

**INTERNATIONAL TRAINING COURSE(S)
FOR**

**PLANT ENGINEERS ON REAL TIME DIGITAL SIMULATOR
FOR SMALL HYDRO POWER**

- **First course** **March 17 – 28, 2009**
 - **Second course** **May 12 – 23, 2009**
- at Roorkee, India**



सत्यमेव जयते

Sponsored by
Ministry of New and Renewable
Energy (MNRE)
Government of India, New Delhi



Organised by
Alternate Hydro Energy Centre
Indian Institute of Technology Roorkee
Roorkee - 247 667 (Uttarakhand) India

COURSE OBJECTIVES

The development of small hydropower around the world is on the increase. Small hydro offers a wide range of benefits especially for rural areas and developing countries. Governments, financiers, and developers are finding new ways to fund and promote small hydropower development. Efforts are also being made to improve the exchange of ideas and technology related to small hydropower. Small hydropower stations throughout the world contribute more than 45,000 MW, representing about 5 percent of the installed hydropower capacity worldwide.

In India, small hydropower up to 25 MW capacity also includes mini-and-micro hydro power projects, which are usually confined strictly to local use. A potential of over 15,000 MW has been identified from small hydropower and Government of India has been according priority to SHP development as thrust area.

The success of any SHP Plant depends on successful operation and maintenance of the plant and equipment. Many SHP plants could not perform even to their planned life and had serious equipment failure resulting in closure of the plants. Besides design and erection deficiencies, incorrect plant operation and maintenance is a major cause. It is with this objective 'AHEC, IIT Roorkee' has installed a 'Real Time Digital Simulator' for the training of operating personnel to be engaged by the SHP developers, manufactures as well as those already operating plant for improvement in operation practices of SHP. The simulator provides realistic simulation of small hydropower plant, its control room environment, hardwired panels and soft panels.

The participants will be provided an insight to SHP type & layouts, design of civil works, hydro mechanical components, hydro turbine, generator, control monitoring protection, power transformers, switchyard and power evacuation system. They will have hands on training on real time digital simulator for having confidence in operating plants in normal condition, handling plant during abnormal conditions, optimizing generation and reducing downtime of plant. The course is designed to provide following benefits to the plant owners:

- Reduce O & M costs
- Avoids damage to plant
- Increased plant life
- Increased generation time
- Training of engineers and technicians to handle all sorts of fault conditions effectively which is not possible in training on real plant.

COURSE TOPIC

- Introduction to SHP hydraulics
- Types and layouts of SHP
- Details of civil works of SHP
- Elements of hydro power plants
- Classification hydro turbine, construction details, turbine auxiliaries, governor and OPU system
- Classification of hydro generator, excitation system and AVR bearing and generator cooling system
- Power transformer, switchyards and power evacuation
- Control, monitoring and protection systems
- Safety, firefighting and first aid
- Introduction of real time digital simulator
- Introduction of projects which have been simulated
- Hands on training on RTDS – Preset condition, start up, synchronizing, raising and lowering load, normal shut down, electrical shut down, emergency shut down and various mal functions like grid failure, overloading, over speed, loss of auxiliary supply, valve blocking in position, sensor defects and all sorts of other malfunctions.

TARGET PARTICIPANTS

The course has been designed for the participants having engineering background involved in operation of small hydro power plants. The participants may be from government departments, private developers, manufacturers and NGOs etc. who are involved or intend to involve in operation of small hydropower plants.

COURSE PROGRAMME

The classroom teaching using modern teaching aids, training on RTDS, site visit etc. will be used to impart training. The course will have lectures, exchange of experiences of participants from different countries through country presentations, hands on training on Real Time Digital Simulator for normal operation of SHP and all sort of mal functions which may occur in a real plant.

NUMBER OF SEATS

There shall be only 8 seats for each training course. Accordingly, the participants will be advised to send their nominations at the earliest. The admission will be granted on first cum first basis. The representation will be given to large number of countries. Women candidates will also be encouraged to apply.

Participants should have good health and proficiency in English reading, speaking and listening.

VENUE

The course will be held at Alternate Hydro Energy Center (AHEC), Indian Institute of Technology Roorkee (Uttarakhand), India. Roorkee is about 180 km North of Delhi and has a number of academic and research Institutions. It is connected by road and rail from Delhi. The nearest international airport is in New Delhi. The average statistical temperature is about 15°C during March and 36°C in May. A large number of interstate buses ply from Delhi to Roorkee on way to Haridwar and Dehradun. Roorkee is also connected by rail from Delhi and other important towns.



BOARDING/LODGING & COURSE FEE

All the expenses during the course on accommodation, boarding, field visits and course material will be borne by us directly. The accommodation is arranged at Officers guest house (Continuing education /Khosla International House) of Indian Institute of technology, Roorkee on twin sharing basis. There is no course fee for attending the course.

TRAVEL

The nominating organization(s) or the participant(s) shall have to bear all expenses on travel from their home town to Delhi International Airport and back.

The organizer and sponsor would not hold any responsibility for risk of illness, accidents and loss of property incurred by the participants. Participants are strongly advised to insure themselves for such risks.

The travel of participants from Delhi Airport to Roorkee and back of to Delhi airport shall be arranged/met by host institution on the receipt of the confirmed programme in advance.

COURSE FACULTY

The course faculty will comprise faculty from AHEC and other departments of the IIT, Roorkee, planners, policy makers, equipment manufacturers and engineers with considerable experience in SHP development. The experts from other countries are also expected to deliver the expert lecturers.



THE SPONSOR, MNRE GOVT. OF INDIA

The Ministry of New Renewable energy (MNRE), Government of India, the nodal Ministry for the development of Small Hydropower (upto 25 MW) has sponsored the course(s). MNRE offers several incentives to utilities and private developers for the development of Small Hydropower in India.

AHEC, THE HOST INSTITUTION

Alternate Hydro Energy Center (AHEC) was set up initially at Indian Institute of technology, Roorkee by the Ministry of New Renewable Energy (MNRE), Government of India in the year 1982 to work for power generation through the development of small hydropower in hilly as well as in plain areas. AHEC, an Academic centre of IIT, Roorkee, has been imparting training to the field engineers and technologists regularly. It provides real time simulator based training for operation of SHP plants

AHEC provides expert services on all aspects of SHP development to the utilities in both govt. and private sector nationally as well as to other developing countries. AHEC has been identified as 'Apex Technical Institution' for the Small Hydropower Development in India. AHEC offers 4 semester duration Master of Technology (M.Tech.) programmes in "Alternate Hydro Energy Systems" and "Conservation of Rivers and Lakes" as well as Ph.D. programmes to national and international candidates.

For further information and registration, please contact or write to:

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ahec
IIT Roorkee



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Affix Photo

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Name(Mr./Dr./Mrs./Ms.)
(Write in block letters as in your passport)

Nationality..... Age :Gender: Female/Male

Position:

Company/Organisation :

Department/Division :

Mailing Address :

Tel (Off.) :Residence :
(with country and area code)

Fax : E-mail :

Duties and Responsibilities :

Please describe briefly your professional experience in the course subject area on the reverse of this page.

Educational Background

Degree	Year	Field of Study

Proficiency in English: Speak Understand Read

PERSONAL

Passport No. :Place of Issue :

Date of Issue :Date of Expiry :

Date of Birth :

Date :

Signature

For further information and registration, please contact or write to:

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