

Talk On
“Power Conversion Systems for Battery Energy Storage and Utility-Scale Photovoltaic (PV) Generation”

(Organised by Electrical Engineering, Technical Division, IEM)

Date : 28th October 2017 (Saturday)
Time : 9.00am to 11.00am (*Refreshments will be served*)
Venue : Tan Sri Prof. Chin Fung Kee Auditorium, Wisma IEM, Petaling Jaya
Speaker : Assoc. Prof. Dr. Nadia Tan Mei Lin

BEM Approved CPD/PDP Hours: 2
Ref No. IEM17/HQ/349/T

SYNOPSIS

According to Global Market Outlook for Solar Power 2017, the total PV installed capacity increased by 33% (77.5 GW) to 306.5 GW by the end of 2016 as compared to the end of 2015. With increasing penetration of utility-scale PV generation, grid codes are being adapted to maintain power systems reliability. Grid codes from countries having a long experience with distributed generators such as Germany, Britain, and etc., are demanding that grid-connected inverters provide static and dynamic voltage supports. During grid-faults, grid-connected inverters are required to stay connected and support the grid-voltage by injection of reactive current that is also known as having low-voltage ride-through (LVRT) capability. In addition, due to the intermittent nature of renewable energy sources, a large-scale renewable-energy distributed-generators penetration in the utilities requires for integration of energy storage systems. Power electronics for power conversion of PV sources and energy storage systems need to be efficient, safe, reliable, and meet the grid code requirements.

Malaysia is committed in minimising its CO₂ emissions from fossil-fuel-based electricity generation through renewable energy generators. PV generation contribution to the nation's electricity generation mix is currently less than 1%. Hence, in order to achieve the renewable energy target in Malaysia, utility-scale PV generation is given emphasis, with an aim to reach an aggregate capacity of 360 MW in Peninsula Malaysia and 100 MW in Sabah/Labuan between 2019 and 2020. As the penetration of utility-scale PV generation increases, considerations of LVRT capabilities in PV inverters and the technology for energy storage systems will become pertinent.

This talk provides an overview of PV-generation and energy-storage systems. The talk's focus will be divided in two parts that are based on the speaker's research works. The first part of the talk discusses low-voltage ride-through control of a modular multilevel single-delta bridge-cell (SDBC) inverter that is intended for utility-scale PV systems. The second part of the talk presents the design and improvements in performance of a bidirectional isolated dc-dc converter for a battery energy-storage system.

BIODATA OF SPEAKER

Nadia Tan Mei Lin received the B.Eng. (Hons.) degree from the University of Sheffield, Sheffield, U.K., in 2002, the M.Eng. degree from Universiti Tenaga Nasional, Kajang, Malaysia, in 2007, and the Ph.D. degree from Tokyo Institute of Technology, Tokyo, Japan, in 2010, all in electrical engineering. Between 2011 and 2017, she has been invited numerous times as a Visiting Research Scientist at Tokyo Institute of Technology, Japan. From July to September 2016, she was an Adjunct Associate Professor at Tokyo Institute of Technology. Since April 2017, she has been an Associate Professor in the Department of Electrical Power Engineering, Universiti Tenaga Nasional. Her current research interests include power conversion systems for energy storage, bidirectional isolated dc-dc converters, multilevel cascaded inverters for renewable energy applications. She has authored and co-authored papers in indexed journals and international conferences. She has also made presentations as an invited speaker in Malaysia, Japan, Korea, and China. Dr. Tan is a Chartered Engineer registered with Engineering Council, United Kingdom, a Member of the Institution of Engineering and Technology (IET) and the Institute of Electrical and Electronics Engineers (IEEE), and a Graduate Member of the Institution of Engineers Malaysia (IEM).

Ir. Chong Chew Fan
Chairman
Electrical Engineering Technical Division

ANNOUNCEMENT TO NOTE

Effective 1st October 2017

FEEES FOR TALKS

Members:

Registration Fee: FOC
Administrative Fee:
 Online: RM15.00
 Walk-In: RM20.00

Non-Members

Registration Fee: RM50.00
Administrative Fee: RM20.00

- Limited seats are available on a "first come first served" basis (maximum 100 participants).
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