



STRATEGIES FOR FUTURE PROGRESS ~26-28 October 2020

MONDAY 26 October

Plenary Opening: Welcome and opening by A. Bartle, Aqua-Media International, including a review of hydropower worldwide
Opening addresses from ICOLD, IEA, African Development Bank, Asian Development Bank, World Bank

1. Potential and planning

Chair: A. Palmieri, International Advisor on Water Infrastructure (formerly World Bank), Italy

Keynote on new opportunities for hydro, and papers on planning tools, and on ranking identified projects.

4. New approaches to project finance

Chair: M. McWilliams, McWilliams Energy, UK

As the role of hydro changes, new approaches to finance are emerging. Consultants, researchers, and representatives of development banks will explore progress and challenges.

7. Hydro machinery: Operational issues

Chair: D. Paschini, EDF, France/Myanmar

Topics will include dealing with excessive vibrations, sediment erosion, ultrasonic flow measurement, and 3D laser measurement technology to improve performance.

10. Civil engineering: Materials

Chair: M. Conrad, AFRY, Switzerland

A keynote address on RCC dams worldwide will be followed by presentations on topics including RCC dam design, CFRDs and experience with the use of geomembranes.

Break and visit to the virtual exhibition

2. Challenges and opportunities

Chair: H.I. Aker, Dolsar Engineering, Turkey

Managing hydro during COVID; hydro outlook in Brazil, India and Venezuela, are among the topics. Emphasis will be on turning challenges into new opportunities.

5. Contractual aspects

Chair: P. Rae, P.J. Rae Consulting, Canada

Discussions will include aspects of EPC contracts in the emerging market, legal aspects, and some case studies where contractual and financing issues have been complex or challenging.

8. Hydro machinery: Case studies

Prof C. Munch-Aligné, HES-SO, Switzerland

Case studies will include talks on fatigue life assessment of runners, increasing flexibility of machinery, failure analysis and retrofitting a control room, with speakers from Brazil, Russia, Austria, Germany and the Czech Republic.

11. Challenging sites

Chair: Prof J. Reynolds, International Consultant, UK

Experience will be shared by speakers on tackling the challenges and constraints of construction sites, including cases of adverse geological or climatic conditions, proximity to existing infrastructure, and seismic areas.

Meetings, discussions and presentations in the exhibition

3. Cross-border collaboration

Chair: J-M. Devernay, Consultant, France

The session will address benefits and challenges of collaborating on hydro development on a regional scale. Among the topics will be long-distance transmission lines for regional schemes in the Nile basin; and collaborative research among the riparian countries of the Lancang/Mekong, in preparation for drought protection measures.

6. Dealing with financial risk

Chair: Dr J. Plummer Braeckman, University of Cambridge, UK

There will be a keynote address, followed by presentations and a discussion by a panel of experts on managing the risks of investment in hydropower.

9. Hydro machinery: Research

Chair: Prof F. Avellan, EPFL-LMH, Switzerland

Topics will include research on monitoring cavitation, optimizing machine performance, and modelling ultra-high-head pump turbines, and the use of CFD for stability analysis.

12. Civil engineering: Design and construction

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

The talks in this session focus on the design and construction of some major schemes, under implementation in Angola, Madagascar, Myanmar and various parts of Europe. The increasing use of new tools such as BIM will be discussed.

Short presentations by exhibitors
Viewing of virtual exhibition stands
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TUESDAY 27 October

13. HYPOSO - Hydropower solutions for developing and emerging countries

Co-chairs: Prof B. Pelikan, University of Natural Resources and Life Sciences, Austria; and Prof V. Minaya Maldonado, University of Quito, Ecuador

The objectives and scope of this EU-supported research programme will be presented and discussed. It is aimed at mapping the European hydro industry, and identifying small hydro potential in targeted developing countries.

17. The European XFLEX programme

Chair: Prof F. Avellan, EPFL-LMH, Switzerland

This major EU-funded initiative, led by EPFL of Switzerland, and with partners including EDF, EDP and Alpiq SA, as well as major hydraulic equipment manufacturers, aims to demonstrate how hydro plants can enhance power system flexibility. Speakers will present details of pilot schemes in France, Portugal and Switzerland.

21. Tunnels and underground works - 1

Chair: Dr G. Zenz, TU Graz, Austria

Some complex and challenging tunnels and underground works for hydro schemes will be described, including a very large surge tank in China and the tunnel system for Laúca in Angola. Safety issues and a method to monitor the construction of long tunnels will also feature.

Break and visit to the virtual exhibition

14. River and reservoir management

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

Speakers from Europe, Africa and Latin America will share experience on topics such as flood control, decision-making in reservoir management, and hydrometeorological probabilistic forecasting.

18. Operation and maintenance

Chair: M. Oliveira, EDP, Portugal

Timely and thorough O&M becomes increasingly important, as powerplants and infrastructure continue to age. Digital health assessment of hydro plants in Germany, e-monitoring in France, predictive maintenance in Norway, machine learning in Italy, and O&M best practice in India are among the topics to be presented in this session.

22. Tunnels and underground works - 2

Chair: L. Mouvet, Hydro Operation International, Switzerland

This second session on tunnelling will go further into the technical aspects of tunnelling techniques, including complex geology, and working in seismic areas. There will be talks from the USA and four European countries.

Meetings, discussions and presentations in the exhibition

15. Climate and hydrology

Chair: J. Damazio, CEPEL, Brazil

With input from organizations such as Hydro-Québec and CEPEL, this session will include talks on climate change resilience, quantifying GHG emissions from a large reservoir, and inflow modelling for Ruzizi III in changing climatic conditions.

19. Pumped-storage projects

Chair: B. Trouille, Mott MacDonald, USA

First filling of a major new pumped-storage plant in Switzerland, a complex design for a Norwegian plant, operating problems at a plant in Ukraine and mitigating hydropeaking are among the topics of the first session on pumped storage.

23. Civil engineering: Dam safety

Chair: M. Lino, ISL, France

Safety continues to be one of the most important topics for the dam engineering profession. This session will include lessons from incidents and failures, dam break analysis and the use of drones for monitoring and mapping.

Break and visit to the virtual exhibition

16. IEA Session on Hidden Hydro

Chair: Prof F. Avellan, EPFL-LMH, Switzerland

Opportunities can often be overlooked to add or increase hydro capacity at existing sites. This IEA Hydro session will reflect successful cases of the development of 'hidden hydro' as well as barriers which sometimes have to be overcome.

20. Pumped-storage technology

Chair: Dr R. Bucher, Tractebel, Germany

Speakers will focus on: the role of pumped storage to ensure economic and sustainable energy transition; the contribution of small pumped-storage plants to smart grids; and, multi-objective joint optimal scheduling of pumped-storage plants.

(Session 24 to be announced)

After some consideration, it was decided to defer the planned Panel Discussion on Risk until our 'live' conference next year. This is because the session would have constituted much discussion between experts in different time zones, as well as interaction with the audience. The session will be replaced in the coming days by another, focusing on safety

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WEDNESDAY 28 October

<p>25. Environment Chair: Prof M. Aufleger, University of Innsbruck, Austria</p> <p><i>One speaker will describe a decision support tool for the HYPOSO research programme, aimed at promoting the sustainable development of small hydro in developing countries. The assessment of environmental impacts will be another theme.</i></p>	<p>29. Hybrid renewable energy systems Chair: Dr K. Laksiri, CEB, Sri Lanka</p> <p><i>As countries around the world race to meet their targets for renewable energy production, the importance of taking advantage of hybrid systems increases. Hydro has a critical role to play alongside intermittent energy sources. This will be reflected in the session, with contributions from Portugal, Austria and Ukraine.</i></p>	<p>33. Hydro plant uprating and refurbishment - I Chair: H. Obermoser, AFRY, Switzerland</p> <p><i>Presentations will explore issues such as: outsourcing rehabilitation work; the extent to which upgrading is possible; and, the concurrent upgrading of multiple plants in a cascade development.</i></p>	<p>37. New technology and design approaches Chair: L. Deroo, ISL, France</p> <p><i>New technology, including digitization, will be the main focus of the session. Two talks will present cloud-based systems for dam monitoring and hydro plant control, respectively. Others explore aspects of digitization for hydro plant design and operation.</i></p>
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<p>26. Fish protection Chair: T. Coe, Fishtek, UK</p> <p><i>Studies on fish migration, structural measures to enable fish passage through hydro plants, and retrofitting of existing screens for fish protection are among the many topics to be covered in seven talks.</i></p>	<p>30. Small hydropower – 1 Co-Chairs: V. Denis, Mhyllab, Switzerland; and, P. Duflon, Andritz Hydro, France</p> <p><i>Design, performance and operational issues relating to a range of different mini and pico hydro turbines will be discussed, with input from South Africa, the UK and Switzerland.</i></p>	<p>34. Hydro plant uprating and refurbishment - 2 Chair: Prof L. Lia, NTNU, Norway</p> <p><i>The importance of keeping good documentation for use at the time of upgrading will be discussed, and case studies will describe upgrades at CNR's plants on the Rhône, Ukrhydroenergo's plants on the Dnieper, and some large hydro plants in Brazil.</i></p>	<p>38. Design, construction and rehabilitation of spillways Chair: P.J. Mason, Damsolve, UK</p> <p><i>Innovation in modelling for spillway design, construction of the Nam Theun spillway in Laos, and increasing spillway capacity during the refurbishment of a French dam are among the topics to be presented.</i></p>
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<p>27. Social aspects Chair: Dr S. Sparkes, Statkraft, Norway</p> <p><i>Talks in this session will stress the importance of long-term planning, to optimize socio-economic development opportunities around hydro developments, as well as the value of strategic partnerships. Delegates will also hear about lessons learnt from a large resettlement scheme in West Africa.</i></p>	<p>31. Small hydropower – 2 Co-Chairs: Prof D. Williams and G. Black, Learning Hydro, UK</p> <p><i>Norway's impressive achievement of implementing 900 small hydro plants in the past 20 years will be highlighted, and the session will also focus on a high head mini hydro plant in France, and the use of GIS in Nigeria to assess small hydro potential.</i></p>	<p>35. Enhancing powerplant safety Chair: Ø. Westberg, Consultant, Norway</p> <p><i>The increasing challenges of cyber-attacks are the theme of several presentations, and one focuses particularly on the risks of the hacking of spillway gate control systems. Devices for monitoring the safety of hydraulic structures will also be discussed.</i></p>	<p>39. Gates and penstocks Chair: B. Leyland, Consultant, New Zealand</p> <p><i>Mending gate rails, a gated weir design, penstock rehabilitation, risk assessments for waterways, and non-intrusive ultrasonic flow measurement for penstocks at large hydro plants will be among the topics discussed.</i></p>
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<p>28. IEA Session: The role and value of hydropower in mitigating risks in a changing climate Chair: A. Harby, SINTEF, Norway</p> <p><i>Speakers will present talks on examples of ways in which hydropower can serve to mitigate the effects of climate change, for example through controlling floods and droughts.</i></p>	<p>32. Designing a small hydro plant (tutorial) By Prof D. Williams and G. Black, Learning Hydro, UK</p> <p><i>A 90 minute tutorial will replace the very popular live workshop on 'Designing a small hydro project in a day', which normally takes place as a pre-Conference event, and involves interaction between working groups. This will provide a valuable insight into step-by-step design of a small plant.</i></p>	<p>36. Electrical engineering Chair: Prof C.U. Lundin, Uppsala University, Sweden</p> <p><i>Issues such as generator vibration analysis, a rapid response brushless excitation system and an innovative method for load angle determination in generators will be covered, and there will be case studies from Sri Lanka, China, and European countries.</i></p>	<p>40. Sedimentation management Chair: Prof A.J. Schleiss, Consultant, Switzerland</p> <p><i>Research on sediment management, monitoring systems, and a flushing system used for Andean and Alpine environments are among the topics to be discussed by eminent experts and research students.</i></p>
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Exhibitor 'networking' – informal talks etc

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