



## Proposed Short Term Course On

# Solar Photovoltaic Training for Technicians



March 9<sup>th</sup> – 13<sup>th</sup> , 2015

### Introduction:

India has launched the Jawaharlal Nehru National Solar Mission (JNNSM) in 2009-10 with the ambitious target of installing 20,000 MW of solar power, solar Photovoltaic (PV) as well as solar thermal, in the country by year 2022. The JNNSM provides incentives that promote solar PV system installations both at grid-connected PV system and off-grid PV system levels. There is several state Governments in India that are also making and implementing their own plans for promoting solar PV systems by providing incentives. With the advent of JNNSM and state –level solar energy programs, we now have 3 GWp of solar PV installations in India.

Also, in last couple of years, the prices of PV modules have fallen significantly. Considering the scenario of favorable Government policies and reduction in prices of solar PV modules, there is a huge interest for the installation of solar PV systems. In order to enable the deployment of solar PV systems in India, there is a need for large number of trained people in the solar PV area. As per the MNRE, Govt. Of India, the requirement is of 100,000 people. The trained manpower is required at various levels ranging from managers and researchers to engineers and technicians. The training is required in various disciplines ranging from design and engineering through to installation, testing, operation and maintenance.

The Continuing Education Program (CEP) of the IIT Bombay and NCPRE are jointly organizing a series of five-day introductory courses and workshops on **“Solar Photovoltaic Training for Technicians”**.

This program aims at training people in installation, operation and maintenance of solar PV systems. The program is useful for master trainers, technicians in Indian Technical Institutes (ITIs) and Colleges as well as technicians working in the field. The program is useful for technicians in various disciplines: electrical, mechanical, civil, computer and systems.

This 5-day course on **“Solar Photovoltaic Training for Technicians”** will bring basic knowledge and beginner level hands-on experience in solar PV components and systems. The program will consist of classroom, laboratory and field modules. The main focus areas will be component specifications, system design and integration, installation and testing technics as well as operation and maintenance proceduers. The program will also cover safety aspects and best field practices in solar PV power plants. The participants will gain hands-on laboratory experience in test and measurement of components and system parameters. They will also get the benefit of field assembly, testing and monitoring. The participants are expected to take part in further training programs.

### Target Participants:

- ITI trainers and Diploma level trainers in polytechnic colleges.
- Technicians currently installing, testing, operating and maintaining solar PV power plants.

**Course Contents:**Proposed Classroom Topics:

- Introduction to Renewable energy and Photovoltaics (PV)
- Solar Radiation Basics and Measurement
- Solar Cells, Modules and Arrays
- Basics of Electricity
- Battery, Charge Controller and Inverter Basics
- Solar PV Systems Design and Components Selection
- Balance of Systems Components
- Plant Safety, Tools and Assembly
- Plant Installation and Testing
- Plant Operation and Maintenance

Proposed Laboratory Experiments:

- Solar Radiation Measurement
- Measurement of PV module parameters
- Series and Parallel connections of modules
- Solar LED Light
- Solar DC Fan
- Inverter, Rectifier and Transformer
- Measurement of Battery, Charge Controller and Inverter parameters
- Testing of Standalone PV system

Proposed Field Sessions:

- PV Panel Assembly
- PV String Assembly
- Grid connected PV Plant Assembly and Testing
- PV plant Operation and Maintenance checks
- Solar PV water pump site visit

**Schedule and Venue:**

We are planning on four courses to be scheduled Jan-Sept 2015. Two of the courses will be conducted at IIT Bombay and the other two will be conducted at ITI or Polytechnic institutes.

The first course is scheduled on March 9<sup>th</sup> – 13<sup>th</sup>, 2015 at IIT Bombay.

**Trainers:**

The trainers constitute faculty and experts from various engineering disciplines at IIT Bombay. Experts from Solar PV power components industry and EPC integrators may be invited to deliver training modules. The teaching will be in a mix of English and Hindi languages.