



## PROGRAMME

### Tuesday 14 March – Morning

#### 09.00 hrs Opening Plenary Session Siroua Room

##### Welcome and Introductory Messages

- 09.00: Welcome and Introduction to AFRICA 2017 – *A. Bartle, Aqua-Media International*  
09.10: Welcome from ICOLD – *Prof A. Schleiss, President, International Commission on Large Dams*

##### Opening Speakers

- 09.25: *H.E. Charafat Afailal, Minister Responsible for Water, Ministry of Energy Mines, Water and Environment, Morocco*  
09.40: *K. El Ghomari, Ministry of Water and Energy, Morocco*  
09.55: *A. Fassi Fihri, Director of ONEE, Morocco*  
10.10: *Dr L. Mofor, African Climate and Policy Centre, UNECA*
- 10.25: Opening of the Exhibition and Coffee in the Exhibition Halls
- 11.00: *M. De Vivo, Secretary-General, ICOLD*  
11.15: *N. Sans, The World Bank*  
11.30: *R.P. Singh, Renewable and Rural Energy Unit, UNIDO*  
11.45: *N. Nielsen, Joint Secretary, IEA Hydro*
- 12.00: Lunch

### Tuesday 14 March – Afternoon (3 Parallel Sessions)

#### Session 1 Water resources development in Morocco

Chairman: *A.F. Chraibi, Consultant, Morocco*

Siroua Room 14.00 hrs – 15.30 hrs

- 14.05: Integrated development masterplans of water resources, planning and water management tools and an instrument to identify water mobilization project by dams – *A. Ziyad, Ministère Délégué Chargé de l'Eau/DRPE, Morocco*  
14.20: Experience of ONEE with water intakes – *A. Ridati, ONEE-Branche Eau, Morocco*  
14.35: ONEE's Global Rural Electrification Programme (PERG) – *H. Lissigui, ONEE - Branche Electricité, Morocco*

- 14.50: Water transfer project in Morocco from northern zones to the south – *M. El Mentoumi, Novec, Morocco; K. El Ghomari and N. El Mohammadi, Ministry in Charge of Water, Morocco*
- 15.05: Development perspectives in Morocco's electricity sector – *T. Taki, ONEE - Branche Electricité, Morocco*
- 15.20: Discussion
- 15.30: Coffee

**Session 2**                      **Hydrology and climate issues**  
**Chairman:**                      ***Prof A. Schleiss, President, ICOLD and EPFL-LCH, Switzerland***

**Oliveraie Room**              **14.00 hrs – 15.30 hrs**

- 14.05: Water resources and floods: trends in the context of climate change – *Prof L. Berga, Hon. President, ICOLD, Spain*
- 14.22: A free and state-of-the-art probabilistic flow forecasting tool designed for Africa – *J.P. Matos and A.J. Schleiss, EPFL-LCH, Switzerland*
- 14.39: Operational inflow forecasting for the Kainji-Jebba hydropower scheme on the Niger river – *M. Fuchs, H. Kling and B. Wiplinger, Pöyry Hydropower, Austria; L. Audu, A. Amadi, B.J. Prince-Awoderu and J. Villegas Garcia, Mainstream Energy Solutions Ltd, Nigeria*
- 14.56: A look at new and existing hydropower projects on the Zambezi under climatic uncertainty – *J.P. Matos and Prof A.J. Schleiss, EPFL-LCH, Switzerland*
- 15.13: Discussion
- 15.30: Coffee

**Session 3**                      **Legal, contractual and financial issues**  
**Chairman:**                      ***L. Canale, World Bank***  
**Orangeriaie Room**              **14.00 hrs – 17.30 hrs**

- 14.05: Experiences and lessons learned in the implementation of multinational electricity generation projects on transboundary rivers: Case study of the Ruzizi III hydro project – *C. Kayetinkore, Energie des Grands Lacs, Burundi*
- 14.25: Critical success factors for a hydropower plant: Dam construction and erection contract – *B. Geisseler, Geisseler Law, Germany*
- 14.45: Turkish financing model: PPP experiences in Turkey and possible applications in Africa – *H.I. Aker, Dolsar Engineering Inc Co, Turkey*
- 15.05: Discussion
- 15.30: Coffee
- 16.00: Panel discussion: Approaches to financing projects in Africa. *Panellists will include representatives of Power China, Ethiopian Electric Power, Joule Africa, ICOLD and the World Bank.*
- 17.30: Close

**Session 4**                      **North Africa: Water resources management**  
**Chairman:**                      ***K. Tahri, ONEE - Branche Eau, Morocco***  
**Siroua Room**                      **16.00 hrs – 17.30 hrs**

- 16.05: Integrated planning for Morocco's drinking water supply – *A. Elissami, ONEE- Branche Eau, Morocco*

- 16.20: Design and management of reservoirs in semi-arid zones – *A. Nombre and M. Kabore, IFEC Consultancy, Burkina Faso; F. Millogo, Sonabel, Burkina Faso*
- 16.35: Dams and water resources management in Algeria in the context of climate change – *R. Afiri, S. Hadi Abderrahmene and S. Gabi, Maloud Mammeri University, Algeria*
- 16.50: Role of water storage in the watershed management of the Sanaga river – *A. Towa, E. Bell and S. Ndam, Electricity Development Corporation, Cameroon*
- 17.05: Seguelil dam: Challenges and solutions – *J-L. Cervetti and A. Si-Chaib, Tractebel Engie, France; M.L. Aliane, Cob El-Djazair, Algeria*
- 17.20: Discussion
- 17.30: Close

**Session 5**                      **Climate resilience**  
**Chairman:**                      ***P. Karki, The World Bank***  
**Oliveraie Room**                **16.00 hrs – 17.30 hrs**

- 16.05: Impact of climate change on hydropower in Cameroon – *A. Towa, Electricity Development Corporation, Cameroon; J. Grijsen, Consultant, USA*
- 16.20: Effects of climate change on domestic water use in Southern Africa: A case study with proposed adaptation and mitigation measures – *M. Fuamba and F. Houssa, Polytechnique Montréal, Canada; H. Jacobs and C. Makwiza, Stellenbosch University, South Africa*
- 16.35: Climate change impacts and resilience: challenges and opportunities for hydropower and water storage in Africa – *G. Prudent-Richard, Artelia Eau & Environnement, France*
- 16.50: Resilience guidelines for climate change and natural disasters: the World Bank approach – *B. Trouille, Mott MacDonald, USA*
- 17.05: Discussion
- 17.30: Close
- 20.00:**                      ***Welcome Reception and Buffet Supper – Palm Grove (adjacent to the Palmeraie complex); Co-sponsored by Andritz***

**Wednesday 15 March – Morning (3 Parallel Sessions)**

**Session 6**                      **Potential and developments in West Africa**  
**Chairman:**                      ***J-L. Cervetti, Tractebel Engie, France***  
**Oliveraie Room**                **09.00 hrs – 10.30 hrs**

- 09.05: Regional assessment of the hydropower potential of rivers in West Africa – *H. Kling, P. Stanzel and M. Fuchs, Pöyry Hydropower, Austria; H. Bauer, ECREEE, Cape Verde*
- 09.20: The role of the Kaléta hydro project in the development of Guinea's socio-economic environment – *J-L. Cervetti and B. Jacquemart, Tractebel Engie, France; M. Condé and M. N'fah Fofana, ACGPMP, Rep of Guinea; A. Camara, PAHS, Rep of Guinea*
- 09.35: Harnessing the hydropower potential of the Fouta Djallon: A catalyst for regional development – *J. Teyssieux and N. Tomczak, Tractebel Engie, France; C. N'fall Cissoko, National Energy Authority, Guinea*
- 09.50: Challenges and progress at the Bumbuna phase II project in Sierra Leone – *J. Mödinger, Lahmeyer International GmbH, Germany; R. Scott, Joule Africa, UK*
- 10.05: Design of the Samendeni dam and hydropower project – *A.C. Lahjomri and A. Laghzaoui, CID-Maroc, Morocco; A. Ouedraogo, PDIS, Burkina Faso; D. Mazel, Tractebel, France; D. Nikiéma, BERA, Burkina Faso*
- 10.20: Discussion
- 10.30: Coffee

**Session 7**                      **Civil engineering: Design and construction**  
**Chairman:**                      **Dr A. Hughes, Atkins Global, UK**  
**Siroua Room**                      **09.00 hrs – 10.30 hrs**

- 09.05:                      Oued Martil dam: Adaptations made to the project during construction and implementation challenges – *K. Tenouri, Novec Consulting Engineers, Morocco; M. Bahtat, Directorate General of Hydraulics (DGH), Morocco*
- 09.17:                      Adjustments to the design of the Moulay Bouchta dam, Morocco – *A.F. Chraibi, Consultant, Morocco; A. Zaki, Hydraulic Developments Directorate, Morocco*
- 09.29:                      The design and construction of Neckartal dam, Namibia – *E. Lillie and G. Steyn, Knight Piésold Consulting, South Africa*
- 09.41:                      Dam foundation grouting at Gibe III dam: A case study – *A. Cagiano, G. Pittalis, B. Tesfamariam and A. Pietrangeli, Studio Ing. G. Pietrangeli Srl, Italy*
- 09.53:                      Melah dam: Design changes during construction – *T. Vincent, Artelia Eau & Environnement, France*
- 10.05:                      Tunnelling solutions for hydropower projects – *P. Schmaeh and R. Sistermans, Herrenknecht AG, Germany*
- 10.17:                      Discussion
- 10.30:                      Coffee

**Session 8**                      **Machinery: Research and new developments**  
**Chairman:**                      **D. Paschini, EDF-GEH, France**  
**Orangeriaie Room**                      **09.00 hrs – 10.30 hrs**

- 09.05:                      The Inga 1 hydroelectric powerplant, Democratic Republic of Congo – *S. Francin, Voith Hydro GmbH & Co KG, Germany; F. Kuljevan, Voith Hydro Inc, USA*
- 09.17:                      Large Francis machine developments in Africa and recent large Francis experience – *J-M. Henry, E. Flores and J. Brémond, GE Renewable Energy, France; A. Buscarini, GE Renewable Energy, Switzerland*
- 09.29:                      Electro-mechanical equipment for the Kashimbila multipurpose dam, Nigeria, Africa – *M. Motz and H. Wolfhard, Andritz Hydro GmbH, Germany Inc*
- 09.41:                      A verification of draft tube modifications of a vertical axis Kaplan turbine using CFD – *J. Schiffer, H. Benigni and H. Jaberg, Graz University of Technology, Austria; G. Penninger, Verbund Hydro Power GmbH, Austria*
- 09.53:                      New approach in machine shaft centering: Potential and prospects for future development – *A. Kapović, A. Elez, and J. Študir, Končar, Croatia*
- 10.05:                      Fatigue assessment in hydro generator pole fixation – *D. Ludwig and H. Henning, Voith Hydro Holding GmbH, Germany; M. Hagemeyer, Voith Hydro Inc, Canada; T. Hildinger, Voith Hydro Ltda, Brazil*
- 10.17:                      Discussion
- 10.30:                      Coffee

**Session 9**                      **Planning**  
**Chairman:**                      **H.I. Aker, Dolsar Engineering, Turkey**  
**Oliveraie Room**                      **11.00 hrs – 12.30 hrs**

- 11.05:                      Planning tools and approaches used by Nile Basin Initiative – *R.G. Rubomboras, Nile Basin Initiative*
- 11.17:                      Methodology for automated hydropower potential estimations: Dam siting for hydropower and water storage – *T. Ivanov and V. Oleshko, JSC VNIIG, Russia*
- 11.29:                      The importance of hydropower plants in Nigeria's energy planning – *O.A. Fasipe and V.O. Eniola, Energy Commission of Nigeria; J.G. Aikhuele, Humboldt State University, USA; I.P. Fasipe, National Centre for Energy and Environment, Nigeria*

- 11.41: The Gibe III dam monitoring and instrumentation system – *G. Pietrangeli, A. Cagiano de Azevedo, G. Pittalis and C. Rossini, Studio Ing. G. Pietrangeli Srl, Italy*
- 11.53: Innovative application of the ‘Giraffe’ technique for dam foundation mapping – *M. Rinaldi, D. d’Alberti and S. Cutini, Studio Ing. G. Pietrangeli Srl, Italy*
- 12.05: Planning and design considerations for early impoundment of a concrete gravity dam – *S.B. Shinde, Gibb (Pty) Ltd, South Africa*
- 12.17: Discussion
- 12.30: Lunch

**Session 10**                      **Civil works: Materials**  
**Co-Chairmen:**                ***M. Lino, ISL, France; Dr Malcolm Dunstan, MD&A, UK***  
**Siroua Room**                    **11.00 hrs – 12.30 hrs**

- 11.05: Tamalout dam: the first large RCC dam in Morocco with a low cement content – *A. Zakaria and M.H. Zoubeidi, Novec, Morocco*
- 11.20: State of the art thermal analysis of Neckartal dam, Namibia – *R.P. Greyling and C. Zhang, Knight Piésold, South Africa*
- 11.35: The faced symmetrical hardfill dam: Feedback from 20 years of experience – *M. Lino, ISL Ingénierie, France; Dr Jia Jinsheng, China Institute of Water Resources and Hydropower Research, China*
- 11.50: Alkali-aggregate reaction at Nalubaale hydropower station, Uganda – *R. Brueckner, Mott MacDonald, UK; N. Ndugga and T. Meri, Mott MacDonald, Uganda; M. Mahsen, Eskom, Uganda*
- 12.05: Effective geomembrane systems for hydraulic structures in Africa – *A. Sciuero and G. Vaschetti, Carpi Tech, Switzerland*
- 12.20: Discussion
- 12.30: Lunch

**Session 11**                      **Hydro machinery: O&M and rehabilitation**  
**Chairman:**                        ***W. Hakin, Manitoba Hydro International, Canada***  
**Orangeriaie Room**                **11.00 hrs – 12.30 hrs**

- 11.05: Securing long-term O&M in the SSA hydropower sector: The development bank’s perspective – *L. Canale and N. Sans, World Bank*
- 11.17: Modernizing Africa’s hydropower fleet: Partnering solutions at Mount Coffee hydro, Liberia – *H. Kathirvel and O. Baechle, Voith Hydro Heidenheim GmbH & Co KG, Germany*
- 11.29: New challenges in Africa: Nseke case study – *J. Virone, M. Leroy, O. Cibert, T. Bellenger and S. Broizat-Broman, GE Renewable Energy, France; J.P. Ebalá, SNEL, Democratic Republic of Congo*
- 11.41: All from one source: The rehabilitation of the Kpong plant in Ghana and Nkula A in Malawi – *B. Mühlbachler, P. Angerer, V. Kienberger and A. Koenigsberger, Andritz Hydro GmbH, Austria*
- 11.53: Challenges and opportunities for the rehabilitation of hydropower plants in Africa – *S. Kaleb and J. Sudarevic, Končar Power Plant and Electric Traction Engineering Inc, Croatia; V. Poljancic, Končar Generators and Motors Inc, Croatia*
- 12.05: Addressing operation and maintenance challenges through service agreements – *H. Maeder, GE Renewable Energy, Switzerland; F. Czerwinski, GE Renewable Energy, France; D. Tessier, GE Renewable Energy, Canada*
- 12.17: Discussion
- 12.30: Lunch

## Wednesday 15 March – Afternoon (3 Parallel Sessions)

**Session 12**                      **Capacity building**  
**Chairman:**                      **A. Nombre, Hon President, ICOLD, Burkina Faso**  
**Oliveraie Room**                **14.00 hrs – 15.30hrs**

- 14.05:                      An introduction to the ICOLD Capacity Building Plan – *A. Nombre, Hon. President, ICOLD, Burkina Faso*
- 14.20:                      Case studies in technology and training to increase electrical and knowledge capacity in Africa – *C. Ferrari, Voith Hydro Inc, Canada; M. Henkes, Voith Hydro Holding GmbH & Co KG, Germany*
- 14.35:                      Strategic education and communications plans for environmental and social challenges to promote hydropower development for Africa – *R. Stearnes, Foundation for Water and Energy Education, USA*
- 14.50:                      Capacity for operators of water and energy facilities in Africa – *K. Lagtari, ONEE-Branche Eau, Morocco*
- 15.05:                      Engineers in the field of the hydroelectric powerplants: Which role should they have in the current context? – *L. Mivelaz and Ph. Jungo, Sarine Engineering SA, Switzerland*
- 15.20:                      Discussion
- 15.30:                      Coffee

**Session 13**                      **Workshop on dam safety guidelines and regulatory frameworks**  
**Led by:**                              ***Dr R. Charlwood, USA; L. Hattingh, South Africa, and M. Abebe, Ethiopia***  
**Siroua Room**                      **14.00 hrs – 17.30 hrs**

This will provide a preview of proposed Generic Dam Safety Guidelines being developed by ICOLD as a reference document for use by countries wishing to establish a comprehensive dam safety management framework. These Guidelines should be read in conjunction with ICOLD Bulletin ‘Development of a Dam Safety Regulatory Framework’, which will also be discussed.

### **Introductory session: Objectives and current practice**

- 14.05:                      Introduction and objectives – *R. Charlwood, USA and M. Abebe, Ethiopia*
- 14.15:                      Challenges and lessons learnt during the construction of the Karuma hydro plant, Uganda – *H.E. Mutikanga and A.M. Byaruyhuanga, UEGCL, Uganda; UK; M. Conrad, O. Voborny and J. Brommundt, AF-Consult, Switzerland*
- 14.25:                      Reconstruction of the Matala spillway: Dam safety issues – *A. Bouayad, SNC Lavalin, Canada*
- 14.35:                      Operational safety at US Army Corps of Engineers’ dams and hydropower facilities – *R.C. Patev, US Army Corps of Engineers, USA; A. Komey and G. Baecher, University of Maryland, USA*

### **Status of regulation**

- 14.45:                      Regulation of dam safety: An ICOLD overview of current practice worldwide – *J. Poláček, Vodni Dila, Czech Republic; M. Bartsch, Svenska Kraftnät, Sweden; M. Balissat, Consultant, Switzerland*
- 14.55:                      The history of dam safety implementation in South Africa – *L. Hattingh, Hattingh Anderson Associates, South Africa; C. Oosthuizen, Consultant, South Africa*
- 15.05:                      Progress towards a regulatory framework in the Eastern Nile sub-basin and consideration of transboundary dimensions – *M. Abebe, ENTRO, Ethiopia*
- 15.15:                      What does a dam safety management system need to involve? Roles and responsibilities: Government, regulator, owner consultants, industry, and so on – *R. Charlwood, USA*

- 15.25: Discussion  
 15.35: Coffee

**Dam safety management systems**

- 16.00: Key elements of a dam safety regulatory framework: Legislation and regulations, transboundary issues – *R. Charlwood Consultant, USA*  
 16.10: Dam safety guidelines: Required scope and role – *L. Hattingh, Consultant, South Africa*  
 16.20: Hazard classification systems – *L. Hattingh, Consultant, South Africa*  
 16.30: Potential failure modes analysis, Risk-informed decisions: Objectives and methods – *R. Charlwood, Consultant, USA*

**Implementation**

- 16.40: Regional and national dam safety units, capacity building and training – *M. Abebe, ENTRO, Ethiopia*  
 16.45: Owners' dam safety programmes: Scope and responsibilities – *R. Charlwood, Consultant, USA*  
 16.50: Surveillance, monitoring, instrumentation plans and reviews – *L. Hattingh, Consultant, South Africa*  
 16.55: Safety reviews: Owners, regulators, panels of experts, independent consultants – *L. Hattingh, Consultant, South Africa*  
 17.00: Operation and maintenance manuals – *R. Charlwood, Consultant, USA*  
 17.05: Emergency action plans – *R. Charlwood, Consultant, USA*  
 17.10: Discussion and feedback – *Moderated by R. Charlwood, USA, M. Abebe, Ethiopia and A. Nombre, Burkina Faso*
- 17.30: Close

**Session 14 Pumped storage: Potential and development**  
**Chairman: B. Trouille, Mott MacDonald, USA**  
**Orangeriaie Room 14.00 hrs – 17.30 hrs**

- 14.05: Pumped-storage plants working in synergy with other renewable energy systems – *A. Saphar, ONEE, Morocco*  
 14.20: Pumped-storage powerplants: How traditional and recent solutions integrate in large and small grids – *K. Krueger, L. Lorenzini, T. Foitzik and T. Aschenbrenner, Voith Hydro Holding GmbH & Co KG, Germany; A. Slocum, MIT, USA*  
 14.35: Evolution of the design of Abdelmoumen pumped-storage project from 2003 to 2013 – *B. Chanzy and C. Bousquet, Tractebel Engie, France*  
 14.50: Some questions about pumped storage: Why? How much? When? Where? How? – *F. Lempérière, Hydrocoop, France*  
 15.05: Monont'sa pumped-storage scheme: A potential and sustainable hydroelectric development to serve Africa – *C. Logan, Gibb (Pty) Ltd, South Africa*
- 15.20: Discussion  
 15.30: Coffee
- 16.00: Summary and feasibility study of the 300 MW Ifahsa pumped - storage project, Morocco – *P. Baztán Moreno, F.J. Baztan Moreno and G. Rodriguez, Gas Natural Fenosa Ingeniería, Spain*
- 16.15: Discussion on presented papers  
 16.30: Panel Discussion  
 17.30: Close

**Session 15**                      **Environmental and social aspects**  
**Co-Chairs:**                    **L. Nielsen, Joint Secretary, IEA Hydro;**  
   **S.D. Usher, Aqua~Media International Ltd, UK**  
**Oliveraie Room**                **16.00 hrs – 17.30 hrs**

- 16.05:                      Approaches to manage, mitigate and allocate GHG emissions from hydropower reservoirs – *N. Nielsen, IEA Hydro*
- 16.19:                      System-scale planning for hydropower development: A path to sustainability – *J. Opperman, C. Apse and A. Newsock, The Nature Conservancy, USA; M. McGrath, Sustainable Water Infrastructure in Africa, Gabon*
- 16.33:                      Lessons learned from the construction of four storage schemes in Cameroon: Environmental and social management and assessment of the socio-economic results – *S. Ndam, A.S. Towa and T. Nsangou, Electricity Development Corporation, Cameroon*
- 16.47:                      Key environmental aspects of the Lom Pangar hydroelectric project – *J.P. Grandjean, Oreade-Breche Est, France; M. Lino, ISL Ingénierie, France; G. Gwet, EDC, Cameroon*
- 17.01:                      Sustainability and financing of dams – *R.H. Hotchkiss, Brigham Young University, USA*
- 17.15:                      Discussion
- 17.30:                      Close

**17.30:**                              **Workshop on small dams**  
**Workshop leaders: A. Nombre, Burkina Faso;**  
**M. Ho Ta Khanh, France; A. Chraibi, Morocco**

**Objectives and content**

Small dams, according to ICOLD's definition, are numerous in many countries, and have been constructed for various purposes. They present many advantages, but also some drawbacks, with specific issues depending on the countries and the sites; some problems may relate to economic, environmental, safety or sustainability aspects. On the other hand, the conception and operation of small dams can be different compared with large dams. As these topics can sometimes be controversial, a discussion, during this workshop, between specialists from various developed and developing countries, sharing their experience and opinion, will be interesting. The workshop will focus on these topics and on possible innovations to lower costs and increase the safety of small dams. Interactive discussion between participants on other related topics will be welcomed.

**17.30 – 19.30: AFRICA 2017 Exhibition networking**

In accordance with usual tradition, the AFRICA 2017 exhibition halls will remain open after the sessions and workshops, to give participants an extra opportunity to visit exhibitors in a relaxed and informal atmosphere. Drinks and light refreshments will be available.

**Thursday 16 March – Morning (3 Parallel Sessions)**

**Session 16**                      **Potential and developments in Southern Africa**  
**Co-Chairmen:**                    **E. Baptista, Mozambican Commission on Dams,**  
   **Mozambique; F. Coelho da Rocha e Silva, Senior Advisor for**  
   **REN (Portugal), Mozambique**  
**Siroua Room**                    **09.00 hrs – 10.30 hrs**

- 09.05:                      Design, excavation and performance of the Laúca hydro plant power house cavern in Angola – *J.M.G. Duarte and P. de Carvalho Thá, Intertechne Consultores S.A, Brazil*



- 09.20: The Tsate hydropower plant: Starting signal to overcome the energy scarcity in Central Mozambique – *R. Siebel, Lahmeyer International GmbH, Germany; A. Rafael and N. Gulab, Electricidade de Moçambique, Mozambique*
- 09.35: Kariba dam: More than 50 years of safe operation and surveillance – *C. Noret and O. Clave, Tractebel, France; K. Gurukumba and C. Chibvura, Zambezi River Authority, Zimbabwe*
- 09.50: The planned Batoka Gorge scheme on the Zambezi river – *D.imba, Zesco Ltd, Zambia*
- 10.05: Discussion
- 10.30: Coffee

**Session 17**                      **Managing sedimentation**  
**Co-chairmen:**                **Dr G. Annandale, Consultant, USA; and S. Alam, Consultant, France**  
**Oliveraie Room**                **09.00 hrs – 12.00 hrs**

- 09.05: RESCON2: Rapid identification of optimal strategies to mitigate reservoir sedimentation and climate change impacts on water supply reliability – *G.W. Annandale, G.W. Annandale Inc, USA; N. Efthymiou and S. Palt, Fichtner, Germany; P. Karki, The World Bank*
- 09.20: Mitigation of reservoir sedimentation: A new life for the Timi N'Outine dam – *K. El Ghomari, Hydraulic Development Department, Morocco; F. Del Rey, Hydroplus, France*
- 09.35: Impact of siltation on the use of surface water resources in the Moulouya watershed and upstream storage method as a countermeasure: The case of Mohamed V dam – *M. Hasnaoui, Ministry of Energy and Mines, Morocco*
- 09.42: Upstream storage method and RUSLE model to assess and regionalize erosion and siltation for efficient watershed planning and management – *M. Hasnaoui, Ministry of Energy and Mines, Morocco; D. Ouzar, Hydro Systems Analysis Laboratory at EMI and National High School of Mines Rabat, Morocco; A. Bouziane, Hydro Systems Analysis Laboratory, University Mohamed V, Morocco; K.B. Moumouni, National Directorate of Meteorology, Niger*
- 09.50: Sedimentation in the Ruzizi 1 and 2 reservoirs: Means of response and forecasting – *A. De Bonviller, O. Barbet and X. Mayau, ISL Ingénierie, France*
- 10.05: Experimental study on siphon dredging system at Wonogiri multipurpose dam – *T. Sumi and S. Kantoush, Kyoto University, Japan; H. Itoh, T. Satoh and T. Sase, Damdre Corporation, Japan*
- 10.20: Questions on presented papers
- 10.30: Coffee
- 11.00: Panel discussion on sedimentation
- 12.00: Lunch

**Session 18**                      **Small hydro technology**  
**Chairman:**                      **Prof D. Williams, Learning Hydropower, UK**  
**Orangerai Room**                **09.00 hrs – 10.30 hrs**

- 09.05: Automation system for a small hydro plant connected to the isolated grid of Iboundji, Gabon – *I. Labiano Garcia, Ingeteam Power Technology SA, Spain*
- 09.17: Numerical and experimental development of a cross-flow-turbine – *C. Bodner, H. Benigni and H. Jaberg, Graz University of Technology, Austria*

- 09.29: Techno-economic feasibility analysis for energy production by variable speed Francis turbines in water distribution networks – *A. Santolin, Tamanini Hydro Srl, Italy; G. Pavesi, G. Cavazzini and G. Ardizzon, University of Padua, Italy; J.I. Pérez-Dfiaz, University of Madrid, Spain; M. Van Dijk, University of Pretoria, South Africa*
- 09.41: A small propeller turbine to supply drinking water to the small town of Kahemba, DRC – *N. Frosio and G. Frosio, Studio Frosio s.r.l, Italy; F. Pozzi, Techydro Srl, Italy*
- 09.53: An alternative concept for low and medium head powerplants – *G. Holzmann and C. Gentner, GE Renewable Energy, Switzerland; J. Bougherara, GE Renewable Energy, France*
- 10.05: smarT: An economic concept for mini hydropower plants – *M. Graml, Global Hydro Energy GmbH, Austria*
- 10.17: Discussion
- 10.30: Coffee

### **Session 19 Potential and development in East Africa**

**Chair:** *Azeb Asnake W., EEP, Ethiopia*

**Siroua Room 11.00 hrs – 12.30 hrs**

- 11.05: Rusumo Falls 80 MW hydropower project: Design optimizations – *T. Vincent and A. Mikroutsikos, Artelia Eau & Environnement, France*
- 11.20: Design of the Grand Ethiopian Renaissance RCC main dam – *A. Bezzi, D. D'Alberti, A. Masciotta, G. Pietrangeli and C. Rossini, Studio Ing. G. Pietrangeli Srl, Italy*
- 11.35: New hydropower in Northern Malawi: The updated Fufu hydropower project – *S. St-Pierre, G. Mathieu and C. Chancel, Artelia Eau & Environnement, France; B. Andral and F. Laigle, EDF, France; L. Mhango and J. Ali, Ministry of Natural Resources, Energy and Mining, Malawi*
- 11.50: Kamuzu Barrage Operation Model (KABOM) – *M. Sehatzadeh and J.A. Roti, Multiconsult ASA, Norway; N.R. Sælthun, Oslo University, Norway*
- 12.05: Refurbishment and repair of hydropower plants in Tanzania – *G. Pétursson, Landsvirkjun Power, Iceland*
- 12.20: Discussion
- 12.30: Lunch

### **Session 20 Small water and energy schemes for rural development**

**Chairman:** *Prof B. Pelikan, University of Natural Resources and Applied Life Sciences, Austria*

**Orangeriaie Room 11.00 hrs – 12.30 hrs**

- 11.05: The need for small and low dams in Africa and specific solutions – *A. Nombre, Burkina Faso National Committee on Large Dams; F. Lempérière, Hydrocoop, France*
- 11.17: Challenges for small hydro development in Sub-Saharan Africa – *J. Kenfack, SolarHydroWatt Sarl, Cameroon; N. Crettenand, BG Ingénieurs Conseils, Switzerland*
- 11.29: How to implement small scale hydropower installations for rural electrification in South Africa: Unique challenges – *G.J. Bonthuys, M. van Dijk, I. Loots and B.G. Scharfetter, University of Pretoria, South Africa; J.M. Bhagwan, Water Research Commission, South Africa*
- 11.41: Improvement of access to clean drinking water in rural areas: Development of management methods for sustainability – *M. Elkhdar, ONEE - Branche Eau, Morocco*
- 11.53: The economic case for small hydropower in Africa – *H. Preuss, Amore Hydro, South Africa*

- 12.05: The role of mini hydropower projects in Uganda's energy development –  
*R.K.B. Nyakabwa-Atwoki, Sustenersol Uganda Limited, Uganda*
- 12.17: Discussion
- 12.30: Lunch

### **Thursday 16 March – Afternoon (3 Parallel Sessions)**

**Session 21**                      **Potential and developments in Central Africa**  
**Chairman:**                      ***L. Mouvet, Hydro Operation International, Switzerland***  
**Orangerie Room**                **14.00 hrs – 15.30 hrs**

- 14.05: The hydroelectric potential and electric grids for inter-connection in Central Africa –  
*P. Mavoula, PEAC, Rep of Congo*
- 14.20: Potential and developments in the Great Lakes Region – *C. Kayitenkore, Energie des Grands Lacs, Burundi*
- 14.35: Lom Pangar dam in Cameroon: From design to commissioning – *T. Guillemot and M. Lino, ISL Ingénierie, France; C. Daux and B. Coq, Tractebel Engie, France; T. Nsangou and A. Emadak, EDC, Cameroon*
- 14.50: The Inga developments in DRC – *J.S. Gonzalez, AEE Power Holdings, Spain*
- 15.05: Development of hydropower potential in the Sanaga river catchment in Cameroon –  
*T. Nsangou, A.S. Towa and C.E. Bell, Electricity Development Corporation, Cameroon*
- 15.20: Discussion
- 15.30: Coffee

**Session 22**                      **Civil works: Safety monitoring and rehabilitation**  
**Chairman:**                      ***Dr H. Kreuzer, Consultant, Switzerland***  
**Siroua Room**                    **14.00 hrs – 15.30 hrs**

- 14.05: Drilling of a 150 m-long new pendulum line to improve dam safety at the Kariba dam – *K. Gurukumba and C. Chibvura, Zambezi River Authority, Zimbabwe; D. Fioret and F. Clauss, Sondages, Auscultation & Maintenance, France*
- 14.15: Multiple seismic hazards at the Kesem rockfill dam, located in the main Ethiopian rift system – *A. Aman and T. Mammo, Addis Ababa University, Ethiopia; M. Wieland, ICOLD Committee on Seismic Aspects of Dam Design and Pöyry, Switzerland*
- 14.25: Rehabilitation of Belfort dam: Walking the tightrope of challenges – *C. Oosthuizen, DS3 Consultants (Pty) Ltd, South Africa*
- 14.35: The impact of freeboard on embankment dams – *N. Nigatu Tessema and A. Kemal Jabir, Addis Ababa Institute of Technology, Ethiopia; L. Lia and F.G. Sigtryggsdottir, NTNU, Norway*
- 14.45: Importance of diligent inspections in the effective surveillance of dams –  
*L.C. Hattingh, Hattingh Anderson Associates, South Africa; C. Oosthuizen, DS3 Consultants (Pty) Ltd, South Africa*
- 14.55: Influence of compaction on the safety of earth dams in Burkina Faso – *E. Somda, A. Nombre and M. Kabore, IFEC Consulting Firm, Burkina Faso*
- 15.05: Some problems in installing and monitoring embankment dam instrumentation –  
*A.R. Majidi, Mahab Ghodss Consulting Engineering Company, Iran*
- 15.15: Discussion
- 15.30: Coffee

**Session 23**                      **Gates and flood discharge works**  
**Chairman:**                      **Dr P. Mason, MWH, UK**  
**Oliveraie Room**                **14.00 hrs – 15.30 hrs**

- 14.05:                      The risk of gated spillways in a developing country: The South Africa experience –  
*L.C. Hattingh, Hattingh Anderson Associates CC, South Africa; C. Oosthuizen,*  
*DS3 Consultants (Pty) Ltd, South Africa*
- 14.20:                      Short discussion
- 14.25:                      Modern radial gate design in new dams and refurbishment projects – *H. Føsker,*  
*Norconsult AS, Norway*
- 14.40:                      Design and hydraulic model of the Gibe III dam mid-level outlets – *A. Cagiano,*  
*F. Pianigiani and A. Pietrangeli, Studio Ing. G. Pietrangeli Srl, Italy*
- 15.55:                      Assessment of the curvature and slope for the VC-Ogee relationship allowing for 3D  
flow – *G.L. Coetzee, Knight Piésold Consulting Engineers, South Africa;*  
*F. van Vuuren, University of Pretoria, South Africa*
- 15.10:                      The discharge of free-flow spillways could be increased fivefold by combining  
innovative spillways – *A. Ouamane, University of Biskra, Algeria; F. Lempérière*  
*and J-P. Vigny, Hydrocoop, France*
- 15.25:                      Discussion
- 15.30:                      Coffee

**Closing Plenary Session**  
**Session summaries and key outcomes**

**Siroua Room**                      **16.00 hrs – 17.00 hrs**

Conclusions and recommendations based on Chairmen's reports  
Welcome to HYDRO 2017, Seville and ICOLD 2017, Prague  
Close of the AFRICA 2017 sessions

**20.00 hrs Farewell Gala Dinner at the Beldi Country Club,**  
**hosted by the Moroccan National Committee on Large Dams**  
**(Coaches depart at 19.30 hrs)**