HYDRO 2018

GDANSK, POLAND

AMBEREXPO

15-17 October 2018

organized by

THE INTERNATIONAL JOURNAL ON HYDROPPOWER & DAMS

Progress through Partnerships

PROGRAMME AND REGISTRATION DETAILS

Supporting organizations include:

Regular updates will be posted on our website, and published in Hydropower & Dams
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www.hydropower-dams.com
HYDRO 2018 MISSION AND SCOPE

HYDRO 2018 will be the 25th in Aqua-Media’s series of international events hosted in Europe, and will once again be the most significant conference and exhibition of the year for the global hydropower community. The annual conferences have become renowned as the most international gatherings in the profession, with delegations representing all countries with major hydropower development programmes underway. An exchange of experience is encouraged on practical and topical issues, and an international steering committee works with the Aqua-Media team to ensure the high quality of papers accepted.

The event will bring together delegations from around 75-80 nations, sharing the common interest of advancing hydropower development in all parts of the world. Lessons from past experience will be reviewed, achievements will be showcased, and new challenges will be tackled. The conference sub-title ‘Progress through Partnerships’ highlights the underlying theme of international collaboration which will be the basis for discussions. The location aims to facilitate participation from more countries in the Central Asian and eastern European region.

Emphasis will be on helping the less developed countries to unlock their hydropotential to advance socio-economic development, on cross-border collaboration and regional projects, and on maximizing the potential to increase hydropotential in the industrialized countries. Timely maintenance of existing hydropotential is another key theme, along with designing for the sustainability of greenfield projects.

WHO SHOULD ATTEND?

All who are involved in researching, planning, designing, financing, constructing, supplying, operating and maintaining hydropower plants and associated civil structures worldwide should not miss the opportunity to join this international forum. HYDRO 2018 will be the most international gathering of the year specifically for the hydropower profession.

Key participants will be specialists on environmental and social issues, climate, energy economics, managing financial risk, the changing role of hydropower, safety and dealing with natural hazards, cyber security, and broader aspects of water storage and renewable energy.

HYDRO 2018 HOST CITY

Gdansk, on Poland’s Baltic coast, is one of the country’s most elegant and fascinating cities. It has played a significant role in Polish history. Notably in 1980, it was the birthplace of the Solidarity movement, which had a profound influence not only on Poland, but on the entire eastern European region. Our HYDRO 2018 Welcome Reception will take place in the ‘European Solidarity Centre’, and there will be a short talk by the Director on Poland’s history in recent decades.

The centre of the old town is characterized by colourful facades, for example in the Long Market, which is full of small shops and gourmet restaurants. Nearby is the Neptune Fountain, a 17th century symbol of the city, topped by a bronze statue of the sea god. The 14th century Town Hall houses the city’s historical museum. Other places to be explored include: the 16th century Oliwa cathedral, featuring baroque and rococo architecture, and Artus Court, a former meeting place of merchants.

The Green Gate is another attraction, located on the water front between Long Market and the River Motława. The magnificent four-arched gatehouse was built between 1568 and 1571, and reflects the Flemish architectural influence in Gdansk.

Gdansk, named as one of the Best European Destinations in 2017, is also a centre for the world’s amber trade. There is a museum dedicated to amber craftsmanship, as well as a number of small workshops around the town.

The river Motława and a number of small canals in the old part of the city provide a perfect setting for an evening stroll.

Plenty of restaurants offer gourmet specialities of Polish, including Kashubian, cuisine.

HYDRO 2018 offers a pre-conference visit to the historic port city of Gdansk, Poland, one of Europe’s most interesting industrial museums, and a unique opportunity to explore the rich history and cultural heritage of this city.

HYDRO 2018 will be the most international gathering of the year specifically for the hydropower profession.
## HYDRO 2018 TIMETABLE

<table>
<thead>
<tr>
<th>Sunday 14 October</th>
<th>Monday 15 October</th>
<th>Tuesday 16 October</th>
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<td><strong>From 09.00 hrs:</strong> Conference Registration opens&lt;br&gt;Exhibition set-up for custom stands only</td>
<td><strong>08.30 hrs:</strong> Opening Plenary Session:&lt;br&gt;Welcome addresses&lt;br&gt;Keynote addresses</td>
<td><strong>08.30 hrs:</strong> Parallel Sessions:&lt;br&gt;11 - Valuing hydro and pumped storage services (IEA)&lt;br&gt;12 - Civil engineering: Safety - I&lt;br&gt;13 - Innovative technology&lt;br&gt;14 - Environment: Fish protection</td>
<td><strong>08.30 hrs:</strong> Parallel Sessions:&lt;br&gt;25 - Hydro plant safety and cyber security&lt;br&gt;26 - Upgrading and refurbishment - I&lt;br&gt;27 - Small hydro - I&lt;br&gt;28 - Gateworks and penstocks</td>
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| **09.30 hrs:** Small Hydro Seminar begins | **09.00 hrs:** Parallel Sessions:<br>1 - Project structuring and financing<br>2a - Development opportunities - I<br>2b - Development opportunities - II<br>3 - Hydraulic machinery: Research<br>4 - Civil works: Design and construction - I<br>5 - Contracts and procurement<br>6a - Hydraulic machinery - I<br>6b - Hydraulic machinery - II<br>7 - Civil works: Design and construction - II

**Coffee**<br>**Lunch**<br>**Coffee**<br>**Coffee**
| **19.00 hrs:** Chairmen’s Meeting followed by<br>Speakers’ Briefing at the AMBEREXPO Congress Centre | **19.00 hrs:** Welcome Reception European Solidarity Centre Gdansk | **17.30 hrs:** Networking party Refreshments in the Exhibition Halls (Evening free for private parties) | **19.00 hrs:** Conference Dinner (preceded by a short concert) Baltic Philharmonic Hall, Gdansk |
| **19.00 hrs:** Exhibition open | **Coffee**<br>**Lunch**<br>**Coffee**<br>**Coffee** | **Closing Plenary Session:**<br>Summary and outcomes | **Coffee**<br>**Coffee**<br>**Coffee**

### HYDRO 2018 KEYNOTE ADDRESSES:

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LARGE PLANT OPERATORS’ ROUNDTABLE

The Third Roundtable on Large Hydroelectric Power-plant operation will be held on 14 October. Organised by Itaipu Binacional, Brazil/Paraguay, this full-day event will be an informal, exclusive, high-level forum to exchange knowledge about real-time operational challenges and experiences at some of the world’s major hydro plants.

The mission is to allow for discussion among senior professionals responsible for the daily operation of the plants. Participants will be invited to play an active role in the discussion. Interventions will be welcome on best practice, or on challenging issues where the opinions of other operators could be helpful in resolving problems.

After invited presentations, a facilitated discussion will take place. Specific topics will be agreed in advance. Examples could include:

• Human factors in real-time operation
• SCADA systems and associated apps
• Operational inspections
• Shift work challenges and practices
• Emergency action plans

Places are limited for the Roundtable; to express interest in securing a place, please email: hydro2018@hydropower-dams.com as soon as possible, giving details of your organisation, role and responsibilities, and the powerplant you would discuss during the Roundtable.

PRE-CONFERENCE EXCURSION

An local cultural excursion is planned for participants and accompanying persons on the day of registration (Sunday 14 October). This will begin mid-morning (allowing for time to register beforehand), and will include lunch in a local restaurant, in a scenic part of town. This will provide an opportunity to get to know the old city of Gdansk, with its picturesque marina, its stunning architecture, and some key landmarks such as the Neptune Fountain, the 14th century Town Hall houses, the Green Gate, the Long Market and the Artus court.

There will also be an opportunity to visit the Maritime Museum, Granary, and famous Old Crane building. Gdansk was named as one of the Best European Destinations in 2017, and is well worth exploring. The tour on 14th October is designed to give HYDRO 2018 delegates a first taste of the sights the city has to offer.

AMI HYDROPOWER FOUNDATION

This is an independent charitable foundation, governed by an international board of trustees, set up in 2007 with the principal aim of facilitating the participation at the annual Hydro Conferences of delegates from the less developed and developing countries, and others with current economic difficulties.

Details of the application process for funding can be found on the dedicated web page, at: www.hydropower-dams.com

Fully completed applications, with supporting references, must be received by the organizers at least 10 weeks prior to the date of the conference, to allow sufficient time for processing by the trustees.

Successful applicants will normally be granted assistance to cover the conference registration fees, and in some cases accommodation. Travel expenses will generally not be covered, although in some exceptional cases, contributions towards travel costs may be granted.

If you or your company would like to make a donation to the Foundation, you will have the opportunity to do so at the time of registration.

PRE-CONFERENCE SMALL HYDRO WORKSHOP

Many factors are considered in the design and construction of the optimum hydropower project. All parts of a scheme will be interrelated and interdependent. Change one component and all others will be affected.

This workshop, following successful ones held in Vientiane, Montreux, Marrakech, Seville and Danang, is aimed at people who are, or will be, involved in hydropower development as part of rural electrification programmes. It will cover run-of-river hydro projects in the ‘pico’ to ‘mini’ range (1 kW to 1 MW capacity).

As this is a diverse form of energy production, there are always areas which are unfamiliar to people, despite many individual specialisms. This workshop aims to fill in the gaps, and help people to gain a good basic grounding in the topic.

All relevant aspects will be covered, from rainfall to energy evaluation, including:

• Analysis of scheme location and definition of potential catchments
• Turning rainfall into an available flow range from a catchment and development of a flow duration curve
• Power and energy generated calculation
• Intake structures, channel and/or pipeline routes and sizing
• Powerhouse design and equipment
• Turbine selection
• Generator, controls and switchgear options
• Grids, national and local

This will be a ‘hands-on’ workshop, which will involve the participants, working in groups, to develop an actual hydropower project during the day. After presentations on the individual scheme aspects, the groups will put together the components of the project. This will follow through to the completed design.
CONFERENCE SESSIONS

The following pages present the status of the HYDRO 2018 programme in August. Some additional invited papers are still to be confirmed and will be announced shortly. Please visit our website for regular updates.

Monday 15 October - Morning

Session 1: Project structuring and financing
Chair: P.J. Rae, Peter J. Rae Consulting, Canada
- Public Private Partnership (PPP) in hydropower development in Laos PDR — A. Vongsay, Ministry of Energy and Mines, Laos PDR
- The Azamhi hydro plant: A private hydropower development in Africa — J. Steele, Randgold Resources, Kilifi Gold Mine, DRC, R. Greyling, Knight Piésold Consulting, South Africa; E. Scherman, Knight Piésold Consulting, Canada
- Do Chinese developers build better hydropower at home than abroad? — Dr J. Plummer Braeckman, University of Cambridge, UK; J. Kirchherr, McKinsey & Company, UK
- Greenfield development - brownfield acquisition: The unmasking of hidden risks and value — K.J. Condey, Aqua Energie LLC, USA; L. Nohmi-Lionard, Virunga Power, Kenya

Session 2a: Development opportunities - I
Chair: L. Mouvet, Hydro Operation International, Switzerland
- Screening of potential hydropower sites in a large region using GIS and global data resources — P. Thiapp, P. Schafer and S. Pelt, Fichtner GmbH & Co KG, Germany
- Development potential in Afghanistan — (Author to be announced)
- Development of water storage projects in Iraq to secure food, drought threats and clean energy needs — H.A. Nowramany, Ministry of Electricity, Iraq
- Bornean hydropotential under changing climate: An assessment on existing large hydro plants — M. Hussain, S. Hadya, J. Janggu, and A. Syam Sul, Sarawak Energy Berhad, Malaysia
- Opportunities and challenges in Myanmar — Wunna Etn, DHI, Ministry of Electricity, Myanmar
- Status quo and future trend of FDI along B&R by Chinese companies — Y.M. Sheng and G.I. Zhang, PowerChina Resources Ltd, China

Session 3: Hydro machinery – R&D
Chair: Prof F. Avellan, EPFL-UMH, Switzerland
- Use of compact laser Doppler velocimetry in reduced scale model testing of hydraulic machines — M. Solvakvira, A. Muller and K. Yamashita, Nippon Koei Co., Ltd, Japan; L. Andolfato, V. Berxvux and F. Avellan, EPFL Laboratory for Hydraulic Machines, Switzerland
- Investigation of different ways of the axial thrust reducing on Francis turbine — Y. Kuznetsov, E. Spiridonov and V. Kuznetsov, Power Machines PJSC/LMZ, Russia
- On the use of pressure pulsations in draft tube to determine the cam curve on Kaplan turbines — M. Sandelius and A. Pettersson, Sweco Energide AB, Sweden; M. Cervantes, Luleå University of Technology, Sweden
- Erosion resistance of structural materials used in hydropower installations: assessment by means of the fractal approach — J. Stoller, Polish Academy of Sciences, Poland
- Modal testing beyond the scope of international standards: An outlook — L. Andolfato and F. Avellan, EPFL Laboratory for Hydraulic Machines, Switzerland
- Numerical analysis and laboratory test of a high speed Francis hydro turbine — M. Kamiecki, ZKE Gdańsk S.A., Poland; A. Kremianowski, Polish Academy of Sciences, Poland

Session 4: Civil engineering: Design and construction I
Chair: Dr A. Hughes, Dams and Reservoirs, UK
- Design and operation of Gibe III power waterways — A. Pietrangeli, A. Cagiana de Azevedo, G. Pitella and C. Rossi, Studio Ing. G. Pietrangeli Srl, Italy; E. Zoppi, Salini Impregilo SpA, Italy
- Intake structure designs of entirely steel-lined pressure conduits across an RCC dam — R. Arnold, A. Lanz and R.M. Bees, Swiss Federal University of Technology (ETH) Zurich, Switzerland; A. Bazzi, Studio Ing. G. Pietrangeli Srl, Italy
- Design of the Muzizi hydropower project, Uganda — G. Kräger, C. Auel, R. Frizier, J. Thome and A. Richmond, IFL Consulting Engineers Austria GmbH, Austria; M. Mwaanga, UEGCI, Uganda
- Physical hydraulic model study of complex hydropower structures: A case study on Upper Yangja hydropower project, Myanmar or — Aung Lwin,Ministry of Electricity and Energy, Myanmar; J.P. Matus and M.L. Ribeiro, Stocky Ltd, Switzerland
- Determining the optimum scheme layout for the Sambwe hydropower project — E. Lillie and R. Greyling, Knight Piésold Consulting, South Africa

Session 5: Contracts and procurement
Chair: Dr J. Plummer Braeckman, University of Cambridge, UK
- EPC contracting in Hydro: risk or opportunity? — V. Poluboth, EDF-CIH, France
- Trivialities with a major impact on a successful project execution: ‘Small details’ of a hydropower plant construction and erection contract — B. Geisseler, Goisseler Low, Germany
- Split contracting approach to hydropower procurement to increase competitiveness — M. Lacey, Westglen Consult, UK
- Utilizing Building Information Modelling (BIM) methods to mitigate project risk for construction activities in dam and hydropower projects — C. Bicks, Simm -MegaProject, Italy
- Power utility asset inspection and evaluation — M. Parameshwaran, J. Dymond and D. Partridge, Multiconsult, Norway

Session 2b: Development opportunities - II
Chair: L. Lie, NTNU, Norway
- Hydropower in the East European region: Challenges and opportunities — J. Stoller, Polish Academy of Sciences, Poland; M. Lewonowski, Polish Hydropower Association, Poland; B. Mellick, Polish Association for Small Hydropower Development, Poland; E. Krenn, ICSH, China; B. Popa, University Politehnica of Bucharest, Romania; P. Purnu, A. Studzinski University, Lithuania
- The construction of a hydroelectric powerplant as a partnerships lever — A.P. Moreira and A. Seirea, EDP - Gestão da Produção de Energia SA, Portugal
- Integration and optimization of hydrokinetic turbines in existing water infrastructure in South Africa — C. Nioboh and M. van Dijk, Pretoria University, South Africa; J. Bhagwatt, WRC, South Africa
- Perspectives of hydropower development in Ukraine — E. Antunova and I. Tregava, Hydroproject Ltd, Ukraine
- Various innovations in the uses of dams — F. Lempériere, Hydropac, France; A. Nombre, BUCCD, Burkina Faso; L. Derso, IRS, Ingénierie, France

Session 6: Hydraulic machinery
Chair: J.H. Gunner, Hydro-Consult Pty Ltd, Australia
- Comparison of hydraulic losses for bulb, pit and 5-tube turbulator tunnels — D. Joti, V. Pirnat, F. Filipi, and A. Staravoj, Kolesar Turbane dnebnik d.o.o. Slovenia
- Leakage flow effect and labyrinth losses impact on Francis turbine efficiency prediction and performance — S. Dalla Costa and M. Sartori, Tonello hidraulica srl, Italy
- Investigation of unsteady flow inside the draft tube cone of model Francis turbine using bi-directional piezometric probe — R. Akulov, A. Kaznacheyev, I. Kuznetsov and Y. Kuznetsov, PSCE Power Machines, Russia
- Reliable prediction of pressure pulsations in the draft tube of a Francis turbine at medium and deep head load conditions — validation of CFD results with experimental data — J. Schacher, J. Partner, A. Austria, H. Banajiri and H. Joburg, TU Graz, Austria; M. Ehrenberg, WWS Wasserkraft, Austria
- Comparison of high and low pressure systems in hydro electric turbine speed regulation — H. Botelho Le Grand and T. Riso, Bosch Rexroth AG, Germany
- High loaded PEK coated bearings: Measurements at hydro plant power — P. Neubauer, O. Berchtold, M. Spiridon and A. Schubert, GE Renewable Energy, Switzerland
- Experience in developing and operating anti-friction materials for the blades turning mechanism of ecologically clean Kaplan turbines — R.M. Shokrany, S.Y. Ilin and O.Y. Meron, RSC Power Machines, Russia
- Oil to water lubricated turbine bearing conversions — J. Thornhill and R. Strickland, Wärtsilä Seals & Bearings, UK; J. Druck, American Hydro, USA
- Hydro lubricants: Water-based lubricants for hydropower applications — B. Venguprasamy, E.V. Hoersten, M. Schweingart and M. Kuhn, Klüber Lubrication München SE & Co KG, Germany; W. Liu, Gansu University of Technology, Poland
- Water lubricated main shaft bearings: Modern solution for hydropower industry — W. Liwin, Gansu University of Technology, Poland; T. Matsumura, Kamel Co, Japan; N. Hirota, Mikasa, Japan
- Noppakioski hydropower plant: Experience from design, assembly and commissioning — J. Vesely and F. Ambroz, CKD Blansko holding a.s., Czech Rep
- Spherical valves for the Polish Parakoba-Zar pumped-stORAGE plant: Interests and experiences from design, manufacturing, assembly and commissioning — O. Klisou, M. Krupa and F. Ambroz, CKD Blansko holding a.s., Czech Rep
- Runner blade modernization technology in a 48 MW Deriaz turbine project for the performance improvement — H. Kikutaka, R. Suzuki, M. Nakai, and S. Nakamura, Voith Fuji Hydro K.K., Japan; D. Anziger, Voith Hydro Holding GmbH & Co KG, Germany

Session 7: Civil engineering – Design and construction II
Chair: Dr K. Laksiri, Ceylon Electricity Board, Sri Lanka
- Why BIM is the future of civil design and construction of hydropower plants: Examples and methodology from large Norwegian hydropower — D. Gundersen, B. Rixing Nesje and H.B. Smith, Multiconsult Norge AS, Norway
CONFERENCE SESSIONS

Session 8: Commercial implications of the changing role of hydro (Panel discussion)

Co-Chairs: C.R. Head, Consultant, UK; and M. McWilliams, McWilliams Energy, UK

As renewables become an increasingly important element in many power systems, the role of hydro is rapidly changing. The challenge is to reflect this versatility in the commercial arrangements that are needed to induce private investment in optimal developments. This Panel session will be based on the following three short presentations, followed by discussion.

- Monetising ancillary services for hydropower – M. McWilliams, McWilliams Energy, UK
- Hydro concessions: Maximizing the national benefit – B. Leyland, Consultant, New Zealand
- Financing for project sustainability – P.J. Roe, P.J. Roe Consulting, Canada

Session 9: Potential, plans and project implementation

Chair: H.J. Aker, Delsar Engineering, Turkey

- Yangol river hydropower development and innovations – Yuntuo Chen, Yangol River Hydropower Development Company Ltd., China
- The 1870s JW Ge III scheme: The unique Ethiopian way to develop a major hydropower project from identification to commissioning – Azbel Asnake, EEP, Ethiopia; V. Bainsy, J. Biquet and P. de Barron, Fautrelle Engineering SA, France; F. Ravetolle and S. Amadeo, EEC Electroconseils SpA, Italy
- Boloh hydropower project: Planning, challenges and preparation – Tran Chan Nguyen, C.T. Oang, Shi and Goh Chee Hui, Sarawak Energy Berhad, Malaysia
- ‘Twin dams’ could double the use of rivers for energy production – F. Lampériné, Hydrocoop, France

Session 10: Hydrology, climate and flood management

Chair: Prof. A.J. Schleiss, Hon President, ICOLD

- Sustainable hydropower development ‘part of the solution’ toward the UN Sustainability Development Goals: An Assessment of Climate Change Action Goal (SDG 13), Affordable and Clean Energy Goal (SDG 7) – M.L. Awan, B. Giles and M. Hasnain, Sarawak Energy Berhad, Malaysia
- Climate resilience for hydropower in glaciated catchments: Risks and opportunities – C. Plüss, E. Widmer and G. Miculka, Apg AG, Switzerland
- Water level forecasting in a hydropower controlled river catchment using Artificial Neural Network (ANN): A case study from South of Norway – G. Yakoub and J. Leal, Agerder University, Norway
- Nam Thuan 1 hydropower plant: Flood management during construction of 180 m high dam – A. Arnnson, and M. Golta, Pryor Energy Ltd, Thailand

Tuesday 16 October - Morning

Session 11: Valuing hydropower and pumped-storage services

Chair: A. Beckitt, Hydro Tasmania, Australia

Multipurpose hydropower and pumped-storage schemes are significant contributors to electricity system stability, yet their development often triggers a major regulatory process to be met. Furthermore, for both new and existing projects, their role in providing grid stability and flexibility is not generally valued appropriately, nor compensated adequately. This situation is compounded by two key issues affecting the hydropower sector: the substantial increase in grid penetration by variable renewable energy (VRE) sources and the moveable impacts of climate change. The work of IEA Hydros is considering the role of hydropower in supporting VREs, and providing flexible energy services to support electricity systems (hydro balancing), through: Valuing and compensating hydropower and pumped storage for providing grid stability and flexible energy services; and, valuing the role of hydropower in providing climate change adaptation services.

- Developing a valuation guidance for pumped storage hydropower – V. Koritarov, Argonne National Laboratory, USA
- Review of existing studies on valuing energy services in Japan – K. Ota, Kansai Electric Power Co., Inc., Japan
- Possibilities and challenges for balancing hydropower; Results of the CREDHER Hydrobalance project – M. Boltes, SINTEF Energy Research, Norway
- The value and capabilities of US hydropower – A. Samani, Pacific Northwest National Laboratory, USA

Session 12: Innovative technology

Chair: L. Derou, ISL, France

- High definition wide angle imaging of underwater civil structures in hydroelectric undertakings – W.F. Jardim, P. Rea and M.A. Jardim, Venturo Environmental Consulting Ambiental, Brazil
- Development of manufactured copper-based anti-fouling coatings on stainless steel for freshwater applications – J. Krasucki and K. Grabowski, CM-IK Mes Projekty Sp. z o.o., Poland; Z. Buzzo and E. Osiuchowska, Institute of Precision Mechanics, Poland
- A smart low-cost approach for remote surveillance of small hydro – F. Tartaro, M. Lupo and S. Iard, Hydro Energa S.C.L., Italy
- Hydro-optic TV technology provides non-chemically environmentally friendly approach to biofouling control in hydroelectric facilities – F. Reisberg and T. Abramovich, Atlantium Technologies, Israel
- According monitoring being in a safe and secure cloud approach – C. Steinmuller and A. Jung, Volta Hydro Holding GmbH & Co. KG, Germany; P. Eisen, and R. Muench, Volta Digital Solutions GmbH, Germany
- Direct on-line synchronous permanent magnet generator with a hybrid rotor for small hydroplants in Finland – A. Parvinen and Y. Alexandra, Asco Motors Ltd, Finland; K. Kaminu, The Switch (A Yaskawa Company), Finland; G. Fassona, Ecco di Zerano and C. Shi, Italy
- Information-Gap Decision Theory (IGDT): A new promising method for management of uncertainties in hydropower projects: Case Study – F. OBERST, Pöyry Energy Ltd, Switzerland; A. Schleiss, EPEL, Switzerland

Session 13: Civil works – Safety I

Chair: M. Rogers, President, ICOLD, and Stantec, USA

- Monitoring of the embankment dams at the Upper Alborz hydroplant in Sudan – Y. Scheid and E. Zillmer, Lohmeyer International GmbH, Germany; M. Mukhtar, Ministry of Energy and Damms, Sudan
- Implemented solutions to enhance the safety of the alluvial foundation of the Cresuma-Lever dam – L. Fernandes, C. Lima, M. Queral, EDP-Gestão da Produção de Energia, Portugal; L. Caldeira and L. Miranda, INTEL – National Laboratory for Civil Engineering, Portugal
- Intelligence from the underground: Improving dam safety and hydropower plant performance – R. Keresztes, Vandan Znafinit, Austria; S. Ylönen, FRA, Finland
- Analysis of turbine stresses arising in the concrete slab of CFRDs in seismic areas – E. Catalano, R. Sciscioni and R. Crapp, Lombardi Engineering Ltd, Switzerland; R. Basa, Lombardi Engineering Ltd, Chile
- The Nam Ngum 3 CFRD dam: An advanced numerical analysis to prevent upstream face damage – F. Andrian, M. Monacki, N. Ueleck and X. Ducas, Artelia Eau & Environment, France
- Getting prepared for the next decades: Strengthening of dam and dykes of Angat multipurpose scheme – S. Moll, Pöyry Energy Ltd, Thailand; S. Ehlers, Pöyry Switzerland Ltd, Switzerland
- Rehabilitation greasing at Mosul dam, Iraq – R. Granata and C. Ciappa, Trevi SpA, Italy

Session 14: Fish protection

Chair: Prof. B. Pelikan, Univ. of Nat. Resources and Applied Life Sciences, Austria

- Fisheries and hydropower: A collaborative approach to best practice design – P. Kibol, T. Cao and A. Fryer, Fichtek Ltd, UK
- LIFE4FISH - An ambitious programme targeting silver eel and salmon small protection at six successive hydropower plants along the river Messe (BE). First results and presentation of the programme 2018-2022 – D. Sonny and J. Beguin, Pratich Technology, Belgium; and R. Roy, Pratich Technology, France
- Downstream fish passage at hydropower plants by fish guidance structures – I. Albayrak, B. Cek, M. Jeste, H. Fuchs and R. M. Boes, Swiss Federal University of Technology (ETH) Zurich, Switzerland
- Fish-friendly Kaplan turbine technology applied in a European turbine refurbishment project – M. Lang, J. Micheloz, P. Romero-Gomez and S. Westenberger, Andrae Hydro GmbH, Austria
- Sauvetere Fish pass and small hydropower plant – A. Schaffner, H. Chapaux, N. Leignier and C. Molot, CNRS, France
**CONFERENCE SESSIONS**

**Session 15: Civil works – Safety II**

**Chair:** Dr R. Charlwood, Consultant, USA

- Special dam safety features at Uganda dams: Case studies of the 183 MW Isimba and 600 MW Karuma hydro plants – F. Wasike and R. Arhoo Ayebare, UEGC, Uganda
- Improving dam safety across Indonesia – T. Hartanto, Ministry of Public Works and Housing, Indonesia
- Towards a more detailed evaluation of the consequences of dam failure and a more realistic dam safety classification – G.H. Kipulesid and C. Almeastad, Multiconsult Norge AS, Norway; A.M.H. Knud, Stakkraft Energi AS, Norway
- Managing land/sluice risk during the construction of an 80 m-high hydropower dam in Albania – T. Blower and S. Davidson, Mott MacDonald Ltd, UK
- Extending the lifetime of Skagen hydro plant subjected to alkali-aggregate reaction by stabilizing the foundations of electromechanical parts – A. Reynaud, H. Thorsen and S. Johansen, Norconsult AS, Norway; J. Brevheim, Hydro Energi AS, Norway

**Session 16: Transboundary projects**

**Chair:** J-M. Devernay, Consultant, France

- Development opportunities and regional collaboration in emerging energy between Blutan, Bangladesh, India and Nepal – Dasho Chhowang Rinzin, Blutan
- An organization for hydropower exporting countries? Maybe not a bad idea – C.R. Head, Consultant, UK
- The Fimi multipurpose scheme: A cross-border project and a shared vision of water resources – C. Farqutte, J.M. Bouquet, and D. Aggou, Tractebel Engineering, France; A.S. Cande, Ministry of Energy and Hydraulics, Guinea; S. Kone, Autorité du Bassin du Niger (ABRN), Niger

(About presentations to be announced)

**Session 17: Hydro and the environment**

**Chair:** Prof M. Ausleger, University of Innsbruck, Austria

- Sustainable design in renewable energy projects through BIM – F. Fougner and C.K. Sandvik, Norconsult AS, Norway
- Improvement of EIA methods for large reservoirs by using network thinking analysis approach: A case study of Azad dam, Iran – M. Nikravan, M. Azizi, A. Kiani, M. Payyami, M. Sedegh, A. R. Zarattti, Amirkabir University of Technology, Iran; A. Amin, Y. Fesler, J. Martin, L. Müller, A. Sauvin, N. Schmid, and A. Schleiss, EPFL, Switzerland
- Multi-criteria analysis for the assessment of the environmental and social impacts of hydropower plants: Twenty years of history and some recent developments – G. Frosio and L.L. Papari, Studio Frosio S.C.L, Italy

**Tuesday 16 October - Afternoon**

**Sessions 18: Pumped storage**

**Chair:** B. Trouille, Mott MacDonald, USA

(a) Technical aspects

- Transient process field test and inversion calculation analysis of large pump turbine – Gashui Li, Shounyi Chen, Deluo Wang and Tianzh Zhou, PowerChina Huadong Engineering Corporation Ltd, China
- Numerical design of high pressure concrete lining and application to a pumped storage hydropower plant under construction – J.R. Lohrberg, P. Aigrain and J. Perronel, Arténo Eau & Environnement, France
- Advanced control and new testing facilities allowing transient sequences of hydropower plants – A. Rochas, P. Y. Lowes, J.M. Verzeroli and R. Guillaume, GE Renewable Energy, France
- Frides II: Europe largest and most powerful double fed induction machine: A step ahead in variable speed machines – T. Hildinger, Voith Hydraulics Ltda, Brazil; L. K{"a}ddig, A. Kunz and H. Henning, Voith Hydraulics Holding GmbH & Co KG, Germany; Eibebruch, Voith Fuji Hydro K.R. Japan
- Live test results of the joint operation of a 12.5 MW battery and a pumped hydro plant – R. Bucher and A. Schreider, Lahnemeyer International GmbH, Germany; and S. Lehmann, Ing. Deutschland GmbH, Germany

(b) The case for pumped storage

- The benefits of pumped storage hydro to China – Li Xinyi, YE Jianqun and Huang Ziping, Power China Huadong Engineering Corporation Limited, China; Zhang Yannan, Shi Leiming, Yao Chenchao and Yang Lifeng, PowerChina Huadong Engineering Corporation Ltd, China
- Pumped-storage benefits to the grid: Case study in South Africa – C.L.E. Van Dongen and R.S.J. Van Wyk, AECOM, South Africa; B. Bekker, Eskom, South Africa; J. Wright, CSIR, South Africa
- Enhancing power generation at 7 Forks hydro dams cascade through pumped-storage scheme – J.A. Szwab and T.M. Babakhsa, Kenya Electricity Generating Co Ltd, Kenya
- The value of pumped storage plants in the context of integrating the unified power system of Ukraine with the European Power System ENTSO-E, Ukraine – Y. Landois and T. Stasiuk, Ukryhydrosystem Pr-55, Ukraine
- Managing landslip risk during the construction of an 80 m-high hydropower dam in Albania – T. Blower and S. Davidson, Mott MacDonald Ltd, UK
- Extending the lifetime of Skagen hydro plant subjected to alkali-aggregate reaction by stabilizing the foundations of electromechanical parts – A. Reynaud, H. Thorsen and S. Johansen, Norconsult AS, Norway; J. Brevheim, Hydro Energi AS, Norway

**Session 19: Civil engineering – Materials**

**Co-Chairs:** Prof Xu Zeping, CHINCOLD/IWHR, China; and Dr M.R.H. Dunstan, MD&A, UK

- Prediction of concrete compressive strength using deep neural networks (DNN) machine learning algorithm – Yifeng Lin and C. Horel, Tractebel, France
- Trial mix methodology: One of the effects for changing the properties of RCC in Myanmar, Myanmar – Zaw Win Min, Ministry of Electricity and Energy, Myanmar
- Giant dam: Design of RCC concrete – A. Piriangghi, A. Gogia de Azvedo and G. Pittaluga, Studio Ing G. Pietrangeli Srl, Italy; A. Marzetti, Studio Marzetti, Italy
- Quality management drives global resurgence of asphalt core embankment dams (ACED) – J. Knoop and D. Moller, Walo International AG, Switzerland; S. Patricio, Walo Bertschinger Central AG, Switzerland
- Considering the durability of Polibahi dam’s rockfill: Past, present and future – M. Wainstein, Gibb, South Africa; C. Niente, Tractebel Engineering SA, France; T. Blower, Mott MacDonald, UK
- Dealing with separates as materials and foundations of embankment dams: Case study of the Bagre dam, Burkina Faso – A. Nambra, BUCOF, Burkina Faso
- Key technologies for dolomite aggregate dam construction in Lombok hyperpower station – Li Xinyi, Ye Jianqun and Huang Ziping, PowerChina, Huadong Engineering Corp Ltd, China
- Are GFRP the future of rockfills? – P. Perezoo, G. Lulli and M. Scarella, Carpi Tech, Switzerland

**Session 20: Multipurpose hydropower**

**Chair:** A. Palmieri, Water Resources Specialist, Italy

- Introductory talk from Poland’s Ministry of Maritime Economy and Inland Navigation
- Inland waterways combined with hydropower plants in Romania – Bogdan Pava, University Politehnica of Bucharest, Romania and Florian Pava, University Politehnica of Iasi, Romania
- Combining hydria with inland navigation: Experience of the Yolga river – E. Bellendine, Russian Federation
- The Włocławek barrage on the Lower Vistula – W. Majewski, Institute of Meteorology and Water Management, Poland
- Inland waterways in the Czech Republic – Ing. Lubomir Fojt, Czech Waterways Directorate
- Small hydra on inland navigations: An ideal partnership – M. Crosby and D. Griffof, KEBAL Consulting Engineers Ltd, UK
- The new Asati barrage and hydropower plant near completion, Egypt – E. Faleir and L. Börner, Lahnemeyer International, Germany; M. Abbas, RGBS, Egypt; M.A. Rade, HPVPEA, Egypt

**Session 21: Social aspects**

**Co-Chairs:** L. Nielsen, IEA, Australia; Dr S. Sparkes, Stathkraft, Norway

- Infrastructure development induced resettlement - Does it happen? Lessons learnt from the Karuma hydropower project – J. Asiwowo, Geotropics Consultants Ltd, Uganda; M. Olin, UEGC, Uganda
- Resettlement and community support programme for the Bui hydropower project – M.W. Sailfu and E. Owora, Bui Power Authority, Ghana
- The use of mobile devices and applications for data collection in large resettlement action plans: The case of Randadji dam in Niger – M. Tomczak, R. Brits and C. Meunier, Tractebel Engineering SA, France; A. Horrana, Randadji Dam Agency, Niger
- Innovative approaches to financing local development for communities affected by hydropower reservoirs: Guinea as a case study – J. Skinner, Global Water Initiative West Africa, UK; B. Trouille, Mott MacDonald, USA; J. Khuendo, IUCW Water Programme, Senegal; D. Lamsa Kourousou, CSMD, Guinea
- Development initiatives and CSR: How much is enough? – S. Sparkes, Stathkraft, Norway
- Programme management in developing countries: A holistic approach to capacity building and social upliftment – M.R. Mitchell, CDREC, Global Consulting Engineers Ltd, UK
- Social aspects of the 233 MW Jamuna III hydropower station in India – P. Kaul, National Hydropower Power Corporation (NHPC), India
- Developments in stakeholder communications in Côte d’Ivoire – D.G.M. Kouame and E.M. Koffi Kouadio, CF, Côte d’Ivoire; M.L. Kouakou, Ozone Initiatives Plus, Côte d’Ivoire
CONFERENCE SESSIONS

Session 22: Spillways

Chair: P.J. Mason, Statnet, UK

- Grand Ethiopian Renaissance Dam design of stepped spillway – G. Pietrangeli, A. Beazzi, G.M. Beltrami and S. Marfurt, Studio Ing. Pietrangeli Srl, Italy
- Consolidation of the Karmit dam sluice area – H. Obermoser and M. Friedrich, AF-Consult, Switzerland; F. Bandi, KESH, Albania

Session 23: Reservoir operation

Chair: Prof. B. Popa, University Politehnica of Bucharest, Romania

- Optimization of a multi-purpose multi-reservoir system in Sudan – Dr. J. Moedinger and Dr. B. Dibrani, Lahmeyer International, Germany
- Increase in performance of a hydropower plant cascade as exemplified by Bratsk and Ust-Ilimsk hydropower plants: Utilization of digital twins for accelerated realization and analysis of expected results – S. Formin and V. Leith, Rakurs Engineering LLC, Russian Federation
- Practice of flood control operation modes for the Three Gorges reservoir’s optimized operation under climate change – Li Shuai, Gao Yulei, Zhou Man and Wang Hai, China Three Gorges Corporation, China
- Study of rehabilitation plan of bottom outlet service and emergency gates for the de-sedimentation tunnel at the Shahid Abbaspour dam and powerplant – M. Ghaderi, Fanarav Novin Nitro Co, Iran

Session 24: E&S insights from Nam Theun 2, after 10 years of operation

Chair: D. Fields, The World Bank, Laos PDR

Ten years after impoundment, the Nam Then 2 project in Laos PDR continues to support local development and wider economic growth. As the World Bank’s first major investment in a hydro project following the World Commission on Dams report, the NTZ scheme has often been referenced as a template for successful environmental and social management. This special session will consist of presentations and a panel discussion by key project staff including D. Fields (The World Bank), Akhometh Vongpay (Ministry of Energy and Mines, Government of Laos), Frederic Hofmann (EDF / Nam Theun 2 Power Company), Pierre Guedant (Nam Theun 2 Power Company), and Stephen Sparkes (Stantec).

Particular emphasis will be on:
- The key obligations that have been met and the associated costs and management structures: employed to achieve these.
- The transition period, which includes closure of resettlement implementation and the ‘take off ramp’ for the Government.

Wednesday 17 October - Morning

Session 25: Powerplant safety and cyber security

Chair: O.A. Westberg, Consultant, Norway

- Hydraulic transient survey at Cleson-Dixence with real-time hydro-clone monitoring system – C. Nicotret, M. Dreyer, A. Bézin and E. Bolleter, Power Vision Engineering Sarl, Switzerland; S. Torrent, Hydro Exploitation SA, Switzerland; J.D. Deyter, ALPID SA, Switzerland
- Special features of condition management systems improving quality of hydro turbine generator alarm management – M. Sydney, Baker Hughes, a GE Company, USA, R. Nowicki, Consultant, Poland
- Hydro-powerhouse drainage and waterproofing systems – J.H. Giemme, Hydro-Consult Pty Ltd, Australia
- A review of Liao electric power technical standard designs. (LEPS) – Synesth Boutsatsakrat, Ministry of Energy and Mines, Laos PDR; PC. Piso, Entura Hydro Tasmania, India; C. Grant, Multiconsult UK Ltd

Session 26: Upgrading and refurbishment – Civil works

Chair: A. Zielenksi, Ontario Power Generation, Canada

- Underwater rehabilitation of Studeno buttress dam with an upstream geomembrane – A. Scoeva, G. Lilliu and F. Wagnier, Carpi Tech, Switzerland

Session 27: Small hydro

Co-Chairs: E. Malicka, TRAMEV, Poland; V. Denis, Mhylab, Switzerland

- The negative aspects of classifying the hydropower plants according to their installed capacity – A. Adamkowicz and M. Lewandowski, Polish Academy of Science, Poland; S. Lewandowski, Polish Hydropower Association, Poland; and S. Lewandowski, Polish Hydropower Association, Poland
- Nigerian rural areas and the quest for hydro-kinetic turbine water wheel as a renewable energy harvester – I.A. Masul and Y. Suna, Shibaura Institute of Technology, Japan
- Concept for gentle hydropower use at ecologically sensitive sites – B. Brinkmeier and M. Außerleger, Insbruck University, Austria

Session 28: Gateworks and penstocks

Co-Chairs: Paulo Erbistii, Consultant, Brazil; B. Leyland, Consultant, New Zealand

- Some preliminary remarks on the experimental results of the laboratory tests on high-head gates – P. Zanenich and F.M. Runa, ATB River Calzoni, Italy; U. Frainio, B. Malangin and G. Peschechaer, Polytechnic University of Bari, Italy; A. Pagano, CNR-IRSA, Italy
- Benefits of saturation diving for dam bottom outlet rehabilitation – J. Brunet-Mangquat and J. Bordingan, Hydrokraft, France
- Dams, situation and low-level outlets – B. Leyland, Consultant, New Zealand
- Penstock leak detection system – R. Wimmer and R. Boehmman, Rittmeyer Ltd, Switzerland
- Extending the lifetime of the penstock at a pumped-storage plant by surface mechanical treatment of the welded joint – B. Chlomzy and M. Akreutz, Tractebel Engineering SA, France; C. Hoert-Hannes, Graz University of Technology, Austria
- Fitness for service of penstocks made of T-1 high-strength steel – O. Chine, E. Papilloud and N. Rougi, Alpiq SA, Switzerland; A. Kronig, Grande Dixence SA, Switzerland

Session 29: Capacity building and training

Chair: A. Nembere, Consultant, Burkina Faso

- Transformation expected in the development of small hydro in sub Saharan Africa energy scenario: Role played by UNIDO and the Universities through capacity building – J. Penkott, University of Younou, Cameroon; R.P. Singh, UNIDO, Austria
- Hydro generator state assembly training to enhance operations and maintenance: Karuma hydropower plant – I.P. Sedirimba, J.C. Akiror, and O. Aryanyijuka, UEGCL, Uganda
- Engineers’ training on T&D in low-income countries: A case study in Africa – S. Galantino, I. Gabosi and R. Vignoli, Studio Ing. Pietrangeli Srl, Italy
- Technology training for hydropower plant in Africa – Feng Yinglong, Liu Changdong, J. Hui, Yan Yan, Yu Yanzhao and Song Peng, China Three Gorges Corporation, China
- Capacity building in Uganda in preparation for operation and maintenance, UEGCL, Uganda – R. Lutaya, J.C. Akiror, and O. Aryanyijuka, UEGCL, Uganda
- Toward the development of small hydro plants in Kenya: The impact of a training course at SERC – I.W. Maranga and S.O. Odero, Stratmore Energy Research Center (SERC), Kenya
- Operation Starship: A hydropower lesson where no one has gone before – R. Stuhrns, Tacoma Power, USA

Session 30: Upgrading hydro plants

Chair: W.D. Hakin, Manitoba Hydro International, Canada


- Asbestos in Hydropower rehabilitation projects: Stucky Ltd’s recent experience – D. Kelleher and P. Draz, Stucky Ltd, Norway
- Leakage detection at hydro plants – A. Hughes, Consultant, UK

- Asbestos in Hydropower rehabilitation projects: Stucky Ltd’s recent experience – D. Kelleher and P. Draz, Stucky Ltd, Norway
- Leakage detection at hydro plants – A. Hughes, Consultant, UK
Optimization of Francis turbine start-up procedure to extend runner lifetime – Z. Čepa, G. Alc and D. Dobbel, Litestrom Power, d.o.o., Slovenia

Renewing existing hydropower plant infrastructure for the next 70 years: Retrofit of the St. Anton powerplant with increased power output and flexibility – S. Höller and H. Jakob, Graz University of Technology, Austria; F. Pinamonti and P. Fraselli, Ensaewerk S.à.R.L., Italy; A. Dereng, Studio G Gmbh, Italy

Increase hydropower plant performance and flexibility; The Gabril hydropower plant renovation case – M.R. C. Perchuk and J.G.S. Correia, EDP Gestão de Produção de Energia, SA, Portugal

Renovation of hydraulic powerplant: How to select the best technical option? – C. Lundy and C. Nicolai, Power Vision Engineering Sàrl, Switzerland; J. Gomes, L. Andolfatto and F. Avellan, EPEI Laboratory for Hydraulic Machines, Switzerland; C. Todd, Group E S.A., Switzerland

A study on the timely modernization plan of aged hydropower plant – B.J. Jun, J.H. Yin, B-J. Kim, J.P. Gill and E.T. Jung, K-water, Republic of Korea


Secondary systems refurbishment and problems concerning the control system upgrade at the Faha hydropower plant – M. Rebernik and D. Talian, Drava River Power Co d.o.o., Slovenia

Session 31: Small hydro II
Co-Chairs: Prof. D. Williams and G. Black, Learning Hydro, UK

Kota 2 small hydro: A fit-for-purpose solution – M. Mehtni, Entura Hydro Tasmania, Australia and A.J.S. Sang, Sarawak Energy Berhad, Malaysia

Efficient evaluation and ranking of eight hydropower sites in Indonesia based on HPC and a multi-criteria analysis – T. Mohringer, T. Lutfihayu and P. Schaller, Eichner GmbH & Co. KG, Germany; D. Cahya and A. Dickhuyzen, PPL (Perusahaan Perseroan), Indonesia

Upgrading control systems of small hydropower plants in Poland: The challenges and the achievements – D. Daszkiewicz and J. Kasprzycki, Small Power Engineering, Poland

Hydraulik turbine farm on the Rhône river: Demonstrator for the ecology and energy transition – A. Kladal, N. Perez and E. Dubost, Compagnie Nationale du Rhône, France; J.F. Simon and T. Jaquier, HydroDreux, France

Predictive maintenance in small hydro through condition monitoring: Opportunity and complexity – S. Mezzoloni and L.L. Papetti, Studio Frosio S.r.l., Italy

Facing over-power and over-speed issues during the commissioning of hydropower plant – M. Baggio, R. Clementi, A. D Vittoria and F. Pascol, S.T.E. Energy SpA, Italy

Session 32: Sediment
Chair: Dr. C. Aud, ILE, Austria

Evolution of reservoir flushing and employing practices in a cascade of large reservoirs over several decades, EPPF, Switzerland – P.A. Manos, S.I. Vrabet, and G. De Cesare, EPEI EMAC IUC PL-LUCH, Switzerland; S. Guillén-Ludina Universidad Politécnica de Cartagena, Spain; J. Stamm, B. Schweger and A.U. Fankhauser, Kraftwerke Oberhasli AG, Switzerland

Sediment management in Northern India – S. Bhardwaj and V. Kumar, SIVIN Ltd, India

Reducing economic risks in hydropower developments through independent satellite based turbidity and sediment measurements in the river systems of Georgia – T. Heega, Enmap GmbH & Co KG, Germany; D. Kallehe, lucky Ltd, Switzerland

Dealing with sediments at hydropower schemes: designs of desanding facilities and bypass tunnels – R. M. Reis, D. E. Vetsch, M. Stoll, Hagemann and I. Abou Karim, Swiss Federal Institute of Technology (ETH) Zurich, Switzerland; C. Pischmann, Speckermann Consulting Engineers, Germany

Floating modular unit for controlled sediment flushing regarding sediment size and concentration – G. De Cesare, LCH, EPEI, Switzerland, B. Mangiardi, Open Mechanics Research Ltd, Italy; F. Binder, FMI Engineering. Ch GMBH, Switzerland

Energy requirements for reservoir management dredging – M.O. Winkelman, Damen Dredging Equipment, The Netherlands; A. Staat and O.P. Marco, Damen Shipyards Gorinchem, The Netherlands

Implementation of an automatic SedCon drudge into an existing forebay in Chile – I. Mora and A. Jiménez, SedCon SA, Costa Rica; J. Hernandez, Calbus SA, Chile

Wednesday 17 October - Afternoon

Session 33: The Most Renewable Energy programme
Chair: C. Almeida, Multiconsult, Norway

Multiconsult is highly committed to attracting students to the hydropower business and to showcase the life of a hydropower engineer. In addition to supporting and supervising Bachelor- and Master’s level theses, the initiative ‘Multiconsult for Students’ (Mast) aims to recruit talented and committed students to bring new knowledge to the company. Every summer, Multiconsult’s Department of Energy engages three to four students for the Most Renewable Energy International Hydropower summer programme. The 2018 project involves a revised pre-feasibility study of the Usuensi hydro scheme in Kenya. The clients are Malthe Winje AS and Empower New Energy. The Usuensi project is in Kysua sub-county of Kitui County, about 280 km northeast of Nairobi. The hydropower plant uses water from Tana river which has a catchment area of approximately 85 000 km². The Must project is divided into three phases, each lasting for two weeks:

- Desk study, including evaluation of available material and planning for field investigations
- Field survey at Kikuletwi river, Tanzania
- Evaluation of gathered data and completion of the report.

The four students (J.G. Garbitz, S.M. Steinkefjord, A.F. Otbye, and V.M. Bjerkelid) will report each area of this work during the session as well as reflect on the general experiences gained from their first overseas project.

Session 34: Identifying and developing the potential of hidden hydro (IEA session)
Chair: N. Nielsen, IEA-Hydro, Australia

In many countries a significant number of the hydro projects which are most economic have already been developed. However, there are opportunities for new hydropower by utilizing unenhanced flow and head at both new and existing project sites, as well as improving the performance of existing facilities. These can be categorized into: Upgrading and refining existing hydropower inventories to seek additional potential, Improving the performance of existing facilities; and, Adding power to non-powered dams, distribution infrastructure such as irrigation schemes and water supply facilities. The work of IEA Hydro is to understand the potential for hidden hydro not already addressed through traditional approaches to hydro development planning and identify improved development approaches through technology innovation, regulation policies and deployment measures.

- Needs for identification of the potential for hidden hydro not addressed through traditional approaches to hydropower development planning in Japan – T. Miyagawa, CRIEPI, Japan
- Resource assessment approaches for hidden hydro in the USA – P. O’Connor, Oak Ridge National Laboratory, USA
- Experience gained from adding power to a water supply scheme in Norway for the transfer of knowledge – T. Jensen, NVE, Norway
- Upgrading small hydro units with an improved design at an irrigation scheme in the USA – A. Eaton and J. Chaplin, Gilbert, Gilkes and Garden Ltd, UK
- Overview of hidden hydro in Japan – H. Murashige, JIEPC, Japan
- A Review of innovative hidden hydro projects in southern Australia – N. Nielsen, IEA Hydro, Australia

Discussion: Identifying and developing the potential of hidden hydro, led by N. Nielsen, IEA Hydro

Session 35: Operation and maintenance
Co-Chairs: H. Obermoser, AF-Consult, Switzerland; F. Coelho da Rocha e Silva, Senior Advisor for REN, Portugal

- Monitoring experience from a Norwegian-Swedish research project on industry 4.0 and digitalization applied to fault detection and maintenance of hydropower plants – J.M. Welle,Saltel Energy Research, Norway; M.H. Nielsen, Energy Norway, M. Advin, Energieskolen, Sweden
- Predictive maintenance and life cycle estimation for hydro power plants with real-time analytics – A. Willeckert and A. Arnes, Hymatek Controls, Norway; P. Kratz, Rainpower, Norway; L. Imsland, NTNU, Norway

Session 36: Electrical engineering
Co-Chairs: R. Bucher, Lahmeyer International, Germany; Prof. P.J. Simond, EPFL, Switzerland

- A test bench combining real-time comparison between reality and dynamic models of hydro generators and VSC hosting – R. Langvin and A. Bahlouli, OPAL-RT Technologies Inc., Canada
- Experimental identification of endwinding mechanical impedances based on continuous vibration measurements – O. Husein and O. Oreškovic, Veski Ltd, Croatia; D. Bojic□ and N. Vrkic, H E P Proizvodnja d.o.o, Croatia
- Challenges of meeting governor response requirements of hydro generating units within primary grid frequency control per Commission Regulation (EU) 2016/631 – D. Dolenc, M. Milojar and J. Golić, Unistray Power, d.o.o., Slovenia

Closing Session: HYDRO 2018
A three-day package of excursions is being organized for accompanying persons during the three days of the Conference. The provisional programme is as follows:

15 October: The Baltic region is home to the largest known deposit of amber, and it has been estimated that forests in the region have created more than 100,000 tons of the material. Gdansk has been the center of amber artistry for hundreds of years. Accompanying persons will visit a workshop to learn more about the origins of amber, the history of the trade, and to see an expert craftsman at work. There will then be a short journey by coach to the district of Oliwa, for an organ concert in the cathedral built in the mid-18th century. The famous organ comprises 7876 pipes made of oak, fir, pine and tin. The tour will continue to the nearby town of Sopot, on the Baltic coast, for lunch. Sopot, the ‘summer capital’ of Poland, is renowned for its art nouveau style houses, beaches, and pier. There will be time for a walk along the sea front after lunch, before the return to Gdansk.

16 October: The group will travel about 40 km from the city, to the picturesque Kashubian Forest area, to see its post-glacial landscape of thick forests and hundreds of lakes and hills. The area is famous for its unspoilt nature, excellent local food and handicrafts. There will be a short walk through a forest to the Wiezyca hill and viewing tower (the highest point on the North European Plain). A visit is then planned to an open air museum, with a chance to learn more about the region. The next stop, after lunch, will be a craft workshop, before the return trip to Gdansk.

17 October: The final excursion planned is to Malbork castle, the largest Gothic defence structure in Europe, constructed in the 13th century. It was originally built by Teutonic knights, a German Catholic religious order of crusaders. It has served as Polish royal residences and was classified as a World Heritage Site in 1997. There will be a tour of the castle, with a chance to see a courtyard full of life-size iron warriors, the chapel, and the corridor of cloisters, and to learn about the history and restoration work on the castle. The return to Gdansk will be in good time to relax before the Farewell Dinner in the evening.

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SOCIAL PROGRAMME

Sunday 14 October: Reception for Chairmen and Speakers
After meetings and briefings about arrangements for the conference, at AMBEREXPO, those chairing or co-chairing sessions, and speakers presenting accepted papers will be welcomed to a reception with a buffet supper at the Hilton Hotel, which overlooks the Marina in the old part of the city. Transport will be provided from AMBEREXPO. The Hilton is one of the main HYDRO 2018 where rooms have been blocked. Other hotels where rooms have been reserved are nearby.

Monday 15 October: Welcome Reception
The Welcome Reception on 15 October will take place in the European Solidarity Centre, a museum and library devoted to the history of Solidarnosc – the Polish trade union and civil resistance movement which marked a major turning point in Poland’s history in the late 1970s and early 1980s, and also deeply influenced other Eastern European nations. The movement led to former shipyard worker Lech Walesa becoming a national hero, and eventually President of Poland.
Drinks and a light supper will be served, and this informal evening will be an opportunity to catch up with friends and make new contacts in the hydro industry, as well as to learn about Poland’s industrial and political history.

Tuesday 16 October: Networking Party in the Exhibition
When the sessions have ended on the second day of the conference, all participants are invited to an informal party in the exhibition halls, with a chance to sample some famous Polish beer, as well as soft drinks and snacks. The halls will be opening for an extra two hours, to provide an opportunity for all delegates to get around to some of the stands they may have missed during coffee and lunch breaks.
Exhibitors are invited to prepare special demonstrations of equipment, or to welcome key groups of delegates to their stand for drinks and to view material of special interest.

Wednesday 17 October: Farewell Gala Dinner
The Polish Baltic Frédéric Chopin Philharmonic, on the bank of the Motawa river, is the largest music institution in the northern Poland. The Farewell Gala dinner, featuring some specialities of Northern Polish cuisine, will take place in the restaurant and foyers of the Concert Hall; it will be preceded by a short classical concert, and a drinks reception.
POST-CONFERENCE STUDY TOURS

Three options will be available for those wishing to visit some hydro and pumped-storage plants, and associated hydraulic works, in Poland. Detailed planning of the tours is still being finalized, so the itineraries below may be subject to minor change.

Tour A – One day
For delegates who are short of time but would like to see a major powerplant within a day, Tour A will be a local excursion to the 680 MW Zarnowiec pumped-storage plant. Completed in 1983 and upgraded between 2007 and 2011, it is the largest hydro installation in Poland, housing four 170 MW Francis pump-turbines. There will be a technical briefing at the powerplant, and then a tour, including a visit to the upper reservoir.

There will then be a short visit to the ‘Kashubian Eye’. Set in attractive gardens, this is an observation tower offering views over the surrounding countryside.

Lunch will be in a scenic area, with a chance to visit a country manor house, before the bus journey back to Gdansk.

Tour B – Three days
The first day of this tour will be the same as Tour A, with the groups joining to visit the Zarnowiec pumped-storage plant.

In the late afternoon, the group will continue to the charming seaside town of Sopot (about 20 minutes by road from the centre of Gdansk), to check in to the hotel on the coast where the group will stay for three nights.

On the second day, after breakfast, the tour will leave for a short bus journey to the first in a series of small hydro plants in the Radunia cascade development, operated by Energa and constructed between 1920 and 2005. It is planned to visit the Straszyn (2.45 MW), and Bialkowo (7.2 MW) schemes.

The Radunia river is a tributary of the Motlawa, which flows into the Gulf of Gdansk. A total head of 162 m is available along the 103 km-long river, and the nine small plants have a total capacity of 14 MW.

The third day will provide a chance to visit the Szonowo lock and small hydro plant as well as the Biala Gora small hydro plant. There will be some time for sightseeing in the Teutonic Order castle in the afternoon after taking lunch there.

Tour C – Three days
After breakfast, the group will depart at around 08:00 hrs for a bus journey of slightly more than two hours, to the 160 MW Wloclawek powerplant on the Vistula river, which is the largest classical hydro plant in Poland. There will be refreshments, a briefing, and a technical tour. The group will then proceed to Czestochowa for lunch, followed by a sightseeing tour of the Jasna Gora sanctuary.

In the afternoon the journey will continue to Bielsko Biala for dinner and an overnight stay.

The second day will start with a visit to the Porabka-Zar pumped-storage plant, operated by PGE. After a welcome with refreshments and a technical briefing, there will be a visit to the plant, including the upper and lower reservoirs.

The tour will then continue to the Swinna Poreba flood protection and hydro dam, on the Skawa river, operated by RZGW Krakow.

Lunch will be at a country inn before the onward journey. Dinner and the overnight stay will be at Niedzica. On the third day after breakfast, the group will drive a short distance to Niedzica dam and powerplant, for a briefing and guided technical tour.

After lunch, the tour will continue to Krakow, and there will be an afternoon tour of the charming old town, including a chance to see the picturesque market square, and the Wawel Royal castle.

The overnight stay will be in Krakow, where the tour will end after breakfast.
HYDRO 2018 EXHIBITION AND SPONSORSHIP

A major element of the HYDRO 2018 event will be the Technical Exhibition, running for three days alongside the conference (15 to 17 October). The spacious, purpose-built exhibition pavilions will be the main hub for business networking, between delegates and the industry representatives who will be exhibiting their supplies and services. Exhibitors typically comprise consultants, contractors, manufacturers, developers and professional associations. All lunch and refreshments will be served in the exhibition pavilions, with catering points arranged to ensure that delegates will move around the whole area regularly during the three days. Feedback from previous events indicates that delegates maximize the opportunities to circulate in the exhibition, and that valuable contacts are made, which are maintained after the event. The pavilion will remain open for a networking event after the conference sessions on Tuesday 16 October, to provide extra opportunities for business meetings in an informal atmosphere.

Stands are sold in units of 6 m² and 9 m², and multiple units can be combined to create larger displays. Standard or custom-built stands can be arranged. Sponsorship packages are available for various items associated with the event. This can be an excellent way of making your company stand out among competitors.

TECHNICAL EXHIBITION PLAN AND PRICING (Blue denotes reserved)

Single stand prices:

- **3 x 2 m (6 m²)** = €3125
- **3 x 3 m (9 m²)** = €4650

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**Auditorium: Opening plenary session**

**Catering area**

**Business lounge**

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**Registration**

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Industry co-sponsors:

- **VOITH**
- **Wärtsilä**
- **BLANSKO**
- **MAVEL**
- **WaterGenPower**
- **kinz**
- **MAPEI**
- **LITOSTRJPOWER**
- **GamesaElectric**
- **HYDAC**
- **FLOVEL**
- **ROCKFIN**
- **ENERGETYKA WODNA**

Media Partner:
EXHIBITION STANDS BOOKED

Stands reserved, as of September 2018:

- Adams Schweiz AG, Switzerland
- Alfa-Laval, Sweden
- Alfa-Laval, Sweden
- American Governor Company, USA
- Ambiex, Poland
- API SpA, Italy
- Aquaculture Engineering Sarl, Switzerland
- Arcan, UK
- Armaturen-Gruppe, Czech Republic
- Artelia, France
- ATT Rive Gauche, Switzerland
- Bauer Electric Company, Germany
- Billinger VAM Airbomatiktech, Austria
- Bolloré Logistics, France
- Bredaanz Delft A.S., Norway
- Bosch Rexroth, The Netherlands
- Boussier & Kier Vibro, Belgium
- Carpi Tech, Switzerland
- Centralin, Spain
- Cem Ghezzi & Motori, Hungary
- CIB Srl Carpanerio Industriale Bergamo, Italy
- CKD Blansko, Czech Republic
- Damen Shipyard, The Netherlands
- Delphi Technologies, USA
- Design Engineering and Construction Group, Ukraine
- DFME Sp. z o.o., Poland
- DSD Noell GmbH, Germany
- Dyshold, UK
- Elia, Belgium
- Energi Teknix, Norway
- Enacon, Norway
- EPFL-LMI, Switzerland
- Federal Solarpower GmbH, Germany
- Ferro Invest, Macedonia, FYR
- Fichtner GmbH & Co. KG, Germany
- Fisetek Ltd, UK
- Flame Spray, Italy
- Fleet Renewables, UK
- Ford, Mexico
- Fracero Meccanica SpA, Italy
- Frakne-Filter GmbH, Germany
- Gamma Electric, Spain
- Gdansk University of Technology, Poland
- GE Renewable Energy
- Geb, South Africa
- Gileks, UK
- Global Power Energy, Austria
- Hibernum, USA
- Hilroadgroup, Slovakia
- Hohehang Hydro Valve, China
- HPG France
- Hydroad, Hungary
- Hydrodrift, Italy
- Hydrogrid Group, Austria
- Hydrokrast Group, France
- Hydroplan, UK
- Hydropolas, France
- Hydropower & Dams (Aqua-Media International), UK

To receive further details of the exhibition and/or sponsorship opportunities, please contact:

Dr Lukas Port or Mrs Maria Loreda  •  Tel: +44 20 8773 7260  •  Email: sales@hydropower-dams.com
Alternatively we invite you to book exhibition space online via our website: www.hydropower-dams.com
BOOKING CONDITIONS

The Conference HYDRO 2018 - Progress through Partnerships, is being organized by The International Journal on Hydropower & Dams with ASK Event Management Ltd.

On-line Registration
You can register on-line via the Hydropower & Dams website at: www.hydropower-dams.com. This is a secure site. Registrations will be handled by ASK Event Management on behalf of Aqua-Media. You will receive an acknowledgement of registration on completion of this process; however, this is not a confirmation (until payment is received).

We encourage all delegates to register on-line, using the newly upgraded system which provides more information during the registration process.

In the unlikely event of any difficulties using this system, please contact ASK Event Management (see contact details below).

Picking up conference documents and badges
The registration desk will be open from 08.30 hrs on Sunday 14 October 2018, at the AMBEREXPO Conference Centre, and bags can be collected from 14.00 hrs. Pre-registration is generally required, by one of the methods mentioned above.

Payment
Payment for all services (fees, hotels, tours) must be made in Euros (€) and received in advance of the Conference. Payment is possible by the following methods:
• On-line by Visa or Mastercard
• Banker’s draft to ASK Event Management (see details on the registration form);
All fees paid by credit card will be charged in Euros (€).

Accommodation
The Conference organizers have negotiated rates at hotels in several price categories in Gdansk. Accommodation bookings are being handled by ASK Event Management. Please include your hotel booking at the time of registering (using the on-line booking system). Beware of scam accommodation bureaux who are operating this year, falsely claiming to represent HYDRO 2018. We recommend that you do not pass credit card details to them.

For further details of the programme, please contact: Mrs Margaret Bourke at: Hydropower & Dams, PO Box 285, Wallington, Surrey SM6 6AN, UK.
Tel: +44 (0)20 8773 7244 • Fax: +44 (0)20 8773 7255 • Email: hydro2018@hydropower-dams.com
Website: www.hydropower-dams.com

As soon as a registration is confirmed, a number of expenses are incurred by the organizers; therefore the following cancellation conditions apply:

<table>
<thead>
<tr>
<th>Date cancellation received</th>
<th>On or before 24 August 2018</th>
<th>From 25 August to 21 September 2018</th>
<th>On or after 22 September 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration for the Conference</td>
<td>10% of fee will be forfeited</td>
<td>50% of fee will be forfeited</td>
<td>No refund</td>
</tr>
<tr>
<td>Technical Excursions (Study Tours)</td>
<td>10% of fee will be forfeited</td>
<td>No refund unless place can be resold</td>
<td>No refund</td>
</tr>
<tr>
<td>Accommodation</td>
<td>10% of fee will be forfeited</td>
<td>No refund unless place can be resold</td>
<td>No refund</td>
</tr>
</tbody>
</table>

NB: Separate booking conditions apply to Exhibition Stands, and these will be sent directly to Exhibitors by our Sales & Marketing Department.

A reduced registration fee is available for current subscribers to Hydropower & Dams. See booking information form for details.

CONTACT DETAILS

For enquiries concerning registration and accommodation, contact:

ASK Event Management Ltd
Abigail Stevens or Keta Hunt, Co-Directors
hydro 2018@askeventmanagement.com
Tel: +44 (0)1725 519287
On-line registration via: www.hydropower-dams.com

For further details of the programme, please contact: Mrs Margaret Bourke at: Hydropower & Dams, PO Box 285, Wallington, Surrey SM6 6AN, UK.
Tel: +44 (0)20 8773 7244 • Fax: +44 (0)20 8773 7255 • Email: hydro2018@hydropower-dams.com
Website: www.hydropower-dams.com
The online HYDRO 2018 registration will open in early July, and bookings can be made via: www.hydrouers-dams.com
The system is simple to use, but in the event of any difficulties, please contact ASK Event Management.
Email: hydro2018@askeventmanagement.com ~ Tel: +44 (0)1725 519287
Prices for each delegate category and conference activity are given below.

**FULL DELEGATE FEE:** Includes attendance of the Conference and Exhibition; documentation; conference papers on a USB stick; morning and afternoon refreshments; lunches during the Conference; full social programme

€ 1080 (until 24 Aug)  € 1185 (from 25 Aug)

**REDUCED DELEGATE FEE:** For existing subscribers to Hydropower & Dams.

€ 1010 (until 24 Aug)  € 1115 (from 25 Aug)

**FEE INCLUDING NEW SUBSCRIPTION TO H&D:** (6 issues from No. 5, 2018 + Atlas + Maps)
(This represents a saving of about 35 per cent on the normal H&D subscription rate).

€ 1210 (until 24 Aug)  € 1315 (from 25 Aug)

**SPEAKER FEE:** Includes all facilities described above for Full Delegates, plus an additional reception on Sunday 14 October.
NB: This fee applies to one person per paper (main author or presenter).

€ 610

**FIRST EXHIBITOR FEE:** (One full participant fee is included with exhibition booking).

€ 0

**SECOND + THIRD EXHIBITOR FEE:** (Fee per person for up to two additional exhibitors).
(Includes all benefits available to full delegates).

€ 765

**SMALL HYDRO TRAINING SEMINAR:** (Full day on Sunday 14 October - Design a small plant in one day).

€ 50

**ACCOMPANYING PERSON FEE:** (For family members, partners or friends not colleagues attending the Conference or Exhibition).
The fee includes the excursions each day, with lunch, and the evening social events. The cost for registering as an accompanying person is € 385.

**HALF DAY EXCURSION:** The details of this are presented on a previous page. The cost for joining the tour including lunch, is € 80 per person.

**OPTIONAL DONATION TO THE AMI HYDROPOWER FOUNDATION:** As in past years, there will be opportunity when registering online to make a donation to the AMI Hydropower Foundation. This is a charitable foundation, set up by Aqua-Media and governed by a board of international trustees. It exists to facilitate the participation of delegates from the less developed countries at the annual Hydro Conferences.

**TECHNICAL TOURS:** Prices include all transportation, meals, guides, entrance fees during sightseeing trips, and accommodation.

- **Tour A** - 1 day: Zarnowiec pumped-storage scheme, lunch and Kashubian Eye visit  € 75 per person
- **Tour B** - 3 days: Zarnowiec, Radunia cascade (SHP), Vistula Marshland, Szonowo lock, Malbork Castle  € 745 per person, single room; € 625 per person sharing double room
- **Tour C** - 3 days: Wloclawek, Porzobka Zar (PS), Swinna Poreba flood protection, Niedzica dam, Krakow  € 795 per person, single room; € 705 per person sharing double room

**DIETARY REQUIREMENTS:** These may be specified on the online registration system (including, for example, vegetarian, vegan, kosher, halal, gluten free, etc).

**VISA REQUIREMENTS:** You will be able to apply for an invitation letter to support your visa application during the on-line registration process.

NB: Attendance of the Welcome Reception and Farewell Dinner are included within the registration fees for all participants. However, we request a nominal contribution of € 15 per event for those wishing to attend, to encourage a firm commitment to participate. This is important to enable us to assess numbers for catering, and avoid food wastage.
Q Hotel Grand Cru, 4* Superior
Location: Rycerska 11, 80-882 Gdansk
Distance to AMBEREXPO Congress Centre: Approx. 15 min drive.
Check in: from 14.00 hrs / Check out: by 12.00 hrs
The Q Hotel Grand Cru is a modern stylish hotel close to the historic waterfront of the city. The hotel offers 24-hour access to a fitness centre and spa. Free WiFi is available in all the rooms, as well as being equipped with a TV, safe, kettle and ensuite with shower. The hotel’s restaurant, Grand Cru, offers traditional and modern cuisine and is open seven days a week from 13.00 hrs to 22.00 hrs. A buffet breakfast offering a wide selection of hot and cold items is included.
Single occupancy: € 89.00
Double occupancy: € 103.00
www.qhotels.pl

Craft Beer Central Hotel, 4* Superior
Location: Podwalne Grodziakie 4, 80-895 Gdansk
Distance to AMBEREXPO Congress Centre: Approx. 15 min drive.
Check in: from 15.00 hrs / Check out: by 12.00 hrs
This boutique hotel is close to the Gdansk main railway station and a 10 minute walk from the Old Town. The hotel has a gym, and the rooms are newly refurbished and include a TV, kettle, ensuite bathroom and free WiFi. The hotel has a restaurant serving Polish cuisine, which is open seven days a week from 13.00 hrs to 22.00 hrs. The hotel’s bar-brewery is open until 23.00 hrs. An international buffet breakfast offering a wide selection of hot and cold items is included.
Single occupancy: € 86.00
Double occupancy: € 100.00
www.centralhotelgdansk.pl

Mercure, 4* Superior
Location: Jana Heweliusza 22, 80-890 Gdansk
Distance to AMBEREXPO Congress Centre: Approx. 15 min drive.
Check in: from 14.00 hrs / Check out: by 12.00 hrs
The Mercure business hotel is located in a commercial area of the city. The hotel has a fitness centre and spa, as well as basic computer and printing facilities. Rooms include a TV, kettle, ensuite bathroom and free WiFi. The hotel's restaurant, Winitone, serves international cuisine seven days a week from 12.00 hrs to 23.00 hrs. An international buffet breakfast is included with a wide selection of hot and cold items. Parking is available at the hotel, please contact ASK Event Management for further details and costs.
Single occupancy: € 83.00
Double occupancy: € 95.00
www.mercurehotels.com

Scandic Gdansk, 4*
Location: Podwale Grodziakie 9, 80-895 Gdansk
Distance to AMBEREXPO Congress Centre: Approx. 10 min drive.
Check in: from 15.00 hrs / Check out: by 12.00 hrs
This business hotel is located near the Gdansk main railway station. The rooms have been recently refurbished and are equipped with a TV, kettle, ensuite bathroom and free WiFi. The hotel's restaurant serves international cuisine seven days a week from 12.00 hrs to 23.00 hrs. The bar is open until 23.30 hrs. An international buffet breakfast with a wide selection of hot and cold items is included.
Single occupancy: € 75.00
Double occupancy: € 87.00
www.scandichotels.com

Ibis Stare Miasto, 3*
Location: Jana Heweliusza 24, 80-861 Gdansk
Distance to AMBEREXPO Congress Centre: Approx. 15 min drive.
Check in: from 14.00 hrs / Check out: by 12.00 hrs
This modern hotel is located near the commercial centre of Gdansk. The hotel’s rooms have been recently refurbished and include TV, en suite bathroom and free WiFi. The restaurant, Ibis Kitchen, offers international cuisine seven days a week from 17.00 hrs to 22.00 hrs. A buffet breakfast with a selection of hot and cold items is included. Guests are advised that step-free access is not available at this hotel.
Single occupancy: € 56
Double occupancy: € 66
www.ibishotels.com

Hotel Number One, 3* Superior
Location: ul. Jagiello 4, 80-749 Gdansk
Distance to AMBEREXPO Congress Centre: Approx. 12 min drive.
Check in: from 15.00 hrs / Check out: by 12.00 hrs
This new hotel is located on the south bank of the Motlawa river. The historic Old Town is 10 minutes walking distance. The rooms include a TV, kettle, ensuite shower and free WiFi. Guests have access to an indoor pool and wellness centre. The hotel’s restaurant serves European cuisine seven days a week from 12.00 hrs to 23.00 hrs. A buffet breakfast with a selection of hot and cold items is included.
Single occupancy: € 49
Double occupancy: € 59
www.ibishotels.com

ASK Event Management
Contacts: Abigail Stevens or Keia Hunt, Co-Directors Tel: +44 (0) 1725 519287
hydro2018@askeventmanagement.com
Unit 7, Town Farm Workshops, Sixpenny Handley, Salisbury SP5 5PA, UK