have immense expertise and attention to detail, but they are also 'hands on' and embraced the challenges and constraints of the Burnhope site."

Scan the QR code to watch a video of the discharge valve in operation. Isn't it fascinating?



COMPETITION



We are happy to announce that the winners of the competition in AVK InterLink no. 63 are:

- Susana Arias, Customer service, InterApp
- Arianna Saccato, Technical office, AVK Valvulas S.A.
- Shalini Gowthaman, Internal Sales, AVK Gulf

Gifts are on their way.

The correct answer was: 9 hydrants could be spotted in the image (but well hidden, so all answers were accepted)

New competition:

How many tonnes of water is passing through the discharge valve at the Burnhope reservoir?

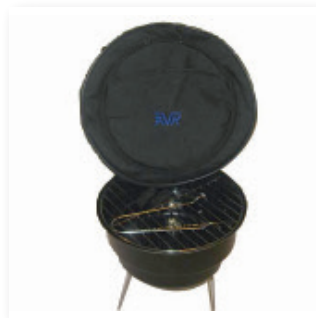
Send an e-mail with the correct answer in which you state your address and the gift you would like to receive - if you win.

E-mail to: kakl@avk.dk

Choose between:



Beach towel with AVK valve



Picnic grill in a cooler bag



Ocean bottle

AVK Holding A/S

Søndergade 33
8464 Galten
Denmark

Tel.: +45 8754 2100
Fax.: +45 8754 2120
www.avkvalves.com

©AVK Group A/S 2023

Expect... **AVK**



MIX
Paper | Supporting
responsible forestry
FSC® C134689

