2012 IEEE Third International Conference on Sustainable Energy Technologies

(ICSET 2012)

Kathmandu, Nepal
24-27 September 2012

IEEE Catalog Number: CFP1279D-PRT
ISBN: 978-1-4577-1870-0

TABLE OF CONTENTS

On the Dynamics of Photovoltaics vs Nuclear Power 1
Reinhard Haas

Optimization of Residential Grid-Tied PV Systems without Net-Metering Using Load Management 6
Sangita Sharma, David W. Galipeau

Life Cycle Analysis of an Off-Grid Solar Charging Kiosk 12
Christopher J. M. Emmott, Abdalla A Jaoude, Antonio Urbina, Nicholas J. Ekins-Dawkes, Jenny Nelson

Effects of Parasitic Circuit Elements in RF Energy Harvesting Circuit 18
Masaki Muramatsu, Hiroki Nishiyama, Hirotaka Koizumi

Interleaved Zero-voltage-switching Active-clamped Current-fed Full-bridge Isolated DC/DC Converter for Fuel Cell Applications: A Case Study Analysis 23
P. D. Dharmesh, Akshay K. Rathore, Xiaodong Li

Modelling of Multi-Pick-up Bi-directional Inductive Power Transfer Systems 30
Akshya K. Swain, Srikanth Devarakonda, Udaya K. Madawala

A Power Electronic Controller for PV-tied Grid-Connected System with Single Parameter Sensing for MPPT using Boost Converter and Line-Commutated Inverter 36
A. Arjun, B. Vinod, N. Kumaresan, D. R. Binu Ben Jose

Single-Sensor HCC PWM Control of 3-Phase Boost Type AC-DC Converter Giving Unity Power Factor 41
A. N. Arvindan

An Efficient Isolated Bi-directional Half Bridge Resonant DC/DC Converter 48
Xiangwu Yan, Huichao Zhao, Qingli Zhang, Hongchang Liu, Zheng Lv

A Modular Multi-level Converter (M2LC) based on Inductive Power Transfer (IPT) technology 54
Baljit Singh Riar, Udaya Madawala

Controller Synthesis of a Bidirectional Inductive Power Interface for Electric Vehicles 60
M. J. Neath, A. K. Swain, U. K. Madawala, D. J. Thrimawithana, D. M. Vilathgamuwa

Grid Connection of Micro Hydropower, Mini Grid Initiatives and Rural Electrification Policy in Nepal 66
Suraj Baral, Suman Budhathoki, Hari Prasad Neopane

The Approach for HPP Generation Optimization under Liberalized Electricity Market 77
Anna Mutule, Artjom Obusev, Aleksandr Lvov

Dynamic Management of Power System Sustainable Development with Smart Grids Application on Transmission Level 81
Irina Oleinikova, Mario Turcik, Artjom Obushev

Genetic Algorithm Based Simultaneous Coordination of PSS and FACTS Controllers for Power Oscillations Damping 85
Rajendraprasad Narne, P. C. Panda, Jose. P. Therattil

Current Control Techniques for Utility Interface Converters with Low THD 91
Wei-Hsiang Wang, Ying Yu Tzou

PSCAD Validation of Delta-Wye Transformer as a Harmonic Filter for THD Mitigation of Line Currents in Three-Phase Bridge Rectifier 97
A. N Arvindan, V. Muthukumarasamy

Single-Sensor HCC PWM Control of the Boost Type AC-DC Converter Giving Unity Power Facto 103
A. N. Arun Kumar

Power Quality Analysis of 1-Phase Matrix Topology in PWM AC Chopper and Cycloconverter Modes 110
A. N. Arvindan, A. Aathithya

Comparing Electric Mobility Policies to Transition Science: Transition Management Already in Action? 123
Christoph Mazur, Marcello Contestabile, Gregory Offer, Nigel Brandon

Technological, Ecological and Economic Perspectives for Alternative Automotive Technologies up to 2050 129
Amela Ajanovic, Reinhard Haas

Fully Thermally Coupled Distillation Column Design for Liquid Petroleum Gas Recovery 135
Hosanna Uwitonze, Amit Goyal, Minchul Ha, Kim Se Jung, Kyu Suk Hwang

Implementation of VVVF, CVVF & CFVV Control Strategies for Control of LIM 141
S. N. Mahendra, Srihari Velisetti, Kunwar Aditya

Design of Static Wireless Charging Coils Integration into Electric Vehicle 146
Subhadeep Bhattacharya, Y. K. Tan
The Design of Full-Bridge Phase-Shifting ZVS Switch Power Supply Based on Adaptive Delay Control Technology 152
Xiangwu Yan, Hongchang Liu, Huichao Zhao, Qingli Zhang, Bo Zhang
CTF Control Algorithm of DSTATCOM for Power Factor Correction and Zero Voltage Regulation 157
Sabba Raj Arya, Bhim Singh
Power Quality Improvement using Buck-Boost Converter for Fluorescent Lighting 163
Ashish Shrivastava, Bhim Singh
Dual Active Bridge Converter as Gyrator 169
Walbermark M. Dos Santos, Denizar C. Martins
Grid Interfaced Solar Photovoltaic Power Generating System with Power Quality Improvement at AC Mains 177
Arun Kumar Verma, Bhim Singh, D. T. Shahani
A New Digital Double Integral Sliding Mode Maximum Power Point Tracker for Photovoltaic Power Generation Application 183
Raseswari Pradhan, Bidyadhar Subudhi
Energy Production Estimation of a Photovoltaic System with Temperature-dependent Coefficients 189
Giovanni Accetta, Luigi Piroddi, Luca Ferrarini
Comparative Study of Grid-Tied Photovoltaic (PV) System in Kathmandu and Berlin Using PVsyst 196
Paras Karki, Kusang Sherpa
Development of Photovoltaic System Planning Software 200
Chong Learn Khang, Yung C. Liang
Design of Permanent-Magnet Synchronous Gear Motor with High Efficiency for Elevators 205
Jong-Chin Hwang, Chuan-Sheng Liu, Po-Cheng Chen
A Battery-Balancing Seven-Level Inverter 211
Liang-Rui Chen, Chung-Ming Young, Neng-Yi Chu, Chia-Che Li, Yu-Chih Hsiao
Study of the Optimal Pulse Current Discharging Frequency of the Li-ion Battery 217
Liang-Rui Chen, Jin-Jia Chen, Chun-Min Ho, Shing-Lih Wu
Generalized Carrier-based PWM Method for Indirect Matrix Converters 223
Tuyen D. Nguyen, Hong-Hee Lee
Dual-Balancing Control for Improving Imbalance Phenomenon of Lithium-Ion Battery Packs 229
Chang-Hua Lin, Chien-Ming Wang, Hsuan-Yi Chao, Min-Hsuan Hung
Eliminating the Wall Charge Effect in Field Emission Lamp Based on the Impulse-Power Technique with PLL Feedback Mechanism 235
Chang-Hua Lin, Chien-Ming Wang, Min-Hsuan Hung, Rong-Hou Wu
The Effect of Collector Aspect Ratio and Fin Density on the Thermal Performance of Rectangular Finned Absorber Solar Air Heaters 241
Prabha Chand, S. P. Sharma
Mitigation of Unbalanced Currents in Three-Phase Asynchronous Generator Supplying Single-Phase Nonlinear Load 246
Abhishek Kumar, Sarsing Gao
Analysis of Parallel Operation of SEIGs with Voltage Based Controller in Mini-Grid 252
V. Bhandari, R. Dahal, T. Toftevaag, L. Lindquist, J. Marvik, B. Adhikary, R. K. Maskey, N. Shrestha
Reliability Evaluation of Small Standalone Hybrid Solar PV-Wind Power System 259
N. Pradhan, N. R. Karki, B. R. Pokhrel
Performance Study of Micro-Hydropower System in Nepal 265
Shyam Sundar Khadka, Ramesh Kumar Maskey
Control of Solar Powered Micro-grids Using Electric Vehicles 270
Lanka Udawatta, Udaya K. Madawala, Dharshana Muthumuni, Mahinda Vilathgamuwa
A Soft-switching Inverter Using a Voltage Clamp Soft-Switching Step-up/Down DC Link 276
Chien-Ming Wang, Chang-Hua Lin, Hsin-Yi Lin, Yu-Hao Lai, Maw-Yang Liu
A Single-Stage Three-Phase to Singe-Phase Current-Fed High Step-Up AC-DC Matrix Converter with PFC 281
Chung-Ming Young, Ming-Hui Chen, Hong-Lin Chen
Comparison of Performances of Hysteresis and Dead Beat Controllers in Active Power Filtering 287
R. Panigrahi, P. C. Panda, B. D. Subudhi
Optimal Power Interface Topology for DC Grid Connected LED Lighting System 293
Nirnaya Sarangan, Y. K. Tan
A ZVS-PWM INterleaved Transformer-Isolated Boost DC/DC Converter with a Simple ZVS-PWM Auxiliary Circuit 299
Chien-Ming Wang, Chang-Hua Lin, Shih-Yung Hsu

An Enhanced Controller for Shunt Active Filter Interfacing Renewable Energy Source and Grid 305
K. Ilango, P. V. Manitha, Nair G. Manjula
Illumination Design of Freeform Lens for Multiple Point Sources 311
Ku-Chin Lin
An Introduction to Tidal Power Generation and Analyzing the Potentiality in Bangladesh 316a
Saifullah Al Yusuf, Sabuj Das Gupta, Tausif Ali, Iftekhar Zaman Arnab, Johora Begum
Experimental Optimisation of a Low-head Pico Hydro Turgo Turbine 322
S. J. Williamson, B. H. Stark, J. D. Booker
The Ultimate Fuel Choice for Power Plants of Bangladesh: An Essential Initiative Towards National Energy Security 327a
Sabuj Das Dupta, Md. Fakhrul Islam, Md. Rifat Rayhan, Abid Hasan
Turbine Emulator for Development of Variable Speed Microhydro Power Generation Systems 335
Rex Joseph, L. Umanand
A Hybrid Energy System for a Household in Northern Part of India 341
Natasha Agarwal, S. Chakrabarti
Modified Boost Inverter Opology for Compensation of Unbalanced and nonlinear Loads in Three Phase System 346
Soumya Kanta Panda, Sathish Kumar Kollimalla, Mahesh K. Mishra
Series-Parallel Loosely Coupling Power Supply with Primary-Side Control 352
Yuan-Hsin Chao, Jenn-Jong Shieh
A Gate Driver with Output Voltage Equal to Triple Input Voltage 357
K. I. Hwu, Y. T. Yau
A Novel Inductor-Coupled Step-up-Down Converter 361
K. I. Hwu, T. J. Peng
High Step-Up Converter Based on Coupling Inductor and Bootstrap Capacitos with Active Clamping 364
K. I. Hwu, Y. T. Yau, Jenn-Jong Shieh
Modelling of a Multi-Source Low-Head Pico Hydropower Off-Grid Network 369
S. J. Williamson, B. H. Stark, J. D. Booker
A Load Flow Algorithm for Radial Distribution System with Distributed Generation 375
D. Bhujel, B. Adhikary, A. K. Mishra
Design and Analyses of Earth-Air Heat Exchange Systems for Space Cooling 385
Ankit Agarwal, Rohit V. Maitri, Praveen Garg, Laltu Chandra
Post-Installation Analysis of Locally Manufactured Small Wind Turbines: Case Studies in Peru 396
J. Leary, R. Howell, A. While, J. Chiroque, K. Verkamp
Impact of Transients Due To Drive Train in Variable Speed Wind Energy Conversion System 402
R. K. Thakur, N. K. Jha
Design of a Standalone Wind Energy Conversion System using Sensorless MPPT Approach 409
Neha Adhikari, Bhim Singh, A. L. Vyas
Major Methods of Steady-State Analysis of Three-Phase SEIGs - A Sumamry 415
Namani Rakesh, N. Kumaresan, S. Senthil Kumar, M. Subbiah
A Study on Boost Chopper Circuit Design for Thermaelectric Generators 420
Yuki Takahashi, Hirotaka Koizumi
A Method of Rapid Detection of the Grid Voltage Sudden Change 426
Xiangwu Yan, Qingli Zhang, Hongchang Liu, Huichao Zhao, Lin Li
Analysis and control of DC-DC Buck converter using Average Power Balance Control (APBC) 432
Sathish Kumar Kollimalla, Mahesh Kumar Mishra
Analysis of High Temperature Thermal Energy Storage for Solar Power Plant 438
Bhaskar Rahul Nandi, Santanu Bandyopadhyay, Rangan Banerjee
A Calculation Method of Photovoltaic Array's Operational Point for MPPT Evaluation Based on One Variable Newton-Raphson Method 451
Makoto Uoya, Hirotaka Koizumi
Designing Models and Screening Biomass Residues for Facilitationg the Implementation of Local Biomass Energy Technologies 457
Rikke Lybaek, Tygre Kjaer, Thomas Budde Christensen
Author Index