Message from Editors

POWER electronics is a key technology that enables the revolution of electric power generation, transmission, and distribution in modern power systems for improved energy security, efficiency, and sustainability. In distribution systems, power electronic converters not only serve as the critical interfaces between the utility grid and distributed energy resources such as solar, wind, and energy storage, but also play a pivotal role in power quality control and management. In transmission systems, high voltage high power electronic converters are the ideal candidate for achieving flexible and efficient power flow in bulk interconnected power systems. On one hand, it is no doubt that more electronic apparatus will be integrated into future power systems to further reduce carbon emissions. On the other hand, power electronic converters exhibit significantly different characteristics with traditional power system components and may bring a number of challenging stability issues from both converter-level and system-level perspectives. The knowledge and theories for understanding and analysis of more electronics power systems are still lacking and deserve in-depth studies.

This Special Section is dedicated to the recent developments of control and modeling techniques as well as system stability analysis for more electronics power systems. Six invited and submitted papers are selected for publication and categorized into three groups in this special section. The first group has three papers on modeling and control of multi-inverter power systems. Xiaoqiang Guo *et al.* present a comprehensive review on the control strategies of parallel-operated inverters and discuss about circulating current and current sharing issues. Wei Zhao *et al.* propose a reduced-order mathematical model for analyzing the low-frequency stability of multi-inverter microgrids. Yang Qi *et al.* propose a coordinated control strategy to mitigate voltage and current harmonics caused by non-linear loads and switching dead-time in multi-inverter microgrids. The second group has two papers focusing on modeling and control of power electronic converters. Tao Li *et al.* present a comparative study of Z-source inverter and several variants of this topology in terms of boost ratio and component stress. Fan Feng *et al.* present the impedance model and stability analysis of dual active bridge converters with an *LC* input filter. The parameter design of the *LC* filter is also discussed in the paper. The last group has one paper directed to grid applications of power electronic converters. Jiafa He *et al.* propose a current feedforward control strategy to reduce the dc-link voltage fluctuations of permanent magnet synchronous generator-based wind turbine systems when used for power system frequency support.

We would like to thank all the authors for their great contributions and the technical reviewers for their rigorous assessment and constructive comments and suggestions to ensure high quality publications.

Prof. Xinbo Ruan
Deputy Editor-in-Chief

Prof. Yi Tang
Prof. Paolo Mattavelli
Guest Editors

Digital Object Identifier 10.30941/CESTEMS.2018.00031

Deputy Editor-in-Chief:

Professor Xinbo Ruan received the B.S. and Ph.D. degrees in electrical engineering from Nanjing University of Aeronautics and Astronautics (NUAA), Nanjing, China, in 1991 and 1996, respectively.

In 1996, he joined the Faculty of Electrical Engineering Teaching and Research Division, NUAA, where he became a Professor in the College of Automation Engineering in 2002 and has been engaged in teaching and research in the field of power electronics. From August to October 2007, he was a Research Fellow in the Department of Electronic and Information Engineering, Hong Kong Polytechnic University, Hong Kong, China. From 2008 to 2011, he was also with the School of Electrical and Electronic Engineering, Huazhong University of Science and Technology, Wuhan, China. He is a Guest Professor with Beijing Jiaotong University, Beijing, China, Hefei University of Technology, Hefei, China, and Wuhan University, Wuhan, China. He is the author or coauthor of 9 books and more than 200 technical papers published in journals and conferences. His main research interests include soft-switching dc-dc converters, soft-switching inverters, power factor correction converters, modeling the converters, power electronics system integration and renewable energy generation system.

Dr. Ruan received the Delta Scholarship by the Delta Environment and Education Fund in 2003 and the Special Appointed Professor of the Chang Jiang Scholars Program by the Ministry of Education, China, in 2007. From 2005 to 2013, and since 2017 again, he served as Vice President of the China Power Supply Society, and from 2014 to 2016, he served as Vice Chair of the Technical Committee on Renewable Energy Systems within the IEEE Industrial Electronics Society. He is currently an Associate Editor for the IEEE Transactions on Industrial Electronics, IEEE Transactions on Power Electronics, IEEE Journal of Emerging and Selected Topics in Power Electronics, and IEEE Transactions on Circuits and Systems – II: Express Briefs. He is also a Deputy Editor of CES Transactions on Electrical Machines and Systems

Dr. Ruan is an IEEE Fellow.

Guest Editors:

Prof. Yi Tang, Nanyang Technological University, Singapore, yitang@ntu.edu.sg
Prof. Paolo Mattavelli, University of Padova, Italy, paolo.mattavelli@unipd.it