CONFERENCE VENUE
Graz University of Technology
Rechbauerstrasse 12
Hauptgebäude, Alte Technik, Foyer
8010 Graz/Austria

CONFERENCE LANGUAGE
English

REGISTRATION
Participants are requested to register online. Please note that the registration is binding. We will confirm your registration by sending the invoice. You will receive your name badges and the list of participants at the conference office before the start of the workshop. Please mention the company’s invoice address with all other necessary data.

VGB PowerTech e.V.
Deiblbachstr. 173
45257 Essen/Germany
Dagmar Oppenkowski
Phone: +49 201 8128 – 237
EMail: vbgdigit@vbg.org
Online Registration

EVENING EVENT
On Thursday, 25 April, starting at 7.30 p.m., all workshop participants are invited to get together at the Graz University Rooftop Mensa
Stremayrgasse 16
8010 Graz

ATTENDANCE FEES
Workshop fee non-VGB members € 850.–
Workshop fee VGB members € 500.–
Universities, students € 200.–

The attendance fees are free of VAT and include the list of participants, the conference presentations (after the conference), coffee breaks and beverages, lunch and the participation in the evening event as well as in the visitation. It is not possible to accept credit cards or currency at the conference office.

ROUTE DESCRIPTIONS
For route description to the conference venue please see:

Map Conference

For route description to the evening event please see:

Map Event Evening

Tramways 6 and 26. Stop: “Neue Technik”

HOTEL RESERVATION
For your hotel reservation please see:
Service TU Graz

VGB offices regret being unable to make hotel reservations.

CONFERENCE OFFICE
The conference office will be open from 08.00 a.m. on.
Regarding conference procedures please contact
Dr Mario Bachhiels.
Landline: +49 201 8128 270
Mobile: +49 151 18248023
EMail: mario.bachhiels@vbg.org

PRIVACY POLICY
VGB is committed to protect your privacy. We will only use the information that we collect about you lawfully. We collect information about you to process your order and to provide you with best possible service in the future. The documents will list your name, surname, title, function, company and place of business. Photos and videos from the event will be published in VGB publications as well as in other publications and the internet.

IN COOPERATION WITH

TU Graz (www.iet.tugraz.at) Verbund (www.verbund.com)

DIGITALIZATION IN HYDROPOWER

VGB WORKSHOP

25/26 APRIL 2019 – GRAZ / AUSTRIA
DIGITALIZATION IN HYDROPOWER

Enhanced digital controls can contribute to improving the performance of hydropower fleets, plants and equipment by reducing costs and optimising asset management. Digital control systems can also play a major role in improving decision-making and supporting operations to work more efficiently. The fact that a growing number of the world’s hydropower plants needs to be refurbished and modernised in the next few years makes the transformation process so highly challenging.

The international VGB workshop will again provide a comprehensive overview of digitalization in hydro power dealing mainly with the results of newly developed and implemented techniques:

- Cyber Security & Advanced Data Analyses
- Experiences from implemented digital projects

The workshop will bring together experts from leading operator and manufacturer companies as well as related stakeholders to discuss challenges and opportunities for the operation of hydro power fleets accruing from digital transformation.

Based on practical examples you will gain insights on how digital solutions are already successfully implemented and applied. This may contribute to improving and optimising digital solutions in your own company.

There will be enough time for detailed bilateral discussions and for answering questions.

In this context and as a valuable complement to the lectures, on 26 April all participants are invited to visit the Rabenstein run-of-river power plant, which is located near Frohnleiten/Styria. In Rabenstein (demonstration project of VERBUND) implemented and currently tested digitalization techniques will be presented.

Free transportation (bus shuttle) will be provided.

WORKSHOP PROGRAMME

09.00 Welcome and opening of the workshop
Univ-Prof. Dr. Harald Kainz, Rector of Graz University of Technology

09.10 Digitalization in Hydropower – Vision and Reality
Dr. K. H. Gruber, Chairman VGB Strategic Forum
“Hydro” (VERBUND Hydro Power GmbH)

09.50 SESSION 1: Cyber Security & Data Analysis

Lecture 1
Cyber Security within Power Plant Control Systems
Richard Biala, ABB AG

Lecture 2
Visual Analysis of Process Data in Hydropower Using ViSplore
Dr. Harald Piringer, VVIS Zentrum für Virtual Reality und Visualisierung ForschungsgmbH

Lecture 3
Engineering the Future – Merging AI with Engineering Expertise
Michael Jakob Frank, uniper Anlagenservice GmbH

10.50 Panel discussion, Q&A session

11.05 Coffee Break

11.30 SESSION 2: Experiences from implemented digital projects

Lecture 4
Digital Initiatives to Excel Resource Allocation @innogy hydrop
Dr. Jens Schramm, Hendrik Eden, Dr. Christian Baier, innogy SE

Lecture 5
EDP’s Journey through the Digital World
Filipe Duarte, EDP Gestão da Produção de Energia S.A.

Lecture 6
Dynamic Maintenance Scheduling
Bernard Valluy, Alpiq S.A.

12.30 Panel Discussion / Q&A session

12.45 Lunch Break

13.35 Lecture 7
Establishing an IoT platform for the Digital Hydro Power Plant
Dr. B. Hollauf, VERBUND Hydro Power GmbH
D. Wagner, VERBUND Services GmbH

14.30 Panel Discussion / Q&A session

14.50 Coffee Break

15.15 Lecture 10
Digitalization of CEZ Hydro Asset as Support of Predictive Maintenance Effort
Roman Mašík, ČEZ a. s.

Lecture 11
Modernization of EDF Hydro Operating Mode by Taking Advantage of Digital Solutions
Frédéric Michaud, EDF Électricité de France

Lecture 12
The Theory of EveryBIM
Marius Jablonskis, Norconsult AS

16.00 Lesson 13

16.30 Outlook Rabenstein
Dr. B. Hollauf, D. Schlüsselberger, VERBUND Hydro Power GmbH

16.45 Closing words
Dr. K. H. Gruber, VGB Chairman Strategic Forum
“Hydro” (VERBUND Hydro Power GmbH)

19.30 Get-together: Rooftop Mensa of Graz University
**WORKSHOP PROGRAMME**

Demonstration of implemented digital test systems in Rabenstein power plant (demonstration project of VERBUND) On the second workshop day VERBUND will present versatile digital test systems in the pilot plant Rabenstein (Frohnleiten/Austria). The participants can do a guided tour with max. 5 stations (rounds) in the morning. At each station one digital test system will be explained and demonstrated by VERBUND and project partners. In the afternoon the participants can do a self-guided tour to the stations (open house). Experts will be on site for answering questions and intensive technical discussions.

*Please note: Sturdy shoes are required for the plant visit!*

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>09.00</td>
<td>Arrival at Rabenstein power plant and grouping of participants</td>
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<tr>
<td>09.30</td>
<td>Guided Station Tours (Demonstrations)</td>
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<tr>
<td>10.00</td>
<td>Round 1</td>
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<td>10.30</td>
<td>Round 2</td>
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<td>11.00</td>
<td>Round 3</td>
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<td>11.30</td>
<td>Round 4</td>
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<tr>
<td>12.00</td>
<td>Networking Lunch Break</td>
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<td>Snacks, soft drinks, coffee</td>
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<tr>
<td>13.00</td>
<td>Self-guided Station Tours (Open House)</td>
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<td>Visiting stations &amp; knowhow exchange with experts</td>
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<td>15.00</td>
<td><strong>End of visitation</strong></td>
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Free transportation (bus shuttle) to Graz city and Graz airport.

**Station 1: Remotely Operated Vehicle**
Demo: Underwater inspection of hydro power equipment

**Station 2: Real-time 3D Sonar**
Partner: Coda Octopus
Demo: Trash take inspection with the realtime 3D sonar the Echoscope®

**Station 3: Fish Monitoring**
Camera monitoring of fish passes & Video analysis
Demo: Fish monitoring system

**Station 4: Generator Inspection System**
Demo: Buckling Visualisation System & Video analysis with artificial intelligence

**Station 5: Interactive Troubleshooting**
Partner: Augmensys
Demo: Mobile assistance system for troubleshooting (UBIK)

**Station 6: Virtual 3D-Model**
Partner: Loclab
Demo: Use Cases of the virtual 3D-Model of Rabenstein power plant

**Station 7: Advanced Data Analysis**
Anomaly detection
Demo: Predictive maintenance model & Monitoring systems for large dams

**Station 8: Digital Workforce Management**
Demo: Status quo of the Digital Workforce Management System

**Station 9: Brush Monitoring**
Partner: MERSEN
Demo: Demonstration model & Failure simulation (MERSEN iBrush®)

**Station 10: Intelligent Maintenance Optimization System**
Partner: ANDRITZ Hydro
Demo: Sensor Data & Physics based Technology Modules (Metris DiOMera®)

**Station 11: Acoustic Monitoring System**
Partner: Voith Hydro
Demo: Intelligent sound analysis with Voith OnCare Acoustic

**Station 12: Digital Twin**
Partner: CADFEM & Efficient
Demo: Real time model for lifetime analysis of relevant components

**Special Highlight: Virtual Bungee Jump**
Virtual bungee jump of VERBUND’s large dam “Kölnbreinsperre”

In cooperation with **Verbund**
(www.verbund.com)