Workshop on

ABRASIVE EROSION IN HYDRO PLANTS

Feb 23 – 24, 2018
at IIT Roorkee

Alternate Hydro Energy Centre
Indian Institute of Technology Roorkee
Roorkee – 247667 (Uttarakhand) INDIA

BACKGROUND

Himalayas being the young mountain has substantial soil erosion resulting in high sediment concentration in rivers. Due to the high suspended sediment, the hydropower development encounters two major challenges (a) loss of storage capacity of reservoirs due to settling of suspended sediments and (b) hydro-abrasive erosion of turbine parts and hydraulic structures. The second challenge of hydro-abrasive erosion is the focus of the workshop.

The complications associated with hydro-abrasive erosion are not new, but the issue is increasingly emphasized because of the worldwide growing energy demand and hydropower development in Himalayan region. Hydro-abrasive erosion has a detrimental effect on generation efficiency, leading to significant maintenance costs and causing higher downtime of turbines with corresponding generation losses. Sometimes even replacement of turbine runner and other components are required. The abrasion also has been observed at the civil structures made of concrete, steel and masonry.

Although the relevant parameters for hydro-abrasive erosion, such as suspended sediment concentration, size, hardness and shape of particles, relative velocity between the flow and structure as well as turbine geometry and material,have been identified, the effect of these parameters on the hydro-abrasive erosion is not fully understood. To take adequate measures in design, construction, manufacturing and operation and maintenance of hydropower plants (HPPs), the knowledge on sediment, hydro-abrasive erosion as well as efficiency reduction needs to be improved and relevant parameters have to be quantified correctly/accurately.

The monitoring of incoming sediment throughout the year and measurement of hydro-abrasive erosion with reduction inefficiency is not common due to lack of awareness and practically proven measurement techniques / instruments. For optimization of a hydropower plant, systematic erosion studies with advanced instruments and methodologies are required with simultaneous measurement of hydro-abrasive erosion in turbines, suspended sediment and efficiency reduction to decrease the losses in electricity generation.

Even though various research groups from academia, government, plant owners, individuals and equipment manufacturers are working on hydro-abrasive erosion issues in hydro power plants, a need is felt to organize a common platform for sharing experiences, discussions, deliberations and providing focused efforts.

To study and mitigate the hydro-abrasive issues in Himalayan region, a laboratory with state of the art instrumentation is established at AHEC, IIT Roorkee recently with support from the Ministry of New and Renewable Energy, Govt. of India. Both laboratory as well as online instruments like LISST-Infinite, AquaScat, Solitax, Camsizer, Analysette 3 Proetc. are available for sediment measurement along with high end 3D-scanners like Comet L3D, HandyScan, Comet Rotary for erosion measurement.

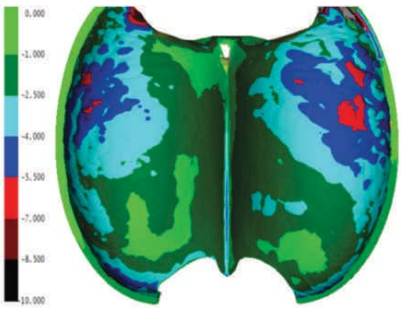
OBJECTIVE

To create general awareness on technical, measurement and financial aspects of hydro abrasive erosion among the hydropower developers, policy makers, manufacturers and academia, a workshop is planned on Feb 23 – 24, 2018 at IIT Roorkee.

TOPICS FOR WORKSHOP

The workshop is expected to meet following objectives:

1. Hydro abrasive erosion – experience and mitigation.
2. Measurements in hydro plants for hydro-abrasive erosion studies.
3. Instruments/methods of measurements for suspended sediment and hydro-abrasive erosion.
4. What to be done by hydropower plant operators?
5. Steps involved in optimization studies for hydro-abrasive erosion.
6. Financial and economic analysis of hydro-abrasive erosion.



How to Register : Participation is only by invitation. Confirmation for participation may be sent to organizer by email or fax or post latest by Feb 18, 2018.

Accommodation : May be arranged on request in the institute guest houses and nearby hotels

Workshop Venue : AHEC, IIT Roorkee, Roorkee – 247667 India

PROGRAMME SCHEDULE

Feb 23, 2018 (Friday)	
Time	**Particulars**
10:00-10:30	Registration
10:30-11:00	Welcome and opening remarks
11:00-11:30	Coffee/Tea Break
11:30-13:30	First Session: Hydro abrasive erosion – experience and mitigation
13:30-14:30	Lunch
14:30-16:00	Second Session: Instruments for measurements of sediment and hydro-abrasive erosion
16:00-16:30	Tea Break
16:30-18:00	Third Session: What need to be done by hydropower plants operators
Feb 24, 2018 (Saturday)	
Time	**Particulars**
9:30-11:00	Fourth Session: Steps involved in optimization studies for hydro-abrasive erosion
11:00-11:30	Coffee/Tea Break
11:30-12:30	Fifth Session: Financial and economic analysis of hydro-abrasive erosion
12:30-13:30	Closing session – Workshop Findings, recommendations and action plan
13:30-14:30	Lunch
14:30-16:00	Visit the facilities available at AHEC IITR for sediment and hydro-abrasive erosion measurement

FEE : There is no fee for participation.

INVITEES PARTICIPANTS

Government	:	CEA, UJVNL, JKPDC, HPSEBL, HPPCL, SJVN, NHPC, BBMB, NEEPCO, MeSEBL, DOHP, SIKKIMDOP
Private Developers	:	JSW, Greenco, TEESTA
Foreign Developers	:	NEA, DRUK, StateKraft
Turbine Manufacturers	:	Voith, Andritz, GE, BHEL, Toshiba, HPP,Flovel
Sediment Monitoring Equipment Manufacturers	:	Sequoia, Aquatek, Hydrovision, Hach, Xylem, Rittemeyer, Endress + Hauser
Academics	:	IIT Roorkee, IIT Madras, IIT Mandi, NIT Hamirpur
Foreign Universities	:	HSLU, ETH, NTNU, KU

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WORKSHOP ON

ABRASIVE EROSION IN HYDRO PLANTS

ON

Feb 23 – 24, 2018 AT IIT Roorkee

Registration form

Name (In Capital Letters) : _____

Designation : _____

Organization : _____

Address (Office) : _____

_____

_____

Telephone No. : (O) _____ (R) _____

Mobile : _____

Fax No. : _____

Email : _____

Specialisation : _____

Dated: **(Signature of participant)**

Nomination form may be sent to:

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