

2016 IEEE International Conference on Sustainable Energy Technologies (ICSET 2016)

**Hanoi, Vietnam
14-16 November 2016**



**IEEE Catalog Number: CFP1679D-POD
ISBN: 978-1-5090-5201-1**

**Copyright © 2016 by the Institute of Electrical and Electronics Engineers, Inc
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

******This publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP1679D-POD
ISBN (Print-On-Demand):	978-1-5090-5201-1
ISBN (Online):	978-1-5090-5200-4

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2016 IEEE International Conference on Sustainable Energy Technologies (ICSET) 14 – 16 November 2016, Hanoi, Vietnam

Table of Contents

Papers	Page
Dynamic Environmental Economic Dispatch: A Distributed Solution based on an Alternating Direction Method of Multipliers <i>Dinh Hoa Nguyen, Tatsuo Narikiyo and Michihiro Kawanishi</i>	1
Robust transient stability assessment of renewable power grids <i>Thanh Long Vu and Konstantin Turitsyn</i>	7
Options for emergency control of power grids with high penetration of renewables <i>Thanh Long Vu and Konstantin Turitsyn</i>	13
Voltage multi-stability in distribution grids with power flow reversal <i>Hung Nguyen and Konstantin Turitsyn</i>	19
An Optimal Reactive Power Dispatch (ORPD) for Voltage Security Using Particle Swarm Optimization (PSO) in Graph Theory <i>Diksha Kaur, Tek Tjing Lie, Nirmal K C Nair and Brice Valles</i>	25
Performance Evaluation of Electric Spring: Effect of Load Variation on Voltage Regulation <i>Binita Sen, Ren Kailin, Romika Sharma, Jayantika Soni and S. K. Panda</i>	31
Evaluation of Statistical Interpretation Methods for Frequency Response Analysis based Winding Fault Detection of Transformers <i>Wesley Neoh-Khoo, Saurabh Bhandari, Aravinth Subramaniam, Mehdi Bagheri and Sanjib Kumar Panda</i>	36
A Wireless Sensor and Actuator Network (WSAN) Framework for Personalized Thermal Comfort in Office Buildings <i>Sindhu Shetty, Duc Chinh Hoang and Manish Gupta and Sanjib Kumar Panda</i>	42
GIS Integrated Automation of a Near Real-Time Power-Flow Service for Electrical Grids <i>Joymala Moirangthem, Krishnanand K.R., Sanjib Kumar Panda, and Gehan Amaratunga</i>	48
Optimal sizing of energy storage devices in wind-diesel systems considering load growth uncertainty <i>Hong-Nhung Nguyen and Huy Nguyen-Duc</i>	54
Multi-Objective Optimization Approach for SVRs Annual Optimal Operation and Optimal Placement <i>Ryuto Shigenobu, Ahmad Samim Noorzad, Atsushi Yona and Tomonobu Senjyu</i>	60
Study on Demand and Supply Operation Using Forecasting in Power Systems with Extremely Large Integrations of Photovoltaic Generation <i>Taisuke Masuta, Joao Gari Da Silva Fonseca Junior, Hideaki Ootake and Akinobu Murata</i>	66

Analysis and Control Design of Transformerless High Gain, High Efficient Buck-boost DC-DC Converters <i>Tran Anh Vu, Dao Phuong Nam and Pham Thi Viet Huong</i>	72
A P&O MPPT Method for Photovoltaic Applications Based on Binary-Searching <i>Chi-Thang Phan-Tan and Nam Nguyen-Quang</i>	78
Placement and Sizing Optimization for PV-Battery-Diesel Hybrid Systems <i>Carlos D. Rodriguez Gallegos, Manuel S. Alvarez Alvarado, Oktoviano Gandhi, Dazhi Yang, Wenjie Zhang, Thomas Reindl and Sanjib Kumar Panda</i>	83
Numerical Simulation of Channel Induction Furnace to Investigate Frequency-Dependent Efficiency <i>Ninh Tran Thi Hang and Ulrich Lüdtke</i>	90
Bidding Strategy for Virtual Power Plant With Intraday Demand Response Exchange Market Using Stochastic Programming <i>Hieu Trung Nguyen and Long Bao Le</i>	96
A Reduced-order Observer-based Control System Designed in the Frequency Domain for Dual-Active-Bridge Converter <i>Duy Dinh Nguyen, Goro Fujita, Quang Bui Dang and Cao Minh Ta</i>	102
Converters with High Boost, Energy Storage and Bi-Directional Power Flow in Energy Systems <i>M. F. Rahman, I. Osman, D. Xiao and K. S. Alam</i>	108
LED Lighting as Energy Management Tool through Correlation Analysis of Daily Electricity Demand and Supply Curve <i>Junaid A. Qureshi, Tek Tjing Lie and R Hasan</i>	114
Non-Isolated Dual Half-Bridge ZVS/ZCS High Step-Down Converter with Zero DC Bias Current Coupled Inductor and Active Clamp <i>K. I. Hwu and W. Z. Jiang</i>	120
DC-DC Converter with Large Step-Down Voltage Conversion Ratio <i>K. I. Hwu and W. Z. Jiang</i>	126
A Research of Large –Scale Biomass Densification Technology in order to Reduce The Greenhouse Gases Emission <i>Tran Tien Anh</i>	132
A Comparison Study of MVDC and MVAC for Deployment of Distributed Wind Generations <i>Thai-Thanh Nguyen, Hyeong-Jun Yoo and Hak-Man Kim</i>	138
Real-time Optimization for Microgrid Operation based on Auto-Configuration in Grid-Connected Mode <i>Van-Hai Bui, Akhtar Hussain, Thai-Thanh Nguyen and Hak-Man Kim</i>	142
Optimal Microgrid Operation Considering Auto-Configuration in Islanded Mode <i>Van-Hai Bui, Akhtar Hussain and Hak-Man Kim</i>	147
Modeling and Analysis of An Integrated AC-DC Network under AC and DC Faults <i>Duc Nguyen Huu</i>	151
An Adaptive Control of Hybrid Battery-SuperCapacitor Storage for Integration of Wind and Solar <i>Duc Nguyen Huu</i>	157

SVPWM Method for Dual Indirect Matrix Converter with Zero-Common Mode Voltage <i>Tuyen D. Nguyen, Tran Thanh Vu, Van-Tung Phan and Quoc Dzung Phan</i>	163
RCAM Based Asset Management Study for Turkish National Power Transmission System: Verification Stage <i>Aysun Koksak and Aydogan Ozdemir</i>	169
Dynamic Voltage Restorer-Multilevel Inverter Based on Predictive Voltage Controller <i>Hai N. Tran, Quoc Dzung Phan, Nhuan A. Le and Tuyen D. Nguyen</i>	174
Data-driven design of a cascaded observer for battery state of health estimation <i>Christoph Hametner, Stefan Jakubek and Wenzel Prochazka</i>	180
Design of Novel Grid Tie Solar - Wind Hybrid Power Plant Using Photovoltaic Cell Emulating System <i>Vu Minh Phap, Naoki Yamamura, Muneaki Ishida, Junji Hirai and Nguyen Thuy Nga</i>	186
Applications of SVM networks in hybrid model for environment parameters estimation <i>Dinh Do Van, Dinh Van Nhuong and Hoai Linh Tran</i>	190
Use of plasmonic metal nanoparticles to increase the light absorption efficiency of thin-film solar cells <i>Saniat Ahmed Choudhury and Mustafa Habib Chowdhury</i>	196
Modified Controls for DFIG under Unbalanced Voltage Dip for Reduction of Current Harmonic using PI-F plus Resonant Controller <i>Nguyen-Thanh Hai, Quoc Phan Dung and Vo Viet Cuong</i>	202
Electric-Thermal Photovoltaic Model Characteristics Validation <i>Xuan Hung Mai, Jee-Hoon Jung and Katherine Kim</i>	208
Simulation to Optimize a DC Microgrid in Okinawa <i>Taichiro Sakagami, Yoshiyuki Asai and Hiroaki Kitano</i>	214
The Analysis of Piecewise PI Compensation Based on the Digital Control of Half-Bridge LLC <i>Weiping Zhang, Peng Mao and Jie Li</i>	220
Adaptive Virtual Impedance Control Scheme to Eliminate Reactive Power Sharing Errors in Islanded Microgrid <i>Van-Tuan Hoang, Tuyen D. Nguyen and Hong-Hee Lee</i>	224
A Review of Maximum Power Point Tracking Methods for Photovoltaic System <i>Weiping Zhang, Peng Mao and Xiaoxiao Chan</i>	230
Improvement of Power Converter Configuration in Heliostat System <i>Pascal Maussion, Quoc Dzung Phan, Bao Anh Nguyen, Tuyen D. Nguyen and Kinh Luan Van</i>	235
Fault detection on the transmission lines using the time domain reflectometry method basing on the analysis of reflected waveform <i>Linh Tran Hoai and An Hoa Duong</i>	241
Toward building energy management: Electric analog modeling for thermal behavior simulation <i>Hoang-Anh Dang, Benoit Delinchant and Frederic Wurtz</i>	246
Hydrochar slurry fuels and high-grade activated carbon for electricity production and storage - Conceptual process design and analysis <i>Khanh-Quang Tran, Terese Løvås, Øyvind Skreiberg and Rajesh S. Kempegowda</i>	251

An Overview of Power Circuit Topologies for Inductive Power Transfer Systems <i>Bac Xuan Nguyen, Wang Peng and D. Mahinda Vilathgamuwa</i>	256
Multilevel Converter topologies based High Power Inductive Power Transfer systems <i>Bac Xuan Nguyen, Wang Peng and D. Mahinda Vilathgamuwa</i>	264
Current THD Reduction for Grid-Connected Inverter Operating in Discontinuous Current Mode <i>Hoai Nam Le and Junichi Itoh</i>	270
Design of a Bi-Directional DC-DC Converter for Solid-State Transformer (SST) Application by Exploiting the Shoot Through Mode <i>Kazi Saiful Alam, Lew Andrew R. Tria, Daming Zhang and M.F. Rahman</i>	276
An Intelligent Home Appliance Control-based on WSN for Smart Buildings <i>Cui Kaiwen, Arun Kumar, Nikhil Xavier and Sanjib Kumar Panda</i>	282
Simulation and Performance Analysis of a New LVRT and Damping Control Scheme for DFIG Wind Turbines <i>Minh Quan Duong, Huu Hieu Nguyen, Kim Hung Le, Thanh Viet Phan and Marco Mussetta</i>	288
Stability Certificate for Transmission Power Grids under Network Changes <i>Dinh Hoa Nguyen, Huynh Ngoc Tran, Tatsuo Narikiyo and Michihiro Kawanishi</i>	294
Analysis and Design of a Current-Fed Push-Pull Parallel-Resonant Converter for Cooker Magnetrons <i>Yueh-Ru Yang</i>	300
Dual-Band Rectenna for Ambient RF Energy Harvesting at GSM 900 MHz and 1800 MHz <i>Dinh-Khanh Ho, Ines Kharrat, Van-Duc Ngo, Tan-Phu Vuong, Quoc-Cuong Nguyen, Minh-Thuy Le</i>	306
Comparison of two level PWM and three level PWM in Dual Active Bridge converter <i>Yuki Nishiya, Duy Dinh Nguyen and Goro Fujita</i>	311
Battery Charger with Small DC-Link Capacitors for G2V Applications <i>Hoang Vu Nguyen, Yoon-Cheul Jeung and Dong-Choon Lee</i>	315
Fuzzy Logic Based Maximum Power Point Tracking Technique For A Stand-Alone Wind Energy System <i>Son Nguyen Thanh, Hoa Ha Xuan, Cong Nguyen The, Phi Pham Hung, Tuan Pham Van and Ralph Kennel</i>	320
Grid-connected PV system design option for nearly Zero Energy Building in reference building in Hanoi <i>Nguyen Xuan Truong, Nguyen Lang Tung, Nguyen Quang Hung and Benoit Delinchant</i>	326
Fault-Tolerant Cascaded Multi-level Inverter with Improved Output Quality <i>Kalpani Thantirige, Sanjib Kumar Panda, Akshay Kumar Rathore, Suvajit Mukherjee, Michael Adam Zagrodnik and Amit Kumar Gupta</i>	332
Review of Smart Grid Requirements and Design Standards for Future Naval Vessels <i>Sivakumar Nadarajan, Amit Kumar Gupta and Sanjib Kumar Panda</i>	338
Hydrogen and Electricity Production from Anaerobic Digestion of Rice Vermicelli Wastewater by Mixed Acidophilic Consortia in a Microbial Fuel Cell	344

Woranunt Lao-Atiman, Suphatcha Chiraphatphimon, Nusara Sinbuathong, Chuttchaval Jeraputra and Chularat Sakdaronnarong

Maximum Efficiency Design of Line Start Permanent Magnet Synchronous Motor 350
Bui Minh Dinh, Ho Manh Tien

Electromagnetic and Thermal Calculation of Surface Mounted Permanent Magnet Motor using Finite Element Method 355
Bui Minh Dinh, Dinh Hai Linh

A Non-Isolated Converter Design with Time-Multiplexing Control Topology for Un-Binned High-Power LEDs in Parallel Operation for Off-Grid Solar-PV Streetlamps 359
Ramprakash Kathiresan, Sanjib Kumar Panda, Pritam Das and Thomas Reindl

Saturable q-axis magnetizing inductance calculation of Line Start-Permanent Magnet Synchronous Motors using Lumped Parameter Model 364
Le Anh- Tuan, Bui Duc-Hung and Phung Anh-Tuan

Photovoltaic Power Predictions using Modified Adaptive Response Rate Exponential Smoothing Method 369
P. Y. Lim and Farrah Wong

Using double fed induction generator to enhance voltage stability and solving economic issue 374
Nguyen Huu Hieu and Le Hong Lam

High-Performance Coordination for Accurate Matlab Simulink PV Module Simulator based on a Two-Diode Model 379
Nguyen Huu Hieu and Minh Quan Duong

Online Ensemble Learning for Security Assessment in PMU Based Power System 384
Hieu Trung Nguyen and Long Bao Le

Minmax Profit Sharing Scheme for Cooperative Wind Power Producers 390
Hieu Trung Nguyen and Long Bao Le

Load Frequency Control by Integrating Real-time Price Presentations for Consumers and Direct Commands issued to Generators and Batteries 396
Ryo Satouchi, Yu Kawano and Toshiyuki Ohtsuka

Enabling Technologies for Sustainable All – Electric Hybrid Vessels 401
Ricky R. Chan, Liza Chua and Tegoeh Tjahjowidodo

Distributed Intelligence: Unleashing Flexibilities for Congestion Management in Smart Distribution Networks 407
A.N.M.M. Haque, T.H. Vo, P.H. Nguyen

Design and Implementation of a Multi-Output Inductive Charger for Electric Vehicles 414
Van-Binh Vu, Van-Tung Phan, Dinh -Tuyen Nguyen, Thillainathan Logenthiran and R. T. Naayagi

Battery Storage Technologies, Applications and Trend in Renewable Energy 420
Nesimi Ertugrul