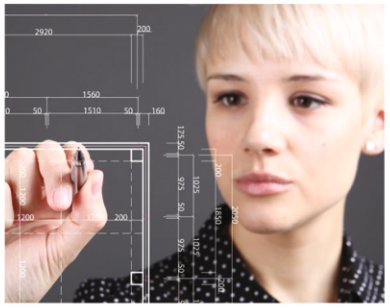
Advance Electrical Design & Engineering Institute (AEDEI)

(ISO 9001:2008 CERTIFIED INSTITUTE) : NEW DELHI
(Solar Power Plant Design Training)



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About us :

Advance Electrical Design & Engineering Institute (AEDEI) ISO certified 9001:2008 Electrical Design & Engineering training programs for Dedicated to Electrical Engineers. AEDEI is latest venture for providing the quality education in the best possible facilities is a key aim of Skill developments for various verticals in Electrical Engineering design.

Our Mission :

Our Technical Institute offers a full range of training in electrical ,Electronics & communication and mechanical design courses full fill requirement of current industries ,

These courses which encompass all aspects of core electricity from fundamentals to in-depth of design knowledge are based on several value adding pillars.

Our trainers share their know-how and design experience through demonstrations on dedicated equipment on industries. Courses include training dedicated documents and the possibility of follow-up with regular /internship /e-learning modules. Over one to 45 days depending on the topic, trainees get in-depth, hands-on instruction and the opportunity to practice their acquired know-how.

We cover all the range of engineering industries skills disciplines:

- Electrical System Design
- Solar Power Plant Design
- Technical Transformer Design
- Cable Design
- Thermal Power Plant Design
- Mechanical design
- HVAC Design
- Oil & Gas Plant Design
- Gas insulated Substation Design
- Automation & Control
- Electrical Testing Engineer
- QA/QC Electrical
- Power System Software
- Hybrid Electric vehicle Design
- Railway Traction Design

Solar Power Plant Design

This solar power plant design course has been developed to meet the requirements of the National Occupational Standards. The Solar PV course is designed to provide already practising electrical installers with all the skills and knowledge required to enable them to select the most appropriate solar PV system for a building based on consultation with the client about their needs and demands, to install any of the common types of PV systems in a safe and workmanlike manner. It also provides training in the maintenance and servicing of PV systems.

Experienced Instructors :

Your instructors, professional engineers with many years of field and design experience, will trained you through theory calculation practical, instructor having expertise solar power plant design .

Duration : 60 Days

Mode: Regular /Internship/online/Correspondence

Why You Should Attend :

When you complete this course you will be able to:

Energy Yield Calculation ● Grid interactive solar power plant design ● Off Grid Solar Power Plant Design ● Roof top Solar Power Plant Design ● MW Solar Power Plant Design ● Tilt Angle Calculation ● Net Metering Solar Power Plant Design ● Solar Energy Calculation Software Auto Cad Software

Study Materials :

You will receive extensive course materials that will serve as valuable references in your work.

What You Will Study (Syllabus)

Module 1 : Types of Solar Power Plant

- Grid Connected solar Power Plant
- Grid interactive solar power plant
- Net Metering Solar Power Plant
- Off-Grid / Hybrid solar power plant
- Schemes of solar power plant

Module 1 : Selection of site and shadow analysis

- PV module structure interrow spacing calculation
- Pitch analysis
- Selection of PV module tilt angle
- Near shading object calculation
- Site survey and plant assessment
- Type of solar radiation
- Irradiance assessment and comparison
- Solar Radiation Data
- Sun path Diagram
- Defining the Position of the Sun
- Solar Altitude
- Geometric Effects
- Tilting Solar Modules
- Magnetic North & True North

Module 3 : Selection of PV module technology

- Crystalline technology
- Thin film technology
- Bi-facial technology
- Comparison between PV module technology
- Comparison between solar power plant energy out put

Module 4 : Selection of PV module (cells and BOM) and sizing

- Types Crystalline module cells
- Manufacturing process of PV cells
- Comparison between mono crystalline
- Selection of PV cells
- Selection of front and rear sheet
- Selection of PV module glass
- Selection of EVA sheet , Bus bar and frame
- Characteristics of a Solar Cell
- Power Characteristics of a Solar Cell
- Fill factor and Equivalent Solar cell Circuit
- STC and NOCT
- Factors Which Affect the Performance of Solar Cells
- Commercial Modules v Electrical Protection

Module 5 : Inverters Selection and Sizing (Grid Connection and Off Grid)

- Types of solar inverter
- Selection of string /central / off grid inverter
- Selection of power conditioning unit (PCU)
- Sizing of solar inverter for roof top and grid connected projects
- Selection and sizing of string inverter
- Selection and sizing of central inverter
- AC/DC overloading calculation and losses
- Protection requirement of solar inverter
- Passive and active protection
- Anti- islanding protection
- Mounting arrangement of string inverter
- IEC/IEEE /Grid Compliance of inverters
- Grid-Connected Inverters vs. Stand-Alone Inverters
- Inverter Communication and remote monitoring
- Inverter Products For Use In India

Module 6 : Connection of PV Module(Series and Parallel Circuit)

- Series Circuits
- Parallel Circuits
- Combining Series & Parallel Circuits
- PV module string connection
- Selection of string fuse
- Matching The PV Array To The Voltage Specifications of An Inverter
- Matching the PV Array to the Inverter's Current Rating
- Matching the PV Array to the Inverter's Power Rating
- Summary of Calculations for Matching Array and Inverter

Module 7 : Preparation of single line diagram and plant array layout .

- Preparation of rooftop solar power (single line diagram) SLD
- Preparation of Net Metering solar power (single line diagram) SLD
- Preparation utility scale solar power (Ground mounted) SLD
- Preparation of off Grid solar power (single line diagram) SLD
- Rooftop solar power plant layout
- Ground mounted solar power plant layout
- DC SLD /AC SLD
- Protection SLD
- Earthing Layout/ AC /DC cabling Layout
- DC Block sizing layout
- Overall Array Plant Layout

Module 8 : Solar Power Plant String Combiner Box/ ACDB/ MDB/Metering cubical

- Selection and sizing of SCB/SMB
- Selection of Isolator/ fuse
- Selection of Monitoring of SCB/SMB
- Mounting arrangement of SCB/SMB
- Selection sizing of SPD and Protection
- ACDB Switchgear sizing
- Types of energy meter and selection

Module 9 : Solar power plant HT switchgear selection and sizing

- Selection and sizing of inverter duty transformer
- Selection and sizing of HT switchgear
- Selection and sizing of ICOG/ Main switchboard
- Selection and sizing of Aux. transformer
- Aux. Losses calculation
- Inverter duty No-load and load losses calculation

Module 10 : Selection and sizing of AC and DC Cable

- Ampacity calculation of solar cable
- Sizing of solar cable /DC cable
- Sizing of String cable
- Derating factor of cables
- Sizing of AC cable (Inverter to ACDB ,ACDB to MDB)
- Sizing of DC cable (Module to SMB , SMB to Inverter)
- Sizing of energy meter /ABT Meter

Module 11 : Selection and sizing of AC /DC Side Earthing

- Types of earthing
- Types of Earthing strip/ ground conductor
- Types of Vertical electrodes
- Sizing of Cross section area of GI strip
- Resistance calculation of GI strip
- Resistance calculation of Pipe electrode
- Solar Plant resistance calculation
- Preparation AC /DC earthing layout

Module 12 : Solar Power Plant Substation and switchyard

- Preparation of Protection SLD
- Selection and sizing of Substation
- Preparation of ring main and redial feeder SLD
- Selection and sizing of Power transformer
- Selection and sizing of Current transformer
- Selection and sizing of PT/Isolator/Breaker
- Construction of 33KV/132 KV substation
- Construction of four pole structure
- Construction of metering switchyard
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Module 13 : Selection and sizing Lightening Protection (LA)

- Types of Lightening Protection Arrestor
- Lightening protection assessment calculation
- Protection zone calculation of Conventional type LA
- Down conductor cross section area calculation
- Method of Lightening protection
- Basic Consideration for Protection
- Calculations for Evaluating the Need for Protection
- Calculation of Protective Angles and Zone of Protection For Various
- Forms of Air Termination
- Selection of lightening protection device
- Selection of ESE type Lightening Protection
- ESE LA down conductor and earthing calculation

Module 14 : System Losses of Solar Power Plant

- Determining the Size of the DC and AC Cables
- Losses in a Grid-Connected PV System

Module 15 : -Solar Power System Yield Performance(Energy Guarantee)

- What Determines the Energy of a System
- Calculating the Energy Yield for a PV Grid-Connected System
- Specific Yield
- Performance Ratio
- CUF Calculation

Module 16- Maintenance And Troubleshooting

- System Maintenance
- Troubleshooting

Module 1 7: - Costing and Tendering of Solar Power Plant

- Introduction
- Simple Payback
- Life Cycle Costing
- Determining Costs Associated with the Whole PV System
- Valuing a PV System

Module 18 : Smart Grid/Net Metering and software

- Smart Grid
- Smart Meters
- PVsyst, Google sketchup, Helioscope

LIVE Practical Projects on ROOFTOP and Ground Mounted Scale