



# International Symposium on Current Research in Hydraulic Turbines - VI



## Time and Venue

**14 March 2016**  
**09:00 AM to 5:00 PM**

CV Raman Auditorium  
Kathmandu University  
Dhulikhel, Nepal.

## Presenters



## Keynotes and Guest speakers

Confucius Institute  
ICH- International Centre for Hydropower  
Norwegian University of Science and Technology  
SkillBuild Australia



**ORGANIZED BY:**  
**TURBINE TESTING LAB**

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## Renewable Energy for Sustainability

Turbine Testing Lab (TTL) at Kathmandu University was established in 2011 in support with various national and international organizations with the vision of supporting hydropower development in Nepal and South Asian Region. From its early starting phase, TTL has been emphasizing in research activities regarding development of hydropower system in Nepal along with competence development among the local hydropower promoters. So far TTL has been able to develop competence regarding design and development of hydraulic turbines, computational analysis and commercial test certification. Most of the researches at the lab are focused on design, development and testing along with mitigation of problems (sediment erosion, fatigue etc.) in hydraulic turbines.

**Current Research in Hydraulic Turbines (CRHT)** is an effort of TTL to create a platform for aspiring researchers from hydropower sector to share their ideas and information regarding their research activities. We are proud to present this event for the **sixth time as CRHT-VI** after the successful completion of the previous five events in 2010, 2011, 2013, 2014 and 2015. We are including other renewable energy sources as additional topics for the symposium.

We expect all the presenters and participants to benefit from this program and gain knowledge on the recent ongoing activities in the related field of R&D.

## Program Schedule

Time	Program	Room
9:00 - 9:30	Registration	
9:30 - 11:00	Inaugural program Welcome speech by Dr. Hari P. Neopane, TTL Member Secretary & Assoc. Prof., KU Recent activities at TTL by Mr. Binaya Baidar, Research Fellow, TTL-KU Remarks & Keynote speech by Dr. Ole Gunnar Dahlhaug, Professor, NTNU Guest presentation by Mr. Bill Gammon, SkillBuild Australia Keynote speech by Dr. Krishna Kanta Panthi, Assoc. Prof., NTNU Inaugural speech by Prof. Dr. Ram Kantha Makaju Shrestha, Vice Chancellor, KU	CV Raman Auditorium
11:00 - 11:15	Tea/Coffee break	
11:15 - 12:15	Technical Session I Refer <i>Technical Sessions for details</i>	Mini Auditorium & Senate Hall
12:15 - 13:30	Lunch	KU Canteen
13:30 - 15:00	Technical Session II Refer <i>Technical Sessions for details</i>	Mini Auditorium & Senate Hall
15:00 - 15:20	Tea/Coffee break	
15:20 - 17:00	Closing program Remarks on behalf of Session Chairs Remarks from the event sponsors Certificate distributions to Session Chairs, Volunteers and winners of Aviyantaa'15 Closing speech and vote of thanks by Prof. Bhola Thapa, Registrar, KU	CV Raman Auditorium

Monday, 14 March 2016

**TECHNICAL SESSIONS**

Session I: 11:15 – 12:30

Time	<b>Sediment Erosion in hydraulic turbines (Room: Senate Hall)</b>  Session Chair: Dr. Ole Gunnar Dahlhaug/Dr. Hari P. Neopane	<b>Modeling and Simulation in Hydropower (Room: Mini Auditorium)</b>  Session Chair: Dr. Krishna Kanta Panthi/Dr. Bim Prasad Shrestha
11:15	<b>Study of Sediment Erosion in Guide Vanes of Francis Turbines</b> Paper no: CRHT2016-01 <b>Lars Petter Nora, Biraj Singh Thapa, Sailesh Chitrakar, Ole Gunnar Dahlhaug</b> , Norwegian University of Science and Technology	<b>Modelling and Simulation of Hydropower Plants</b> Paper no: CRHT2016-05 <b>Simen Valaamo</b> , Norwegian University of Science and Technology
11:30	<b>Design and Development of Rotating Disc Apparatus to Test Sediment Erosion in Cross-flow turbine runner blades</b> Paper no: CRHT2016-02 <b>Oblique Shrestha, Nirmal Acharya, Bhola Thapa, Hari Prasad Neopane</b> , Kathmandu University, <b>Young-Ho Lee</b> , Korea Maritime and Ocean University	<b>Performance Analysis of 5 kW Cross-flow turbine with insertion of air layer effect</b> Paper no: CRHT2016-06 <b>Nirmal Acharya, Oblique Shrestha, Hari Prasad Neopane</b> , Kathmandu University, <b>Young-Ho Lee</b> , Korea Maritime and Ocean University
11:45	<b>Development of a Sediment Erosion-Proof Micro Class Cross-flow Hydro Turbine</b> Paper no: CRHT2016-03 <b>Ji-Hoon Park</b> , Korea Maritime and Ocean University, <b>Da-Hye Lee</b> , Donggu Infra, <b>Seok-Jun Cha</b> , Shin Han Precision Co. Ltd, <b>Young-Ho Lee</b> , Korea Maritime and Ocean University	<b>Dynamic Analysis of Sauland Hydropower Plant</b> Paper no: CRHT2016-07 <b>Lars Laache</b> , Norwegian University of Science and Technology
12:00	<b>Preventive Maintenance Techniques to Ease the Maintenance Activities of Hydropower Stations</b> Paper no: CRHT2016-04 <b>Balendra Chhetry, Bhola Thapa, Hari Prasad Neopane</b> , Kathmandu University, <b>Biraj Singh Thapa</b> , Norwegian University of Science and Technology	<b>CFD Study of Andhi Khola HEP Penstock</b> Paper no: CRHT2016-19 <b>Kristine Gjørseter</b> , Multiconsult ASA
12:15	<b>Numerical Study of Hydro Cyclone Separator to Reduce Sediment Erosion Potential in Micro/Pico Hydro Turbines</b> Paper no: CRHT2016-08 <b>Atmaram Kayastha</b> , Kathmandu University, <b>Young-Ho Lee</b> , Korea Maritime and Ocean University, <b>Hari Prasad Neopane, Bhola Thapa</b> , Kathmandu University	<b>Development of Design Tool for Low-head Francis Turbine</b> Paper no: CRHT2016-20 <b>Lars Frøyd</b> , Turbine Testing Lab, Kathmandu University
12:30 - 13:30	<b>Lunch Break (Ku Canteen)</b>	

Time	<b>Renewable Energy, Devices, and Energy Efficiency (Room: Senate Hall)</b> Session Chair: Dr. Ole Gunnar Dahlhaug/Dr. Hari P. Neopane	<b>Experimental methods in Hydropower (Room: Mini Auditorium)</b> Session Chair: Dr. Krishna Kanta Panthi/Dr. Bim Prasad Shrestha
13:30	<b>Design of a Portable Reverse Osmosis System</b> Paper no: CRHT2016-09 <b>Thea Karlsen Løken, Ole Gunnar Dahlhaug,</b> Norwegian University of Science and Technology	<b>Pressure Pulsations and Vibration Measurements in Francis Turbines with and without Freely Rotating Runner Cone Extension</b> Paper no: CRHT2016-15 <b>Stian Solvik, Magomed Selmurzaevand, Ole Gunnar Dahlhaug,</b> Norwegian University of Science and Technology
13:45	<b>Study of Current Energy Consumption of Dhulikhel Municipality</b> Paper no: CRHT2016-10 <b>Ashish Shrestha, Anil Ghimire, Kshitiz Khanal, Sangrila Phuyal,</b> Kathmandu University	<b>Design of Experiment-Pressure Measurements inside the Tokke Runner</b> Paper no: CRHT2016-16 <b>Katarina Kloster, Einar Agnalt, Ole Gunnar Dahlhaug,</b> Norwegian University of Science and Technology
14:00	<b>Possibilities of Implementing Energy Efficient Building Techniques in Nepal</b> Paper no: CRHT2016-11 <b>Isabell Borgkvist,</b> Lund University	<b>Dynamic Loads on Francis Turbines</b> Paper no: CRHT2016-17 <b>Ingebjørg Valkvæ, Pål-Tore Storli,</b> Norwegian University of Science and Technology
14:15	<b>Microstructural Study of Bearing Material Failure due to Rolling Contact Fatigue in Wind Turbine Gearbox</b> Paper no: CRHT2016-12 <b>Niroj Maharjan, Wei Zhou,</b> Nanyang Technological University, <b>Yu Zhou,</b> Advanced Remanufacturing Technology Centre	<b>Experimental Investigation of a High Head Model Francis Turbine During Steady-State Operation at Off-Design Conditions</b> Paper no: CRHT2016-18 <b>Carl Bergan, Ole Gunnar Dahlhaug,</b> Norwegian University of Science and Technology
14:30	<b>Aero-elastic Performance Analysis and Fabrication of Wind Turbine</b> Paper no: CRHT2016-13 <b>Anish Silwal, Subhanjan Bista, Niraj Satyal,</b> Kathmandu University	
14:45	<b>Re-design and Optimization of Traditional Undershot Wheel using High Density Polyethylene (HDPE) Blades</b> Paper no: CRHT2016-14 <b>Abinish Kr Dutta, Bibhor Shrestha, Janak Shahi, Vijay Kr Chaudhary, Pratisthit Lal Shrestha,</b> Kathmandu University	
15:20-17:00	<b>Closing program in CV Raman Auditorium</b>	