



EXPECT
STORIES FROM THE
AVK WORLD

Expect... **AVK**



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FRONTPAGE PICTURE

Image of a shiny DN2200 AVK butterfly valve after a finalised shot blasting process.

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DEAR READER

In the next few pages, you can read about my exciting trip to Kyrgyzstan, which aimed to identify relevant water utilities for a non-revenue project similar to the LEAKman project; a project partnership carried out by Danish companies from 2016-2021, to develop the most efficient leakage management solution.

Prior to the trip, the Kyrgyz government had visited Denmark. They wanted to see our solutions to one of the major challenges that they predict will face them soon, due to climate change: less water resources. Therefore, they want to focus on efficiency and minimal loss in the water infrastructure. Their initiative makes me believe that governments around the world are finally realising the importance of taking care of our available water resources.

The EU has been focusing on drinking water for quite some time, and most recently, urban wastewater. Now, it has been decided to form a Water-KIC (Knowledge Innovation Community) that will focus on water in all its forms: drinking water, wastewater, marine and maritime water. In Denmark, we will contribute with a Co-location Center under the umbrella of Water Valley Denmark, an organisation that AVK has helped to establish.

The Water-KIC was initiated by members of the current European Parliament, which will be replaced in 2024. Therefore, it is important that the lead candidates for the new European Parliament are also aware of water's importance. And thus, we were pleased to welcome a leading candidate from one of the Danish political parties here at AVK, where we talked about the water initiatives we are part of, and why they are crucial in securing a sustainable future. The more we can highlight water's importance, the more possibilities for action we are able to generate.

Presentation at the IWA

On World Water Day last year, there was a lot of talk about groundwater at the UN Global Water Conference, where Danish Water Forum held a side event with the World Bank. Therefore, it feels like a huge pat on the back to the Danish Water Forum that we have been asked to give a full-day seminar at the International Water Association (IWA) conference and exhibition in Toronto this August.

The seminar will be about groundwater and the challenges that come with the use and protection of it. Among other things, Canada wants to focus on the groundwater pollution that comes from a new type of mining, namely the extraction of

rare minerals and metals that are used in the green transition, such as the production of batteries. AVK is part of the group that will prepare the presentation.

Introducing groundwater as a resource

The theme for this year's World Water Day was *Water for Peace*. I've talked about cubic kilometres of unexploited groundwater under the Horn of Africa before, and I'm currently trying to bring together a group of companies and aid organisations that can jointly implement a project where this groundwater is brought to the surface. On that basis, small local communities can be established in the area, where they will have access to drinking water, irrigation for their crops, and water for their livestock.

The challenge right now is to localise the groundwater geographically. And since water knows no boundaries, certainly not in the Horn of Africa, the biggest question will probably become: who has the rights to the water, when it is made available. For sure, it will be exciting to follow.

Enjoy reading,
Michael Ramlau-Hansen



WATER IS KEY IN SECURING GOOD CONDITIONS FOR DEVELOPMENT

KYRGYZSTAN

Kyrgyzstan has a challenged water infrastructure, especially in rural areas. To accelerate change, the government has sought help outside the country which has resulted in, on the recommendation of UNEP, a Kyrgyz delegation visiting Denmark.



*By Michael Ramlau-Hansen,
Head of Public Affairs & Global
Partnership,
AVK Holding A/S*

Kyrgyzstan, officially the Kyrgyz Republic, is a 200,000 km² mountain-covered country located in Central Asia. The country has about 6.7 million inhabitants, of which 35% live in cities. A major infrastructural challenge for Kyrgyzstan is excessive water losses, which are estimated to be on the wrong side of 40%. Moreover, only about a third of Kyrgyz homes are connected to a sewage system. 300+ villages are lacking water supply, and almost 500 villages have an inadequate water supply which requires renovation.

Poor conditions for development

Based on the Kyrgyz delegation's visit, I was on a return visit to Kyrgyzstan in November 2023. The aim was to explore the possibilities of implementing one or more non-revenue-water projects in the country; projects to mitigate the current excessive water loss.

During the visit, we stopped by three villages in the Issyk-Kul region: Toru-Aijgyr, Kyzyl-Oruk and Sary-Kamysh. Issyk-Kul is a lake located about 250 km east of the capital Bishkek, and the region has been designated by the government as a tourist area because of the beautiful nature and mountains surrounding the lake. Therefore, the

region wants to develop the area so it becomes more attractive for permanent residents, who can then help to kick-start tourism in the area. The central government is even making land available to first-time buyers in the hope of developing the region. However, this is held back by the lack of proper water infrastructure. Who wants to settle in a place without proper water supply?

Insufficient – and contaminated - water supply

All three villages have previously been supplied with groundwater from separate boreholes. None of the three wells are in operation due to worn-out equipment and/or insufficient maintenance. All three villages are

therefore supplied with meltwater from the nearby mountains. The meltwater runs in open channels until it reaches a sort of reservoir, from where it is piped to the respective village. The village of Toru-Aijgyr is supplied with water two days a week, Kyzyl-Oruk has no water supply, and Sary-Kamysh is supplied two hours a day.

Meltwater from the mountains runs in open channels over fields where livestock is kept. This means that livestock is polluting the water and, in the absence of any water treatment, the villages are supplied with contaminated water posing a health hazard to the population. When visiting the local doctor's office, I asked about the extent of sick leave due to waterborne disease. The doctor could of course not give any answer to this, but could however share that the entire community, approximately 6,400 inhabitants, was infected with hepatitis A and B in 2017.

The limited water supply is not only for households, but also for public institutions such as the local medical centre. Here, water is collected in two buckets and a milk churn. Tools used in medical practice are sterilised by pouring boiling water over it. Hand washing is carried out to a very limited extent to save water. The same goes for the local school, attended by more than 300 students, as well as two kindergartens.

Status quo threatens groundwater resources

In connection to our visit to the Issyk-Kul area, we had the opportunity to look into a resident's private home in the village with water supply two days per week. The supply of water came from a 32 mm PEL hose lying on top of the ground in the backyard. The water is then collected in canisters as well as a freestanding water container. At the same time, livestock is kept in the same backyard, with shared use of the water and with the danger of fecal contamination. Apart from the school, there is no actual toilet in the entire visited area with about 1,500 households. All properties have a tiny house on the plot, where a hole in the ground functions as toilet. This creates a risk of the groundwater eventually becoming polluted, if not already.



Suggesting a solution

The local authorities have made a rough estimate of establishing a stable water supply. Based on calculations made by the former geological centre in Toru-Aijgyr, it is stated that there is enough groundwater in the area to supply the current population as well as a possible expansion with newcomers.

The initial proposal is to re-establish the boreholes for groundwater pumping. The drilling field must be provided with a simple purification, similar to what we do in Denmark with aeration of the raw water and filtration through a sand filter. The water will then be pumped into a buried distribution network to the respective villages - one drilling field supplying one village - with associated mains to each household with a barrier and a water meter.

The present estimate describes about 7 km main line as well as approx. 90 km of connectors.



TEAMWORK AND DEDICATION PAYS OFF WITH LARGEST ORDER TO DATE

EGYPT

In 2023, AVK secured a +USD20 million contract for the transmission line and pumping stations within the Future of Egypt initiative. The ambitious project spans over two to three years and has already required the overcoming of many challenges through close collaboration between AVK Gulf and AVK Anhui.



*By Valerie Berthelsen,
People, Learning and Leadership
Development Manager,
AVK Middle East*

Launching Future of Egypt

In April 2017, Egypt's President Abdel Fattah El-Sisi gave directives on the immediate implementation of the Future of Egypt project with the aim of boosting the local agricultural production. The idea behind the project was as follows: if the country would be able to provide high quality agricultural products at reasonable prices for citizens, and export the surplus abroad, it would considerably enhance the local liveability as well as the country's economic status.

The project would thereby reduce imports, provide hard currency, and support Egypt's goals for sustainable development. Additionally, the project would provide thousands of employment opportunities in

different specialisations, adding to the development efforts in the country.

The Future of Egypt project functions as a milestone in the New Delta project, which covers the construction of a 114 km long artificial river through the Egyptian desert. The new river will run parallel to the river Nile, which is currently supplying 90% of Egyptians with drinking water, water for irrigation and other industrial purposes. It will use Lake Nasser as its water source and is immensely critical in terms of Egypt's future water supply; with an estimated 50% rise in population by 2050, the already sparse resources will simply not cover the needs.

The New Delta project covers an impressive area of 10,000 km².

Presenting our capabilities

For us at AVK, the first hurdle to overcome was convincing the client, Water Department of the Armed Forces, and the consultant, Hydro, to modify their specifications and accept

valves manufactured in China. The original project requirement favoured European-origin valves and castings, providing an edge to our competitors, and potentially excluding AVK from the bid. Undiscouraged, the AVK Gulf team worked closely with our production facilities in China, AVK Anhui, presenting the technical and production capabilities of AVK. They highlighted key product features that ensure minimal maintenance and an extended lifetime, further bolstering the proposal with a 10-year warranty.

Besides our capabilities, another critical factor in winning the project was having a trusted local partner like AVK's agent in Egypt, ASL. They played a crucial role in organising meetings with key stakeholders, allowing our technical expertise to be presented to the right audience. These efforts proved successful, ultimately leading to AVK securing the major tender with AVK Anhui specified as the manufacturer of choice.



In 2016, Egypt introduced Vision 2030 – a strategic plan to transform the country by fostering sustainable economic growth, improving infrastructure, and enhancing the overall quality of life for Egyptians. One of the plan's initiatives is the Future of Egypt project for sustainable agriculture, which includes an extensive water supply solution for irrigation.

Largest valve order for AVK

AVK valves are a key component in agricultural practices that result in responsible water management, and we are proud of our contribution to such an ambitious project. The first contract, which has been followed by additional orders since, included:

- 84 pcs hydraulic combined check valves, DN2200
- 161 pcs electric butterfly valves, series 756, DN2200-2500

The first batch of orders, including 24 check valves and 34 butterfly valves, has already been released to AVK Anhui.

This project's valve order is quite significant for AVK, as it is the largest order so far in the company's history.

Expect solutions, not just products

AVK Anhui managed to live up to the high requirements for stainless steel welded seats and hydraulic actuation for the large-sized butterfly valves.

The first batch of products have been successfully tested and approved by the third-party inspector SGS and are currently in the shipping process. The next batch of 54 valves are expected to be shipped out in the first quarter of 2024.

The complete lot is expected to be manufactured and ready by June 2024 – a remarkable achievement for AVK, and yet again confirms the strength

of our Group's broad capabilities within product expertise, efficiency in production, and how we are able to work across companies towards a common goal.



CONVINCING PRODUCT FEATURES MAKE WAY FOR NEW VALVE SOLUTION

HONG KONG

An underground station's cooling solution was disturbed by operational issues and has now been equipped with high-end quality valves from Wouter Witzel.

*By Stig Th. Bondrup,
General Manager,
AVK Hong Kong, Macau & Taiwan*



Mass Transit Railway Corporation (MTRC) operates the major public transport network of heavy and light rails in Hong Kong. They use a seawater cooling system to provide air-conditioning for some of their stations located close to the sea. The seawater cooling systems are installed in seawater cooling plants inside buildings or underground nearby MTR stations.

High-end and reliable engineering products are essential for the seawater cooling systems to withstand seawater corrosion as well as offering stable water flow for air-conditioning system.

Therefore, for the seawater cooling plant of Tsim Sha Tsui Station, one of the largest and busiest underground stations in Hong Kong, six Wouter Witzel butterfly valves and one recoil check valve have successfully been supplied to the end-user, the MTR Corporation.

The original equipment installed at the plant had been in use for several years, but the on-site operations team faced problems with disc opening or closing of the existing butterfly valves from a competitor, which was naturally causing disturbance to the operation.

Suggesting the better match

Upon learning about these challenges, we at AVK Hong Kong, Macau & Taiwan Team managed to reach out to MTR's lead engineer. Over a series of meetings and workshops, we presented the engineering team with the product features of Wouter Witzel butterfly valves, including robust design, corrosive resistance, low operating torque and long, maintenance free life with vulcanised lining. Following the meetings, we managed to convince MTR of the benefits which would be achieved by switching to AVK Group products, including Wouter Witzel, which resulted in the successful sale and supply of six Wouter Witzel butterfly valves.

Upon the completion of the successful sale of the butterfly valve solution, it had come to our knowledge that an aging existing conventional swing check valve had also been causing



issues. We suggested the possible switch to a suited AVK valve.

With focus on the AVK Series 641 recoil check valve, the AVK Hong Kong team held workshops with the MTR engineering team to introduce them to the valve's high performance and fast acting non-slam check valve properties which can handle rapid reflux and high deceleration of pumping systems. This ultimately resulted in the sale of a recoil check valve, which has now been installed. It serves as a safety critical valve on site to prevent the upstream

pump system from water hammer with silent and rapid-closing features.

The valve solutions have successfully resolved the end user's issues and they have expressed their great satisfaction with the products.

Products supplied to the project:

- 2 pcs Wouter Witzel butterfly valves, DN400
- 4 pcs Wouter Witzel butterfly valves, DN800
- 1 pcs recoil check valve, Series 641, DN800



ENHANCED WATER DISTRIBUTION EFFICIENCY WITH IOT SENSORS

SLOVAKIA



Bratislava Water Company (BVS) has successfully implemented a pilot project digitising their water distribution network with battery-operated IoT sensors and software for data visualisation.

*By Anton Makel,
Product & Promotion Manager,
Slovakia,
AVK International A/S*

A need for reliable data

For some gate valve installations, it is important to ensure reliable information about valve open/close positions. This can be i.e. for valves at DMA inlets or other critical points in the supply network. Traditionally, valve status has been determined by manual check-ups which are, however, both costly and time-consuming.

Also, pressure and flow measurements, e.g. at DMA inlets, pressure reducing valves and other critical points in the network, are important for optimal performance and management of the supply network.

These challenges are effectively addressed by AVK battery-operated IoT sensors collecting data directly from the network and visualise this in AVK Smart Water's dedicated software platform VIDI Cloud.

BVS goes digital with AVK Smart Water sensors

A three-month pilot project has kicked off the journey of digitising the BVS supply network with AVK Smart Water battery-operated wireless IoT sensors. The project includes valve open/close position indicators, pressure and flow sensors as well as software enabling visualisation and analysis of data.

Position indicators were installed on selected gate valves of which it is of particular interest to know the exact valve open/close position. BVS also wanted to test a new solution for pressure and flow measurements, and sensors for this purpose were installed in a designated well.

Setup of VIDI software and subscriptions for the pilot project period has been taken care of by AVK in order for BVS to easily get started utilising their data.

Moving forward with digitising the network

It has been a pleasure to collaborate with BVS on providing reliable, efficient and cost-effective solutions for digitalisation of their distribution network. We are looking forward to being part of their continuous digital improvements.

Now, BVS is evaluating performance of pressure and flow sensors for installation in a wider area of their supply network. It has already been decided to continue the use of VIDI Positioners at DMA inlets and other critical points in the network, and they will increase the number of Positioners significantly to get real-time data on open/close positions of even more of their gate valves.

AVK Smart Water IoT sensors

Our VIDI Positioner is a battery-operated device that detects in

percentages how much a gate valve is open, making it easy to get an overview of network assets. AVK Smart Water also offers VIDI sensors for other purposes, such as VIDI Pressure, Flow, Temperature, Cap, Level and Open/Close.

Data can be integrated into any preferred IT system which makes it easy to compare data and compile a complete overview of the network.

About Bratislava Water Company

Bratislava Water Company (BVS) supplies drinking water to approx. 740,000 customers in 118 municipalities across western Slovakia. The distribution network consists of more than 3,200 kilometers of pipes and 130 water reservoirs. In addition, BVS is handling wastewater treatment and manages more than 1,800 kilometers of pipes for the purpose.

COMMITTED TO GREEN PARTNERSHIP

GLOBAL

Since the signing of the Memorandum of Understanding (MoU) in 2022, the business between AVK and Larsen & Toubro (L&T) has developed and grown.

Today, AVK is a key supplier for valves to L&T, and also a trusted partner for large irrigation projects. L&T, in return, is providing IT services to the AVK Group.

Back in January, Niels Aage Kjær, Chairman of the AVK Holding Board and owner of AVK, visited L&T in Chennai and Mumbai, India. During the

visit, he met with L&T's Chairman and MD, S. N. Subrahmanyam, and E.P. Sajit, Senior Vice President & Head of Water & Effluent Treatment.

AVK and L&T confirmed their commitment to the MoU and had good discussions about how to further strengthen their partnership and cooperation.



AVK BRASIL SUPPLIES VALVES TO EXTENSIVE DEVELOPMENT PROJECT

BRAZIL



Operating within the pulp and paper segment, the “Cerrado Project” is substantial in terms of sustainability, local development, and job creation.

*By Juliana Cristine Celestrim,
Marketing Analyst,
AVk Válvulas do Brasil*

Being one of the largest private investments in Brazil today, the “Cerrado Project” is transforming the region's socioeconomic reality through the generation of jobs, income, and sustainable development. The project covers the construction of a new pulp mill, enhancing the production capacity with about 20%.

The project represents the company Suzano's most daring undertaking in their history of expansion and consolidation as a global leader in the production of eucalyptus pulp. Eucalyptus is an efficient material for pulp and paper purposes, as the required material per ton of pulp produced is small.



Named after the location

The origin of the name "Cerrado Project" is a reference to the plant's location, which is Mato Grosso do Sul in the Cerrado, one of Brazil's largest biomes. A biome is an area on the planet classified according to the plants and animals that live in that exact location.

The municipality of Ribas do Rio Pardo, 100 kilometers from the capital Campo Grande, was chosen to host the plant due to the low level of carbon emissions expected after the start of operation.

Social development in strengthening citizenship

The company's social investment model is premised on operating in communities neighboring its operations, through social projects that enable economic and social development, the strengthening of citizenship and the awakening of socio-environmental education.

Inspired by the future

The new plant will use gasification of biomass to replace fossil fuel in lime kilns, a new milestone in eco-efficiency, which highlights the company's commitment to people and the planet.

Valves supplied to the project:

- 245 pcs butterfly valves, wafer type, series 931, DN50-700
- 5 pcs butterfly valves, lug type, series 931 DN80
- 64 pcs butterfly valves, flanged, series 931 DN700-900
- 21 pcs butterfly valves, flanged, series 926, DN1100-1400
- 2 pcs butterfly valves, flanged, series 933, DN600-800
- 23 pcs check valves, quick close, flanged, series 928, DN700-900



HYDRAULIC PENSTOCK SOLUTION BOOSTS PLANT'S RESILIENCE

CHINA

To ensure urban water environment safety, an upgrade project was initiated for wastewater treatment plant Zhuyuan No. 2 in Shanghai, China, which now includes penstocks from Orbinox.

*By Ken Yan,
B&D Marketing Director,
AVK Shanghai*



With development comes new challenges

With the rapid growth of urban population and water consumption, large wastewater treatment plants not only need to achieve stable and compliant operation; they also need to be able to overcome challenges such as peak flow clipping (reducing peak loads at specific periods) and overflow mitigation.

This is especially true in megacities like Shanghai, where the resilience of wastewater treatment plants is directly related to the safety of the urban water environment. And this particular project is not a stand-alone urban infrastructure construction, it is part of

a far-reaching outline for future urban development of the Zhuyuan area.

A dual test of time and quality

According to the "Shanghai Wastewater Treatment System, Sludge Treatment and Disposal Plan (2017-2035)", the Zhuyuan area will initiate the Phase IV project – also referred to as the 10 billion project - including a 1.2 million tons/day wastewater treatment plant and a 500,000 tons/day storage tank.

The Phase IV project's target is to link with the existing Zhuyuan wastewater treatment facilities, eliminate overflow during the dry season, and reduce overflow during the rainy season. Therefore, to handle wastewater

distribution and regulation among several plants and storage tanks, a large wastewater distribution structure called Total wastewater distribution well has been established. It now serves as the hub for wastewater distribution in the entire Zhuyuan area.

After the commissioning of Phase IV, the legal requirements for wastewater distribution and regulation control have been revised and will soon be increased – and the facilities were not ready to meet these approaching requirements. Therefore, the functional improvement and renovation project of the well has been initiated. The construction phase includes an upgrade of the weir gate solution on the north side of the distribution well,



improving its corrosion resistance level and power system to ensure long-term stable and reliable operation. Additionally, according to the project schedule of Phase IV, the renovation project includes a one-year construction period, meaning that the valve supplier should be able to deliver within a time-critical and challenging frame.

Expect lasting innovations

Matching the strict requirements of the project, AVK provided a customised hydraulic solution including 10 weir penstocks (maximum size 6000mm x 2000mm) of Orbinox' RB model as well as five sets of supporting hydraulic

station systems. This solution not only lives up to the requirements of water regulation in the well, but also allows for remote wireless control and precise adjustment.

AVK's core technology ensures high planarity of the weir gate steel plate, effectively solving the demanding conditions of on-site installation. Meanwhile, the wall-mounted installation method improves engineering efficiency and provides a strong guarantee for the timely completion of the project. Furthermore, AVK's proprietary core technology can control the planarity error of the weir gate steel plate

within 1-2mm, effectively solving the demanding requirement of a 5mm height difference during on-site installation of the weir gate. A wall-mounted installation method is adopted, making the on-site installation more convenient, thereby effectively improving engineering efficiency and laying an important foundation for the timely completion of the project construction.

Expect quality in every step

We understand that customers expect not just high-quality products but complete solutions and comprehensive service and support. Therefore, the AVK Shanghai team is personally involved in the entire process of specification development and implementation, helping to improve and optimize the existing valve system and design new urban water infrastructure. Through close collaboration with customers, AVK creates value at every step, demonstrating its professionalism and responsibility as a partner in the field of urban water services.



One of the weir penstock hydraulic control units finalised.

AGAIN TODAY, WE ARE LUCKY TO HAVE ACCESS TO WATER

Every year, World Water Day is there to remind us of water's significance in our lives, as well as our responsibility in handling it with respect. Of course, we celebrated the day with our colleagues around the world of AVK.

Access to water = stability

This year, the theme is Water for peace, highlighting water's ability to create peace and stability – or to spark conflict.

When water is scarce or polluted, or when people have unequal or no access, tensions can rise between communities and countries, resulting in an unsafe and unpredictable everyday life.

2.2 billion live without safely managed drinking water services, with devastating impacts for their lives and wider society (UN).

With World Water Day, UN seeks to inspire action to tackle the global water crisis. A core focus of World Water Day is to

support the achievement of Sustainable Development Goal (SDG) 6: Water and sanitation for all by 2030.

The product portfolio in our business division AVK Water is a direct extension of UN SDG 6 which aims to ensure that everyone has access to clean drinking water and sanitation and that this is managed sustainably.

Therefore, we of course want to do our part to raise attention to water on this important day.

To celebrate water's contribution to stability in our lives, employees from around the world of AVK have shared their thoughts below, in words and images. Enjoy!



"It's often said that claiming 'without water there is no life' is like stating the obvious - we all know its vital importance. Yet, as crucial as water is within our bodies, it holds equal significance outside of them. Have you ever noticed how many of our happiest moments are linked to water? It's time we truly grasp its importance and recognize that it's everyone's responsibility to avoid its wasteful use."

– Juliano Castanho de Moraes, AVK Brasil



"Water can save our lives, but it can also destroy it. This photo is taken by the Budapest-Donau River during the flood in January 2024."

– Tamás Bedegi, AVK Magyarország Kft., Hungary

“Water is essential for life, and to me, its importance is even more significant. As a mother, I know that water is vital for the sustenance of lives. My twins were immersed for 9 months in a water bag, protected and nurtured, which is incredibly beautiful. As a mother, Environmental Manager, and inhabitant of this world, I strive to teach this importance to my children so they understand the value of this precious resource. I encourage them not to waste water, whether it's during bath time, brushing their teeth, or helping with the dishes. In the photo, they are helping me wash the dishes and keeping the faucet turned off while scrubbing.”

– Thalita Navarro Gomes, AVK Brasil



“Water gives you a lot of energy and allows you to be in harmony with nature.”

– Anton Makeľ, AVK International, Slovakia



“We are inseparable from water, apart from water in our daily life, water can also bring us romantic scenery, such as oceans and lakes, which are beautiful and mysterious.”

– Iris Yan, AVK Anhui, China



“Water for peace - this is my peaceful place.”

– Kristin Eftang, AVK Norge



“Lake Tahoe is the clearest lake in the US with average annual clarity of 72 feet (22 m). It is also an outstanding recreational resource both during the summer and winter time.”

– Krzysztof Bazylewicz, American AVK

RISING TO THE CHALLENGE OF THE NUCLEAR INDUSTRY

UK

*By Robert Milligan,
Marketing Manager,
Glenfield Invicta*

Glenfield Invicta and Orbinox have a long history of innovation and engineering excellence, and both companies collaborate on a regular basis.

Over four years ago, we embarked on joint venture to market our combined experience and expertise to provide penstocks for use in a nuclear power station.

The penstocks are to be used for critical isolation purposes on the seawater intake and screening system. The seawater is used by the condensers, to cool the superheated steam from the turbines.

Rising to the challenge

The extent of the design, engineering, and project management that has gone into the project thus far is completely unparalleled in our combined experience of over 200 years. The client's unwavering and unsurpassed commitment to safety has required the most meticulous planning and attention to detail, in every aspect of the project. The scale of the quality assurance processes involved in a nuclear power plant are necessitated by the critical need to ensure all aspects of the plant can safely function in the most extreme circumstances, because the cost of failure is unimaginable. As a result, the client has had to extend the project timeline to allow for this true 'safety above all else' approach.

This was our first venture into a new and very exacting sector - we were in effect pioneers. The complexity and challenges of designing, manufacturing, and supplying bespoke equipment into a cutting-edge nuclear power station has been like nothing we have seen before; another world from our core markets of water, wastewater, dams, reservoirs, and hydropower. The learning curve has therefore been very steep, but we have proudly risen to the challenge.

Dedication and commitment

The sheer dedication of our engineering and project management teams to reach one of the first key milestones, completion of manufacture of the first tranche of penstocks, is remarkable. Thousands of man-hours and numerous revisions have been invested in this achievement.

We faced the critical task of ensuring our products met stringent safety criteria, specifically aligning with 'Safety Class 1'— which is the highest safety classification required for equipment operating within a nuclear power station. Items categorised as Safety Class 1, are defined as those critical to plant safety.

To put this into context, the penstocks had to undergo seismic qualification as well as explosion pressure wave qualification. This is to ensure that the penstocks can not only withstand an earthquake or blast but will also remain fully operational. This represented a significant step-up from our standard design criteria, and its testament to the dedication of the teams involved that we successfully met all of these very exacting requirements.

Manufacture of first batch successfully completed

The contract included 24 wall and channel mounted penstocks, covering a range of sizes up to 2800mm x 2000mm aperture and pressures in excess of 23 m off-seat. All the penstocks are manufactured in super

duplex stainless steel, ensuring their resilience against exposure to pure seawater. Following a successful Factory Acceptance Test (FAT), attended by our customer, which included operational tests of every penstock as well as thorough visual, documental and dimensional checks, we have now completed the manufacture of the first fourteen penstocks.

Alex Philo, our Product Manager for Penstocks, shares:

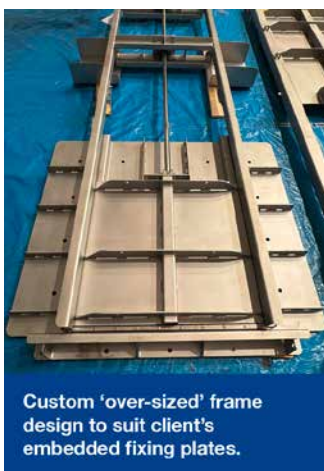
“Our combined teams have dedicated an immense effort to deliver the very highest quality product and adhere to the extremely complex and onerous set of specifications that this unique market segment dictates. The hard work and know-how of Orbinox has been absolutely invaluable. This endeavour spans thousands of man-hours and reflects an unwavering commitment to meticulous attention to detail.”

Pursuing new business

In our pursuit of opportunities within new sectors, particularly one as lucrative as nuclear power, we recognise the importance of harnessing the critical insights and knowledge we’ve acquired. With this in mind, we are actively and strategically exploring further business development opportunities within the nuclear power industry.

Ricardo Iturrioz, Sales & Marketing Manager at Orbinox International, adds:

“Given the operational nature of nuclear power plants, these projects have very demanding requirements both for the nuclear radioactive areas and outside non-radioactive areas, where our products are going to be installed. Our Project Management Team has shown an impeccable professional disposition to project milestones these last three years with permanent flexibility and consideration of ongoing frequent project development requirements.”



Custom 'over-sized' frame design to suit client's embedded fixing plates.



Highest quality welding, subject to 100% visual and dye-penetrant NDT, with client witness hold points at every stage.



CC penstock being prepared for FAT including functional and feeler gauge testing.



Customised chainwheel system for ergonomic and accessible manual operation.

WHEN QUALITY, RELIABILITY AND TECHNICAL SUPPORT ARE KEY PRIORITIES

CZECH REPUBLIC



In a recent renewal and rehabilitation project, AVK VOD-KA has supplied numerous products for both old and new installations.

*By Tomas Tichý,
Sales Manager,
AVK VOD-KA*

The water company Jihočeský Vodárenský Svaz (JVS) supplies water to about 380,000 inhabitants in 173 towns and villages. The volume of water supplied is around 16 million m³. The water supply system is 556 km long and supplies an area of 6300 km².

In 2023, company JVS renewed four valve shafts that were regularly flooded. The existing - and often non-

functional - gate valves were replaced with AVK PREMIUM100 gate valves in DN400 together with premium all-stainless-steel extension spindles. JVS chose the solution because of the requirement for maximum quality and control reliability even in the most difficult conditions.

Thanks to the additional 1.5 mm thick protective layer of PUR, which is applied on top of a superior epoxy layer, the valve no longer needs to be protected against corrosion and stray currents by banding (external added insulation). This premium protection

also saves a lot of time for the contractor on site.

JVS also appreciates that the guaranteed service life of the product well exceeds the requirement of the EU standards (many times), and AVK guarantees an extended warranty of 20 years in addition to the premium materials used in the production of the PREMIUM100 valve.

An example of an AVK PREMIUM100 gate valve from the construction site and the originally changed fittings.

Rehabilitating the raw water intake system – using AVK products

Also in 2023, JVS started the renewal of almost 7 km of raw water supply pipeline from the dam to the treatment plant. A new 1200 mm diameter steel pipe will run alongside the current DN1400 line which has been in operation for 42 years since the water treatment plant was commissioned.

The project also includes an 82 m long DN1000 line under the river, three reinforced concrete shafts, and other structures.

Several AVK butterfly valves DN1000 and DN800 in stainless steel seat design are installed on the line. These butterfly valves have the disc seated and fixed in the line so that there is no vibration of the disc during operation,



An AVK PREMIUM100 gate valve installed in the system, and one of the old, now replaced valves.



eliminating the rapid wear of the seal which is essential to the functionality of the valve. This seal is uniquely shaped and is manufactured in AVK GUMMI's own plant.

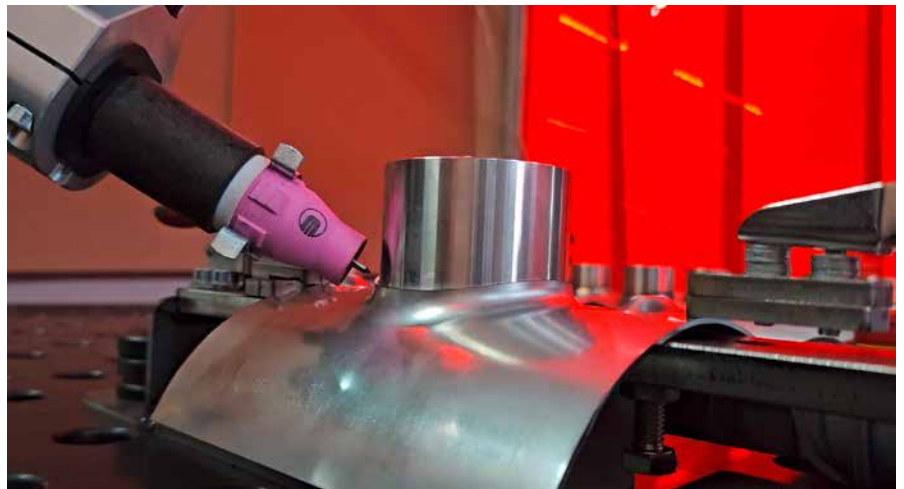
In addition to the shut-off valves, AVK supplies dismantling joints and control valves. The shafts are fitted with AVK air valves, which guarantee the necessary air supply capacity when filling or draining the line, as well as operational air supply and venting. AVK air valves has a feature of large opening for high-capacity airflow. This large opening also significantly reduces the possibility of dirt build-up. The air valves use a patented roll seal system that can be sensitive to even small pressure differences.

For us, the use of AVK products is proof that JVS relies on reliability, quality, technical support and service in their projects, which we really appreciate to be part of.

USING COBOTISATION IN OUR PRODUCTION FACILITIES

THE NETHERLANDS

By Wouter Oudenampsen,
Manager Operations,
AVK Nederland BV



At the production facility of AVK Nederland, also known as AVK Rewag (REparing WAter and Gas), we are constantly working as a team to improve our processes and automate them if possible. We work with various machines including welding robots, hydraulic presses, shearing machines, (contour) rollers and press lines to produce parts, mainly out of stainless steel. Some machines are standalone, while others are part of a larger process.

Focusing on a safe and interesting work environment

By automating activities with a higher risk or with a lot of repetition (in series), we keep the work safe and interesting for the employees. Several steps have already been taken in this area in recent years and we would like to expand that further.

In the past year, we have invested in our first cobot for tig welding. The cobot takes over some of the manual tig welding and increases capacity. An advantage of a cobot is that it works together with the operator in a safe way without having to take extra safety measures. We have noticed that programming is easy, especially thanks to the good support from our supplier. The cobot performs tig welding with extreme precision without getting tired. This allows our employees to focus on the more challenging and interesting tasks within our production process. This innovative solution fits seamlessly with our CSR objectives with focus on health, well-being, and innovation.

We are convinced that use of cobots will help determine the future of our factory and that we can support and relieve our employees as well as fulfil our social responsibilities in the best possible way.

A cobot, or collaborative robot, is a robot which is intended for human interaction in a shared space, or where humans and robots are working right next to each other.



AVK SAUDI HONoured WITH ARAMCO QUALITY EXCELLENCE AWARD

SAUDI ARABIA

Aramco, the world-renowned energy company, recently hosted the prestigious Aramco Quality Excellence Awards 2023 event to acknowledge local manufacturers for their outstanding Quality Management Systems (QMS). The event focuses on service delivery, strong commitment to Saudisation, and the dependability of the supply chain for not only Aramco and the Kingdom, but for the entire region.



*By Randa Aby Mazen,
Marketing Coordinator,
AVK Saudi Valves Manufacturing*

At the event, AVK Saudi Valves Manufacturing was honoured with an award for our remarkable management in processes.

Committed to quality

Aramco had sent a dedicated assessment team to evaluate the QMS of each of the vendors. These assessors meticulously evaluated AVK on our QMS performance on the day of October 3, 2023 - without our knowledge. Out of 450 local suppliers, AVK SVMC was awarded with the

second place in the 'small and medium manufacturers' category.

This achievement highlights our commitment to meeting our customers' requirements while continuously improving our management system to ensure outstanding quality in every step.

We would like to extend our gratitude to Aramco for recognising the efforts of local manufacturers and for their unwavering support. We also couldn't have achieved this remarkable accomplishment without our incredible team whose hard work and dedication have led us to this accomplishment. Their passion and steady commitment have lifted us to new heights, and

we are eternally grateful for their contributions.

To our customers, we are truly honoured to have your support throughout this journey. Your trust and confidence in AVK Saudi have been instrumental in our success, and we promise to continue exceeding your expectations.

As we move forward into the new year, we are committed to raising the bar even higher and providing AVK quality. Together, with determination, passion, and a shared vision, we believe that no milestone is beyond our reach. Let us continue to drive towards even greater success!

DRIVING INNOVATION AND INSIGHTS TO CUSTOMERS AROUND THE COUNTRY

UK



The AVK UK Mobile Roadshow is touring up and down the country sharing the latest product innovations in water and gas valves and fittings, and introducing solutions in person, such as the AVK Smart Water and PUR gas valve products, with demonstrations to utility providers and contractors.

*By Emily Davies,
Marketing Manager,
AVK UK*

The bespoke designed 3.5 tonne tourer is equipped with display screens, product stands, hands-on samples, information and more on AVK UK's wider product ranges.

Valve and Fittings Specialists

Knowledgeable AVK UK specialists bring their expertise right to the

customer's doorstep, showcasing products and solutions, delivering training, and answering any questions in-person.

In one of the latest visits undertaken by the mobile roadshow, two of AVK UK's experts showcased a fire hydrant, the Series 36 PE Tailed Gate Valve, flange adapters, and the trademarked Supa Maxi™ range.



Mamoun Humayra, Water Product Manager for AVK UK, was one of those involved. He shares:

“These visits can be customised to the customers’ requirements. So, if they want to know more about air valves, we can do that by tailoring the products we take in the roadshow van and sending the relevant expert from AVK UK. It really can be tailored to what each customer is interested in knowing more about.

For example, on the latest visit that I participated in, the fire hydrant was of particular interest to the customer. We were able to explain how efficient it was, what kind of options are available, such as anti-frost and security devices. They also asked about our Supa Maxi™ range and theory of installation. We discussed the new sizes and how these compared favourably to competitors. It was also good to discuss the Series 36 PE Tailed Gate Valve and its new features.”

Air Valve Demonstrations

Anthony Whittam, Water Network Specialist for AVK UK, has also been involved in customer visits. He says:

“During one roadshow visit, the live air valve demonstration rig we had specially made, with clear pipes and a

clear air valve, gained a lot of attention. The customers saw it and immediately wanted to understand what it was and how it worked, which led to discussions on why, where, and how air valves can optimise the network and reduce common network problems.”

Gas Valve and Fittings Training

Andy Hatton, National Sales Manager for Gas at AVK UK, is heading out with the roadshow van in 2024, and says:

“AVK UK’s mobile roadshow is an excellent opportunity, not only for our customers to see existing products, but to get first-hand experience of innovative ideas and products we are launching and offers apprentices a

chance to discuss future innovative ideas.

“Being able to hold and examine these items is key. They can see first-hand the uncompromising quality that we put into every item we make.”

Smart Water Explained

Rob Edwards, Smart Water Specialist for AVK UK, is also getting involved in roadshow van visits this year. He shares:

“We are excited to be able to take the new range of AVK Smart Water solutions directly to the customer to discuss real opportunities in an informal environment.”



CONTROL VALVES TO OPTIMISE THE CHALLENGED LOCAL WATER INFRASTRUCTURE

SOUTH AFRICA



*By Nicole Singh,
Marketing Coordinator,
AVK Southern Africa*

The water challenges facing South Africa, and Africa as a whole, are multifaceted. They stem from aging infrastructure, affecting both potable water distribution and non-potable pipelines. The use of substandard products without local support exacerbates these issues. Because little attention is paid towards maintaining existing infrastructure and following the South African Bureau of Standards, issues surface, such as over-pressurising old systems that are designed for a limited flow requirement.



The consequences include burst pipes and increased leakages during off-peak hours, and little to no flow during peak hours. This, along with ageing infrastructure, causes the loss of potable water, which is already sparse resource.

Hence, as valves are critical parts of the water distribution network, they should be of adequate quality to ensure efficient and long-lasting infrastructure going forward.

Battling water loss with control valves

To address the growing infrastructural demands, AVK Southern Africa has introduced its Series 869 dual-stage high/low pressure reducing valve – a reliable and effective solution.

The valve enables control of water in a pipeline through maintaining water pressure and flow regardless of changes in the system. It is a dual-stage diaphragm globe-type valve with two downstream pressure settings. The high-pressure setting supplies demand during peak hours which then shifts to a lower pressure setting during off peak periods.

By reducing the pressure, the valve protects the network by decreasing the number of pipe bursts, leakages, and collapses. The valve uses a double pilot system that overrides the demand for flow based on the standard of an IP68-rated electronic device and a pre-programmed solenoid system to switch over at predetermined times.

Hence, should a pipe burst during off-peak hours, the volume of water lost will be less than if the valve was operating at a high pressure.

The valve saves operator's time by allowing for pre-programming of the high/low setting times using remote control with various functionalities. Battery life for the IP68-rated electronic

device is around 10 years before a replacement is required and no electricity is necessary in the valve's chambers, meaning load shedding will not affect operation.

AVK assists with finding the right control valve solution

Our control valves can help mitigate and avoid network failure in pipelines that occur due to air entrapment and water hammer caused by incorrect valve sizing, valve failure, poor design, or simply the implementation of unfit products.

When designing a new system, or extending an existing range, our solutions team assists engineers, consultants, contractors, water boards and end-users by providing cost-effective and ease of operational requirements to ensure that the optimum solution is selected and implemented.

Saving water, time, and resources

The total cost of ownership should be understood and considered when selecting which valve to use for the project in question. Total cost includes product price, maintenance, operation, and man-power costs along with the cost of downtime to the end-user, to allow for a more financially viable valve in the long term.

Our control valve solutions assist in reducing water losses and burst

pipes, thereby decreasing both the amount of non-revenue water loss and the downtime of water supply to the customers. Also, when network equipment is spared for high pressure, the life expectancy of pipeline, valves and additional equipment is increased.

Expect global leadership and local commitment

Our recent launch of the AVK Series 869 control valve included comprehensive technical training for our clients, which encompassed municipalities, water boards, and the mining industry. Additionally, we have strategic plans to establish an expert assistance team to provide support during field breakdowns.

We are excited to announce that we will be launching one-day courses at our state-of-the-art training facility, The AVK Academy. These courses are open to all interested parties, including engineers, consultants, and service teams. Join us to enhance your knowledge and expertise!

In our endeavor, we aim to solidify our local presence and reaffirm our unwavering commitment to South Africa and its future growth. Leveraging our global reach and innovative mindset, we stand poised to provide optimal valve solutions to the water industry.



PROMOTING OUR SOLUTION FOR INTELLIGENT IRRIGATION

SPAIN

For the first time, AVK participated in the FIMA exhibition to present our efficient solution for irrigation.

*By Abigail Izquierdo Torres,
Technical marketing,
AVK Válvulas S.A.*



FIMA is an International Fair of Agricultural Machinery, which took place in Zaragoza, Spain from 13-17 February.

The exhibition was attended by more than 165,000 people from different

nationalities, and our AVK stand and specialised sales team received many visitors.

During the exhibition we were able to showcase our irrigation products, which are so needed in an increasingly warmer climate and with a growing population that demands an efficient exploitation of our resources

optimising irrigation, as well as the IoT wireless sensors that allow digital monitoring of the network.

Also, we received many enquiries regarding repair couplings, which are crucial for repairing and reducing water leaks.

We left the exhibition with gratitude and hope to attend again in 2026.

One of the key products is Hydropass, an intelligent system for planning and



HYDROPASS is an irrigation monitoring and control system that allows farmers to manage and optimise their water consumption for irrigating fields and crops.

The system can be connected to national geodata that provides information on the status of the soil at the time the irrigation is planned, but also on local weather forecasts that contain valuable information such as upcoming rain showers.

HYDROPASS also keeps track of water consumption and in case of alarms, it can interrupt an ongoing watering process.

QUALITY MATTERS

NIGERIA

50-year-old AVK valves are still running without any leakages or maintenance.

In February, His Excellence, Governor of Katsina State in Nigeria, Dikko Umaru Radda, visited AVK International together with his wife and delegation.

*By Jan Ketley,
Area Sales Manager, Africa
AVK International*

*Lone Agaard Østerbøg
Supporter Communication & Learning
AVK Holding A/S*

Dikko Umaru Radda was instated as governor in Katsina State in May 2023 and has promised to focus on the severe water situation in the state.

The population of the state has grown from 5.8 million in 2006 to 9.5 million today. As much of the water is used for irrigation there is a need to upgrade the water supply for drinking water, sanitation, and hygiene services.

In collaboration with the local partner Jovak Limited, AVK International had in December received an order for various valves to be delivered to Katsina State. To mark the order, they invited the governor to Denmark to visit AVK International in Skovby.

AVK International presented the story and business of AVK, and the delegation viewed the ordered valves prepared and ready to be shipped.



Even before the visit, the governor was impressed with the quality of AVK valves, as he knew that the AVK valves installed in a dam in Katsina State in 1974 was still functional.

“We are glad that Kathana was one of your early customers. Since 1970 something, when we employed your services to produce the valves for our water works. Fortunately, it has lasted this long, and we are glad we used your products. They are still there, 50 years later and still working.

So based on that, we feel that if we want to change those valves, we have to come back to the original company

that produced it, so that we get that quality and standard for our valves to continue to work effectively and efficiently for the benefit of our people,” said the governor in his speech.

“It was great to share knowledge, ideas, as well as to show our high-quality valves to the Nigerian delegation. We look forward to serve the Katsina State also for the next 50 years, for the benefit of the people of Katsina State,” says Jan Ketley, Area Sales Manager, Africa and responsible for Nigeria as well as for the partnership with Jovak Limited.

THE AVK GROUP FOCUSING ON SUSTAINABILITY

GLOBAL



*By Niels Aage Kjær,
Chairman of the Board, and
Owner of the AVK Group*

I am pleased to present our sustainability report for the financial year 2022/23. During the past year, the global economy has been affected by several factors, including the impact of the Covid-19 pandemic and the subsequent crisis in global supply chains. These factors have been further influenced by the geopolitical conflicts, which have had a significant impact on the finances of many projects. Supply chains have stabilised, but subsequent inflation and higher interest rates have had a negative impact on investment in most markets.

At the same time, we are seeing increased protectionism, with trade barriers requiring local supply chains. To meet these demands, we continue to invest in local production and supply chains, and as a result have a strong presence in key markets. Despite these challenges, the AVK Group has achieved a good result, which will contribute to securing our future development with a focus on long-term and sustainable investments for the benefit of the company, our employees, customers, and the environment.

We have a strong focus on our environmental and climate efforts, and we have launched an initiative in relation to Life Cycle Assessment (LCA)

and Environmental Product Declaration (EPD) to create accurate calculations of CO₂e emissions throughout the value chain for a given product. This year we have achieved our first certified EPD. We are working focused to minimise energy consumption and at the same time increase the proportion of green energy sources, among other things through investments in solar panels and low-energy solutions, as well as phasing out cars using fossil fuels. In addition, we focus on waste management and the use of recycled materials in the manufacture of new quality products.

The AVK Group has companies in many different countries, and our employees therefore have many



nationalities and backgrounds. We respect the differences of our employees and consider diversity to be a strength in our local anchoring and global development. The fact that we work across geographical and cultural boundaries helps to create an interesting and evolving working environment. AVK wants to be a healthy, professionally challenging, and safe place to work, which also means that we work in a structured way to reduce the number of work-related accidents.

AVK works within several business areas that are in the process of an interesting development. In recent years, there has been an increasing focus on the management of drinking

water and wastewater, which has a huge impact on health and quality of life, as well as energy consumption and climate.

Water plays a crucial role in solving many of the underlying problems that have led to the UN Sustainable Development Goals (SDGs). SDG 6 related to clean water and sanitation, and SDG 9 related to infrastructure, sustainable industry, and innovation, are particularly relevant to AVK.

At the same time, we consider SDG 17 related to partnerships for sustainable development, to be crucial for achieving the goals of the other SDGs. We are part of several partnerships across local, national, and

international authorities, organisations and companies that focus on SDG 6. In addition, AVK also contributes to other SDGs, which you can read more about in this report.



Scan the QR code to read the report on our website

COMPETITION



We are happy to announce that the winners of the competition in AVK InterLink no. 64 are:

- Oscar Hou, Commercial Assistant, AVK Valves Shanghai
- Alba Medin Gallardo, Product Manager, Wastewater, AVK International
- Andy Thornton, Project Manager (South), Glenfield Invicta

The correct answer was: 4.5 tonnes of water every second.

Gifts are on their way.

New competition:

In which country has AVK recently secured its biggest order to date?

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

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