



Fifth International Conference on Water Resources and Hydropower Development in Asia Conference and Exhibition Update

Colombo, Sri Lanka ~11 to 13 March 2014

organized and hosted by



The conference is held under the personal patronage of the Hon Minister of Power and Energy, Pavithra Wanniarachchi

The ASIA 2014 Conference and Exhibition will bring together experts in all the disciplines associated with planning, financing, implementing, operating and refurbishing dams and hydro plants. Delegations from more than 60 countries are expected to attend, and will exchange knowledge and experience on a broad range of topics of particular relevance to the Asian countries, such as policy and planning, project finance, design and construction of water infrastructure, flood management, sedimentation management, hydro plant design, safety, pumped storage, rural electrification, power trading and climate change adaptation.

Local organizations supporting the event include the Ministry of Power and Energy, the Department of Irrigation, the Mahaweli Authority of Sri Lanka, the Ceylon Electricity Board, the Central Engineering Consultancy Bureau, the Sri Lanka National Committee on Large Dams and the Sri Lanka Convention Bureau.

Supporting Organizations include:



Local organizational support:



CONFERENCE AND VENUE



ARRIVING IN COLOMBO

Colombo, the capital of Sri Lanka can easily be reached from all parts of the world. There are direct flights from many countries, or connections via major Asian cities. See information below for more details.

VISAS

An Electronic Travel Authorization (ETA) system operates for Sri Lanka, avoiding the usual lengthy visa application processes. For full details, visit: www.eta.gov.lk

Bandaranaike International Airport is 35 km north of Colombo. Airport transfers can be arranged via our ground agents, who can be contacted via a web link noted under the ASIA 2014 area of the *H&D* website.

BMICH: the Bandaranaike International Conference Hall, where the ASIA 2014 sessions and Technical Exhibition will take place, is a modern world-class convention centre, about 15 minutes drive from the main



5* and 4* hotels in the city. The recent Commonwealth Heads of Government Meetings took place there. It is set in 36 acres of land, and follows an eco-friendly concept: a number of large trees have been carefully conserved, and there is an area dedicated to growing rare, and in some cases, unique Sri Lankan flora and fauna. There is a herb and fruit garden, adjacent to the elegant exhibition halls. Shuttle buses will be available during the conference between the main hotels and BMICH, and to the social events.

OFFICIAL CARRIER



We are pleased that Sri Lankan Airlines is working in collaboration with ASIA 2014 as the official carrier for the event, and will offer discounted air tickets to registered delegates, applying through a Sri Lankan local airline office.

Proof of registration for the conference will need to be presented to the airline office when requesting discounted air fares.

Sri Lankan Airlines will offer all participants and accompanying persons a 15% discount on economy class airfare and a 10% discount on business class airfare (on the prevailing market fare at the time of ticketing) for purchase of tickets for registered delegates travelling to Sri Lanka from the following cities which currently are as follows:

Indian Sub Continent: Delhi, Mumbai, Chennai, Cochin, Bangalore, Trichy, Trivandrum, Pakistan, Maldives.

Far East: Singapore, Beijing, Hong Kong, Kuala Lumpur, Bangkok, Shanghai, Canton, Tokyo.

Middle East: Dubai, Abu Dhabi, Riyadh, Dammam, Jeddah, Doha, Muscat, Kuwait, Bahrain.

Europe/Eurasia: London, Paris, Frankfurt, Moscow, Rome.

(All related taxes must be paid for separately and are not discountable).



ASIA 2014 HOST COUNTRY



SRI LANKA: HISTORY, ECONOMY AND CULTURAL HERITAGE

Sri Lanka was the first country in South Asia to move away from a state-centred economic structure, and embrace a private sector-led market-oriented economy. There are therefore plenty of opportunities for private investment, with almost all exchange controls relaxed and many incentives offered for foreign investments.

Famous for the production and export of tea, coffee, coconuts and rubber, Sri Lanka is proud of its progressive and modern industrial economy, and it has the highest per capita income in South Asia.

Colombo, as a result of its large harbour and strategic position along the East-West sea trade routes, was known to ancient traders some 2000 years ago, and was designated the commercial capital of Sri Lanka. Today it is a modern, and well organized city, where general services operate efficiently. It has a stunning coastline, and most of the state-of-the-art business hotels offer sea views. In the centre of the business district it is possible to breathe the fresh air of the Indian Ocean.

Modern office blocks, hotels and shopping malls co-exist with colonial-style buildings, and buddhist and hindu temples, underlining the fact that Sri Lankans cherish their traditional values and cultural heritage, while keeping pace with all aspects of the 21st century.

In recent years, the city has been identified as one of the most important destinations for international meetings, conventions and exhibitions, and recently was the proud host of the Commonwealth Heads of Government Meetings. Many of the functions associated with this prestigious event took place in the venues to be used for ASIA 2014.



A new express highway from the airport was recently completed, easing access to the centre of the city. Many hotels were recently refurbished in time to greet the Commonwealth leaders.

The weather is tropical and warm, and in March will offer a pleasant contrast for those travelling from Europe, North Asia and North America.

Sri Lanka is proud of its particularly stringent regulations and high standards for air quality, water quality and food safety, and the city offers a wide range of fine dining options.

For those who have time, we recommend staying on for a few days relaxation after ASIA 2014, and our local agents can help to arrange extended stays either in Colombo itself (with possibilities for golf, shopping, relaxing by a poolside, or trying one of the numerous spas) or possibly in one of the other fascinating cities such as Galle or Kandy.

For those with time to spare, the Maldives are also only one hour away.

SRI LANKA AND WATER RESOURCES DEVELOPMENT

Sri Lanka has a long history of water resources development, since the first dams were constructed as far back as 600 BC. One of the earliest dams, constructed in 500 BC, abandoned in the 12th century, and restored in the 1870s, is still in operation, providing irrigation water for 140 ha, as well as domestic water supply. The country now has about 60 large and 200 medium-scale dams in operation, and some 12 000 small ones serving rural areas. The majestic Victoria arch dam is the largest in the country, and is part of the major 660 MW Mahaweli cascade development, the country's main centre of hydro development. Sri Lanka has rich experience to share, from large multipurpose schemes, and cascade developments, to small and micro hydro plants powering the tea estates. Sessions and study tours are planned to give delegates a taste of Sri Lanka's on-going programme of water resources and hydro development, including multipurpose dams of all the main types, medium and small-scale hydro developments.



CONFERENCE OVERVIEW

| Monday 10 March | Tuesday 11 March | Wednesday 12 March | Thursday 13 March |
|---|---|--|---|
| Conference registration Exhibition setup Small Hydro Seminar Local Cultural Excursion | <i>Opening Plenary Session</i> Opening addresses Keynote addresses Opening of the Exhibition | <i>Parallel Sessions</i> Workshop: Theun Hinboun, Laos Hydraulic machinery IWRM, Irrigation, Flood management | <i>Parallel Sessions</i> Regional: SE Asia Environmental and social aspects Sedimentation management |
| | <i>Lunch</i> | <i>Lunch</i> | <i>Lunch</i> |
| Meeting and Briefing for Chairmen Meeting and Briefing for Speakers Reception for Chairmen and Speakers | <i>Parallel Sessions</i> Developments in Sri Lanka Financial and contractual aspects Civil Works: Materials and Design | <i>Parallel Sessions</i> Indian Sub-continent; Climate and Hydro Marine energy; SHP Dam and powerplant safety | <i>Closing Plenary Session</i> Session summaries Recommendations and outcomes Conference closing |
| | <i>Welcome Reception</i> | <i>Exhibition Networking</i> | <i>Conference Beach Party</i> |



PRE-CONFERENCE SEMINAR



Monday 10 March, 11.00 to 18.00 hrs

On the day preceding ASIA 2014, when delegates will be registering for the Conference, the European Small Hydropower Association (ESHA) will be organizing a training seminar on small-scale hydro, with input from the British Hydropower Association. There will be a nominal charge of US \$50 to attend, to cover administration and refreshments only.

The Seminar will be led by Prof Bernhard Pelikan of ESHA and Prof David Williams of BHA, and will have input from the International Energy Agency and the World Bank. It is planned as an interactive discussion, to focus on issues of relevance to small and micro hydro in the Asian region.

Some of the topics to be covered will be: the legal framework and contractual aspects for small hydro development; innovation in technology; low-cost materials and technology; small-scale water storage; operation and automation; installation of small hydro at existing water infrastructure; design of intakes and sedimentation issues; maintenance of small hydro plants; environmental aspects; costs, expenses and revenues; World Bank support for SHP.

The seminar will conclude with a summary of outcomes, providing some take-home messages for participants.

A light lunch will be provided, and there will be time to register for ASIA 2014 either before or after the Seminar.

INTERNATIONAL STEERING COMMITTEE INCLUDES:

H.I. Aker, Turkey
S. Alam, France
J. Antunes Sobrinho, Brazil
I. Araki, Japan
Azeb Asnake, Ethiopia
Dr E. Bellendir, Russian Federation
L. Berga, Spain
Prof P. Boeriu, UNESCO-IHE
H. Brekke, Norway
R. Bucher, Germany
J.M. Buil Sanz, Spain
D. Develay, France
J-M. Devernay, World Bank
M. De Vivo, ICOLD, France
Do Doc Quan, Vietnam
Dr E. Doujak, Austria
Dr Malcolm Dunstan, UK
M. Fauzi, Malaysia
B. Forbes, Australia
M. François, France

J. Freitas, Portugal
M.A. Gómez Balandra, Mexico
M. Gopalakrishnan, India
M. Gospodjinacki, ESHA
R. Grether, Germany
J. Gummer, Australia
C.R. Head, UK
Dr A. Hughes, UK
F. Isambert, France
R.E. Israelsen, USA
Dr Jia Jinsheng, China
Ø. Johannsen, Norway
B. Kamaladasa, Sri Lanka
H. Keck, Switzerland
D. Kenneally, Australia
V. Kercan, Slovenia
Dr H. Kreuzer, Switzerland
T. Kunz, Switzerland
Prof R. Lafitte, Switzerland
Dr Kamal Laksiri, Sri Lanka

F. Lempérière, France
Bryan Leyland, New Zealand
Lin Chuxue, China
F. Louis, France
Dr Peter Mason, UK
T. Matsuoka, TEPCO, Japan
L. Mouvet, Switzerland
U Myo Myint, Myanmar
Mohd Nazri bin Shahrudin, Malaysia
N. and L. Nielsen, Australia
Adama Nombre, Burkina Faso
A. Noorzad, Iran
Ir Zulkifle Osman, Malaysia
A. Palmieri, World Bank
Prof B. Pelikan, ESHA
Prof B. Petry, The Netherlands
Prof Pham Hong Giang, Vietnam
I. Phiri, Zambia
J. Plummer, UK

Dr V. Radchenko, Russian Federation
P.J. Rae, USA
Dasho Chhewang Rinzin, Bhutan
J.R. Rojas Morales, Costa Rica
F. C. da Rocha e Silva, Mozambique
N. Rupasinghe, Sri Lanka
J. Rupčić, Croatia
Prof A. Schleiss, Switzerland
Dr A. Scvero, Switzerland
K. Seelos, Norway
N.R. Shrestha, Nepal
Prof J.-J. Simond, Switzerland
B. Skácel, Czech Republic
Dr Sompop Sucharit, Thailand
Dr S. Sparkes, Norway
J. Thanopoulos, Greece
B. Trouille, USA
C.V.J. Varma, India
Prof D.A. Williams, UK
Dr Xia Jun, President, IWRA

CONFERENCE PROGRAMME

TUESDAY 11 MARCH - Morning

Opening Plenary Session

- >Welcome – A. Bartle, Aqua-Media International Ltd
- >Welcome messages by representatives of the Sri Lankan Government
- >Opening addresses by officers of professional associations
- Coffee break and opening of the Exhibition
- >Keynote addresses by international water and energy experts

TUESDAY 11 MARCH - Afternoon

Session 1a: Development plans and potential in Sri Lanka

Chairman: Dr Kamal Laksiri, Ceylon Electricity Board, Sri Lanka

- Water resources planning in Sri Lanka: Current status – S. Elakanda, DSWRPP, Sri Lanka; M. Chandrasekera, Mahaweli Authority of Sri Lanka
- Ancient irrigation technology adopted in Sri Lanka – B. Kamaladasa, Irrigation Department, Sri Lanka
- Development and application of an advanced decision support system for national and detailed water resources planning and management in Sri Lanka – R. A. Jensen and K. Yamagata, DHI, Denmark; M. Nanseer and D. Milton, SMEC International, Sri Lanka; A. Deen, SMEC, Australia; H.A. Basnayaka, Mahaweli Authority of Sri Lanka
- Sustainable peaking power development planning of Sri Lanka with hydropower – M.T.K. De Silva, CBE, Sri Lanka

Session 1b: Hydro and water resources schemes in Sri Lanka (case studies)

- Case histories of tunnelling problems in the hydropower sector in Sri Lanka – A. K. D. N. Atukorala, Ministry of Irrigation and Water Resources Management, Sri Lanka
- Hydro and water resources schemes in Sri Lanka – P. Nater and P. Huwyler, Pöyry Switzerland Ltd; H. Barghamadi, Mahab Ghodss Consulting Engineering Co., Iran

Session 2a: Financial and contractual aspects

Chair: Judith Plummer, University of Cambridge, UK

- The bankable hydropower feasibility study - who decides what is bankable – A. Noble, Parsons Brinckerhoff, Australia
- Hydro investment challenges: the mixed role of private and public sector B. Smondack, Tractebel Engineering, Thailand; J. Binquet, Tractebel Engineering, France
- Legal considerations of cross-border hydropower projects – D. Doran, DFDL, Thailand
- The difficulties and challenges faced in obtaining CDM registration for the Broadlands hydropower project – M.T.A.P. Wickramaratna and Dr. K. Laksiri, CEB, Sri Lanka

Session 2b: Financial and economic aspects Panel discussion

World experts from international financing institutions ADB, WB, JICA, and financial consultants from the hydropower industry will discuss a range of topical issues, including risk management, and the importance of adequate project preparation for financing.

Session 3a: Civil engineering – Major RCC dams

Chairman: Dr Malcolm Dunstan, MD&A, UK

- Completion of the upper Paunglaung RCC dam – C. Rohrer, AF Consult, Switzerland; U Myint Zaw, Ministry of Electric Power No 1, Myanmar; U. Zaw Min San, Hydropower Implementation, Myanmar
- The RCC dam for the Lai Chau project; RCC full scale trials and challenges in the construction of the RCC dam – M. Conrad and D. Morris, AF Consult, Switzerland
- A review into the tensile strength across RCC lift joints; case studies of some RCC dams in Southeast Asia – M. Conrad and D. Morris, AF Consult, Switzerland; M.R.H. Dunstan, Malcolm Dunstan Associates, UK
- The development of RCC dams in India – M. Dunstan, Malcolm Dunstan & Associates, UK

Session 3b: Civil engineering Dam materials and design

Chairman: Prof Luis Berga, Hon President, ICOLD, Spain

- Innovations in design and construction of the dam for the Subansiri lower hydroelectric project – B. Das, Soma Enterprise Ltd, India
- Geological investigations and critical geotechnical aspects for the design and construction of the 15 km long Uma Oya TBM-headrace tunnel – T. Dietler, Pöyry Switzerland Ltd; N. Alahacoon, Institute of Human Resource Advancement University, Sri Lanka
- Innovative rehabilitation scheme for segmental water transmission tunnel lining at a fault crossing – M. Safi and S. Esfahani, Moshanir Consultants, Iran
- Recent applications of numerical modelling for dam projects – D. Ho and Chee Wei Tan, Worley Parsons Services Pty Ltd, Australia
- Installation of a PVC geomembrane liner for the Tekapo Canal remediation works – M. Campbell and J. Eldridge, Genesis Energy Co., New Zealand; A. Scuero and G. Vaschetti, Carpi Tech, Switzerland; J. Wilkes, Carpi, USA; J. Cowland, Carpi Asia Pacific
- Optimisation of the Shuakhevi hydropower project tunnel alignment – S. Chilton, S. Davidson, A. Mena Cabrera and C. Pound, Mott MacDonald Ltd, UK

WEDNESDAY 12 MARCH - Morning

Session 4: Workshop on the Theun Hinboun Extension Project, Lao PDR

Chairman: R. Allen, Theun Hinboun Power Co, Lao PDR

- Theun-Hinboun expansion project overview - extending a success story – T. Bylund, THPC, Lao PDR
- Design of the THPC expansion project - addressing challenges in construction – L. Lundberg, SWECO, Sweden
- Challenges for the electromechanical supplier in Laos – M. Koubek and H. Kessler, Andritz Hydro GmbH, Vietnam
- Planning and monitoring the impounding of the Nam Gnuoung reservoir – M. Beraud and J-L. Cervetti, Tractebel Engineering, France; L. Barbara and C. Babini, Cooperative Muratori and Cementisti di Ravenna, Italy
- Adapting livelihood models to livelihood conditions in resettlement villages – S. Viravong, THPC, Lao PDR
- Resettlement and adaptive management: Theun Hinboun expansion project case study – S. Sparkes, Statkraft AS, Norway
- The business case for biodiversity: aligning business success with conservation – R. Victorine, Wildlife Conservation Society, Lao PDR

CONFERENCE PROGRAMME

- ▶ Governing requirements of hydro investors at local level in Laos – *K. Sayphouvong, Department of Energy and Mines, Lao PDR*
- ▶ Expanding a successful project: how to invest in growth without endangering your plant – *R. Allen, Theun Hinboun Power Co, Lao PDR*

Session 5: Hydraulic machinery

Chairman: John Gummer, Hydro-Consult Pty, Australia

- ▶ The role of the POE in monitoring M&E contracts – *J. Gummer, Hydro-Consult Pty Ltd, Australia*
- ▶ Kaplan design - fit for future – *A. Rammler and B. Mühlbacher, Andritz Hydro GmbH, Austria*
- ▶ Optimization of the hydropower plant when hydro-abrasive erosion occurs: Case studies from India – *T. Pohlmann, Andritz Hydro GmbH, Germany; K. Winkler, Andritz Hydro AG, Switzerland*
- ▶ Effects of assembly design of electro-mechanical components on turbine maintenance in sediment laden projects – *B. Chhetry, B. Thapa and B.S. Thapa, Kathmandu University, Nepal*
- ▶ Life cycle of a Pelton runner – *E. Parkinson, S. Lais, B. Loetscher, T. Weiss and A. Karakoleu, Andritz Hydro Ltd, Switzerland*
- ▶ Bulb turbine operating at medium head: Xia Jiang case study – *F. Loiseau, C.Desrats and P. Petit, Alstom Renewable Power Hydro, France*
- ▶ Hydraulic development for a hydropower project in Vietnam – *Demin Liu, Yongzhi Zhao and Xiangping Deng, DFEM, China*
- ▶ Experience with the application of numerical tools for design optimization of Francis turbines to minimize sediment erosion – *B. Thapa and K. P. Shrestha, Kathmandu University, Nepal*
- ▶ Hydraulic design of a vertical six-nozzle medium specific speed Pelton turbine – *J. Veselý, J. Mikulášek and M. Jízdny, CKD Blansko Engineering a.s., Czech Republic*
- ▶ Development of hydropower machines for pumped storage projects – *L. Yanzhong, Voith Hydro Shanghai, China; A. Jung, M. Giese and W. Moser, Voith Hydro Power Generation, Germany*
- ▶ Development of an innovative hydrokinetic turbine for inland waterways – *V.V.Rajadhyaksha, M.P. Cherian, M. Anderson, and R. Huff, DLZ, USA*
- ▶ New developments for an integrated automation solution for hydropower plants – *C. Mann, Andritz Hydro, Austria*
- ▶ The role and benefits of variable speed pumped storage – *J. Koutnik, M. Manderia and M. Bruns, Voith Hydro Holding, Germany*
- ▶ Basic principle using new technology applied to electric generators – *M. Cloutier, VibrosystM Inc., Canada*

Session 6: Integrated water resources management and multipurpose schemes

Chairperson: B. Kamaladasa, Irrigation Department, Sri Lanka

- ▶ The advantages of integrated river basin development: example of dams in the Bakırçay river basin, Turkey – *A. Akyatan and M. Teke, Dolsar Engineering, Turkey*
- ▶ Rethinking the role of river basin organizations; facilitating investment and development – *C. Rajapakse, Independent Consultant, Sri Lanka*
- ▶ The study on the operating characteristics of the hydro power plants and weirs that were constructed as part of the Four Major Rivers Restoration Project – *Kim Hyun-Han, K-Water, Korea*
- ▶ Can multiple purpose storage save their integrated positions? Case study of new independent states – *Prof. V.A. Dukhovny, SIC ICWC, Uzbekistan*

Session 7: Floods mitigation and flood discharge works

Chairman: F. Lempérière, Hydro Coop, France

- ▶ Managing future flood risk in Thailand – *S. Chumchean, C. Lertlum and N. Maporn, Panya Consultants Ltd., Thailand*
- ▶ An incident during a flood event which damaged a spillway – *Dr. A. K. Hughes, Atkins, UK*
- ▶ Calculation of runoff recharge community responsibility index for the Nilwala plant in southern Sri Lanka – *C.P. Gunasena and C.M. Navaratne, University of Rahuna, Sri Lanka; K. Athukorala, Lanka Jalani, Sri Lanka*
- ▶ Flood discharge works for low dams: six innovative solutions – *F. Lempérière, Hydro Co-op, France*
- ▶ Adoption of a piano-key weir spillway and stepped energy dissipator at Giritala in uprating of the Giritala reservoir in Sri Lanka – *H. M. Jayatilake, K.T.N. Perera, W.M. Karunaratne and R.M.B. Rajakaruna, Ministry of Irrigation and Water, Sri Lanka*

WEDNESDAY 12 MARCH - Afternoon

Session 8: Plans, potential and power trading on the Indian sub-continent

Chairman: Chhewang Rinzin, Druk Green Power, Bhutan

Overviews will be presented on the hydro potential and development plans and discussions will follow about regional development and power trading.

- ▶ Update and overview of Indian hydro developments – *C.V.J. Varma and T. Sharma, Council of Power Utilities, India*
- ▶ 900 MW Baglihar HEP developed in two stages managing the unexpected – *M.B. Stabel, Lahmeyer International GmbH*
- ▶ Opportunities for CDM approval for hydropower in Nepal – *U. Khatiwada, N.R.N. Investment Ltd, Nepal*

Session 9: Effects of climate change on hydropower

Chairman: Pravin Karki, World Bank

With glaciers melting, variations in monsoon flows and increased sediments runoff, water resources and hydropower management is being challenged. An expert panel will discuss the issues and challenges of this work.

- ▶ Looking at investments in hydropower through a climate change lens - *P. Karki, Senior Hydropower Specialist*
- ▶ Climate change and sediment management – *Prof Dr R.H. Hotchkiss, Brigham Young University, USA*
- ▶ Climate change adaptation - *Prof Dr Å Killingtveit, Norwegian University of Science & Technology, Norway*
- ▶ Quenching the thirst; climate change and water resources management – *Dr G. Annandale, Golder Associates USA.*

Session 10: Marine energy development

Chairman: Prof David Williams, BHA, UK

- ▶ A new solution for tidal energy could double its world potential – *F. Lempérière, Hydro Coop, France*
- ▶ A New wave energy converter technology – *A. Famoorzadeh, Farab Co, Iran*
- ▶ An innovative and economical solution for harnessing low head small hydro potential – *R. Kalra and M. Pachegaokar, Voith Hydro Pvt. Ltd., India; J. Lochschmidt, Voith Hydro Holding GmbH & Co., Germany*

CONFERENCE PROGRAMME

Session 11: Civil engineering - Dam safety

Chairman: Dr Andy Hughes, Atkins, UK

- ▶ Leakage identification at dams including Samanalawewa dam, Sri Lanka – A. Hughes and P. Rollins, Atkins, UK
- ▶ Dam break analysis and emergency preparedness plan in areas of conflict and valleys with limited accessibility due to topographical conditions – R. G. Pacheco, P. Chiodi and S. Lazzaro, ELC Electroconsult S.p.A. Italy
- ▶ Long-term dam safety monitoring of Victoria dam, Sri Lanka – S.R.K. Aruppola, Mahaweli Authority of Sri Lanka; A. Sorgenfrei, Pöyry Switzerland Ltd.
- ▶ Indian dam rehabilitation and improvement project initiative – B.R.K. Pillai and P. Berthet, DRIP, India; S. Giraud, EGIS, France
- ▶ Dam safety and operational efficiency improvement effort, Sri Lanka – D. Elakanda, DSWRP Project, Sri Lanka; R. Braunshofer, Pöyry Energy, Switzerland; L. Talagala, Pöyry Energy, Sri Lanka
- ▶ Using a risk assessment framework to determine a dam's readiness to impound – R. I. Herweynen and A.C. White, Entura Hydro Tasmania, Australia

Session 12: Small and micro hydropower

Chairman: Niels Nielsen, International Energy Agency

- ▶ Small hydro-electric engineering practice – B. Leyland, Consulting Engineer, New Zealand
- ▶ An innovative new approach to small scale hydropower with plug-in type turbines: Hydroring demonstration project in the Philippines – R. Muijtjens and M. van Zanten, Royal Haskoning DHV, The Netherlands
- ▶ Mini hydroelectric power project development at a tea plantation in Sri Lanka (250 kW) – J. Gunawarden, Green Renewable Energy (Pvt) Ltd., India
- ▶ Specific small hydro requirements for generators and their role for grid stability – D. Hoffmann and P. Sailer, Voith Hydro Holding GmbH & Co. KG, Germany
- ▶ Future small hydropower development challenges in Sri Lanka – W.G. Gnanadasa, Department of Irrigation, Sri Lanka
- ▶ Planning, design, construction and operation of small and mini hydropower plants in regulated waterways – J. Karunaratne, Urban Engineering Pvt, Sri Lanka

Session 13: Powerplant safety and maintenance

Chairman: Bryan Leyland, Consultant, New Zealand

- ▶ Sayano-Shushenskaya refurbishment; latest progress – E. Bellendir, VNIG Institute, Russia
- ▶ Earthquake effects on underground hydropower plants – R. Nasiifard, Moshanir Company, Iran
- ▶ Penstock pressure monitoring: an innovative predictive maintenance tool for hydropower plant safety – M. Dupont and J-L. Balester, EDF, France
- ▶ Where there's smoke there's fire - fire protection in hydro facilities – A. Canning, Entura Hydro Tasmania, Australia
- ▶ A review on fire safety assessment report in design of hydropower plants – A. Famoorzadeh, B. Ghashami and M. Saedimanesh, Farab Co, Iran

THURSDAY 13 MARCH – Morning

Session 14: Plans and potential in Southeast Asia

- ▶ Hulu Terengganu hydroelectric project generation enhancement-

- ▶ Tembat power scheme – Choy Fook Kun, SNC Lavalin Power Sdn Bhd, Malaysia; Z. B. Suleiman, Tenaga Nasional Berhad, Malaysia
- ▶ Evaluation of the effects on energy production of an existing hydro project from an upstream planned hydro project – S.L. Hui, Bechtel Power Corporation, USA; A. Wing-Keung Law, Nanyang Technical University, Singapore
- ▶ Completion of the Nancho hydropower project in Myanmar – U Zaw Min San and U Aung Lwin, Department of Hydropower Implementation, Myanmar; K. Inque, DHPI, Japan

Session 15: Social and environmental aspects

Chair: Cecilia Tortajada, Vice President, Third World Centre for

- ▶ Hydropower development and livelihoods: A quest for a balanced approach through research and partnerships – S. S. Sellamuttu - IWMI, Lao PDR
- ▶ The case for trans-boundary environmental and social impact assessments: case studies from the Lao PDR – P.W. Crawford, Xepian Xenamnoy Power Company, Lao PDR
- ▶ A renewed approach to a social safeguard management programme – experience from dam safety and water resources planning project, Sri Lanka – D. Elakanda and P.D. Leelaratne, DSWRP Project, Sri Lanka
- ▶ Environmental impacts and mitigation measures; downstream water releases issues in hydropower generation – S. Shrestha, Butwal Power Company Ltd., Nepal
- ▶ Improving reservoir ecology with constructed wetlands – P-J. Meynell, ICEM, Lao PDR
- ▶ Environmental assessment of small hydropower projects in Sri Lanka – T.S. Jayawickrama and G. Ofori, National University of Singapore
- ▶ Environmental impact of dam reservoirs on natural lakes – M. Najmaii, Farab Co, Iran
- ▶ Scale matters: can revenue-sharing improve equity in hydropower development in Nepal – S. Balasubramanya, IWMI, Sri Lanka; M. Giordano, Georgetown University, USA

Session 16: Sedimentation management

Chairman: Sultan Alam, Consultant, France

- ▶ The importance of sediment management in the selection of diversion dams – S. Alam, Consultant, France
- ▶ New self-cleaning dam-type sediment excluder from water upstream of the dam – A. Keshavarzi and J. Ball, University of Technology Sydney, Australia; R. Pishgar, Shiraz University, Iran
- ▶ Planning, designing and operating hydropower dams for sustainability - Prof Dr R.H. Hotchkiss, Brigham Young University, USA
- ▶ Modelling of sediment management in reservoirs. Case study of the Tarbela reservoir – M. Roca and G. Petkovsek, HR Wallingford, UK
- ▶ Real time suspended sediment monitoring for turbine abrasion siltation using lisst technology – O.A. Mikkelsen and Y. Agrawal, Sequoia Scientific, Inc., USA

THURSDAY 13 MARCH – Afternoon

Closing Plenary Session

- ▶ Outcomes of the ASIA 2014 Sessions
- ▶ Future directions for hydro and water resources development in Asia (Opportunities and challenges)
- ▶ Concluding remarks
- ▶ Evening: Farewell Dinner - Beach Party at the Mount Lavinia Hotel

CULTURAL EXCURSION AND ACCOMPANYING PERSONS PROGRAMME

CULTURAL EXCURSION

A half day trip will be offered for all participants on 10 March (the day of registration) to offer the opportunity for everyone to gain a first impression of the vibrant and colourful city of Colombo. Lunch will be included, close to the Indian Ocean, and a guided sightseeing trip is being planned, which will include the Colombo Museum and Gangaramaya Temple.



SOCIAL EVENTS

As usual, several opportunities will be provided for extra networking in a relaxed and informal way. There will be a reception with supper for Chairmen and Speakers on the evening of 10 March, in the picturesque gardens and Eco-Centre of BMICH.

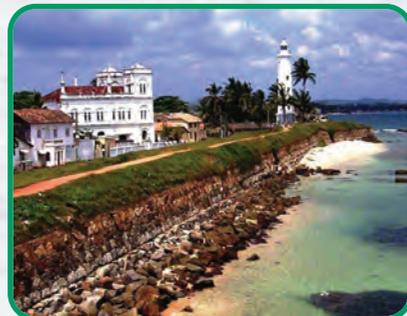
- A Welcome Reception for all participants, to be co-sponsored by Andritz, will take place on the evening of 11 March, at the Apé Gama cultural village
- On 12 March, the Exhibition will have extended opening hours, and drinks will be served in the early evening, to maximize the opportunity for delegates to meet all exhibitors.
- On 13 March the Conference Dinner will be a Beach Party, at the elegant and historical resort of Mt Lavinia close to central Colombo.



ACCOMPANYING PERSONS' TOURS

Accompanying persons will be offered a package of tours, to provide an opportunity to learn more about the culture and history of Sri Lanka, and to experience some stunning landscapes, both inland, and by the sea. Provisional plans include:

- A local tour, including a visit to the Sri Kailawasanathar Swami Devasthanam temple, a tour of the Apé Gama cultural village, lunch together at the Mount Lavinia hotel beside the Indian Ocean, and optional extra time to spend relaxing at Mount Lavinia.
- A day-trip to the Pinnawala Elephant orphanage in the Kegalle District. There will be opportunity to watch the elephants bathing and being fed.
- A day-trip to the City of Galle (see photos below), which was the chief port during the Dutch reign for the export of spices, gems and essential oils. Highlights in Galle will be a visit to the Dutch Fortress, and a chance to explore the little streets and the museum in the inner city. Lunch will be in a seafood restaurant. On the way back to Colombo, there will be a short stop at a turtle hatchery and conservation centre (destroyed by the tsunami and since rebuilt), and a chance to see the tsunami memorial.



ACCOMMODATION



Taj Samudra hotel

SELECTED HOTELS FOR ASIA 2014 DELEGATES

Hotel rooms in 5*, 4* and 3* categories, as well as apartments, in the city are being reserved at favourable rates for ASIA 2014 participants. Some overlook the Indian Ocean, and many have restaurants, swimming pools, fitness centres, WiFi and all normal international hotel facilities.

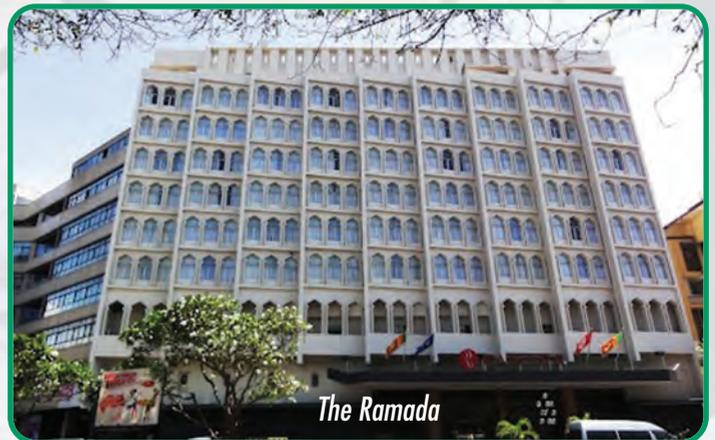
- Our main 5* option within the city is the Taj Samudra, a large luxury category hotel set in extensive tropical gardens.
- Another 5* option is the historical Mount Lavinia hotel, located south of Colombo city. Mount Lavinia is the former residence of British Governor Sir Thomas Maitland, who lived there in the early 19th century, and today services as both a business hotel and holiday resort, being located directly on the seashore.
- In the lower budget categories we offer the Ramada, a large 4* hotel in the heart of the city, and Renuka City, a smaller business hotel in the city, equipped with a pleasant roof-top pool overlooking Colombo.
- The modern Global Tower apartments offer an economical way of booking modern 2 or 3-bedroom accommodation, with individual bedrooms and bathrooms, and communal living space and kitchen facilities. This would be ideal for colleagues wishing to stay together in pleasant lower cost accommodation. Most bedrooms have a sea view.

Shuttle bus services are being provided during the conference period to the BMICH Congress Centre, both from the city hotels, and from Mount Lavinia, which is slightly further away to the south. The journey time is likely to vary between 20 and 30 minutes, depending on traffic.



Mount
Lavinia
Hotel

**ASIA 2014
Final Dinner venue**



The Ramada



Renuka City entrance and lobby



A room at the Global Tower apartments



Renuka City pool and rooftop terrace

STUDY TOURS

Three Technical Tours within Sri Lanka and one to Bhutan are planned to follow the conference.

Sri Lanka

Tour A

A three-day trip will take delegates to the Mahaweli complex with a total hydro capacity of 660 MW.

The first day will include a visit to the Upper Kotmale 201 MW underground powerhouse and Lower Kotmale dam, before proceeding to nearby Kandy (the name means city on the hills). The evening will be spent in Kandy, so named as it was protected by water, rocks and jungle. It was also the final capital of the Sri Lankan kings prior to the British arrival in 1815 AD.

On the second day, after departing from Kandy there will be visits to the Victoria arch dam and the 210 MW powerhouse, completed in 1986 and equipped with three Francis units; the Randenigala dam and hydro plant (2 x 61 MW) completed in 1986. On arrival back in Kandy there will be a visit to the famous Temple of the Sacred Tooth Relic of Buddha.

The third day will be spent visiting small and low head hydro schemes, including the Ukwela plant, Nalanda reservoir and Bowathenna plant, before returning to Colombo.



Tour B

A three-day trip will take delegates to the Walawe river basin.

On the first day, delegates will travel southeast from Colombo stopping at Ratnapura (translated as City of Gems) en route to visit the Samanalawewa dam and power station. The evening will be spent in Ella, located in the Badulla district, with lush forests and tranquil tea estates, which provide a pleasant backdrop to the journey here.

The second day will start with an optional early morning walk up Mini Adams Peak, also known as 'Punchi Sri Pada' in Sinhala, before departing for the construction sites of the Uma Oya multipurpose dam. This scheme includes a 120 MW hydro plant, to be equipped with two Pelton units. A TBM is being used for the first time in Sri Lanka at this scheme. After lunch continue to Udawalawe for the overnight stay.

The third day starts with a jeep safari through the Udawalawe National Park with possible elephant sightings, before visiting the Udawalawe dam. Lunch will be back in the hotel before departing for Colombo.

Tour C

A two-day trip to the Kelani river basin.

The tour starts with a visit to the old and new Laxapana powerplants. After lunch the group will proceed uphill, out of the forests and into the tea estates, passing the Devon and St. Claire waterfalls before stopping to visit a tea factory.

After dinner and overnight in a hotel, the second day will include visits to the Lower Kotmale dam and the Upper and Lower Kotmale power stations before heading back to Colombo to arrive by early evening.



STUDY TOURS

Kingdom of Bhutan *Tour D (Provisionally planned)*

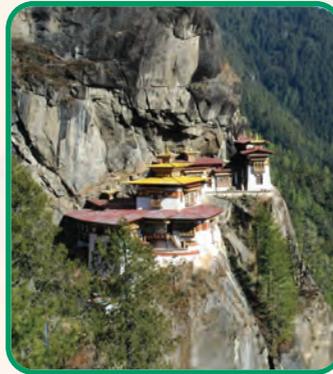
The Kingdom of Bhutan has an estimated hydro potential of 30 000 MW by virtue of its geographical location on the very steep southern slopes of the Himalayas. Just 5 per cent of the total potential (approximately 1500 MW) has been harnessed to date. Almost 100 per cent of the electricity generation in Bhutan is from hydro. The Government is embarking on the 10 000 MW by 2020 plan, with the Government of India agreeing to assist Bhutan in the development of the planned capacity, and the purchase of some of the power.

Bhutan is located on the southern slopes of the eastern Himalayas, landlocked between the Tibet Autonomous Region to the north and India to the south. The landscape in the kingdom ranges from sub-tropical plains in the south to the Himalayan heights in the north, where some peaks exceed 7000 m (23 000 ft).

Until the early 17th century, Bhutan existed as a patchwork of minor warring fiefdoms when the lama and military leader Shabdrung Ngawang Namgyal, fleeing religious persecution in Tibet, unified the area and cultivated a distinct Bhutanese identity. Later, in the early 20th century, Bhutan came into contact with the British Empire and retained strong bilateral relations with India upon its independence.

The first large hydro plant to be commissioned was the 336 MW Chhukha project in 1986-1988. After the Chhukha project, the 1020 MW Tala (2006-2007) hydropower plant was constructed with financing by the Government of India in a mix of grants and soft term loans. The construction of the two stages of the 64 MW Basochhu (2001-2005) was financed by the Government of Austria in a mix of development aid and soft term loans. Delegates will have an opportunity to visit each of these important projects during the tour.

The proposed tour will include visits to all of the major infrastructure of the Chhukha (336 MW), Tala (1020 MW) and Basochhu (Upper, 20 MW and Lower, 40 MW) projects. Refurbishment and maintenance is underway and planned at these schemes and the study tour will facilitate the exchange of expert advice to tackle some identified challenges. Delegates will also have a close up view of the 1200 MW Punatsangchhu I project which is under construction close to the site of the Basochhu scheme.



All interested persons should note that there is a considerable amount of mountainous travel between projects with early starts and late finishes, however, while long journey times are a pre-requisite to reaching the hydropower installations, the roadside views of waterfalls and wildlife are a perfect distraction.

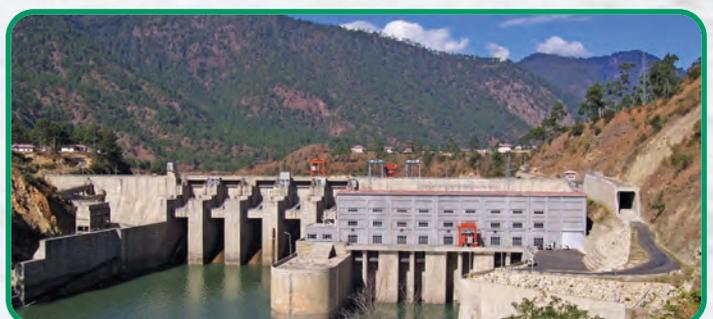
As a change from the originally publicized itinerary, the tour will now depart from Sri Lanka the day after the ASIA 2014 conference (morning of Friday 14 March) so that all conference sessions and the farewell dinner can be attended by tour participants. The journey will now travel via Bangkok (Thailand) and will include an afternoon and overnight stay at a hotel in Bangkok on Friday 14 March. The tour will end back in Colombo on the evening of Wednesday 19 March.

Thanks to the generous support of Druk Green Power Corp and the Royal Bhutanese Government, Bhutanese visa charges normally levied to visitors will be waived.

Because of the limited availability of airline seats into Bhutan spaces on the tour are being offered on a first-come, first-served basis. The full cost of the six-day Study Tour, including all air transport, meals, domestic transport and accommodation, will be \$1600. This includes an evening meal, airport transfer and a nights accommodation in Bangkok on 14 March.

While the trip is rigorous the study tour presents a rare opportunity to visit a unique and enchanting kingdom and we are confident that the journey will leave a very positive, lasting impression.

**For more information about the tour please contact;
steve.usher@hydropower-dams.com**





TECHNICAL EXHIBITION



STANDS BOOKED BY DECEMBER 2013

(Bold type denotes a Conference Sponsor)

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ASIA 2014 INDUSTRY SPONSORS



To receive further details of the exhibition and/or sponsorship opportunities, please contact: Mr Lukas Port, Miss Melanie Ganz or Mrs Maria Loreda
Tel: + 44 20 8773 7250/7251/7252 • Email: sales@hydropower-dams.com

Water Resources and Hydropower Development in Asia - V

Bandaranaike Memorial International Conference Hall, Colombo, Sri Lanka; 11-13 March 2014

BOOKING CONDITIONS

The Conference **Water Resources and Hydropower Development in Asia (ASIA 2014)** is being organized by *The International Journal on Hydropower & Dams* (Aqua-Media International Ltd) with event management by SureFire Events, UK.

On-line Registration

We strongly encourage you to register on-line via the *Hydropower & Dams* website at:

www.hydropower-dams.com

Registrations will be handled by SureFire Events. This is a secure server website. You may receive an acknowledgement of registration on completion of this process; however, this is not a confirmation.

Registration by post or fax

Complete the registration form and return it, with payment, to the Conference Secretariat. Please complete one registration form per delegate, including any accompanying persons.

www.hydropower-dams.com

The total fees for Conference registration, accompanying persons' programme, accommodation deposit, cultural excursion and/or study tour (if applicable) should be calculated and totalled in the 'Total US\$' column on the second page of the registration form.

Collection of badge and documents

This will begin at 09.00 hrs on Monday 10 March 2014, at BMICH.

Payment

Payment for all services (fees, hotel deposit, tours) must be made in US dollars (\$) and received in advance of the Conference. Payment is possible by the following methods:

- On line by Visa or MasterCard
- By bank transfer to SureFire Events (see details on the registration form).

All fees paid by credit card will be charged in US\$.

Accommodation

We strongly encourage you to register and reserve your accommodation online where it is possible to view the latest availability. The Conference organizers have secured rooms at a wide range of hotels in various price categories in Colombo. Rooms will be offered on a first-come-first-served basis. You are advised to reserve your room well in advance, as availability cannot be guaranteed.

Please complete the accommodation section of the registration form, and return it to the Conference Secretariat (SureFire Events). Full payment will be required to secure your accommodation booking. All hotel room extra charges must be settled in full directly with the hotel prior to departure. SureFire Events will endeavour to meet all accommodation requests. However, should your preferred hotel be full, SureFire Events reserves the right to make your reservation at the nearest available alternative.

Disclaimer

All best endeavours will be made to present the programme as printed. The ASIA 2014 organizers and their agents reserve the right to alter or cancel, without prior notice, any arrangements, timetable, plans or other items relating directly or indirectly to ASIA 2014 for any cause beyond its reasonable control. The organizers and agents are not liable for any loss or inconvenience resulting from such alteration. The Conference and Tours are subject to minimum and maximum numbers. Tour places are subject to availability on a first-come-first-served basis. Full payment for tours must be received at the time of registration.

Cancellations

Cancellations must be made in writing to SureFire Events. Cancellation charges will be payable as shown in the Table below. Substitution of delegates after a reservation has been made is only acceptable before the Conference starts, and no extra fee is payable. Any necessary refunds (see Table below) will be made after the Conference. In rare circumstances, we reserve the right not to confirm a booking if there is a conflict of interest between the applicant and the organisers, co-organisers or host country of ASIA 2014.

Liability/Insurance

The registration fees do not include the insurance of participants against personal accidents, sickness, cancellations by any party, theft, loss or damage to personal possessions. The organizers accept no responsibility for death, injury, loss or accident, delay arising from any act or default of any person, or any other matter arising in connection with Conference services or transport. The organizers make no warranty in this connection. All services provided are subject to local laws. Arrangements for the Conference have been made in accordance with UK Law.

Delegates, exhibitors and tour participants are strongly advised to take out adequate personal insurance to cover risks associated with travel, accommodation, cancellation and theft or damage to personal belongings. The organizers reserve the right to amend any part of the Conference programme or arrangements if necessary. In the very unlikely event that it is necessary to cancel any of the Conference arrangements, an appropriate refund will be made and thereafter the liability of the organizers will cease.

Passport and Visa Requirements for Sri Lanka

It is the responsibility of all participants to check their own passport and visa requirements. Please contact the Sri Lankan Embassy or consulate in your country if in doubt about requirements.

Letters of invitation

For the vast majority of delegates, a visa for Sri Lanka can be obtained online via the ETA scheme. Please let us know at the time of registering and a letter can be issued to assist with obtaining a visa. This does not imply an invitation to the Conference without payment of registration fees, unless such arrangements have been made with the organizers. If you need a letter from the host country, as well as the organizers, please notify us as soon as possible. Please allow plenty of time for visa applications.

| Date cancellation received | On or before 2 February 2014 | From 3 February 2014 | On or after 21 February 2014 |
|--------------------------------------|----------------------------------|--------------------------------------|------------------------------|
| Registration (Conference/Exhibition) | Full refund minus \$50 admin fee | 50% of fee is forfeited | No refund |
| Technical excursions | Full refund minus \$50 admin fee | No refund unless place can be resold | No refund |
| Accommodation | Full refund minus \$50 admin fee | No refund unless rooms can be resold | No refund |

A reduced registration fee is available for current subscribers to *Hydropower & Dams*

CONTACT DETAILS

For enquiries concerning registration and accommodation, contact:



SureFire Events, Unit 8, Hinton Business Park, Tarrant Hinton, Blandford DT11 8JF, UK

Tel: +44 (0)1258 447 040 • Fax: + 44 (0)700 349 7034 • Email: asia2014@surefire-events.com

NB: Registration forms and payment should be sent to SureFire Events, UK.

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, Sutton, Surrey SM6 6AN, UK.

Tel: + 44 (0)20 8773 7244 • Fax: + 44 (0)20 8773 7255 • Email: asia2014@hydropower-dams.com

Website: www.hydropower-dams.com

THE INTERNATIONAL JOURNAL ON
**HYDROPOWER
& DAMS**

Water Resources and Hydropower Development in Asia - V

Bandaranaike Memorial International Conference Hall, Colombo, Sri Lanka; 11-13 March 2014

REGISTRATION FORM

(Deadline for early booking discount: 24 January 2014)

This registration form is a self-billing order form, which should be sent to SureFire Events, UK, with payment for all items booked on the form. By completing this form you are agreeing to the Booking Conditions within this brochure. Fees are payable in US Dollars (US\$). Each Conference/Exhibition participant should complete a separate form.

PLEASE COMPLETE THE FORM IN CAPITAL LETTERS, AND **EMAIL A PORTRAIT PHOTO (JPEG FORMAT)** TO BE USED ON A PHOTOBOARD AT THE CONFERENCE

| | | | |
|--|--|--|---------------|
| Title (Mr/Ms/Mrs/Dr/Prof/etc): | Given name: | Family name: (surname) | |
| Name as it should appear on your badge/in correspondence: ie, Mr John BROWN or Mr Li Jishang | | | |
| Job title within organization: | | | |
| Organization: | | | |
| Organization's postal address (inc. post code and country): | | | |
| Tel (inc. country code): | | Fax (inc. country code): | |
| Mob/Cell (for use by organizers only): | | | |
| Email address: | | Web site: | |
| Data Protection: I do not wish my email address to be passed to any third party <input type="checkbox"/> | | I do not wish any contact details to be passed to a third party <input type="checkbox"/> | |
| FEES | Up to 24 Jan 2014 | From 25 Jan 2014 | Total US\$ |
| FULL DELEGATE FEE: Includes attendance of the Conference and Exhibition; documentation and CD of papers; morning and afternoon refreshments; lunches during the Conference; social programme. | US\$ 995 | US\$ 1100 | |
| H&D SUBSCRIBER DELEGATE FEE: For subscribers to <i>Hydropower & Dams</i> H&D Subscription No: | US\$ 900 | US\$ 1100 | |
| DELEGATE FEE WITH NEW SUBSCRIPTION TO H&D (reduced registration fee + 6 issues of H&D + World Atlas & Industry Guide + Maps) | US\$ 1140 | US\$ 1340 | |
| SPEAKER FEE: Includes all facilities described above for Full Delegates, plus an additional reception on Monday 10 March. NB: This fee applies to <u>one</u> person per paper (main author or presenter) | US\$ 575 | US\$ 575 | |
| FIRST EXHIBITOR FEE: (One full participant fee is included with exhibition booking) Stand No: | Free of charge | | |
| SECOND (+ THIRD) EXHIBITOR FEE: (Covers attendance of Conference sessions, CD of Conference papers, evening social programme and lunches) Stand No: | US\$ 750 | | |
| ACCOMPANYING PERSON FEE: (For family members or friends not attending the Conference) The fee includes activities/excursions during three days, with lunch (see programme), and the evening social events. NB: Accompanying persons who do not register by completing this section are <u>not</u> eligible to attend lunches or social events. Name to appear on badge (inc. title Mrs/Miss/Mr/Dr/etc): | US\$ 350 | | |
| EXCURSION AROUND COLOMBO: (Monday 10 March) Visit to the Gangaramaya Temple and Colombo Museum (includes lunch) I wish to book seats at US\$ 80 per person | | | US\$ |
| DIETARY REQUIREMENTS | | | |
| Participant : | Vegetarian meals required <input type="checkbox"/> | Other dietary requirements / special needs | |
| Accompanying Person: | Vegetarian meals required <input type="checkbox"/> | Other dietary requirements / special needs | |
| OPTIONAL DONATION TO THE AMI HYDROPOWER FOUNDATION This is a charitable foundation, set up by Aqua-Media and governed by international trustees, which exists to facilitate the participation of delegates from the less developed countries to attend the conferences. (More details can be found at: www.hydropower-dams.com). Suggested minimum donation: US\$ 25 | | | US\$ |

PLEASE TOTAL THE COSTS ON THIS PAGE AND CARRY THEM OVER TO THE SECOND PAGE

SUB-TOTAL OF FEES CARRIED OVER FROM PREVIOUS PAGE

US\$

ACCOMMODATION *(Please refer to Booking Conditions)*

We strongly encourage you to register and reserve your accommodation online where it is possible to view the latest availability.
The Conference sessions, Exhibition, Speakers' reception and side events will be held at the Bandaranaike Memorial International Conference Hall.

SOLE USE BEDROOM WITH PRIVATE BATHROOM
(includes taxes and breakfast)

- 5* Taj Samudra **US\$ 175 per night**
 5* Mount Lavinia **US\$ 150 per night**
 4* Ramada Colombo **US\$ 140 per night**
 4* Global Towers Apartments (2 beds) **US\$ 228 per night**
 3* Renuka Hotel **US\$ 126 per night**
 2* Pearl Grand **US\$ 105 per night**

TWIN OR DOUBLE ROOM WITH PRIVATE BATHROOM
(includes taxes and breakfasts for two people)

- 5* Taj Samudra **US\$ 186 per night**
 5* Mount Lavinia **US\$ 160 per night**
 4* Ramada Colombo **US\$ 150 per night**
 4* Global Towers Apartments (3 beds) **US\$ 316 per night**
 3* Renuka Hotel **US\$ 136 per night**
 2* Pearl Grand **US\$ 120 per night**

Preference: Twin Double *(cannot be guaranteed)*

Check-in date: March 2014 Check-out date: March 2014 Total number of nights:

Special requests (eg. non-smoking room):

Twin occupancy: Name of partner

*(If you wish to share a room with another delegate, then you must both request the arrangement, and both send registration forms to SureFire Events at the same time. Only one person should make the payment for the hotel.)***TECHNICAL TOURS** See details of itineraries in this brochure. Prices include all transportation (inc. air fares), meals, guides, entrance fees during sightseeing trips, and accommodation

US\$

Homeward flight details: Date: Flight No: Depart time: From to:

Tour A - Sri Lanka Three day trip to the Mahaweli Complex (Kotmale, Victoria, Randenigala plus low-head schemes)...... Single room US\$ 530 per person *(total tour cost)* Sharing twin room US\$ 420 per person *(total tour cost)***Tour B - Sri Lanka** Three day trip to the Walawe river basin...... Single room US\$ 490 per person *(total tour cost inc. flights)* Sharing twin room US\$ 380 per person**Tour C - Sri Lanka** Two day trip to the Kelani river basin...... Single room US\$ 295 per person *(total tour cost)* Sharing twin room US\$ 240 per person *(total tour cost)***Tour D - Bhutan** Six day trip to Bhutan and Thailand...... US\$ 1600 per person *(total tour cost inc. flights)***EUROPEAN SMALL HYDROPOWER ASSOCIATION PRE-CONFERENCE ONE DAY SEMINAR**

US\$

The European Small Hydropower Association (ESHA) will be organizing a training seminar on small-scale hydro (Monday 10 March, 11.00 to 18.00 hrs).
There will be a nominal charge of US \$50 to attend, to cover administration and refreshments.

I/we will attend *(please tick boxes as applicable):* Yes No **SOCIAL EVENTS** (Included in the registration fee and only available for registered participants)I/we will attend *(please tick boxes as applicable):*

Tuesday 11 March - Welcome Reception at Apé Gama

| Participant | Accompanying Person |
|--|--|
| Yes <input type="checkbox"/> No <input type="checkbox"/> | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| Yes <input type="checkbox"/> No <input type="checkbox"/> | Yes <input type="checkbox"/> No <input type="checkbox"/> |

Thursday 13 March - Conference Dinner and beach party at Mt Lavinia Hotel

TOTAL PAYMENT FOR REGISTRATION, HOTEL AND EXCURSIONS (include total from first page)

US\$

(Please ensure that this box is completed, so that your registration can be confirmed)

Please quote your company VAT / Mwst / TVA / ALV / IVA/ BTW / MOMS number:

PAYMENT

Payment is possible by the following methods:

- Bank transfer (the preferred method) to: Surefire Events Ltd., Barclays Bank, Wimborne, Dorset, UK
 - Sort Code: 20-96-96 • Account: 76359966 • IBAN number: GB86BARC20969676359966 • SWIFT: BARCGB22
 - For on-line bookings, payment will be taken by BarclayCard from your debit or credit card. All on-line fees will be taken in US dollars (\$).
- All credit card transactions will be with SureFire Events (this is the name which will appear on your statement)

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Online registration via: www.hydropower-dams.com