

Top-class European hydropower specialists exchange digitalization expertise at VGB/VERBUND workshop

13/05/2019 by Dr Mario Bachhiesl, Dagmar Oppenkowski

Digital transformation is an ongoing process in nearly all areas of modern life. With regard to the generation of electricity from hydropower established business models and processes are substantially changed through new concepts, methods and models such as “Hydropower 4.0”, machine learning, cyber-physical systems, internet of things, data mining and internet of services. Digitalization will also affect maintenance and operation of hydropower plants with an unexploited potential for reducing costs as well as for increasing the effectiveness of workforce management.

Together with VERBUND and the Institute for Electricity Economics and Energy Innovation of the Graz University of Technology, VGB PowerTech e.V. organised the 2nd international workshop on "Digitalization in Hydropower", which took place in Graz on 25-26 April 2019 in order to promote the Europe-wide exchange of experience among hydropower experts. Chaired by VERBUND, more than 170 experts from 90 companies and institutions from 14 European countries discussed digital developments, implemented measures and opportunities in the hydropower sector. Another focus was set on data protection and cyber security.

VERBUND presented its hydropower plant 4.0

A live demonstration at the pilot power plant Rabenstein in Styria/Austria and unique throughout Europe: VERBUND and technology partners presented for the first time the future of power generation in a hydropower plant 4.0. More than 12 stations with various digital measures, mostly in operation, were demonstrated:

- Station 1: Remotely Operated Vehicle
- Station 2: Real-time 3D Sonar
- Station 3: Fish Monitoring
- Station 4: Generator Inspection System
- Station 5: Interactive Troubleshooting
- Station 6: Virtual 3D-Model
- Station 7: Advanced Data Analysis
- Station 8: Digital Workforce Management
- Station 9: Brush Monitoring
- Station 10: Intelligent Maintenance Optimization System
- Station 11: Acoustic Monitoring System
- Station 12: Digital Twin



3D-model of power plant Rabenstein

With the innovation programme "Digital Hydropower Plant", VERBUND started the development of those applications two years ago to make the hydropower industry ready for the new requirements of the energy market.

Here, VERBUND was able to count on the close cooperation with numerous Austrian and international research and technology partners right from the start. "Our goal is to evaluate all conceivable possibilities of digital applications for hydropower and to put the most promising technologies to the test in a pilot power plant," Karl Heinz Gruber, Managing Director of VERBUND Hydro Power GmbH, stated during the first live demonstration of the hydropower plant 4.0. This approach is unique in the hydropower industry and therefore attracts a lot of international attention.

However, as digital technologies are changing rapidly there are many challenges, which make the application so highly demanding. Networked platform solutions in hydroelectric power plants have to combine previously isolated data and information systems. Data should be available locally and centrally at the push of a button across all areas and enable rapid analyses. But, as Karl Heinz Gruber made clear: "Digital technologies will not displace our employees in the power plants, but rather support them in their daily work in the form of a reliable assistance system".



Karl Heinz Gruber, Managing Director of VERBUND Hydro Power GmbH

Digitalization Barometer - World Premiere for a Status Assessment System

A new free-to-use tool developed by VGB PowerTech and its members was also presented at this event: The "Digitalization Barometer for Hydropower Operators". This barometer is tailored to the specific characteristics of hydropower, intended to support hydropower companies in implementing the digital transformation. It enables the evaluation of both the current status and the target status in three years compared to the sector average. In this way the companies gain a comprehensive insight into their digitalization degree, how they compare to the benchmark and what future goals the sector aims at.