
Editorial

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Biographical notes: Prasanta K. Ghosh is a Professor in the Department of Electrical Engineering and Computer Science at Syracuse University. He has been conducting research in the area of microelectronics and power engineering. He has authored or co-authored many journal articles and conference papers in the area of thin films, solid state devices, and power engineering. His current research focus includes smart grid, sensors, and optimisation of distribution system with distributed sources. He is a senior member of IEEE.

E.F. El-Saadany received his BSc and MSc degrees from Ain Shams University, Cairo, Egypt, and PhD degree from the University of Waterloo, Waterloo, ON, Canada, all in Electrical Engineering in 1986, 1990, and 1998, respectively. He is a Professor at the Department of Electrical and Computer Engineering, University of Waterloo, and currently on sabbatical leave with the Petroleum Institute (PI), UAE. His research interests include smart grids operation and control, power quality, distributed generation, power electronics, digital signal processing applications to power systems, and mechatronics.

Mohammed Safiuddin is an IEEE Life Fellow. He started his career as a Junior Engineer in APESB (India) in 1958. He joined Westinghouse Electric Corporation, Buffalo, NY as an Associate Engineer in 1960, and ended his employment there in 1985 as a Manager, Product/Strategic Planning in Power Electronics/Drive Systems Division. He is the President of STS International and Research Professor Emeritus at the University at Buffalo. He holds ten US patents, and was awarded with 'IUSD Award of Merit' in 1992 by the IEEE-IAS for his contributions to industrial control technologies and service to the IAS. He was also recognised for meritorious achievement in continuing education by the IEEE-EAB award in 2000.

Hossam A. Gabbar is a Full Professor in the University of Ontario Institute of Technology (UOIT) in the Faculty of Energy Systems and Nuclear Science, and cross appointed in the Faculty of Engineering and Applied Science. He has more than 210 publications, including patents, books/chapters, journal and conference papers. He obtained his BSc degree in 1988 with first class honour from the Faculty of Engineering, Alexandria University, Egypt. In 2001, he obtained his PhD degree from the Okayama University, Japan, where he was appointed as a Tenured Associate Professor, in the Division of Industrial Innovation Sciences.

Karl Christoph Ruland studied mathematics, computer science and physics. He received his Diploma and Dr.-degree in Mathematics at the University of Bonn, Germany. After six years in the industry, he became a Professor for Data Communications at the University for Applied Sciences, Aachen, Germany in 1982 and a Full Professor at the University of Siegen, Germany in 1992. His research focus is the integration of cryptography-based security into communications systems, preferably real-time and industrial-oriented systems. He served as a co-Chair of the Security WG of the eSafety Forum (for automotive security and safety) of the EU commission. For the last years, he specialised in smart grid control security.

Economic, environmental, societal and technical advancement have encouraged a proliferation of distributed resources (DR) in the design of microgrids as well as distribution system with better control. Additionally, electric vehicles (EV) have shown potential to be promising solutions for energy cost savings and emission reduction. In recent years, we have observed a significant increase in the usage DRs and EVs. The high penetration of DRs and EVs will impact several aspects of microgrid as well as the electric distribution systems' planning, operation, and regulation. The increased penetration of DRs and EVs have created additional complex technical challenges for grid operation and researchers are working passionately to improve the monitoring, protection, and control strategies to overcome those challenges. In this context, one of the key topics that needs to be addressed is the development of a better understanding of those challenges due to higher penetration of EVs and DRs and then develop solutions for the stable operation of the power delivery system.

This special issue focuses on exploring the future plans, methodologies and possible solutions that address the challenges and needs of the grid with connected EVs. The selected articles provide the readers with a variety of approaches in the development of microgrids and the impact of EV loads on the power system. The technical areas covered by the selected papers include the state of microgrid development efforts, the design of EV charging strategy, the building of microgrid resiliency, the harmonics generation during EV charging and the elevator drive energy analysis. Our expectation is that these articles will help generate further discussions and contributions from subject matter experts, and motivate new generations of researchers to actively participate in this rapidly growing and increasingly complex field.

I would like to thank Professor Hossam Gabbar, Editor-in-Chief of the *IJPSE SEGE*, for the opportunity to lead this initiative and for his instrumental support throughout this process. I would also like to thank Ms. Alexandra Starki, Journal Manager, for her outstanding administrative support. On behalf of the guest editorial board, our recognition goes to the reviewers for their priceless time and hard work evaluating the submitted papers and providing insightful recommendations to the authors. Our objective is that this special issue serves as a reference for the development of solutions to improve the operation of present and future microgrid and power delivery system in general.