TITLE

Power architectures, applications and control of DC and hybrid DC/AC distribution systems

NAME AND AFFILIATION OF THE AUTHORS

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SCOPE AND BENEFITS

The increasing penetration of renewable energy resources and new sizeable loads, like heat pumps and electric vehicle charging stations, has posed many technical and operational challenges in the electric distribution grids.

In this scenario, medium voltage hybrid grids, where AC and DC loads can coexist, seem an attractive solution to upgrade the existing infrastructure. Electric vehicle charging stations, storage or renewable energy conversion systems could be directly connected to the DC network, while traditional loads would still be connected to the AC side. To enable this concept, interface converters between the two grids are necessary. The tutorial will make the audience aware of the main issues related to the management of the DC and hybrid AC/DC grids. The tutorial could help the professional life of the attendees providing them with basic tools of DC grids controls and their interfaces with the main AC grid both at system and at power converters level.

WHO SHOULD ATTEND

The tutorial is aimed for Ph.D. students in the field of electric/electronic engineering or power systems, as well as engineers working in industry. Researchers and engineers who seek for the basic knowledge for entering in this field, ranging from architectural design of DC distribution systems to advanced coordinated control and stabilization concepts. Prerequisite is basic knowledge about power electronics and classical control concepts.

Technical Level: Beginner to Medium

CONTENTS

Schedule is as follows:

Monday, 11 September 2017 - Tutorial day (Location: WUT, Warsaw, Poland)

08:00 - 09:30	Registration for full day and morning Tutorials
09:30 - 11:00	Future Hybrid AC/DC electric distribution grids (Prof. Liserre)
11:00 - 11:30	Coffee break
11.30 - 13:00	Coordinated control of DC distribution grids and microgrids (Assoc. Prof. Dragičević)
13:00 - 14:00	Lunch break and registration for the afternoon tutorials
14:00 - 15:30	Flexible DC Multibus based on the CHB Converter (Prof. Mastromauro)
15:30 - 16:00	Coffee break
16:00 - 17:30	Control of the DAB Converters (Dr. Buticchi)

ABOUT THE INSTRUCTORS

Marco Liserre is the head of the chair of power electronics at the Kiel university. He has published more than 250 technical papers (90 of them in international peer-reviewed journals and magazines), and three chapters of a book (Grid Converters for Photovoltaic and Wind Power Systems, ISBN-10: 0-470-05751-3 – IEEE-Wiley, also translated in Chinese). He has been associate professor at Bari Polytechnic (Italy) and professor in

reliable power electronics at Aalborg university (Denmark). He is associate editor of many IEEE journals. He has been founder and editor-in-chief of the IEEE Industrial Electronics Magazine, founder and the chairperson of the technical committee on Renewable Energy Systems, co-chairman of the International Symposium on Industrial Electronics (ISIE 2010), IES vice-president responsible of the publications. He has received the IES 2009 Early Career Award, the IES 2011 Anthony J. Hornfeck Service Award and the 2011 Industrial Electronics Magazine best paper award. He is senior member of IES AdCom. He has been elevated to the IEEE fellow grade in 2013. In 2014, he received "The Dr. Bimal Bose Energy Systems Awards" and was amongst the highly cited researchers, "The world's most influential scientific minds", by Thomson Reuters. He was also involved with managerial responsibilities in the Center of Reliable Power Electronics (CORPE) at Aalborg University.

Tomislav Dragičević (S'09-M'13-SM'17) received the M.E.E. and the industrial Ph.D. degree from the Faculty of Electrical Engineering, Zagreb, Croatia, in 2009 and 2013, respectively. From 2013 till 2016 he has been a PostDoctoral researcher at Institute of Energy Technology, Aalborg University, Denmark, where is currently an Associate Professor. His principal field of interest is overall system design of autonomous and grid connected DC and AC microgrids, and industrial application of advanced modelling, control and protection concepts to shipboard power systems, remote telecom stations, domestic and commercial facilities and electric vehicle charging stations. He has authored and co-authored more than 100 technical papers and book chapters in his domain of interest. Dr. Dragičević is a Member of the IEEE Power Electronics and IEEE Power Systems Societies and a Senior Member of the IEEE. He has served in Scientific Committee Boards in several IEEE conferences and has been invited for guest lectures and tutorials on a number of international universities, companies and conferences.

Rosa A. Mastromauro (S'05 - M'10) received the M.Sc. and Ph.D degrees in electrical engineering from the Politecnico di Bari, Bari, Italy, in 2005 and 2009, respectively. Since 2005, she has been with the Converters, Electrical Machines, and Drives Research Team, Politecnico di Bari, where she was an Assistant Professor. Currently she is an Associate Professor at the University of Florence, Florence, Italy, and she is engaged in teaching courses in power electronics and electrical machines. Her research interests include power converters and control techniques for distributed power generation systems based on renewable energies, smart grids and aircraft applications. Prof. Mastromauro is a member of the IEEE Industrial Electronics Society, IEEE Power Electronics society and IEEE Industrial Application Society. He has served in several IEEE conferences. She is a reviewer for IEEE conference proceedings and journals.

Giampaolo Buticchi (S'10-M'13-SM'17) was born in Parma, Italy, in 1985. He received the Master's degree in Electronic Engineering in 2009 and the Ph.D degree in Information Technologies in 2013 from the University of Parma, Italy. During his Ph.D., he was visiting scholar at the University of Nottingham, UK.

After working for two years as a senior researcher at the University of Kiel, Germany, he is now guest professor at the same institution. His research focuses on power electronics for renewable energy systems, smart transformer fed micro-grids and reliability in power electronics. He is author/co-author of more than 100 technical papers, 34 of them in international peer-reviewed journal. He is guest editor for the IEEE Transactions of Industrial informatics and he has been organizing tutorials and special session at several IEEE conferences. He has 3 inventions submitted to the German patent office and is co-founder of a spin-off for the development of electric drives.