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Mansoura Engineering Journal

Special issue

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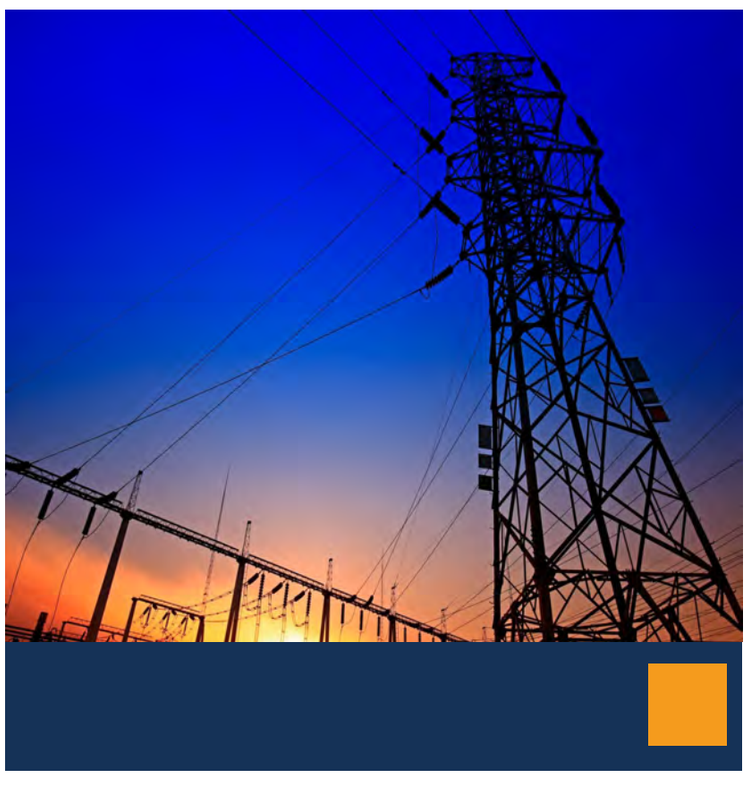
“ Optimal Design and Operation of Smart Grid Systems ”



Summary

Confronting climate change and its accompanying phenomena such as global warming and air pollution have become the most important challenge facing the world. The continuous increase in the world population, the different lifestyles, and the increase in their energy consumption, relying on fossil fuels, makes these phenomena increase and pose a great danger to humanity if it is not confronted before it is too late. In addition to the geopolitical problems related to the production and transfer of energy sources, which was evident in the Russian-Ukrainian crisis, it made the world move more towards finding renewable sources of energy such as solar energy and wind energy. As a result of the intermittent nature of the output of these sources and their low correlation with the loads, it was necessary to find ways to increase this correlation. This was the main motive for the use of smart grid systems. The smart grid system works to increase the correlation between generation, available storage, and the expected load. It can also control the load by adjusting the tariff and increasing consumer awareness to contribute to the stability of the power system. Smart grid systems play an important role in managing the available assets and load requirements to always preserve the stability of the power system even in abnormal operating conditions. Although smart grids solve many of the contemporary problems they give rise to new control and optimization problems with the growing role of renewable energy sources.

Under the highly dynamic nature of the generated power, varying consumer demand, and cost of energy, the smart grid should manage the system such that the load demand is met by giving a higher priority to renewable energy sources. Hence, the generated power from renewable energy sources should be utilized while minimizing the generation from non-renewable sources as much as possible. This special will shed a light on the concepts and challenges of smart grids. Different modeling, simulation, and experimental validation of smart grids integrated with hybrid energy systems will be the main objectives of this special issue. The different demand-side management strategies will be discussed and assessed. Optimal sizing, allocation, and operation of smart grid systems will be covered. Power quality and protection issues are very important in smart grids and they will be covered in this issue. Communications, cyberattacks, and cybersecurity problems and solutions will be discussed and highlighted. The proposed special issue will concentrate on innovation strategies and solutions in the field of smart grid systems. All authors should participate a novel and recent studies in this field which can help researchers, designers, and decision-makers working in this area.

all issues

Special issue

Topics of interest include

"but are not limited to"

-Review of the Smart Grid Concepts
-Smart Grid Opportunities and Challenges
-Demand Side Management Strategies in Smart Grid Applications
-Modern Energy Storage Systems in Smart Grid Applications
-Modern Blockchain Technology on Smart Grid Applications
-Modern Optimization Algorithms used for the Design and Operation of Smart Grid
-Dispatch Strategies used with Smart Grid
-Modeling, and Simulation Techniques used with Smart Grid Systems
-V2G operation in Modern Smart Grid Systems
-Communication Systems used in Smart Grid Systems
-Machine Learning and IoT Approaches Applications in Smart Grid Systems
-Smart Protection Systems Applied in Smart Grid Systems
-Dynamic Stability Evaluation of Smart Grid Systems
-Load and Weather Forecasting Strategies for Smart Grid Systems
-Distributed Generation Management in Smart Grid
-Reseliance Evaluation of Smart Grid under Different Abnormal Operations
-Attacks and Defense Strategies for Enhancing Smart Grid Security
-Vulnerabilities of Smart Grid Systems Against Cyberattacks and Solutions
-Reliability, Security, and Economical Evaluation of Smart Grids
-Future Prospects of Smart Grid Systems.

Manuscript Submission Information

Manuscripts should be submitted online at https://www.editorialmanager.com/meng/default2.aspx
or Contact : Mej@mans.edu.eg , Eltamaly@mans.edu.eg

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Editors Biography

Prof. Ali Mohamed Eltamaly is a full professor at Mansoura University, Egypt and King Saud University, Saudi Arabia. He received the B.Sc. and M.Sc. degrees in electrical engineering from Al-Minia University, Egypt in 1992 and 1996, respectively. He received his Ph.D. Degree in Electrical Engineering from Texas A&M University in 2000. His current research interests include renewable energy, smart grid, power electronics, motor drives, power quality, artificial intelligence, evolutionary and heuristic optimization techniques, and distributed generation. He published 40 books and book chapters and he has authored or co-authored more than 250 refereed journal and conference papers. He published several patents in the USA patent office. He has supervised several M.S. and Ph.D. theses and worked on several National/International technical projects. He got a distinguished professor award for scientific excellence from the Egyptian supreme council of Universities, Egypt, in June 2017, and he has been awarded many prizes in different universities in Egypt and Saudi Arabia. He is participating as an editor and associate editor in many international journals and chaired many international conferences' sessions. He was a chair professor of Saudi Electricity Company Chair in power system reliability and security, at King Saud University, Riyadh, Saudi Arabia

Prof. Ali Mohamed Eltamaly

was born in Monofia, Egypt, on 1960. He graduated from faculty of Engineering, Mansoura University. He received M.Sc. and PhD Degree from Mansoura University, in 1989 and 1998 respectively. He is a member of Electrical Department in faculty of Engineering, Mansoura University. He is interested in electrical power system analyses, renewable energy integration, smart grids and scientific/application researches. He has authored/co-authored numerous articles published in the refereed renowned journals. He is an Editor for Mansoura Engineering Journal. He is a senior member in IEEE. He spent many years working with oil and gas fields in maintenance, commissioning and pre-commissioning. He has wide experience with industry applications, consultations, electrical technical studies and International Training. He has wide experience in designing, planning and delivering basic and/or OJT training programs in different fields (electric networks, oil and gas companies, industrial companies, etc) He introduced hundreds of in house and public training courses all over the Middle East. He enhanced the learning experience for well-known companies in Arabic countries utilizing e-learning methods. He participated in conducting a very robust assessment and verification process.

Prof. Mohamed Kotb

He obtained a B.Sc. (ranked first, with honor), M.Sc., and Ph.D., all in Electrical Engineering from the Faculty of Engineering - Mansoura University, EL-Mansoura, Egypt. Currently, he is an assistant professor at the Electrical Engineering Department at Mansoura University, Egypt. In 2019 he received the best Ph.D. thesis award from Mansoura University. He is IEEE Member from 2021 till now. He has authored and co-authored many journal and conference research papers. He has supervised several M.Sc. and Ph.D. theses. He participates in many national and international projects. His fields of interest include energy management, microgrid operation and control, power system protection, power quality, resiliency enhancement, internet of things, optimization methods, islanding detection, system restoration, microgrid protection, smart manufacturing, cybersecurity, shipboard microgrids, HVDC protection and control, electric vehicles, and hydrogen generation.

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