Design, Operation and Maintenance of GRID CONNECTED PHOTOVOLTAIC SYSTEMS

Collated by Annie 20 March 2014

The course was jointly organised by The Institution of Engineers, Singapore (IES) and Association of Consulting Engineers Singapore (ACES). A total of 38 participants including many very established engineers from private and public sectors, attended the course on 18th, 20th, 25th, 27th February 2014, 4th, 6th, 15th March 2014.

Lecturers: Er. Chan Chee Hin (Day: 18th February 2014 & 20th February 2014)

Er. Chan graduated from the University of Singapore with Bachelor of Electrical Engineering. He was also awarded Master in Building Science for his research work on lift system design. He is a registered Professional Engineer in Singapore and an EMA Licensed High Voltage Electrical Engineer.

He has been working as M & E consultant for many years since graduation. He has designed, supervised and commissioned many major electrical systems both in Singapore and overseas.

He is a member of the SPRING technical committee on “Electrical Installation” and participated in the preparation of the revised CPS5 and the first Singapore Standard on PV installation (First amendment to Singapore Standard SS CPS5:1998). He was a Principal Investigator for a government funded PV related project “Use of solar energy for automated greenhouse ventilation and supplementary lighting in cultivation of leafy vegetables”.

He is a technical assessor appointed by Singapore Accreditation Council to assess the facilities and technical capability of electrical laboratories which are applying for accreditation. He was a Ngee Ann Polytechnic teaching award recipient. Currently he is the Deputy Director of Electrical Engineering Division of Ngee Ann Polytechnic. In the 7 day course, Er. Chan will elaborate on Solar Radiation (Irradiance, Irradiation and peak sun hours, Solar Radiation data, Sun path diagram). Basic PV technology on Solar Cells (Spectral response, Effect of Temperature, Effect of parasitic resistance) Characteristic of a solar cell (fill factor and equivalent circuit, factors affect the performance, efficiency of solar cells). PV cells interconnection and module (Module and circuit design, Module structure, Hot-spot heating and bypass diode, Module protection).
Lecturers: Dr. Jiang Fan (Day: 25th February 2014 & 27th February 2014)

Dr. Jiang Fan, Ph.D, Msc, B.Sc., graduated from Electrical Engineering Department of Fuzhou University, China. He achieved MSc degree in Electrical Power Research Institute (EPRI) of China and Ph.D. in The Robert Gordon University, UK. Recently he is a senior lecturer in the school of Electrical and Electronic Engineering, Singapore Polytechnic. He is the course manager of Diploma in Clean Energy and has been involving the research and technical training in solar PV technology since 1998. His main areas include renewable energy (solar energy and wind energy), power system protection, power quality and high voltage engineering.

He was PI of EDB CERT project “Solar Photovoltaic Test-bed” in charge of design, installation, testing, commissioning and evaluating of 36 grid-tied PV systems from 2008 to 2011 and Co-PI of EDB CERP project “Development of an Integrated Solar Photovoltaic-Thermal (PV/T) Module for the Tropics” in charge of developing, testing and evaluating of new PV/T modules in the tropic region from 2009 to 2012. He also designed, tested and commissioned a 8.3kWp stand-alone PV system for an industrial project in 2012.

Currently, he is the PI of MOE TIF project “Development of Higher Efficiency Solar PV/Thermal (PV/T) Collector and System” from 2013 to 2015.

He has conducted technical talks on solar PV technology to EMA, NEA, BCA, HDB and IET and published fifteen journal and conference papers in solar energy systems.
Mr. Eddie Lee graduated with Diploma in Electrical Engineering from Ngee Ann polytechnic and BSc (Hons) in Business management with the University of Bradford.

He is the Managing Director of reputable PV System Integrated firm, which provides Design, Engineering, Supply, Installation and Maintenance of Photovoltaic System in Asia Pacific. Projects range from PV home, commercial building and PV Power Plant Systems.

He has over 10 years of experience in the solar industry. His previous work experience includes 7 years in Building Management Systems and Intelligent Building Systems with Siemens. As an active member of SEAS.

Eddie also contributes his time as solar trainer by assisting SEAS, NEA & SEI in developing and delivering quality environment training programmes.
Mr. Leong Fai Choy obtained his B. Eng (1st CL Hons) from NUS in 1986, and MSc (Eng) in Power Electronics & Drives from University of Birmingham in 1994. Currently, he is a Senior Lecturer in the School of Electrical and Electronic Engineering. His interest and experiences are involved in aviation industry, sensors, instrumentation and control, and power electronics and drives applications, photovoltaic system, electric and solar vehicles. He had completed several automation projects for the industry and government body, such as NEA and MINDEF. Mr. Leong has been very active in the local industries. He is the member of the following associations: Singapore Institute of Aerospace Engineer (SIAE); Singapore Institute of Automation Association (SIAA); Instrumentation of Control Society (Singapore)(ICS); He is the Vice Chair of the IEEE (Institute of Electrical & Electronics Engineers) Power Electronics / Industrial Application Joint Chapter (IEEE - IA/PELS). Currently, he is serving in the technical committee members of the Electric Road Vehicles Technical Committee.
The practical session highlighted the silent features and safety issue at the solar farm. Participants were required to perform testing and recording of the result during commissioning.
End.