

SOLARINSTALL

Hands-on solar PV System design and Installation training

Course Overview

The course majorly focuses on hands-on training for component installation, commissioning of 1 kWp Off-Grid and 3 kWp On-Grid Solar PV Power Plant. It will also focus on Operations and Maintenance practices pertaining to solar PV systems. The participants will also be given training on marketing & entrepreneurship skill so that they will become the campaigners of solar energy. **Total duration of the training will be 7 days.**

Organizer:-

- **kWatt Solutions Pvt. Ltd. (kSPL), Vanvihar Conference Hall, IIT Bombay**

About kSPL

kSPL is founded by Dr.Chetan Singh Solanki, an IITB Professor in the Energy Science and Engineering department and Principal Investigator, NCPRE. Initiated in September 2013, kSPL is a technology-driven company with a vision to “solarize” the future of India and economize renewable. With the expertise of a strong core team comprising of IIT Bombay graduates, kSPL offers customized comprehensive solar energy solutions right from design and engineering to installation and maintenance with in-house training for people in the solar industry.

kWatt Solutions is also engaged in design and installation of solar PV systems. It has installed over more than 500kW of solar power systems across the country. We use our systems which are already installed or currently being installed for demonstration and on-site practice to our participants. This gives them real life experience of solar PV systems and makes them skillful in installation, repair and maintenance of the solar PV systems.

kSPL Affiliations:-

kSPL is affiliated to National **Institute of Solar Energy(NISE)**, Ministry of New and Renewable Energy(MNRE),GOI. for conducting SuryaMitra solar training program for developing skilled technicians in Solar

kWatt is also an Industry Affiliated Member of **National Centre for Photovoltaic Research and Education(NCPRE)**

kWatt is certified by Ministry **of New and Renewable Energy(MNRE)** for Solar Rooftop installations PAN India

kWatt is affiliated by **Skill India** for solar training programs

Day 1

Timings	Duration	(Theory)
09:45am to 10:00am	15 min	<ul style="list-style-type: none"> Inauguration Ceremony
10:00am to 11:15am	1.25Hr	<ul style="list-style-type: none"> Introduction to Conventional & Non-conventional source of Energy
11:15am to 11:30am	15min	Tea Break
11:30am to 1:00pm	1.5Hr	<ul style="list-style-type: none"> Electricity Basics
1:00pm to 2:00pm	1 Hr	Lunch
		(Practical)
2:00pm to 2:45pm	45 Min	<ul style="list-style-type: none"> Tools Introduction & type of tools <ol style="list-style-type: none"> Safety tools Marking tools Measuring tools Testing tools Working tools Basic knowledge of Irradiance sensor, Temperature sensors, Clamp on-meter, Earth tester, Insulation Resistance tester
2:45 pm to 3:00pm	15min	Tea Break
3:00pm to 5:00pm	2Hr	<ul style="list-style-type: none"> Demonstration of PV plant components <ol style="list-style-type: none"> Module Inverter Battery Structure BoS Site selection, suitability & Planning

Day 2

Timings	Duration	(Theory)
10:00am to 11:00am	1 Hr	<ul style="list-style-type: none"> Study of solar photovoltaic cell & module, type and its applications
11:00am to 11:15am	15min	Tea Break
11:15am to 12:15pm	1 Hr	Handling/storing/packing/unpacking of modules, inverters, other components and tools
12:15 pm to 1:45pm	1.5Hr	<ol style="list-style-type: none"> Solar Photovoltaic system (Module, Battery, Inverter and BoS) Types of solar photovoltaic system <ul style="list-style-type: none"> Grid connected solar PV system Off Grid connected solar PV system/Stand-alone Solar PV
1:45pm to 2:30pm	45Min	Lunch
		Practical (Hands on Sessions)
2:30pm to 4:00pm	1.5Hr	<ul style="list-style-type: none"> System Design on PVSyst, Report generation and plant economic evaluation
4:00pm to 4:15pm	15min	Tea Break
4:15pm to 6:00pm	1.75Hr	<ul style="list-style-type: none"> Series and Parallel connections of PV Modules Series and Parallel connections of Batteries Reading and observations of output from PV module (under various conditions)

Day 3

Timings	Duration	(Theory)Reading of drawing and Specification	
09:30am to 10:00am	30 Min	<ul style="list-style-type: none"> Understanding the parameters of Site Survey, Practical site survey Site survey form filling, Analyzing the shading objects 	
10:00am to 11:15am	1.15 Hr	<ul style="list-style-type: none"> Execution Strategy and steps 1MW Solar PV Plant visit and activity 	
11:15am to 11:30am	15min	Tea Break	
11:30 am to 1:00pm	1.5Hr	<ul style="list-style-type: none"> Understanding the civil Foundation design Structure erection, types of structures 	
1:00pm to 2:00pm	1 Hr	Lunch	
2:00pm to 3:30pm	1.5Hr	Practical (Hands on Sessions for 1kWp)	Practical (Hands on Sessions for 3kWp)
		Batch 1	Batch 2
		<ul style="list-style-type: none"> Civil Foundations implementation Module mounting structure (MMS) and erection of the same. 	
3:30pm to 3:45pm	15min	Tea Break	
3:45pm to 5:00pm	1.25Hr	<ul style="list-style-type: none"> Proper alignment and tightening of MMS 	

Day 4

Timings	Duration	(Theory)	
10:00am to 11:15am	1.25 Hr	<ul style="list-style-type: none"> Reading of Single Line Diagram(SLD) Performance analysis and troubleshooting monitoring of generation per string incoming & outgoing power at junction box & Inverter level. 	
11:15am to 11:30am	15min	Tea Break	
11:30 am to 1:00pm	1.5Hr	<ul style="list-style-type: none"> Types of Cables Cable Protection, Cable routing ,Cable laying Plant Protection System 	
1:00pm to 2:00pm	1 Hr	Lunch	
		Practical (Hands on Sessions for 1kWp) Batch 1	Practical (Hands on Sessions for 3kWp) Batch 2
		<ul style="list-style-type: none"> Module mounting Inverter Installation Installation of balance equipment and End termination Power cable. 	
2:00pm to 3:30pm	1.5Hr		
3:30pm to 3:45pm	15min	Tea Break	
3:45pm to 5:00pm	1.25Hr	<ul style="list-style-type: none"> Module grounding Module interconnection String testing DC combiner box, Cable routing Installation of Battery (For 1 kW Off-Grid PV System) 	

Day 5

Timings	Duration	(Theory)	
10:00am to 11:15am	1.25 Hr	<ul style="list-style-type: none"> Plant commissioning procedure Power Evacuation 	
11:15am to 11:30am	15min	Tea Break	
11:30 am to 1:00pm	1.5Hr	<ul style="list-style-type: none"> Understanding plant interconnections Understanding the concept of grid synchronization Grid Fundamental AC & DC 	
1:00pm to 2:00pm	1 Hr	Lunch	
		Practical (Hands on Sessions for 1kWp) Batch 1	Practical (Hands on Sessions for 3kWp) Batch 2
2:00pm to 3:30pm	1.5Hr	<ul style="list-style-type: none"> Purpose for Inspection & testing Inspection, Testing & commissioning of PV plant 	
3:30pm to 3:45pm	15min	Tea Break	
3:45pm to 5:00pm	1.25Hr	<ul style="list-style-type: none"> String Testing –Pre-checks Inverter Testing Dismantling of System 	

Day 6

Timings	Duration	Practical (Hands on Sessions for 1kWp) Batch 2	Practical (Hands on Sessions for 3kWp) Batch 1
10:00am to 11:15am	1.25Hr	<ul style="list-style-type: none"> Proper alignment and tightening. Fixing of structure and its connection. 	
11:15am to 11:30am	15min	Tea Break	
11:30 am to 1:00pm	1.5Hr	<ul style="list-style-type: none"> Module mounting 	
1:00pm to 2:00pm	1 Hr	Lunch	
2:00pm to 3:30pm	1.5Hr	<ul style="list-style-type: none"> Inverter Installation and Connection Battery Installation (Off-grid System) 	
3:30pm to 3:45pm	15min	Tea Break	
3:45pm to 5:15pm	1.5Hr	<ul style="list-style-type: none"> Installation of balance equipment and End termination Power cable. 	

Day 7

Timings	Duration	Practical (Hands on Sessions for 1kWp) Batch 2	Practical (Hands on Sessions for 3kWp) Batch 1
10:00am to 11:15am	1.25 Hr	<ul style="list-style-type: none"> • Installation of Junction Box 	
11:15am to 11:30am	15min		Tea Break
11:30 am to 1:00pm	1.5Hr	<ul style="list-style-type: none"> • String testing DC Side box • Cable tray , types of cable tray & cable Tray 	
1:00pm to 2:00pm	1Hr		Lunch
2:00pm to 3:30pm	1.5Hr	<ul style="list-style-type: none"> • Inspection, Testing & commissioning of PV plant • Power evacuation 	
3:30pm to 3:45pm	15min		Tea Break
3:45pm to 5:00pm	1.25Hr	<ul style="list-style-type: none"> • Grid Synchronization • String Testing –Pre-checks • Short Circuit Test-Work Method • Inverter Testing-Work Method 	
5:00pm to 5:30pm	0.5Hr	<ul style="list-style-type: none"> • Vote of Thanks 	