Water treatment plant in Brězno, Czech Republic

VAG Armaturen ensures remediated mine water is returned to the environment

VAG On-Site 7

12/07

The mining industry has a long tradition in the Czech Republic. Archaeological finds prove the search for precious metals started as early as the 13th century. Today, VAG ensures that mining has a minimal effect on the environment. Outdated technologies have been replaced with VAG valves, which guarantee that the applicable limit values are not exceeded after the mine water has been remediated. Every year, 2.5 million cubic metres of the highest quality water are remediated, making it safe for the environment and for human consumption. With its integral approach to quality and excellent service, Jihomoravská Armaturka, a manufacturing and sales company within the VAG group, came out ahead of the clearly cheaper competition.

Project overview

Project:	Deliver and install actuator-operated knife gate valves and sluice gates, as well as wafer-type butterfly valves and non-return valves for the remediation of mine water in Brězno, Czech Republic
Valves:	MONO Knife Gate Valve EROX® Sluice Gate ERI® Sluice Gate RETO-STOP Non-Return Valves INTEREX Wafer-Type Butterfly Valves
Project duration:	2004 to 2006
Valve supplier:	Jihomoravská Armaturka spol.s.r.o., Hodonin, Czech Republic
Client:	Severočeské doly a.s.

Water treatment plant Brězno

Photo title page:
Accumulation basin for the cleaned water, average flow rate 13 l/s.

The project

Jihomoravská Armaturka ran this project together with the parent company, VAG-Armaturen GmbH in Germany. The key tender criteria consisted of: operational safety, safety of investment, and remaining below the applicable limit values for the return of mine water into the environment. That is why the operator of the water treatment plant, Severoceské doly a.s., the biggest producer of brown coal in the Czech Republic, had sent an extensive requirements catalogue to the bidding companies. Two things were to be gained from a successful project: the protection of the environment and international prestige. The brown coal mined in Brězno fires most of the neighbouring cogeneration plants in the Czech Republic, which is why it was important that international standards be respected and the environment polluted as little as possible.

Valuable raw materials

A massive amount of water is used in the production of brown coal in the mines near Brězno. Finding a responsible way of handling this precious raw material was crucial. It was ultimately the considerably lower limit values of undissolved elements in the returned, remediated water that made redesigning the ageing water treatment plant impossible.

The higher price on the world market also meant that the production of brown coal in this otherwise unprofitable mine was suddenly worthwhile. The increased use of the mine meant that more water needed cleaning, which finally brought the old water treatment plant to its knees. It was clear that a new plant that could handle the new limit values and the massive amount of water was needed.

Impurity of the input water:

pH value of the water	4-7,6
Fe parts	up to 30 mg/l
Mn parts	up to 20 mg/l
Undissolvable substances (NL)	up to 3500 mg/l

Impurity of the output water:

pH value of the water	6-9
Fe parts	1 mg/l
Mn parts	0,3 mg/l
Undissolvable substances (NL)	30 mg/l

Photos inside page (from left to right):
- INTEREX Wafer-Type Butterfly Valves with electrical actuator in the inlet to the homogenisation basin
- Pump house in the treatment plant
- MONO Knife Gate Valve with electrical actuator to the septic tanks
- The sluice gates installed in the pit are controlled remotely

Reliability – the nuts and bolts
At the same time, the operator required that the valves be highly corrosion-resistant to ensure the plant would operate as long and as cost effectively as possible. The cost of maintaining and servicing the old plant, as well as the cost of spare parts, was extremely high. The tender required that these issues be considered in the plant's new design. The tender also called for valves that provided the highest possible reliability, in particular in those areas where actuated valves would be used to operate the plant automatically.

Integral approach to quality
Jihomoravská Armaturka and its parent company, VAG-Armaturen GmbH, focused on quality to guarantee maximum investment safety for the customer. A fully automated treatment plant with near one-hundred per cent operational safety was designed for the highly sensitive remediation of the heavily polluted mine water. Technology and quality had to meet the new international standards and show a return on investment much quicker than the other, cheaper solutions.

Tender and competition
Jihomoravská Armaturka was suddenly competing against local valve suppliers at an international level. We countered the offers presented by our competitors with an attractive long-term solution. The Czech investor was convinced by the high operational safety and the low operating costs of our solution, enabling us to rebut the competitors' arguments.

Performance and safety throughout the plant's lifetime guarantee a feasible solution
Not only did the total cost of ownership for the plant's lifetime clearly demonstrate the good price/performance ratio of our solution, the technological innovativeness, which reaches far into the effective operation of the plant, and the guarantee of an uninterrupted supply of service and spare parts were what turned the table for VAG: when the team in Březno decided to buy the necessary valves from VAG, they also decided for an integral and economical long-term operating concept.

Water treatment plant Brězno

Corrosion resistance
Corrosion resistance played a key role in the project. Jihomoravská Armaturka and VAG-Armaturen GmbH were convincing: the semi-automated water treatment plant has now been running smoothly for three years.Without a single repair, without one replacement and without expensive, additional protective coating.

All of the 150 gate valves, butterfly valves and non-return valves between DN 50 and DN 500 have been running uninterruptedly since 2004. The higher purchase price has already been amortized and corrosion will not be an issue in Brězno for a very long time thanks to GSK's technologically superior powder coating.

Photos top (from left to right):
- Ventilation basin
- ERI® Sluice Gate with electrical actuator in the distribution channels for the accumulation basin

GSK - Together against corrosion
The protective powder coating developed by VAG-Armaturen GmbH and GSK, the German Quality Association for the Heavy Duty Corrosion Protection of Powder Coated Valves and Fittings e. V., guarantee lasting corrosion protection.

GSK was founded over 10 years ago to meet the increasing quality demands for pipeline networks in all European countries. VAG is one of GSK's 27 members.

VAG's customers around the world benefit from the shared experiences and jointly developed solutions. Effective corrosion protection prevents unnecessary damage, which results in less water loss and fewer prolonged shut-down periods. This makes for a lasting and profitable solution.

RAL GÜTEZEICHEN

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