
Editorial

Ahmed F. Zobaa*

Electrical Power and Machines Department
Faculty of Engineering
Cairo University
Giza, 12613, Egypt
E-mail: a.zobaa@eng.cu.edu.eg
*Corresponding author

Walmir Freitas and José Carlos Melo Vieira

Department of Electrical Energy Systems
State University of Campinas
13083-852, Campinas, Brazil
E-mail: walmir@dsee.fee.unicamp.br
E-mail: jcarlos@dsee.fee.unicamp.br

Biographical notes: Ahmed Faheem Zobaa received his BSc(hons.), MSc and PhD degrees in Electrical Power and Machines from the Faculty of Engineering at the Cairo University, Giza, Egypt, in 1992, 1997 and 2002, respectively. Currently, he is an Assistant Professor in the Department of Electrical Power and Machines, at the Faculty of Engineering, Cairo University. He was an Instructor in the Department of Electrical Power and Machines, with the Faculty of Engineering at the Cairo University from 1992 to 1997 and a Teaching Assistant from 1997 to 2002. His areas of research include harmonics, compensation of reactive power, power quality, photovoltaics, wind energy, education and distance learning. He is an Editorial Board member for *Electric Power Components & Systems Journal*, *International Journal of Emerging Electric Power Systems*, *International Journal of Computational Intelligence*, *WSEAS Transactions on Power Systems*, *International Review of Electrical Engineering*, and *Journal of Electrical Systems*. He is an Editor for *IEEE Power Engineering Letters* and *IEEE Transactions on Energy Conversion*. He is an Associate Editor for *IEEE Transactions on Industrial Electronics*, *Electrical Power Quality and Utilization Journal*, *International Journal of Power and Energy Systems*, *International Journal on Modelling and Simulation*, *International Journal of Energy Technology and Policy*, and *Neurocomputing Journal*. Also, he is an Editorial Advisory Board member for the *Turkish Journal of Electrical Engineering & Computer Sciences*, and *International Journal of Electrical Engineering Education*. Dr. Zobaa is a member of the IEEE Power Engineering/Industry Applications/Industrial Electronics/Power Electronics/Education Societies, Institution of Engineering and Technology, and the International Solar Energy Society.

Walmir Freitas received his PhD degree in Electrical Engineering from the State University of Campinas, Campinas, Brazil, in 2001. From 2002 to 2003, he was a Postdoctoral Fellow at the University of Alberta, Edmonton, Canada. At present, he is an Assistant Professor at the State University of Campinas, Brazil. His areas of research interests are analysis of distribution systems and distributed generation.

Jose Carlos Melo Vieira graduated in Electric Engineering from the Federal University of Uberlandia, Uberlandia, Brazil in 1996. He received his MSc and PhD degrees from the State University of Campinas, Campinas, Brazil in 1999 and 2006, respectively. From 1999 to 2003, he was with Figener, Sao Paulo, Brazil, as a Consulting Engineer. At present, he is a Postdoctoral Fellow at the State University of Campinas. His research interests are distributed generation, power system control, dynamics and protection.

Electrical power distribution systems are experiencing a deep restructuring process worldwide. The number of generators directly connected to these systems has considerably increased. These generators are classified as distributed generators. The interest in the usage of distributed generators has increased owing to technological advances, governmental incentives, concerns about environmental impacts, increase in demand and the need for primary energy sources diversification. However, the connections of these generators directly to medium voltage networks lead to many technical challenges. For example, islanding detection capability is an essential requirement for connecting these generators properly. Islanding occurs when a portion of the distribution system becomes electrically isolated from the rest of the power system, yet continues to be energised by distributed generators connected to the isolated subsystem.

Various technical interconnection guides recommend that immediately after an islanding situation, all the distributed generators must be automatically disconnected from the distribution system and remain disconnected until the normal grid supply is restored. Such action is necessary to avoid damage to loads and generators, as well as to guarantee personal safety. The coordination and selectivity of the protection system must also be evaluated in the presence of distributed generators, since the power and current flows are no longer unidirectional.

Another challenging aspect is the steady-state voltage control in distribution systems with distributed generators, because these generators may interfere with the typical network controllers. Historically, power distribution engineers had not been concerned about stability issues because of the passive behaviour of medium voltage networks. However, this is no longer a reality, and angle and voltage stability issues must be analysed.

The objective of this special issue is to provide a means for the publication and interchange of information, on an international basis, on control and protection of distribution systems with high penetration level of distributed generation.