

HYDRO 2007 OVERVIEW

Sunday 14 October	Monday 15 October	Tuesday 16 October	Wednesday 17 October	Thursday 18 October
<p>From 11.00 hrs: Registration</p> <p>From midday: Exhibition set-up</p> <p>14.00 hrs: Alhambra Palace Tour (Registration continues)</p> <p>19.00 hrs: Chairmen's Meeting</p> <p>19.45 hrs: Speakers' Reception</p>	<p>08.30 hrs: Plenary Opening Session Musical Performance Opening, and Plenary Session (1) Activities, needs challenges and plans</p> <p>LUNCH</p> <p>4 Parallel Sessions: (2) Hydraulic Machinery - R&D (3) Project Finance (4) Upgrading (5) Dam Safety and Monitoring</p> <p>Welcome Reception hosted by Hydropower & Dams and NetWork Events</p>	<p>4 Parallel Sessions: (6) Machinery: Design and Operation (7) Hydro and Society: Planning (8) International Small Hydro (9) Challenges for Civil Works</p> <p>LUNCH</p> <p>4 Parallel Sessions: (10) Pumped Storage (11) Finance Clinic (12) Small Hydro in Europe (13) Managing Sediment</p> <p>Roundtable on Climate Change</p> <p>BHA Seminar</p> <p>Evening free for private parties</p>	<p>4 Parallel sessions: (14) Maintaining Assets (O&M) (15) Environmental Protection (16) New Opportunities for Hydro (17) Turbine Flow Measurement</p> <p>LUNCH</p> <p>4 Parallel Sessions: (18) System Management (19) Electrical Engineering (20) Contractual Issues (21) Penstocks</p> <p>Closing Plenary Debate</p> <p>Conference Dinner hosted by ENDESA and Iberdrola</p>	<p>Study Tours depart*</p> <p>IEA Executive Committee**</p> <p>ICOLD Workshop on Concrete Expansion in Dams**</p> <p>*Tours A and B one day; Tour C ends 20 October</p> <p>** Both end at midday on 19 October</p>
<p>The Conference, Exhibition, Chairmen's Meeting, IEA Meeting and ICOLD Workshop will all take place in the Granada Congress Centre. The Welcome Reception will be held in the Carmen de los Martires in Granada. The venue of the Conference Dinner will be announced later.</p>				

CONFERENCE SESSIONS

MONDAY 15 OCTOBER: Morning

08.30 HYDRO 2007 Opening

- Performance by the Music School of Granada
- Welcome to HYDRO 2007 and presentation of main themes – *Alison Bartle, Aqua-Media International, UK*
- Opening of the Conference – *J. Palop, Director General of Water, Ministerio de Medio Ambiente, Spain*

Plenary Session 1: Activities, Needs, Challenges and Plans

Co-Chairs: *Prof L. Berga, President, International Commission on Large Dams; C.V.J. Varma, President, Council of Power Utilities, India*

Keynote Addresses

- Developing dams in harmony with the environment – *J. Yague, Ministerio de Medio Ambiente, Spain*
- The role of hydropower and pumped-storage in Spain – *A. Meseguer, ENDESA, Spain*
- Dams and Hydropower – *Prof Luis Berga, President, International Commission on Large Dams, Spain*
- Clean Energy Investment Framework: A Global Strategy – *G. Stuggins, Energy Advisor, The World Bank*
- Capacity building: a critical issue for the African region – *Adama Nambre, Vice President, ICOLD, Burkina Faso*

Country Reports

- China's hydro development programme and update on the Three Gorges scheme in China – *China Three Gorges Corporation, China*
- Vietnam's programme to exploit hydro potential – *Lam Du Son, Electricity of Vietnam*
- India's plans for hydropower development – *S.K. Garg, NHPC, India (to be confirmed)*
- The Rio Madeira scheme: a model for hydro development in Brazil – *E. Nunes da Cunha, J.D. Cadman and E. de Freitas Madeira, Ministry of Mines and Energy, Brazil; S. Alam, Consultant, France*
- Potential for hydropower in Guinea: a better opportunity for sustainable energy development for the country and western Africa – *K. Guilavogui, Ministère de l'Hydraulique et de l'Energie, Rep. of Guinea*
- Hydropower in East Africa: the challenges of droughts and floods – *L. Tesha, Tanesco Ltd, Tanzania*
- Considerations on electrification of Africa, with emphasis on the APP region and the hydro potential in Lesotho – *P. Johannesson, Palmi Associates, USA and S. Tohlang, Lesotho Highland Commission, Lesotho*
- The power situation in Nigeria: Progress, problems and prospects floods – *I. Ekpo, Federal Ministry of Water Resources, Nigeria*

MONDAY 15 OCTOBER: Afternoon

Session 2 – Hydraulic Machinery: Modelling and Research

Chairman: *Prof R. Schilling, Technical University of Munich, Germany*

- Best practices in model turbine testing – *P. Leroy, P. Pepin and M. Couston, Alstom Power Hydro, France*
- Numerical prediction of flow induced dynamic load in water turbines: recent developments and results – *M. Sick, S. Lais, P. Stein and T. Weiss, VA TECH Hydro Switzerland*
- Francis runner dynamic stress calculations – *A. Coutou and C. Monette, GE Energy, Canada; O. Velagandula, GE Global Research Centre, USA;*

- Transient numerical simulation of a horizontal shaft tubular bulb turbine – *H. Benigni and H. Jaberg, Technical University of Graz, Austria; J. Lampl and E. Franz, Kössler GmbH, Austria*
- Measurement and simulation of the 3D free surface flow in a model Pelton turbine – *S. Riemann, W. Knapp and R. Schilling, Technical University of Munich, Germany; R. Mack and W. Rohne, Voith Siemens Hydro Power Generation, Germany*
- Unsteady CFD prediction of von Karman vortex shedding in hydraulic turbine stay vanes – *B. Nennemann and Thi C. Vu, GE Energy Hydro, Canada; P. Ausoni, M. Farhat and F. Avellan, EPFL, Switzerland*
- Lagrangian particle tracking: a powerful tool in designing silt erosion resistant hydro turbine profiles – *V. K. Pande, Bharat Heavy Electrical Ltd, India*
- New approach for simulating transient conditions for hydropower plants – *A. Riasi, Farab Co, Iran; A. Nourbakhsh and M. Raisi, University of Tehran, Iran*

Session 3: Project Finance: New Approaches Bearing Fruit?

Chairman: *J-M. Devernay EDF Hydropower Engineering Centre, France*

- Hydropower financing: too many failures, time to go back to first principles? – *C.R. Head, Chris Head Associates, UK*
- World Bank hydro project financing – *J. Plummer, South Asia Energy and Infrastructure Unit, The World Bank*
- EIB financing of hydropower projects – *J. Alario, European Investment Bank, Luxembourg*
- Public/private partnerships in hydro development: allocating risk – *P. Perera, Asian Development Bank, The Philippines*
- The Clean Development Mechanism: an opportunity to attract private funds for hydro projects – *X. Kitzinger, EcoSecurities, UK*
- IDB's sustainable energy and climate change initiative – *Inter-American Development Bank (speaker to be confirmed)*

Session 4: Maximizing Potential by Upgrading

Co-Chairmen: *José Freitas, EDP, Portugal;*

F. Coelho da Rocha e Silva, Hidroelectrica Cahora Bassa, Mozambique

- Feedback on refurbishment of the Stadsforsen and Grundfors turbines, Sweden – *J. Bremond, A. Dumoulin and P. Eberle, Alstom Power Hydro, France*
- Lessons to be learnt from the Drin river cascade rehabilitation project in Albania – *J. Gummer, Hydro-Consult Pty Ltd, Australia; H. Obermoser, Colenco Power Engineering Ltd Switzerland*
- Refurbishment and upgrading of the Chancy-Pougny hydropower plant – *L. Thareau and B. Brusa-Pasqué, Compagnie Nationale du Rhône, France*
- New technical solution for the refurbishment of hydropower plants – *K. Chiba, JPower, Japan*
- Consideration to refurbish five large hydro units in an operating powerhouse based on Guri experience – *D. Flores, CVG EDELCA, Venezuela*
- Rehabilitation and completion works at Bumbuna Falls HEP: a case of interrupted and continued implementation activities – *B. Petry, UNESCO-IHE, The Netherlands and A. Bezzi, Studio Pietrangeli, Italy*
- Adding a 60 MW pump to an existing 240 MW hydropower station – *B. Leyland, Consultant, New Zealand*
- Rehabilitation of the Dokan and Derbendikha hydro plants and dams – *H.A. Hawramany, Ministry of Electricity, Iraq*

CONFERENCE SESSIONS

- Upgrading multipurpose hydroelectric schemes: Enhancing the assets of Tavropos HEP – *J. Thanopoulos, PPC, Greece*
- Refurbishment of Foyers: maximizing hydro potential and development opportunities – *J. Debor and W. Hörger Voith Siemens Hydro Kraftwerkstechnik GmbH & Co. KG, Germany; with Scottish and Southern Energy plc*

Session 5: Dam Safety - Innovative approaches to Monitoring and Refurbishment

Chairman: *Dr Harald Kreuzer, Colenco Power Engineering, Switzerland*

- Deformation monitoring of earth dams using laser scanners and digital imagery – *A. Berberan and J. Marcelino, National Laboratory for Civil Engineering, Portugal; P. Hilário and J. Boavida, LandCOBA, Portugal*
- Methodology for assessment and refurbishment of buttress dams – *F. Lopez and J. Bosler, GHD Pty Ltd, Australia*
- Paradela dam: hydraulic-operational safety assessment and the design of appropriate measures – *M. Sousa Oliveira and J. Sarmiento Gonçalves, EDP Produção – EDP Group, Portugal*
- Rehabilitation of St Marc dam: model studies for the spillways – *M. Leite Ribeiro, J-L. Boillart and S. Kantoush, EPFL, Switzerland; C. Albalat, F. Laugier and A. Lochu, EDF-CIH, France*
- Structural data remote acquisition system for dam safety – *D. Cruz, EDP, Portugal*
- Safety improvement of Kayrakkum dam and hydro plant, Tadjikistan – *A. F. Gurdil, Temelsu International Engineering Services Inc, Turkey*
- Analysis of parameters as a basis for the safe impounding of the Enguri hydro reservoir – *M. Kalabegishvili, Georgian Technical University, Georgia*
- Repairing concrete structures at 95 m water depth using a floating bulkhead at Simón Bolívar (Guri) dam – *J. C. Conde Villasana CVG EDELCA, Venezuela*
- Grouting as a dam safety measure at the Ile-Ife dam project, Nigeria – *E. Ekpo, Federal Ministry of Water Resources, Nigeria*
- Four projects using manually released stoplogs: simple and reliable equipment – *S. Maunier, Hydro-Québec, Canada*

Evening: HYDRO 2007 Welcome reception

TUESDAY 16 OCTOBER: Morning

Session 6: Hydraulic Machinery: Design, Manufacture and Operation

Chairman: *John Gummer, Hydro-Consult Pty Ltd, Australia*

- Design optimization of a Francis runner – *E. Flores, D. Bazin, L. Ferrando and F. Mazzouji, Alstom Power Hydro, France*
- Francis turbines working with a wide range of head variation – *L.E. Félez Gutiérrez, ENDESA Generación; C. Aguerre Telleria, Voith Siemens Hydro, Spain*
- Kárahnjúkar hydroelectric project mechanical equipment – *S.I. Ólafsson, VST Consulting Engineers, Iceland*
- Von Karman frequency excitation caused cracking of the Karun III Francis runner – *A. Aliabadi, IWPC Iran and A. Shamekhi, University of Tehran, Iran*
- Mechanical behaviour of the operation ring of the Francis turbines in Simon Bolivar (Guri) power station – *J.C. Conde Villasana, CVG EDELCA, Venezuela*
- Innovation in main shaft seal design for low to medium head reaction turbines – *D. Edwin-Scott and G. Elliott, James Walker Group, UK*
- A new 3D CFD based design system for water turbine design – *R. Hothersall, Hydroworks Ltd, New Zealand; I. Huntsman,*

CWF Hamilton & Co Ltd, New Zealand

- The development of similar welding consumable for welding steel grades GX4CrNiMo 16-5-2 – *N. Friedrich, F. Winkler and J. Tösch, Böhler Welding Austria GmbH, Austria*
- Water lubricated bearings: experience and development – *Y. Bouvet and J-F. Berthea, Alstom Power Hydro, France*

Session 7: Hydro and Society - Responsibility and Sensitivity in Planning

Co-Chairs: *Daryl Fields, Water Resources Management Group, The World Bank; K. Seelos, Hydro-Québec, Canada*

- Strategic options assessment – *D. Fields, Water Resources Management Group, The World Bank*
- Innovative approaches to improving stakeholder involvement in environmental and social planning: Lessons from projects in Lao PDR and Vietnam – *G. Morgan and C. Mejia, The World Bank*
- Integrating indigenous people into the planning and operation of hydropower project: the cases of Eastmain-1 and 1A / Rupert in Québec – *K. Seelos, J-R. Proulx, and A. Tessier, Hydro Québec, Canada*
- Stakeholder involvement: A key element in Vietnam's National Hydropower Plan – *G. Lifwenborg and A. Hjort, SWECO International, Sweden*
- Integrating and optimising social and environmental aspects in technical planning – *S. Sparkes, Multiconsult/Norplan AS, Norway*
- The International Lake Ontario-St. Lawrence river study – towards improved bi-national water regulation in an intensively developed basin – *Tom McAuley, Canadian Section, International Joint Commission, Canada; and M. Colosimo, US Section, International Joint Commission, USA*
- Hydropower and public acceptance in Nepal – *D.B. Singh, HM Government of Nepal*
- Designing for stakeholders: the case of a 140 MW scheme in an Australian national park – *Paul Caplen Sinclair Knight Merz, New Zealand*
- Social and environmental assessment of the Bujagali hydropower project, Uganda, under IFC Performance Standards and the Equator Principles – *B. Ogilvie, Tonkin & Taylor International, New Zealand*
- Educational tools: education and capacity building in the hydropower field – *G. Favreau, G. Sutherland and J. Isabel, Hydro Québec, Canada*

Session 8: Small Hydro: Technology Update and Development Opportunities

Chairman: *Prof David Williams, CEO, British Hydropower Association*

Small and low-head hydro equipment

- Choice of equipment for small hydro – *H. Brekke, Emeritus Professor, NTNU, Norway*
- Application of CFD methods for flow analysis through chosen types of hydraulic turbines for small hydro power plants – *M. Kaniecki, Polish Academy of Sciences, Poland*
- Micro hydropower system for irrigation canal – *T. Nakazawa, J-Power (Electric Power Development Co Ltd), Japan*
- Contreras II hydro plant: Smaller turbine, bigger output – *J. Navarro Torrijos, J. López Nieto and J.C. Elipe Salamdor, Iberdrola SA, Spain*
- Hydroelectric schemes for ultra-low heads – *A. Choulot, R. Cgebak and V. Denis, MHyLab, Switzerland*
- A new turbine for very low head applications and low environmental impact – *M. Leclerc, MJ2 Technologies Sarl, France*

CONFERENCE SESSIONS

World perspectives for small hydro

- Development perspectives for small hydro in Burkina Faso – *A. Nambre, Burkina Committee on Dams, Burkina Faso*
- Water Resources Management for Small Hydropower in Turkey – *M. Sandalci and Ibrahim Yuksel, Sakarya University, Turkey; K. Kaygusuz, Trabzon University, Turkey*
- Small hydro in Argentina: promoting economic development and quality of life – *C. Avogadro, Consultant, Argentina*

Session 9: Civil Engineering Challenges

Co-Chairmen: *Dr Yannis Thanopoulos, Public Power Corporation, Greece; G. Pétursson, Landsvirkjun, Iceland*

Tunnels and challenging ground conditions

- The use of TBMs for tunnel construction at hydro projects – *R. Grandori, Seli, Italy*
- Challenges during the construction and completion phase of the Kárahnjúkar project, Iceland – *G. Pétursson, The National Power Company of Iceland*
- Evaluating the hydraulic roughness of unlined TBM-bored water conveyance tunnels: Kárahnjúkar headrace – *K. M. Hakonardottir and G. G. Tomasson, VST Consulting Engineers, Iceland; B. Petry, UNESCO-IHE, The Netherlands; and B. Stefansson, Landsvirkjun, Iceland*
- Challenging geological conditions at the Renun hydro project, Indonesia – *H. Kanai, Nippon Koei Ltd, Japan*
- Construction of a large diameter 14 km-long tunnel for the Teesta V hydro project, Sikkim, without a time and cost overrun – *S. K. Mittal and S. Singhal, NHPC, India*
- Challenges in tunnelling at the 2000 MW Subansiri lower hydro project in India – *B. Das, Soma Enterprises Ltd, India*
- Two inclined pressure shafts driven by a 5 m hard rock double shield TBM at Parbati – *W. Güttler, Jäger Bau GmbH, Austria*
- Peribonka dam, Canada: A dam made possible by modern ground engineering techniques – *S. Balian, Bauer Spezialtiefbau GmbH, Germany*

Design, construction and site management

- Numerical analysis and design of the Péribonka powerhouse concrete turbine/generator block – *A. Daly, TecSult Inc, Canada*
- Design and construction of the first Piano Key Weir spillway at the Goulours dam, France – *F. Laugier, EDF-CIH, France*
- Sloped layered method of roller compacted concrete: cases of Brazilian dams based on scientific research – *N. Goulart Graça, A. de Pádua Bemfica Guimarães and R.S. Machado Bittencourt, Furnas Centrais Elétricas S.A, Brazil*
- Information management on large hydro construction projects – *A. Hodgkinson, SoftXS GmbH, Switzerland; M. Smith, Matrics Consult Ltd, UK*
- Moving materials by rope supported conveyors and cableways – *P. G. Graziano, G. Zannotti, and A. Contin, Poma, Italy*
- Challenges of construction planning and management in remote areas – *N. Raghavan, D. K. Sharma and K.K.Gupta, Larsen & Toubro Ltd, India*

TUESDAY 16 OCTOBER: Afternoon

Session 10: Pumped Storage - Recent Developments

Chairman: *B. Navalon Burgos, Director of Hydropower, Iberdrola, Spain*

Machinery and project design

- Enhanced energy balancing and grid stabilization through 3-machine-type variable-speed pumped-storage units – *R. Bucher, Lahmeyer International GmbH, Germany*
- Modern design of large pump-turbines – *P. Nowicki, Andritz VA TECH Hydro, Germany; M. Sallaberger and P. Bachmann, Andritz VA TECH Hydro, Switzerland*

- Recent experiences with single-stage reversible pump turbines at GE Hydro – *J.T. Billdal, A. Wedmark, GE Energy, Norway*
- Analysis of fast pumped-storage schemes by hydraulic modelling – *R. Klasinc and M. Larcher, Technical University of Graz, Austria; A. Predin and M. Kastrevc, University of Maribor, Slovenia*
- Selection of double stage pump-turbines for the Yang Yang 817 m head scheme in Korea – *Sang-Yong Lee, Yang Yang PSPP, Komipo, Korea; J-M. Henry, Alstom Power Hydro, France*
- Design of La Muela II 840 MW pumped-storage scheme in Spain – *J.M. Gaztañaga and J. Cervera, Iberdrola, Spain; I. Oliden and J. de Blas, Iberinco, Spain*
- Design of Upper Cisokan: the first pumped storage plant for Indonesia – *Y. Satoshi, Newjtec Inc, Japan; N. Mulyanto, PT PLN (Persero), Indonesia*

Session 11: HYDRO 2007 Finance Clinic

Moderators: *J. Plummer, The World Bank; C.R. Head, Chris Head Associates, UK*

Panelists will include experts from the World Bank, The European Investment Bank, the Asian Development Bank, the Inter-American Development Bank, as well as other international financial experts - a unique pool of expertise.

This will be an opportunity, in an open forum, for delegates from all parts of the world to raise issues concerning project finance specific to their country, region or project, to seek practical advice from the major international lending agencies, and to learn more about new approaches to project finance and risk management.

Session 12: Small Hydro in Europe

Chairman: *Prof B. Pelikan, President, European Small Hydro Power Association*

- SHP Investment opportunities in the EEC – *M. Gospodjinacki, Slovenian Small Hydropower Association, Slovenia*
- Status of small hydropower policy framework and market development in the old and new EU Member States and selected EFTA countries – *C. Söderberg, Swedish Renewable Energies Association, Sweden; P. Punys, Lithuanian Hydropower Association, Lithuania*
- Implementation of the WFC in Italy and experimental studies on reversed flow – *S. Gollessi and G. Valerio, APER (Associazione Produttori di Energia da Fonti Rinnovabili), Italy*
- The mini-hydros of the Alqueva project – *Jorge Vazquez, Catholic Portuguese University, Portugal*
- Evaluation of the profitability of a small hydro cascade - Estimation of upgrading and dam safety costs and economical viability - *J. Laasonen, Fortum Hydropower Services, Finland; T. Kortelainen, Fortum Power and Heat Oy, Finland*
- Micro hydro in water supply systems - *H. Ramos, Instituto Superior Técnico, Portugal; M. Mello, Hidropower Company, Portugal*
- Is the smallest the best? – *L. Papetti and C.O. Frosio, Studio Frosio - Studio Associato d'ingegneria, Italy*

Session 13: Managing Sedimentation

Chairman: *Sultan Alam, Consultant, France*

- Sedimentation management at the run-of-river Madeira river project in Brazil - *E. Nunes da Cunha, J.D. Cadman and E. de Freitas Madeira, Ministry of Mines and Energy, Brazil; Sultan Alam, Consultant, France*

Research and modelling

- The effect of turbulence on the sedimentation process in settling basins – *P. Boeriu and D. Roelvink, UNESCO-IHE, Netherlands; Tuan Dobar, Yos Firdaus Simanjuntak, Indonesia*
- Modelling of sediment flushing from reservoirs – *S. Tigrek and B. Yilmaz, Middle East Technical University, Turkey*

CONFERENCE SESSIONS

- Hydraulic model tests for sediment removal from the Solis reservoir in Switzerland – *C. Ortmanns, T. Berchtold and A. Lais, ETH Zurich, Switzerland*
- Sediment induced abrasion in hydraulic structures and equipment: Bhutan's experience – *T. Dorjee, Ministry of Trade & Industry, Bhutan*

Prevention, management and removal

- Sediment management at hydro powerplants in the Himalayas – *E. Lesleighter and R. Naderer, SMEC Group of Companies, India*
- Sedimentation management: The case of Kundah Palam reservoir, India – *A.G. Palanisamy, K. Narasimhan, Tamil Nadu Electricity Board, India*
- Sedimentation in some Iranian reservoirs – *M.R. Rahmanian and M. Jamalzadeh, Mahan Ghodss Consulting Engineers; M.A. Bsanihashemy and P. Badiee, University of Tehran, Iran*
- Study on a new low-level sediment venting system for Dez dam – *A. Khosronejad and M. A. Mohammad Mirzaie, Mahab Ghodss Consulting Engineering; K. Ghazanfari, University of Guilan, Iran*
- Sedimentation study of Poechos reservoir: Analysis and solution of the problems – *B. Zdravkovic, Sindicato Energetico SA (Sinersa), Peru*
- SPSS Sediment remover at the Cuyamel pressurized sand trap, Honduras – *T. Jacobsen, GTO Sediment AS, Norway*
- Different dredging systems and features to handle sedimentation problems in power dams – *P.E.W.M. Anssems, Damen Dredging Equipment BV, The Netherlands*

TUESDAY 16 OCTOBER: Late Afternoon

- Debate on Climate Change: "The science and the implications"**
Co-Moderators: *Dr E. Monosowski (formerly World Bank Latin America & Caribbean Dept) and J. Glass, Environmental Consultants, France*
- BHA Seminar: "Working on the (Supply) Chain Gang"**
Chairman: *Prof D. Williams, CEO, British Hydropower Association*

Evening: Free

WEDNESDAY 17 OCTOBER: Morning

Session 14: Maintaining hydro assets

Chairman: *Dr Paul Thackray, Consultant, UK*

- Developing asset management strategies for ageing hydro power stations – *G. Stojmirovic and J. Walsh, Hydro Tasmania Consulting, Australia*
- Integrated vibration, process monitoring at the Momina Klisura hydro plant – *M. Hastings and A. Schübl, Brüel & Kjær Vibro, Denmark*
- On-line condition monitoring of the hydro units at Iron Gates I: Possibilities for predictive maintenance – *I. N. Bleier and D.M. Novac, Hidroelectrica S.H. Portile de Fier, Romania; H. Keck and V.A. Meienhofer, VA TECH Hydro AG, Switzerland*
- Development of a hydroelectric plant data acquisition system – *T. Yokoyama, J-Power, Japan*
- Underwater robotic intervention – *M. Blain, J. Beaudry and F. Mirallès, IREQ Institut de Recherche d'Hydro-Québec, Canada*
- RKIM - Reliability and knowledge integrated maintenance: a Brazilian methodology proposal related to innovative technology process – *E. Laércio Nunes, Itaipu Hydroelectric Powerplant, Brazil; A. Valladares, Brazil*
- Impact of rapidly changing technology on maintenance management practice at hydropower plants in Kenya – *F. Makhanu, Kenya Electricity Generating Co Ltd*
- A study for improving equipment maintenance management for hydropower plants – *Tae-Jin Park and Ki-Won Kim, Korea Water Resources Corporation (Kwater), Korea*
- Making valve maintenance easier: introducing simple methods with great advantages – *A. Cañellas, IMS SA, Spain*

Session 15: Environment

Co-Chairs: *Dr Maria A. Gómez Bandara, IMTA, Mexico; Dr Elizabeth Monosowski, Consultant, Brazil/France*

Planning environmental management

- How an environmental management system can bring about concrete improvements in environmental performance – *D. Gray, Hydro Québec, Canada*
- Environmental incidents: zero risk – *J. López Nieto, J. Riesco Canela and E. Enrique Sola Álvarez, Iberdrola SA, Spain*
- Environmental challenges for a sustainable water and energy future – *V. Hobbs, US Army Corps of Engineers, USA*

Fish protection

- Simulated turbine pressure tests utilizing custom hyper-baric chambers to evaluate turbine passage pressure effects on juvenile salmonids – *B.A. Bird, M. Ahmann and M.J. Langeslay, US Army Corps of Engineers; and T. Carlson, Pacific Northwest National Laboratory, USA*
- Laboratory test and in-situ test for downstream migration of eels – *Th. Strobl, K. Fiedler, M. Ache, Technical University of Munich, Germany*
- Basin-wide monitoring of survival and fine scale behaviour of acoustically tagged salmon smolts at hydropower dams in the Columbia river basin, USA – *B. H. Ransom, T.W. Steig, M.A. Timko and P.A. Nealson, Hydroacoustic Technology, Inc, USA*
- Environmental assessment of Baixo Sabor hydropower project: Compensatory and mitigation measures – *N. Portal and J. Mayer, EDP, Portugal*

Experience

- Using flushing flows to control the excess of macrophytes in the lower Ebro river. An appraisal of a five-year experience – *A. Palau and A. Meseguer, ENDESA; R. Batalla and D. Vercat, University of Lleida, Spain*
- Importance of designing regional environmental assessment in the influence area of large dams in Mexico – *T.C. Lecanda, Comisión Federal de Electricidad, Mexico; M.A. Gómez and F.P. Saldaña, Instituto Mexicano de Tecnología del Agua; S. Contreras, Universidad Autónoma de Guadalajara, Mexico; and L.E. Gutiérrez, Comisión Nacional del Agua, Mexico*
- Implementation of catchment area treatment at Uri power station, J&K, India: post-construction assessment and performance evaluation – *U. Bhat, S. Ali Khan and G. Kumar, NHPC, India*
- The touristic potential of dams – *M. Jakob, University of Geneva, Switzerland*

Session 16: New Opportunities for Hydropower

Chairman: *Niels Nielsen, International Energy Agency, and Kator Research Services, Australia*

- World potential for tidal power – *F. Lempérière, Hydro-Coop, France*
- Development opportunities for tidal current and in-stream energy conversion technologies – *N.M. Nielsen, Kator Research Services, Australia*
- Progress in wave power technology – *J. Weilepp, Voith Siemens Hydropower Generation GmbH & Co Kg, Germany*
- The prospects of using instream flow technology to capture water energy spilling over existing low head dams in the USA – *A. Tseng, Orenco, USA*
- Pumped-storage optimization of wind-hydro renewable energy production in water supply systems – *F. Vieira, H. Ramos, D. Covas and A. B. de Almeida, Instituto Superior Técnico, Portugal*
- Potential opportunities for hydropower in the current mining resources boom – *P. R. Thackray, Consultant, Australia*
- Hydro for bio diesel: an insight to opportunities in Mali – *S. Akuopha, Niger Sahel Energie, Mali*

CONFERENCE SESSIONS

- Wastewater turbinage before and after treatment: the example of Amman City, Jordan – *V. Denis, MHyLab, Switzerland; L. Mivelaz, Groupe E, Switzerland*
- Water recycling for higher efficiency in hydropower generation in Nigeria; Kainji-Jebba case study – *I.U. Emoabino, Eco-Systems Consult Ltd, Nigeria; A.W. Alayande, National Water Resources Institute, Nigeria*
- Markala hydroelectric project, Mali – *M. Hamza and M. Abdel-Latif, Hamza Associates, Egypt*
- Hydropower as a part of Corsica's energy programme – *F. Isambert, ISL, France*

Session 17: Turbine Flow Measurement Workshop

Chairman: *Prof T. Staubli, HTA Lucerne, Switzerland*

- Turbine flow measurement for low-head plants: Owners' options for the 21st Century – *J. Lampa and D. Lemon, ASL AQFlow, Canada; A. Mikhail, HPPE, Canada*
- Case studies of discharge measurements using acoustic scintillation flow meters – *B. Reeb and J-L. Ballester EDF-DTG, France; J. Buermans, ASL AQFlow, Canada*
- Influence of some components of Gibson method instrumentation on flow rate measurement results – *A. Adamkowski, and W. Janicki, Polish Academy of Sciences (IMP PABN), Poland*
- Water turbine tests using the classic pressure-time method with measurement instrumentation inside a penstock – *A. Adamkowski, W. Janicki, G. Urquiza, J. Kubiak and M. Basurto, Polish Academy of Sciences (IMP PABN), Poland*
- Accuracy analysis of the acoustic discharge measurement using analytical, spatial velocity profiles – *T. Staubli, A. Noti, B. Lüscher and T. Tresch, HTA Lucerne; P. Gruber, Rittmeyer Ltd, Switzerland*
- CFD optimized acoustic flow measurement and laboratory verification – *T. Staubli, B. Lüscher and F. Senn, HTA Lucerne, Switzerland; M. Widmer, Rittmeyer Ltd, Switzerland*

(For panel discussion topics, see full description on opposite page)

WEDNESDAY 17 OCTOBER: Afternoon:

Session 18: System Management

Chairman: *Gerhard Wedam, CEO, Enerjisa (Verbund and Sabanci) Austria/Turkey*

- Comparison of different management models of energy generation enterprises – *M. A. Arantes Porto and R. Andre Marques Furnas Elétricas SA, Brazil*
- Short term hydro/thermal co-optimization using a MILP approach – *C.A. Romero and N.G. Scutt, Global Energy Decisions, USA; M. Clemente, Iskra Sistemi, Slovenia*
- Intelligent energy: How IBM is making energy smarter – *S.J. Clambaneva, PLM Americas (IBM), USA*
- Hydropower and climatological extremes operational forecasting and resource management in the hydropower industry – *R. Spolwind, K. Hebenstreit and F. Fröschl, Verbund/Österreichische Elektrizitätswirtschafts-AG, Austria*

Session 19: Electrical Equipment and Auxiliaries

Chairman: *Prof Jean-Jacques Simond, EPFL, Switzerland*

- Stator winding fixing systems and their influence on the high voltage insulation system for large hydro generators – *G. Lemesch, G. Mußbacher, J. Schönauer and F. Ramsauer, VA TECH Hydro GmbH & Co, Austria*
- Hydro generator uprating/upgrading with requirements for intermittent operation – *L-E. Kämpe, VG Power, Sweden*
- Choice of the level of quality for auxiliaries equipment in a new power station – *O. Tricca, Coyne et Bellier, France*
- Investigations on the water-cooled Svartisen hydro generator after consecutive short circuits – *G. Traxler-Samek and A. Schwery, Alstom Ltd, Switzerland*

Session 20: Contractual issues – New Approaches and Experience

Chairman: *Prof Bela Petry, UNESCO-IHE, The Netherlands*

- Accelerating the schedule for the generating units at the Caruachi project, Venezuela – *A. Marciano, T. Palacios and M. Balza, CVG EDELCA, Venezuela*
- Review and analysis of a BOT project in Tajikistan: the case of Sangtuda – *H. Hashemi and M. Vahidi, Farab Co, Iran*
- Build, operate & transfer (BOT) approach for hydropower development – *Partha Pratim Saha and D.K. Sharma, Larsen & Toubro Ltd, India*
- Common problems faced in new EPC projects in Brazilian dams and solutions found – *R. Machado Bittencourt, N. Goulart Graça and A. de Pádua Bemfica Guimarães, Furnas Centrais Elétricas SA, Brazil*

Session 21: Penstocks

Chairman: *Bryan Leyland, Consultant, New Zealand*

- Penstock resonance resulting from unstable turbine characteristics – *J.H. Gummer, Hydro-Consult Pty Ltd, Australia*
- Stress relaxation process and monitoring criteria for the Chandoline penstocks exposed to soil movements – *A. Prigent, P. Marietta and P. Bryla, EDF, France; E. Papilloud and L. Toledano, Hydro Exploitation, Switzerland; R. Bertho, Stucky SA, Switzerland.*
- High head low cost penstocks made of glass fibre reinforced plastics – *G. Palsson, Flowtite Technology AS, Norway*

Closing Plenary Debate:

Accelerating and Supporting Well Planned Hydro Capacity building ~ Training ~ Good practices

Planning and training experts from the hydro profession as well as the international finance and development agencies will join others from the utilities of developing countries for a constructive panel discussion. Conclusions will be disseminated to relevant organizations worldwide.

Evening: **HYDRO 2007 Conference Dinner**

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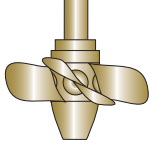
Tuesday 16 October 17.30 to 19.00 hrs

Chairman: Prof David Williams, CEO, British Hydropower Association, UK

Working on the (Supply) Chain Gang:

The UK has experienced a resurgence in the development of hydropower, from micro to large, as a result of the British Government's Renewable Obligation, which has also supported extensive refurbishment and upgrading of old plant. Building on an already strong presence worldwide, the UK hydropower sector has now developed sturdy supply chains and these involve close links with companies and businesses overseas. This debate-style seminar will review the UK's links with overseas designers and suppliers and investigate ways in which we can collaborate more - to the benefit of hydropower worldwide.

**HYDRO
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SECOND WORKSHOP ON TURBINE FLOW MEASUREMENT

Wednesday 17 October 09.00 hrs (Session 17)

Chairman: Prof T. Staubli, HTA Lucerne, Switzerland

The Workshop's focus will be on flow measurement, which is still the weakest component in determining field performance of hydraulic machines. Building on the success of the first workshop during HYDRO 2004 in Porto, the Workshop will provide high level knowledge sharing on the state-of-the-art of turbine flow measurement. In an interdisciplinary meeting, experts from all over the world will discuss innovative developments in, and techniques for, improving the accuracy and cost-effectiveness of flow measurement methods.

Technical paper session

The topics in the paper session will cover:

- Turbine flow measurement for low-head plants: options for the 21st century
- Methods available: acoustic, current meter, pressure time, cross-correlation (scintillation): comparison and assessment of accuracy
- Case studies of flow measurements using acoustic scintillation flow meter
- CFD optimized acoustic flow measurement and laboratory verification

Panel discussion

This will be chaired by Prof T. Staubli, and panellists will include: R. Wittinger, J. Walsh, A. Mikhail, D. Lemon and P. Gruber.

During the discussion, established methods, as well as the newest trends and developments in flow measurement, will be summarized by the panel. An update on IEC60041 and ASME PTC18 standardization activities will be given by members of the corresponding committees. Market needs from the customer perspective and critical problem areas, such as low-head plants with short intakes, will be highlighted and discussed.

This Workshop will be included within the HYDRO 2007 Programme as Session 17 (see opposite page for details of the paper presentations).



IEA EXECUTIVE COMMITTEE MEETING

One and a half days - 18 + 19 October

This Meeting will begin with a briefing, to which all participants are welcome (free of charge), about the recent achievements and current activities of the Hydropower Implementing Agreement of the International Energy Agency. The Executive Committee will then hold several sessions.



WORKSHOP: CHEMICAL EXPANSION OF CONCRETE IN DAMS AND HYDRO PROJECTS

One and a half days - 18 + 19 October

Co-Chairmen: Dr R. Charlwood, Chairman, ICOLD Committee on Concrete Dams and J. Buil Sans, Chairman, SPANCOLD Committee on Concrete for Dams



Objectives

In 1991 ICOLD published Bulletin 79 entitled 'Alkali - Aggregate Reaction in Concrete Dams'. This brought together the latest knowledge on expansion derived from alkali-aggregate reaction (AAR). It has been a useful guide for owners of dams affected by this kind of expansion.

USCOLD held a special meeting in Chattanooga, USA, in 1995 on 'Alkali-Aggregate Reactions in Hydroelectric Projects and Dams' at which a worldwide survey of more than 100 cases was presented with reports on diagnosis and remediation of a number of large dams and powerplants.

In view of the relatively recent discovery of these expansion phenomena, and the increasing realization that they are very complex in all their aspects, there is clearly a need to maintain continuous progress in our understanding. The Granada Workshop will provide an international forum to update the information gathered and identify opportunities for improved understanding and treatment of the problems.

Since the publishing of the ICOLD Bulletin, many expansion cases have come to light and knowledge on the aspects of this document has advanced. Furthermore, greater experience has been gained on technologies applicable to the study of the phenomenon.

Therefore this workshop 'Chemical Expansion of Concrete in Dams and Hydroelectric Projects' aims to update and amplify the information of the ICOLD Bulletin and the USCOLD Conference. Moreover, it should extend the treatment to all kinds of chemical expansion, not only regarding AAR. The reactions in which free lime or magnesia and, above all the sulphur compounds, have a role that should be considered. Following the Granada Workshop, the SPANCOLD and ICOLD Committees on Concrete Dams will produce a new Bulletin on 'Chemical Expansion in Concrete Dams'.

Workshop Themes

1. Statistical survey on expansion **2. Chemical reaction causes, factors and mechanisms** **3. Diagnosis** (including: inspection and monitoring; site tests; Instrumentation. Laboratory analyses. Physical, chemical and mechanical observations.) **4. Control of the phenomenon** **5. Mathematical modelling** **6. Management of the phenomena in affected structures** **7. Prevention** **8. Case histories.**