# TABLE OF CONTENTS

Information Modeling And Implementation Of Monitoring And Control System In Large Scale Battery Energy Storage System .................................................. 1
Y. Liu, W. Huang, T. Yu

The Grey Prediction Of Renewable Energy Development Driven By Smart Grid Platform ............................................... 6
R. Yuan, L. Li, Q. Li, F. Di, D. Jia, Y. Huang, B. Duan

Impacts Of Wind Power Intermittency On Power System Transient Stability .................................................... 10
S. Sun, L. Shi, Y. Ni, L. Yao, M. Bazargan

Multi-Criteria Voltage Vulnerability Index Based On Data Envelopment Analysis ........................................ 15
Y. Lin, L. Shi, Y. Ni, L. Yao, M. Bazargan

A Smart Integrated Schema For Wind Power Plant ........................................................................... 20
Z. Gao, Z. Wang, Y. Liu, L. Tu

Dual Heuristic Programming Control Of The Proton Exchange Membrane Fuel Cell Temperature ................. 24
X. Lin, J. Huang

Research On Real-Time Simulation And Communication Of Regional Power Grid Based On RTDS And DNP 3.0 .................................................................................. 28
J. Li, F. Xue, Y. Fang, X. Song, K. Chang

Adoption Of 132KV Standalone GIS With Condition Monitoring System For Shunt Reactive Load Switching ........................................................... 34
L. Cheng, P. Ma, Y. Yeung

Impact Of Electric Vehicles Charging On Load Curve ............................................................................. 39
Z. Lin, T. Zhong, Z. Jing, S. Huang

Restructuring China's Power Sector: The Technical, Economic And Political Foundations Of Unbundling Transmission And Distribution Segments In China's Electricity Industry ........................................... 46
Z. Yu, H. Nguyen, Y. Wu

Power Quality Concerns And Mitigation Solutions In Respect To Smart Grid Evolution .......................... 52
O. Lee, L. Pang, D. Lin, J. Doescher, C. Chung

Comparative Study Of Direct Power Control With Vector Control For Rotor Side Converter Of DFIG .................................................................................. 58
F. Guo, T. Zheng, Z. Wang

Electricity Consumption And Its Environmental Implications In Two Special Administration Regions: Hong Kong And Macao ........................................................................... 64
T. Lai, W. To, K. Lam, W. Lo

The Application Of Fault Location System For 220KV Overhead Power Line In China ............................................. 69
H. Yuasa, T. Imagawa, M. Nakanishi, S. Niihara, M. Higashi, Y. Chen

Advanced HVDC XLPE Cable And Accessories ................................................................................. 75
T. Igi, Y. Murata, K. Abe, M. Sakamaki, S. Kashiyama, S. Katakai

Economic Dispatch Of Wind Integrated Power Systems With A Conditional Risk Method ........................................ 81
Z. Zhao, X. Tong

Power Quality Evaluation And Its Sensitivity Analysis Based On Improved Close Value Method ................. 87
R. Hu, Z. Jing, Z. He

Transmission Cost Allocation Method Based On Least MW-Mile Value ...................................................... 90
Z. Jin, M. Luo, Z. He

Battery Backup In Mission Critical Applications .................................................................................. 98
H. Kaveh, M. Zou, J. Lim

Grid Energy Storage System For Smart-Renewable ................................................................................. 104
J. Lee, J. Choi, J. Lee, U. Son, J. Lee

New MVAC Control By Making Use Of Human Behavioral Based Technique To Achieve Energy Efficiency ................................................................................................. 110
M. Leung, Y. Mok, N. Tse, A. Fong, L. Lai

A Study On The Effects Of Voltage Distortion On Current Harmonics Generated By Modern SMPS Driven Home Appliances In Smart Grid Network ........................................... 115
Y. Mok, N. Tse, W. Lau

Power Quality And Energy Usage Of A Multi-Purpose Building In Hong Kong ........................................ 121
J. Chan, J. So, M. Leung, N. Tse, P. Kong

The Development Of A Smart Grid And Communication Co-Simulator ...................................................... 127
W. Lau, S. Shum, R. Lam, H. Chung, N. Tse, L. Lai
Smart Grid MV Solution
J. Byoung, D. Wee, C. Lee, S. Nam

A Current Control Strategy For Three-Phase PV Power System With Low-Voltage Ride-Through
Y. Wu, C. Chang, Y. Chen, C. Liu, Y. Chang

A Survey Of Methods Of Estimating Lifetime And Aging Of Assets In Substations
I. Duran, O. Duarte

Challenges And Design Considerations Of PV Inverters In The Future Smart Grids
C. Ho

Security Analysis Of Smart Grids-A Complex Network Perspective
Y. Jia, Z. Xu, S. Ho, Z. Feng, L. Lai

Optimal Allocation Of ESS In Distribution Systems Considering Wind Power Uncertainties
K. Meng, Z. Dong, Y. Zheng, J. Qiu

Unit Commitment Considering Probabilistic Wind Generation
F. Yao, Z. Dong, K. Meng, Y. Xu, H. Ju, K. Wong

The Energy Profile Study Of Electric Kitchen Utensils For Residential Smart Kitchen
Y. Leung, K. Tsang, K. Chui, H. Chu, W. Chow

Energy Optimization Of Public Service Escalators
K. Nefield, S. Ho

Simultaneous Co-Optimization For The Economic Dispatch Of Power And Water Networks
A. Santhosh, A. Farid, A. Adegbeje, K. Youcef-Toumi

Event-Triggered State Estimation For Variable Energy Resources Management
R. Francy, A. Farid, A. Adegbeje, K. Youcef-Toumi

Diagnosis Of Induction Machine Stator Faults By Parameter Estimation Technique Based On Direct
Search On Sparse Grid
F. Duan, R. Zivanovic

DE-Based Two-Stage Reactive Power Planning With Wind Power Penetration
M. Niu, Z. Xu, Z. Dong

Sustainability – A New Business Vision And Strategy For A Century-Old International Energy
Enterprise
T. Yee, H. Leung, Y. Tsang

Introduction Of Mechanical Tests On Intelligent High Voltage Switchgear
Y. Jia, X. Xu, J. Wang, B. Wang, L. Li

Fuzzy-Based Adaptive Pricing Rules For A Typical Microgrid Energy Management System
T. Mahmoud, D. Habibi, O. Bass

Dynamic Model For Quadrupole Six-Phase Electrical Excitation Synchronous Wind Power System
Y. Yi, C. Wang, Q. Wang, X. Zhao, W. Yan, Q. Gao

Steady-State Error Calibration Technology For Electronic Instrument Transformer
W. Ren, Y. Yuan, X. Hu, Z. Yang, Y. Zhang

Application Of Cost-Effective Solution To Ageing 11kV Withdrawable Switchboard
C. Ma, C. Wong, X. Chan

Maintenance Practices For Transmission Overhead Lines
M. Lee, C. Pak

A Reliability-Oriented Outlook On The Critical Components Of Power Distribution Systems
P. Dehghanian, M. Fotuhi-Firuzabad

Impacts Of Controlled And Uncontrolled PHEV Charging On Distribution Systems
S. Shafiee, M. Fotuhi-Firuzabad, M. Rastegar

Multi-Objective Congestion Management In A Deregulated Power System Ensuring System Stability
T. Bhattacharjee, A. Chakrabory

Framework Incorporating Synchronized Phasor Data For Power System Operation And Control
Y. Wu, K. Zhu, M. Chenine, L. Nordstrom

Sensitivity Analysis Of A Fault Impedance Measurement Algorithm Applied In Protection Of Parallel
Transmission Lines
N. Rohadi, R. Zivanovic

Addressing The Security Of A Future Sustainable Power System: The Danish SOSPO Project

Complex Network Theory Based Power Grid Vulnerability Assessment From Past To Future
G. Chen, J. Zhao, Z. Dong, S. Weller

Integration Of Secondary System Based On Unified Data Platform
L. Xu, Q. Gu, G. Du, J. Tian

A New Approach For Leveling Maintenance Cost In Electric Utilities
T. Ichimura, K. Kuroda, H. Magori, R. Yokoyama
Smart Substation Case With Optical/Electronic CT/VT ........................................................................................................ 306
D. Wu, L. Xu, Y. Yang, G. Xu

HVDC Technology And Smart Grid ................................................................................................................................. 311
O. Saksvik

A New Three-Dimensional Space-Vector Modulation Algorithm For Four-Leg Inverter ........................................... 317
A. Chakraborty, B. Bhattacharya

Mid-Term Simulation Analysis Of The Policy Interaction Between Emission Regulation And Res
Promotion .............................................................................................................................................................................. 323
H. Zhang, L. Lai

Reliability And Investment Assessment For Wind Energy Generation ........................................................................................................ 329
J. Huang, H. Wang, F. Xue, X. Song

Lessons Learned From July 2012 Indian Blackout ........................................................................................................... 335

Developments Of Smart Grids And Emission Trading System For Low-Carbon Electricity In China ...................... 341
Y. Wong, L. Lai, Y. Zhang

An Effective Evaluation Approach Of Demand Response Programs For Residential Side .................................................. 346
K. Kuroda, T. Ichimura, R. Yokoyama

Evolving Electric Utility Information Systems To Leverage The Smart Grid ................................................................. 352
C. Roy, S. Mullins

Long Lifetime DC-Link Voltage Stabilization Module For Smart Grid Application .......................................................... 361
H. Wang, H. Chung, W. Liu, F. Blaabjerg

Control Strategies Of BESS For Compensating Renewable Energy Fluctuations ............................................................... 367
N. Xu, M. Ding, C. Chung

Author Index