

## 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.  
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[Online Registration](#)

## EVENING EVENT

On Thursday, 25 April, starting at 7:30 p.m., all workshop participants are invited to join the gettogether 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 Bachhiesl.  
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## 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



([www.iee.tugraz.at](http://www.iee.tugraz.at))



([www.verbund.com](http://www.verbund.com))

# DIGITALIZATION IN HYDROPOWER

## VGB WORKSHOP

25/26 APRIL 2019 – GRAZ / AUSTRIA



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... is the first address in technoeconomic and environmental issues and functions as the collective European platform and key representative for hydropower community.

## 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

**THURSDAY – 25 APRIL 2019**

**09.00 Welcome and opening of the workshop**  
N.N., Graz University of Technology

09.10	<b>Digitalization in Hydropower – Vision and Reality</b> Dr K. H. Gruber; Chairman VGB Strategic Forum "Hydro" (VERBUND Hydro Power GmbH) <b>Digitalization-Barometer-Tool for Hydropower Operators</b> Dr M. Bachhiesl, VGB PowerTech e.V.
09.50	<b>SESSION 1: Cyber Security &amp; Data Analysis</b> <b>Lecture 1</b> <b>Cyber Security within Power Plant Control Systems</b> Richard Biala, ABB AG <b>Lecture 2</b> <b>Visual Analysis of Process Data in Hydropower Using ViSplore</b> Dr Harald Piringer, VrVIS Zentrum für Virtual Reality und Visualisierung Forschungs-GmbH <b>Lecture 3</b> <b>Engineering the Future – Merging AI with Engineering Expertise</b> Michael Jakob Frank, uniper Anlagenservice GmbH
10.50	<b>Panel discussion, Q&amp;A session</b>
11.05	Coffee Break
11.30	<b>SESSION 2: Experiences from implemented digital projects</b> <b>Lecture 4</b> <b>Digital Initiatives to Excel Resource Allocation @innogy hydro</b> Dr Jens Schramm, Hendrik Eden, Dr Christian Baier, innogy SE <b>Lecture 5</b> <b>EDP's Journey through the Digital World</b> Filipe Duarte, EDP Gestão da Produção de Energia S.A. <b>Lecture 6</b> <b>Dynamic Maintenance Scheduling</b> Bernard Valluy, Alpiq S.A.
12.30	<b>Panel Discussion / Q&amp;A session</b>
12.45	Lunch Break

13.35	<b>Lecture 7</b> <b>Establishing an IoT platform for the Digital Hydro Power Plant</b> Dr B. Hollauf, VERBUND Hydro Power GmbH D. Wagner, VERBUND Services GmbH <b>Lecture 8</b> <b>Mobile Apps for Efficient Workforce Management</b> Dr Christian Kunze, uniper Kraftwerke GmbH <b>Lecture 9</b> <b>Complicated Cases Solved with Simple Analytics</b> Camilla Feurst, Statkraft Energi AS
14.35	<b>Panel Discussion / Q&amp;A session</b>
14.50	Coffee Break
15.15	<b>Lecture 10</b> <b>Digitalization of CEZ Hydro Asset as Support of Predictive Maintenance Effort</b> Roman Mašika, Čez a. s. <b>Lecture 11</b> <b>Modernization of EDF Hydro Operating Mode by Taking Advantage of Digital Solutions</b> N.N./EDF <b>Lecture 12</b> <b>TBA</b> Marius Jablonskis, Norconsult AS
16.15	<b>Panel Discussion / Q&amp;A session</b>
16.30	<b>Outlook Rabenstein</b> Dr B. Hollauf, D. Schlüsselberger, VERBUND Hydro Power GmbH
16.45	<b>Closing words</b> Dr K. H. Gruber; VGB Chairman Strategic Forum "Hydro" (VERBUND Hydro Power GmbH)
19.30	<b>Get-together: Rooftop Mensa of Graz University</b>

## 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.

FRIDAY – 26 APRIL 2019	
09.00	Arrival at Rabenstein power plant and group coordination
<b>Guided Station Tour (Demonstrations)</b>	
09.30	Round 1
10.00	Round 2
10.30	Round 3
11.00	Round 4
11.30	Round 5
12.00	<b>Networking</b> <span style="float: right;">Lunch Break Snacks, soft drinks, coffee</span>
<b>Self-guided Station Tour (Open House)</b>	
13.00	Visiting stations & know-how exchange with experts
15.00	<b>End of visitation</b>

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 rake inspection with the real-time 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



### Station 5: Advanced Data Analysis

Anomaly detection

Demo: Predictive maintenance model & Monitoring systems for large dams



### Station 6: Virtual 3D-Model

Partner: LocLab

Demo: Use Cases of the virtual 3D-Model of Rabenstein power plant



### Station 7: Interactive Troubleshooting

Partner: Augmensys

Demo: Mobile assistance system for troubleshooting (UBIK)



### 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 i-brush*)



### Station 10: Intelligent Maintenance Optimization System

Partner: ANDRITZ Hydro

Demo: Sensor Data & Physics based Technology Modules (*Metris DiOMera*)



### Station 11: Digital Twin

Partner: CADFEM & Itficient

Demo: Real time model for lifetime-analysis of relevant components



### Station 12: Acoustic Monitoring System

Partner: Voith Hydro

Demo: Intelligent sound analysis with *Voith OnCare.Acoustic*



### Special Highlight: Virtual Bungee Jump

Virtual bungee jump of VERBUND's large dam "Kölnbreinsperre"

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