



Content
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PV System Design - Photovoltaic Engineering Training

Contact us Today for a FREE quotation to deliver this course at your company's location.

<https://www.electricityforum.com/onsite-training-rfq>

PV Systems are unfamiliar to many electrical engineers involved in power generation and distribution. Our PV System Design training course deals with solar site assessment, installation consideration, financial evaluation of design, DC and AC losses, utility scale inverters, PV system commissioning and authorities technical requirements.

The course focuses on ground-mounted, grid-connected, medium and large utility scale solar farms connected to medium-voltage hydro circuits. Participants will also learn about overall solar farm configuration including DC and AC design and conceptual design of MV substation and AC collector circuits.

Solar Photovoltaic (PV) modules are where the electricity gets generated, but are only one of the many parts in a complete photovoltaic system. In order for the generated electricity to be useful in a home or business, a number of other technologies must be in place.

MOUNTING STRUCTURES

PV System arrays must be mounted on a stable, durable structure that can support the array and withstand wind, rain, hail, and corrosion over decades. These structures tilt the PV array at a fixed angle determined by the local latitude, orientation of the structure, and electrical load requirements. To obtain the highest annual energy output, modules in the northern hemisphere are pointed due south and inclined at an angle equal to the local latitude. Rack mounting is currently the most common method because it is robust, versatile, and easy to construct and install. More sophisticated and less expensive methods continue to be developed.

For PV System arrays mounted on the ground, tracking mechanisms automatically move panels to follow the sun across the sky, which provides more energy and higher returns on investment. One-axis trackers are typically designed to track the sun from east to west. Two-axis trackers allow for modules to remain pointed directly at the sun throughout the day. Naturally, tracking involves more up-front costs and sophisticated systems are more expensive and require more maintenance. As systems have improved, the cost-benefit analysis increasingly favors tracking for ground-mounted systems.

STUDENTS RECEIVE

- Apply basic principles of solar cell operation & comply with electrical authority and system operator
- Perform AC and DC system losses, fault analysis at combiner boxes & assess solar farm site
- Complete design layout and orientation, financial evaluations and operation of utility scale inverters
- Transform to AC and connection medium voltage (MV) distribution system
- Understand safe design (AC arc flash analysis, labeling and interlocking)

COURSE OUTLINE

- PV modules
- String voltage & current sizing
- String combiners & recombiners
- Solar farm site assessment
- DC system losses
- DC to AC transformation

- Grounding
- Schedule
- Testing & commissioning of PV system

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