



International Centre
for Hydropower

ANNUAL REPORT 2014

Gaining through training

www.ich.no



Norad



Dear ICH friends,

With the courtesy of NVE, Photo: Stig Storheim



I am happy to announce that 2014 marked another year in which the International Centre for Hydropower (ICH) experienced an all-time record in the level of activities, while still providing service of the highest quality. Furthermore, the demand for ICH courses has continued to increase across all regions.

In order to best support sustainable development in the hydropower sector, ICH strives to ensure that the highest ethical standards are followed. In an effort towards this mission, ICH has become a member of the United Nations Global Compact, and is thus committed to implementing the 10 principles relating to Human Rights, Labour, Environment and Anti-Corruption.

2014 also saw promising developments in the building of important relationships with other non-profit organisations, government agencies and institutions. We recognize that, in the field of international development, cooperation between organisations united has a far greater impact than that of any single organisation. This is why ICH, in the course of 2014, has established platforms for further collaboration with its partners, including several international development banks. I am confident that these steps will prove rewarding.

In light of the 2014 accomplishments, I anticipate continued growth and further cooperation with the international community, while following ethical practices in the ongoing efforts to facilitate and promote sustainable international development.

A handwritten signature in blue ink, appearing to read 'Kjell Repp'.

Kjell Repp
President of ICH and Chairman of the Board of Directors

International Centre for Hydropower Code of Conduct

The core purpose of ICH is to raise the standards of competency in the hydropower sector through organizing training programmes, workshops and seminars, as well as to promote the sustainable development of hydropower resources.

The Code of Conduct is an integral part of the formal governance regime at ICH. All ICH employees, directors of Board of Directors and contractors delivering educational services on behalf of ICH, must accept this Code of Conduct in writing. The below headings summarises the scope of the Code of Conduct, the full text is available on the ICH website.

- Committed to the UN Declaration on human rights
- Providing equal opportunity
- No forced or child labour
- Freedom of association and free speech
- Committed to environmental protection
- In support of free enterprise
- Legal compliance
- Protecting ICHs information and ideas
- Insider trading
- Corruption & Frauds
- No political contributions
- Gifts and other payments within limits
- No bribes
- Avoiding conflicts of interest



The Board of Directors

Kjell Repp
Chairman

Torbjørn Nielsen
Deputy Chair

Reidar Hindrum

Hege Iversen

Jan Daleng



The ICH secretariat

Tom Solberg
Managing Director

Carole Rosenlund
Head of African Region

Pål Johansen
Project Manager O&M

Laura C. Bull
*Head of Studies and
Latin American Region*

Henriette S. Holberg
*Head of Finance and
Strategic Development*



Kjell Repp



Torbjørn Nielsen



Jan Daleng



Hege Iversen



Reidar Hindrum



Kjell Erik Stensby



Leif Lia



Nils Skjeldal



Ove Rusten



Bjarne Børresen

The work of the Board

Four meetings of the Board were held in 2014. A total of 36 issues have been dealt with. Among the most important were the strategy discussions, budgeting and financial monitoring.

The present Board members were elected at the Annual Meeting in May 2013 for the period 2013-2015. The Board consisted of the following members:

Kjell Repp (*chair*), Norwegian Water Resources and Energy Directorate (NVE)
deputy: Kjell Erik Stensby, NVE

Torbjørn Nielsen (*deputy chair*), Norwegian University of Science and Technology (NTNU)
deputy: Leif Lia, NTNU

Jan Daleng, Statkraft
deputy: Nils Skjeldal, Bergen Grid Company (BKK)

Hege Iversen, Norconsult
deputy: Ove Rusten, Multiconsult

Reidar Hindrum, NEA
deputy: Bjarne Børresen, Energi Norge

Two members of the Board left their positions during the year; Bjarne Børresen left the employment of Energi Norge, and Reidar

Hindrum left the Board due to the Norwegian Environment Agency no longer being an ICH member.

The election committee is elected for the period 2011-2015 and consists of:

- Odd K. Ystgaard, Norconsult AS (chair)
- Øivind Johansen, Norwegian Ministry of Petroleum and Energy (OED)
- Kjell Erik Stensby, NVE

The Academic Committee was established in 2010, and helps to ensure the quality of existing and new courses, participate in the evaluation of ICH's activities and propose new ones, and have this year given valuable input in connection with on-going processes like strategic planning. The committee is called upon by ICH's Managing Director and consists of the following representatives from ICH's members:

- Meg Bishwakarma, Hydro Lab, Nepal
- John Moe, Norconsult AS
- Anders Iversen, DN
- Ole Gunnar Dahlhaug, NTNU

Two members of the Academic Committee left their positions during the year; John Moe retired from Norconsult and Anders Iversen left the committee due to the Norwegian Environment Agency no longer being an ICH member.



The Secretariat

Tom Solberg has served as Managing Director since January 2011. Laura Bull and Carole Rosenlund held full time positions as Head of Studies and as Head of Africa Region respectively. Pål Johansen and Anne Camilla Vaalund held full time and 50 % positions, as Project manager O&M and as Office Administrator respectively. The total capacity of the secretariat was thus 4.5 FTEs (Full Time Equivalent) for 2014. Additionally, capacity was supplemented by the outsourcing of accounting services and through an operating and service agreement for IT services from Evry Økonomitjenester AS. Reception and postal services are included in the rental agreement.

The accounts system was upgraded from May to a modern system, Maconomy, which will enable the administration to follow the expenditures and projects costs much more closely than the old system allowed.



Current activities

Profiling

The Centre's website has been developed continuously and made as dynamic as the capacity and resources allow. During the year the website was re-designed and the functionality improved.

The quarterly ICH Magazine that was introduced in 2011 has continued to grow, and is now regularly receiving contributions from the member organizations, course participants and other parties in the ICH network. Other relevant information is also posted regularly at the website. Through agreements with other organizations many links are established to the relevant websites. Registration forms for all the Centre's activities can be filled in directly on the website. Only on-line applications are now accepted, except in some very few cases where this has not been possible.

The 2015 course programme is distributed on the ICH website and Facebook page.

The course programme, information brochures about new activities such as the turbine courses, Latin-America courses and general ICH information were also distributed at all the events where ICH was represented in 2014.



The Centre is a member of the following organisations:

- International Association for Small Hydro (IASH), India
- International Network on Small Hydro Power (IN-SHP), China
- International Hydropower Association (IHA), United Kingdom
- European Small Hydro Association (ESHA), Belgium
- The Norwegian Hydrological Council (Norsk Hydrologiråd) and
- Forum for Teknologi og Utviklings-samarbeid (FTU) under Tekna.

ICH is represented in the IN-SHP's Coordinating Committee, IHA's permanent committee for research and education, Norsk Hydrologiråd and in NNCOLD's support committee. NNCOLD is responsible for organising the 25th Congress and 83rd Annual Meeting of ICOLD in Stavanger in June 2015, and ICH is on the Organising Committee for this event and is also responsible for the technical symposium Hydropower'15 that will be arranged in connection with this event.

Activities under the Norad agreement

20002: Online Competence Market

The efforts to improve the user friendliness of the website continue. The web interface has been totally refurbished during the year and the functionality improved. The online platform elearning.ich.no is used actively to manage the online turbine monitoring and turbine governor courses.

Courses:

A total number of 30 different courses and training events were organised under the Norad agreement during 2014, thus setting a new all-time high activity level for ICH.

20001: Hydropower and the Environment (HE)

The Hydropower and the Environment course took place 18th August – 4th September 2014. 19 participants representing 11 countries took part in the course. The course commenced in Trondheim and included a field trip to Orkla. From the 30th August to the 2nd September, participants were transported by bus through Åndalsnes, Lom and Lillehammer, visiting local hydropower plants during the day. The delegation arrived in Oslo on the 2nd September where they stayed for the remainder of the course, receiving lectures and institutional visits. A case study was run during the course as well as several group exercises; the interaction and exchanges of experiences gave the entire academic activity a great dynamic. The technical tour ended in Oslo with visits to Statkraft and NVE.

20004: Contractual and Legal Aspects in Hydropower Development

The Contractual and Legal Aspects in Hydropower Development course took place in Trondheim, Norway from 24th to 28th March. In total there were 11 course participants, representing the following countries: Zambia, Tanzania, Nepal, Myanmar, Equador and Costa Rica. The course comprised of lectures from specialists within legal issues and corporate



social responsibility in the Hydropower industry, with focus on reviewing current management systems based on the existing and developing legislation in the participating countries Ecuador, Costa Rica, Myanmar, Nepal and Tanzania. Challenges of political and administrative systems, distribution of power and responsibilities, contractual framework and risk allocation and interaction with international banks and organisations provided participants with the newest legal information applicable to the legislation of their own country.

2005: Condition Monitoring and Maintenance of Turbines (Turbine Governor Principles - Waterway Dynamics and Governing of Hydropower Plants)

The Condition Monitoring and Maintenance of Turbines course comprised of two parts, the latter of which was held in Trondheim, Norway. There were 19 participants, representing Ghana, Honduras, Peru, Sri Lanka, Tanzania, Uganda and Zambia.

Part 1 of this course was a web-based preparatory class consisting of online lectures and assessments as well as a discussion forum to stimulate information flow between participants. The purpose of Part 1 of this course was to familiarize participants with topics to be covered in greater detail and at a higher level in the subsequent part of the course. Part 2 of this course was a 5-day workshop which took place in Trondheim from 1st to 5th September. With an expert instructor this workshop was based on the knowledge the participants gained through Part 1, and involved site visits to Rainpower

and Statkraft Power plants, practical exercises and demonstrations of testing equipment and methods.

2009: Risk Management in Hydropower Development

The Risk Management in Hydropower Development course took place in Trondheim from 6th to 10th October. 15 participants from 9 different countries were present. The course included lectures from specialists within risk mitigation in hydropower financing, corruption and social and political risk and gave insight into the essential issues in the pre-feasibility phase of a potential project in order to assess the environmental and economic sustainability of the respective projects. In addition to the importance of the natural conditions, the course featured different solutions within civil, mechanical and electrical engineering.

2010: Small Hydro Resources

This course took place in Trondheim from 19th to 24th May. 15 participants, 5 of which were women, took part in this course. The intended outcome of the program was to give the participants a better understanding of how to properly evaluate a feasibility study by understanding the requirement to the different elements in a well functional power plant, both individually, and harmonised together in a complete power plant. The program focused on all aspects and elements related to a solid feasibility study of a small hydro project's potential. It gave insight in risk assessment, geology, hydrology, cost and economic analysis, environmental and social assessments,



design of infrastructure and installed technical equipment. The program culminated with a fieldtrip to three different small hydropower plants in the region.

20013: Regional Power Trade Afrika

The Regional Power Trade course took place in Johannesburg, South Africa from 15th to 20th September, and had 19 participants from 8 African countries. This course resulted from collaboration with SAPP (Southern Africa Power Pool) and coincided timely with SAPP's current process of launching the second version of its trading platform aimed at further increasing the regional trading, whilst enabling SAPP to offer its services to other emerging African power pools. Having gained a lot of experience through the first years of operation of its market, SAPP is perceived as a role model for development of regional cooperation by other African regions.

The course focused on the tasks required to bring more liquidity into the markets in order to promote efficient cross-border trading in the medium and short term, whilst highlighting some of the required changes to the structure of the market focusing especially on the regulatory role. Presentations from SAPP & RERA (Regional Electricity Regulators Association of South Africa) were given, opening up discussions on the regulators' roles

both in each of the individual countries, but also regionally. Group exercises and role play on bidding principles were part of the course and this elevated the participants' knowledge and understanding of the SAPP market. Representatives of EAPP (Eastern Africa Power Pool) were also in attendance to share their experiences as well as to gain knowledge from the group.

20015: Kafue Gorge Regional Training Centre; Managing Water Hyacinth

The Managing Water Hyacinth course took place in Kafue Gorge, Zambia from 27th to 31st October, and had 14 participants from Malawi, Tanzania, Uganda and Zambia, representing hydropower companies, authorities and water & sewage companies. This workshop was designed to raise awareness and a call to action to alleviate the socio-economic impacts and costs of water hyacinth and siltation in reservoirs for hydropower applications. This was an intensive course that looked to empower participants with the necessary skills to adopt appropriate mitigations to combat infestation of water hyacinth and fully engage with stakeholders at all levels, in order to coordinate activities aimed at changing bad practices along river courses which exacerbated the spread of the weed. Three of the key resource persons were females from the region.



2016: IPPAN Operation & Maintenance Management

The Operation and Maintenance Management course was held from 24th to 28th November in Duhlikel, Nepal and was a cooperation between Independent Power Producers Association of Nepal (IPPAN) and ICH. All of the 20 participants were from Nepal. The program was extended upon request from the participants. This extension included lectures on sedimentation challenges, and maintenance of power transformers. The first outcome of the program aimed to give the participants a better understanding of how to properly operate and maintain a power plant based on modern maintenance philosophy, with a strong focus on Health, Safety and Environment (HSE). The second aim was to cement the notion that operating according to these principles requires an initial investment, but achieves good results in terms of long-term gain.

2019: Courses in Myanmar

ICH organised 3 separate courses in Myanmar during 2014, with the Ministry of Electric Power (MOEP) being the local partner.

The first training activity was the second instalment of the *Negotiations Techniques* course and was held at Nay Pyi Taw from 3rd to 7th February. There were a total of 21 participants, all from Myanmar, with a slight

female majority of 11 women to 10 men. This concluding part of the 2-part training program mainly consisted of a fairly comprehensive case study based on two teams negotiating a commercial Project Agreement (Concession Agreement) for a Hydro Power Project in Myanmar expected to export the bulk of the production to a neighbouring country. The two teams, one representing the government and the other the developer, had to prepare their position papers and, utilizing advice from experts that were provided as resource persons, would perform the negotiations in stages throughout the week, successfully concluding with an agreement for the development of the project.

The second course had the topic of *Hydropower and the Environment* and took place in Nay Pyi Taw from 12th to 16th March, with 21 participants; all from Myanmar, and with 11 being women. This was the first environmental course delivered of a series of courses that ICH provides in agreement with the Ministry of Electric Power in Myanmar in collaboration with their Department of Hydropower Implementation Design branch. The course activities varied from reviewing case studies, individual assignments and group work. The follow up to this course will be run in 2015.

The third activity was the *Operation and Maintenance Management* course that also took



place in the political capital of Myanmar, Nay Pyi Taw. There were 24 participants, all from Myanmar. The topics were focused on themes such as availability, planning, models & methodology, maintenance philosophy, computerized maintenance systems and health, safety and environment in the operations. The week-long program was supplemented with professional discussions and a significant portion of group work.

20024-01: Indonesia O&M

Three events on the topic of Operation and Maintenance were organised in Indonesia during March 2014:

The *Operation and Maintenance of Small Hydro* course took place from 17th to 19th March 2014. This course was supported by Norad, OED and the Norwegian Embassy in Jakarta, and was a cooperation between ICH and the Indonesian State Utility for Electricity, PLN. The program took place at Makassar on the island of Sulawesi at PLN's University for Renewable Energy, comprising 53 participants, only 3 of which were women. The course focused on the importance and benefits of operating a small scale hydro installation according to a proper and modern operation and maintenance philosophy/system. Health, Safety and Environment as well as indicators which trigger the need of rehabilitation were also important parts of the program.

The *Project analysis of Small Hydro* course took place from 20th to 21st March 2014, and was also held at PLN's University for Renewable Energy in Makassar with the same 53 participants. The program focused on the essential understanding of a small scale hydro project evaluation. The lectures looked into issues such as hydrologic analysis, project layout, grid connections and financial evaluation.

The *Strategic Maintenance and Rehabilitation of Hydropower plants* mini-seminar took place the 24th of March in Jakarta, Indonesia. The event was aimed at anchoring the need for strategic maintenance with top level management in the hydropower sector. The program had 40 participants including 8 females, and the main topics covered were: Plans and strategies; the basis of revenue from a smoothly running plant; Economic advantages of accurate and regular maintenance and Upgrading and Rehabilitation: Technical and Economic indicators.

20024-02: Standardization of the Electricity Supply Chain

The Standardization of the Electricity Supply Chain course was held in Kafue Gorge, Zambia from 18th to 22nd August. There were 23 participants from Kenya, Malawi, Namibia, South Africa, Tanzania, Uganda and Zambia; 7 of which were women. A pilot course and the first ICH activity for 2014 in Africa, this



was a collaboration with KGRTC and PIESA (Power Institute for East and Southern Africa), a voluntary association with a main focus on technical rationalization to achieve economies of scale with local manufacturers in an effort to enhance electrification in the region. PIESA aims to improve electrification in East and Southern Africa through sharing information, research, technology, skills and experiences for the benefit of customers and suppliers in the electricity distribution industry. This course was designed to enhance interaction and communication among stakeholders with greater confidence, clarity and impact. The course provided insight into electricity generation, transmission, distribution and supply as well as the issues related to tariffs and coordination of public awareness on environmental and social aspects.

2024-03: Dam Safety Peru

The Dam Safety course was run in Peru from 22nd to 28th June. There were 21 participants from Argentina, Chile, Colombia, Costa Rica, Guatemala, Peru and Uruguay. This was the first edition of the Dam Safety course in Latin America, and it was tailor made accordingly. The main focus of the course was regulating dam safety and comparing institutional models for dam safety purposes. The 5 day course brought participants to Arequipa where they were privy to seminars by lecturers from Norway, Peru, Costa Rica and Colombia; representing among

other institutions, The World Bank. In addition Interamerican Development Bank (IDB) held a 1 hour presentation via video link from Washington. The last day featured a field trip to Pillones embankment dam and river diversion scheme.

2024-04: Sediment Workshop Bhutan

The Sediment Workshop Bhutan was held in collaboration with Hydro Lab of Nepal and Druk Green Power Corporation Limited (DGPC) of Bhutan, from 24th to 26th September. There were 28 participants, all from Bhutan, 9 of which were women. This course was aimed towards experienced professionals in hydropower planning and operation, based on a concrete request by DGPC for a training program in the area of reservoir sedimentation and sustainability related to the Bathymetric Survey of Reservoirs by DGPS (Differential GPS). An expert was brought in carrying the required equipment, and the workshop was divided into a theoretical part and a practical part, conducted at the Chhukha Hydropower project in Bhutan. The Chhukha project provided all the lecture facilities as well as accommodation and board for the resource persons and the participants.

2024-05: Revenue Protection Management and Vandalism – Uganda

The Revenue Protection Management and Vandalism course took place in Munyonyo,



Uganda from 29th September to 8th October. There were 18 participants from Kenya, Malawi, Tanzania, Uganda and Zambia; 5 of which were women. The course had originally been planned for Ghana but due to the very unfortunate Ebola crisis in the West African region, the course was re-located to Uganda. ICH partnered with UMEME (Uganda's electricity distribution company), UETCL (Uganda Electricity Transmission Company) and KGRTC (Kafue Gorge Regional Training Centre, Zambia) in the execution of this course. The workshop focused on minimizing revenue losses in utilities by providing solutions against pilfering, theft, fraud, misallocation and misappropriation of revenue as well as the education of the role players to implement effective counter measures.

A metering board with different meter types had been constructed for practical exercises demonstrating various tamper defects that participants were tasked with investigating and exposing. This gave a real insight into the magnitude of the problems faced, and losses encountered by utilities, ensuing discussions around lasting solutions. Technical excursions were organized to UMEME's Revenue Collection Centre, Meter Testing Laboratory and Distribution networks and clients, including a visit to the UETCL Monitoring Centre.

20032: Sustainable Reservoir Management – Ethiopia

The Sustainable Reservoir Management course took place from 17th to 19th November in Ethiopia. The participants came from Ethiopia and Norway and included 4 women. This 3-day course was a joint effort between ICH, the Norwegian University of Science and Technology (NTNU), Center for Environmental Design of Renewable Energy (CEDREN) in partnership with the Addis Ababa Institute of Technology (AAiT) School of Civil and Environmental Engineering (SCEE). To positively support progress, the underlying aim of the involved partners is to develop a training program, and contribute to technology transfer in Ethiopia related to Reservoir Management. This course was organized as a first step in developing the program and to set the agenda for future strategic partnerships by defining important topics through discussions with key stakeholders in Ethiopia's hydropower development. The participants of the workshop included faculty staff and students from academic institutions, utilities, authorities and other relevant stakeholders.

The workshop involved a series of presentations from the Norwegian delegation and Ethiopian counterparts, a field visit to the Koka Hydropower Reservoir (a multipurpose facility constructed in 1957-1960, planned by



Norconsult and said to be their first international hydropower project), and discussions on future collaborations.

20023-01: Hydropower Financing and Risk Management Nepal

The Hydropower Financing and Risk Management course took place in Kathmandu, Nepal from 27th to 31st January. The course had 25 participants from Nepal, 4 of which were women. The banking sector in Nepal consists of a multitude of smaller banks and a few larger ones. Representatives from the sector had on several occasions voiced the need for a better understanding of the various ways of financing Hydropower projects, as well as on how to assess and mitigate the different risks associated with such projects. ICH organized a one week training program on these issues, and teamed up with IPPAN (Independent Power Producers Association, Nepal). The program was supported by the Norwegian Embassy in Kathmandu and focused on the important stages of financing of hydropower projects that enable a sound implementation of suitable projects. It included the strategies and processes involved in securing the necessary financing for projects as well as exposing the relevant associated risk factors and suggested ways to manage those risks by highlighting the necessary factors that need to be considered.

20023-02: Hydropower and the Environment Vietnam

The Hydropower and the Environment (H&E) course in Vietnam marked the first H&E course to be held as a South-East Asia regional event and took place from 27th October to 1st November. This was achieved through cooperation with The Water Resources University (WRU) of Vietnam. The course had 21 participants, out of which 9 were women. The course ended with a technical tour to beautiful Dalat guided by WRU to two relevant hydropower projects, to observe first-hand the various mitigation measures and benefit sharing in the respective rural communities impacted by the projects.

20023-03: Mini seminars Bhutan

A series of mini seminars and workshops were requested by the government of Bhutan related to the International Experiences with Agreements relevant to the development of Hydropower projects. The following brief events were organised to facilitate this request:

May 7th: Experiences with International Agreements, with 17 male and 12 female participants, all from Bhutan.

May 8th: Workshop on Concession Agreements, with 15 male and 6 female participants, all from Bhutan.



July 14th and 15th: Workshop on Contractual and Legal Framework, with 9 male and 3 female participants, all from Bhutan.

These events were planned with the aim of assisting Bhutan in its transition towards more private and semi-private investors entering the power sector, compared to the earlier government to government agreements. This puts more pressure on the public sector stakeholders as agreements will be made on direct commercial terms based on established international models.

20022-01: Prevention and Administration of Social and Environmental Conflicts - Ecuador

The Prevention and Administration of Social and Environmental Conflicts course was held in Quito from 26th to 30th January. 11 Latin American countries were represented, with 26 participants of whom 13 were women. Latin American Energy Association (OLADE) co-organised this course with ICH for the first time, with great success. Topics covered included rural communities, civil society, government, industry and international cooperation within the hydropower sector. The combination of these topics in one course was received well by participants, as it covered topics both within private and state-related processes; both necessary components in the development and maintenance of hydropower.

20022-02: Cumulative Impacts San Jose Costa Rica

The Cumulative Impacts course held in San Jose, Costa Rica took place from 21st to 26th April in cooperation with ICE (Instituto Costarricense de Electricidad). There were 26 participants from Colombia, Costa Rica, Nicaragua, Salvador and Peru. Of these, 14 participants were women. Lectures were given by experts from The Inter-American Development Bank and the World Bank, providing participants' insight into the latest requirements for project proposals to secure financing. The course included a technical tour to the Reventazon Hydropower plant currently in development and due to be completed in 2016.

20022-03: Mini seminar Lima

The Mini Seminar Peru took place in Lima on 11th and 12th February. There were 80 registered attendees the first day and 52 registered attendees on the second day. In collaboration with CESEL Consulting Engineers (CESEL) Peru and Colegio de Ingenieros del Peru, this two day seminar took place to present ICH course portfolio to interested parties in the South American Region. Institutional challenges in the Hydropower sector were presented and ICH presented the relevance of the Electric Andean Regional Integration and the on-going challenges regarding environment issues, benefit sharing and social and environmental conflict resolution. The Norwegian expert made several



presentations regarding Risk Management in the region and foreign investment in the hydropower sector in Peru.

20022-04: Small & Microhydro Nicaragua

The Water Governance and Environmental Management in Small & Micro hydro course in Nicaragua took place in Managua from 1st to 5th December and was the first edition of this course in the Latin American region. There were 27 participants from 7 Latin-American countries, of which 15 were women. A main focus of this course was to cover current issues in the region; controversies that arise within water governance in the development of hydro resources. In this capacity, regional experts representing the Inter-American Development Bank and the European Investment Bank contributed with the topics of Environmental safeguards and the Sustainability of water resources.

20022-05: Operation & Maintenance Management, Laos

The Operation and Maintenance Management course in Laos took place from 15th to 19th December in Vientiane, the capital of Laos, and at the Theun-Hinboun Power plant owned by THPC (Theun-Hinboun Power Company). The course had 26 participants. With the collaboration of EDL (Electricite du Laos)-Generation this course followed the same

program as the Operation and Maintenance course in Myanmar, with the additional topics of Water management and Repair of runner cavitation, availability, planning, models & methodology, maintenance philosophy, computerized maintenance systems and HSE in the operations.

Gender issues

A significant focus in ICH activities is on an effort to increase the representation of women in the hydropower sector. Achieving this through integrity and upholding the highest ethical standards is the basis for our reputation and the means by which we fulfill the public trust and the expectations of our benefactors. As can be seen in the Gender Representation graph, the efforts of encouraging more women to engage in the hydropower sector have resulted in a more even distribution between male and female participants in ICH courses.”

ICH Board of Directors

The Board of Directors for ICH has 5 members. Each member also has an alternate member. Out of the five Directors 4 are male and 1 is female. The female component in the Board is thus 20%.

ICH Secretariat

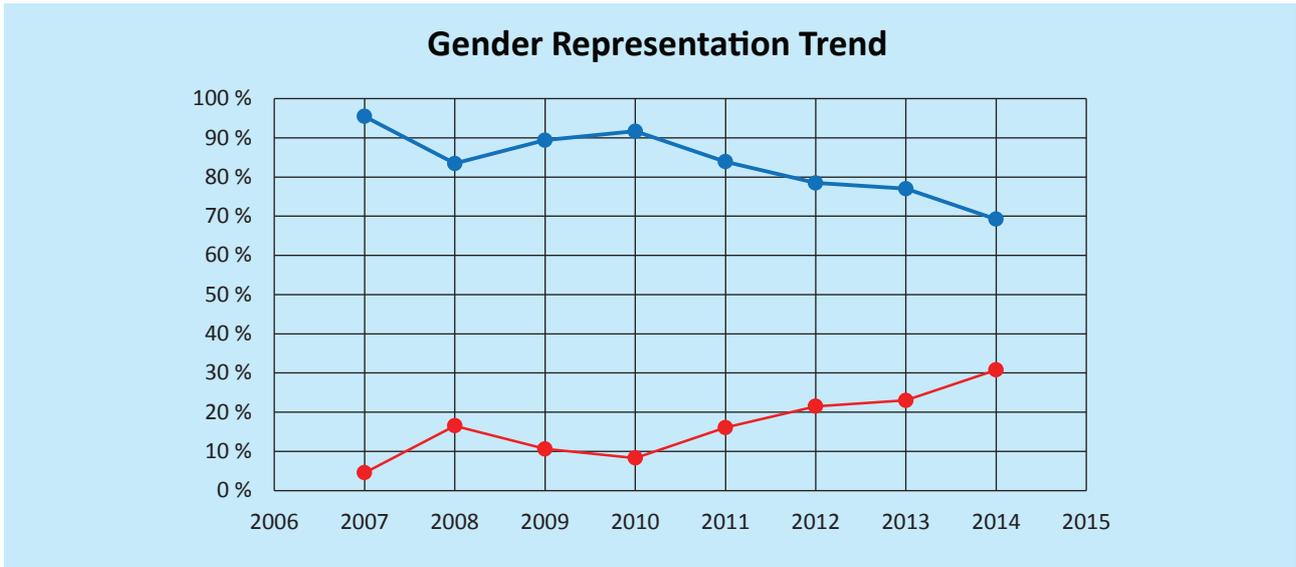
The ICH secretariat has throughout 2014 consisted of 2 male and 3 female staff. Of

the female staff 2 have a 100% and one a 50 % position, and both of the male staff have a 100% position. The female component in the secretariat for 2014 is thus 56%.

ICH Participants

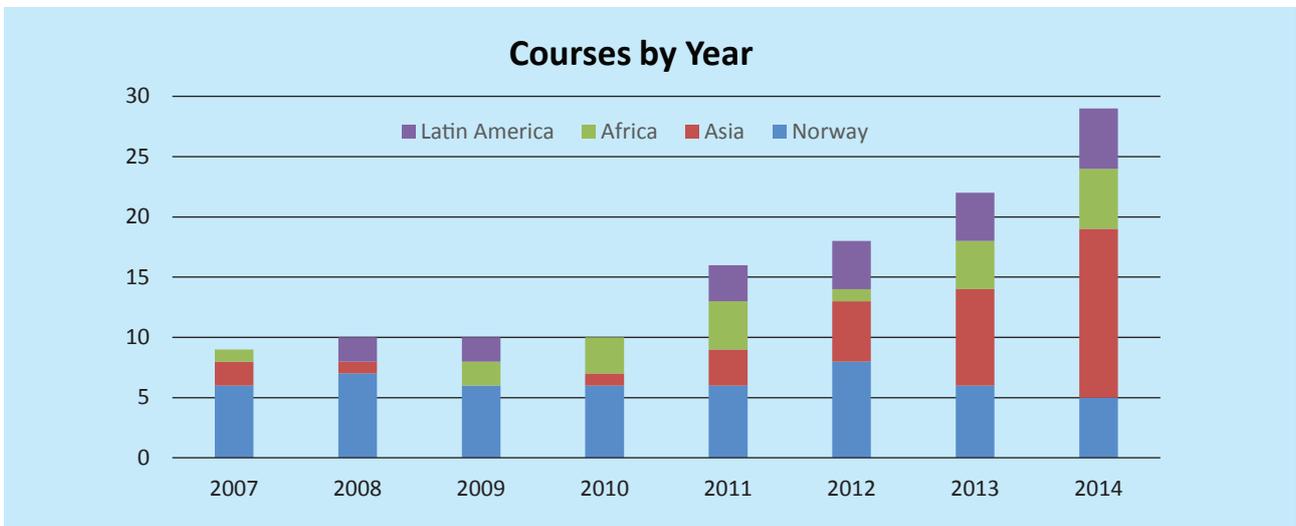
The ICH Course and other Event Participants for 2014 amount to a total of 744 persons, of

which 515 were male and 229 were female. The female component was thus increased from 23% in 2013 to 31% in 2014. ICH continues to encourage females to apply for the courses and events, and it is believed that through sustained efforts the female component will continue to grow.



The above graph illustrates the trend of distribution between male and female participants over the years. The bottom red graph line shows the increasing trend in female representation.

The below graph illustrates the growth in courses over the years, with each colour representing one region. Aside from the significant growth in total amount of courses in the last few years, the graph clearly shows the considerable growth in activities in the Asian region.



Endorsements by cooperation partners and participants to ICH training

Inter-American Development Bank, Washington

If we had to sum up in one sentence what the Bank has won in recent years by working with ICH is perhaps a more holistic approach when preparing and implementing the projects we fund.

Mekong River Commission, Laos

This was the best training course I have ever participated. It provides invaluable knowledge on the Economic and Financial of hydropower aspects.

Manager of bank in Nepal

Within a few months of attending the training we finalized financing of a hydropower project which is under Construction phase now.

Participants of course in Uganda

- ICH has simply been up to the game, excellent management and facilitation of the course.
- The practicals by the facilitators were an eye opener for me.

Ministry of Economic Affairs, Bhutan

The results of the course has assisted very much in drafting a model CA for the first JV project and first PPP project in Bhutan and the outcome will be the final CAs signed for the projects.

Law Firm in Nepal

I got chance to use the knowledge during negotiating with Nepal Investment Board for hydropower project development agreement.

Participants of course in Norway

This course is very well prepared and organised, the teachers and ICH staff are the best, evidenced the great commitment they have.

President of a Power Company in Nepal

It has certainly helped during negotiations with government when they requested for reopening our PPA, converting dollar revenue into rupees, requesting Force Majeure relief post a landslide knocking down several transmission towers.

Participants of course in Zambia

By all standards, ICH course management is splendid. Love the way the course is so balanced, representation from different countries and provide opportunities to network and learn from peers.

Participant of seminar in El Salvador

As a concrete result from the given course information regarding contracts and concession agreements was applied in 16 small hydro that are operative and in 5 ongoing projects in El Salvador.

Member status

At the beginning of 2014, the centre had 73 members from 21 countries, and at the end of the year the number of member organisations stood at 77, of which 13 being Norwegian members, 57 international members and 7 mutual members.

Norwegian members 2014:

Agua Imara AS, Norway
BKK AS (Bergenshalvøens Kommunale Kraftselskap), Norway
Energi Norge (Energy Norway), Norway
Multiconsult AS, Norway
Norconsult AS, Norway
NTNU (Norges Tekniske og Naturvitenskapelige Universitet, Norwegian University of Science and Technology), Norway
NVE (Norges vassdrags og energidirektorat, Norwegian Water resources and Energy Directorate), Norway
OED (Olje- og energidirektoratet, Ministry of Petroleum and Energy), Norway
Powel AS, Norway
SN Power AS, Norway
Statkraft Energi AS, Norway
Sweco Norge AS, Norway
TrønderEnergi Kraft AS, Norway

International members 2014:

ACOPE (Asociación Costarricense de Productores de Energía), Costa Rica
Agro Engineering Works Pvt. Ltd, Nepal
AHPPER (Asociación Hondureña de Pequeños Productores de Energía Renovable; The Honduran Association of Renewable Energy Producers), Honduras
Alternate Hydro Energy Centre, India
Aryabhata Group of Institutions, India
ASER (Asociación Salvadoreña de Energías Renovables), El Salvador
ATC (Arusha Technical College), Tanzania
AURSA (Asociación de Usuarios de la Unidad de Regio San Jeronimo), Guatemala
BFL Latinoamerica (B Fouress Limited), Latin-America
BPC (Butwal Power Company Ltd), Nepal
CAA (Consultoría y Arquitectura Ambiental; Architecture and Environmental Consulting), Ecuador
Carbon Brokers S.A, Colombia
CECB (Central Engineering Consultancy Bureau), Sri Lanka
CELSIA, Colombia
CESEL SA Consulting engineers, Peru
CIF (Centro Internacional de Fiscia), Colombia
CIMEQH (Colegio de Ingenieros Mecánicos, Electricistas y Químicos de Honduras), Honduras
CDL (Consejo Departamental de Lima del Colegio de Ingenieros del Peru), Peru
Consultora Socioambiental del Neotrópico S.A, Honduras
DGPC (Druk Green Power Corporation Ltd), Bhutan
ECB (Electricity Control Board), Namibia
EDL (Electricite du Laos), Laos
ELCOSA (Electricidad de Cortes), Honduras
ENEE (Empresa Nacional de Energía Eléctrica), Honduras

ERG (Environmental Resources Group), Nepal
ERC (Energy Regulatory Commission), Kenya
Estrategia de Inversión S.A, Guatemala
EPM (Empresas Publicas de Medellin), Colombia
FEDEAGRO S.A (Confederación de Asociaciones de Productores Agropecuarios), Venezuela
HPL (Himal Power Ltd), Nepal
HMV Ingenieros, Colombia
Hydroambiental Consulting S.A, Costa Rica
Hydro Lab Pvt. Ltd, Nepal
ICE (Instituto Costarricense de Electricidad), Costa Rica
IPPAN (Independent Power Producers Association Nepal), Nepal
ISAGEN S.A. Energia Productiva, Colombia
IWPCO (Iran Water and Power Resources Development Company), Iran
KENGEN (Kenya Electricity Generating Company), Kenya
KGRTC (Kafue Gorge Regional Training Centre), Zambia
Makerere University, College of Engineering Design, Art and Technology, Dept. of Electrical and Computer Engineering, Uganda
MELECSA (Mercados Eléctricos de Mesoamerica S.A), Guatemala
MUREA (Mulanje Renewable Energy Agency), Malawi
NACEUN (National Association of Community Electricity Users Nepal), Nepal
Newplan Ltd, Uganda
O-Tek internacional S.A, Latin America
PAH Guatemala S.A, Guatemala
Payandab Tavan Consulting Engineers, Iran
PBP (Power Business Partner), Chile
Sanima Hydropower Ltd, Nepal
SARDC (Southern African Research and Documentation Centre), South Africa
Savimaxx Ltd, Uganda
SIGET (Superintendencia General de Electricidad y Telecomunicaciones), El Salvador
Statkraft Holding Singapore Pte. Ltd, Singapore
TANESCO (Tanzania Electric Supply Company Limited), Tanzania
TETYS International Pjs. (International Academy of Capacity Building), Iran
University of Dar es Salaam, Department of Civil Engineering, Tanzania
VRA (Volta River Authority), Ghana

Mutual members 2014:

CELAPEH (Centro Latinoamericano para la Pequeña Empresa), Colombia
ESHA (European Small Hydro Association), Belgium
IC-SHP (International Center on Small Hydro Power), China
IHA (International Hydropower Association), United Kingdom
IASH (International Association for Small Hydro), India
INTPOW (Norwegian Renewable Energy Partners), Norway
NABA (Norwegian-African Business Association), Norway & Africa

Portfolio of courses spanning virtually the whole range of issues within: Planning, design, construction and operation phases in the hydropower sector.

Members:





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