2016 IEEE PES Asia-Pacific Power and Energy Engineering Conference (APPEEC 2016)

Xi'an, China
25-28 October 2016

Pages 1-622

IEEE Catalog Number: CFP16PEE-POD
ISBN: 978-1-5090-5419-0

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

IEEE Catalog Number: CFP16PEE-POD
ISBN (Print-On-Demand): 978-1-5090-5419-0
ISBN (Online): 978-1-5090-5418-3

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

IEEE PES Asia-Pacific Power and Energy Engineering Conference (APPEEC 2016)

Table of Contents

Oral Session A1: Operation and Management

A1-O-1 Minimizing Cost Uncertainty with a New Methodology for Use in Policy Making: China's Electricity Pathways (No. 12).....1
Anne-Perrine Avrin, Scott J. Moura, Daniel M. Kammen

A1-O-2 Unit Commitment Considering Reserve Provision by Wind Generation and Storage (No. 306).....8
Xuehui Jian, Li Zhang

A1-O-3 Fully Distributed Optimal Automatic Generation Control for an Islanded Microgrids (No. 38).....13
Zhongwen Li, Chuanzhi Zang, Peng Zeng, Haibin Yu, Jing Bian

A1-O-4 Impact of Dynamic Load Models on Transient Stability-Constrained Optimal Power Flow (No. 56).....18
Rui Zhang, Yan Xu, Jin Ma, Zhaoyang Dong

A1-O-5 Robust OPF Considering Load and Renewable Power Uncertainties in Multi-Terminal HVDC Grids (No. 138).....24
Wang Zhang, Xu Yan, Zhaoyang Dong, Ke Meng,Rui Zhang

Oral Session A2: Operation and Management

A2-O-1 Modeling and Operating Characteristic Analysis of MMC-SST Based Shipboard Power System (No. 153).....28
Jiamin Xiong, Yong Li, Yijia Cao, Daniil Panasetsky, Denis Sidorov

A2-O-2 A Distribution Network Restoration Decision Support Algorithm Based on Multi-Agent System (No. 171).....33
Yu Liu, Yunhe Hou, Shunbo Lei, Dong Wang

A2-O-3 The Research of Mid-Long Forecasting Based on MGM (1, N) Model with Multiple Linear Regression Analysis in Nanjing Core Area (No. 175).....38
Haiwei Wu, Dawei Su, Xuesong Huo,Shuang Hu, Zhuodi Wang, Kaiqi Sun

A2-O-4 Cooperative Game Model for Power System Secondary Voltage Control (No. 190).....43
Xiaodong Zheng, Haoyong Chen, Chuyao He, Weike Mo, Yiping Chen

A2-O-5 Application of Hybrid Power Flow Technique for Smart Distribution Network Management (No. 220).....48
P. Wirasanti

A2-O-6 Study on Power Grid Dynamic Optimal Allocation of Reactive Power Capacity Considering the Economic Loss of Voltage Sag (No. 244).....54
Yi Chen, Yanbo Chen, Jin Ma

A2-O-7 Study on Regional Autonomy of Active Distribution Network Based on Consensus Theory (No. 809).....59
Lei Dong, Wei Liu, Naishi Chen, Tianjiao Pu

A2-O-8 A Bi-level Trading Model for an Active Distribution Company Considering Demand Response Exchange (No. 253).....64
Yu Cai, Jin Lin, Can Wan, Yonghua Song

Oral Session A3: Operation and Management

A3-O-1 The Design and Optimization of the Urban Residential Electricity Packages for a Load Serving Entity (No. 257).....69
Jiajun Lv, Tao Ding, Zhaohong Bie, Peng Qin, Tianen Chen, Ruifeng Liu

A3-O-2 Moisture and Temperature Effects on Power Transformer Winding Clamping Pressure (No. 284).....74
Lakshitha Naranpanawe, Tapan Saha, Chandima Ekanayake

A3-O-3 Performance Evaluation of Single SVM and LSSVM Based Forecasting Models Using Price Zones Analysis (No. 344).....79
Xing Yan, Yonghua Song, Nurul A. Chowdhury

A3-O-4 A Scenario Probability Based Method to Solve Unit Commitment of Large Scale Energy Storage System and Thermal Generation in High Wind Power Penetration Level System (No. 385).....84

Dalong Ji, Hongtao Wang

A3-O-5 Rural electrification using capacitive induced voltage on transmission lines´ shield wires (No.405).....89
Joan Sebastian Chaves Huertas, Maria Cristina Tavares

A3-O-6 Enhancement of Real-time Operational Efficiency by Applying Dynamic Line Ratings (No. 452).....94
Kwok W. Cheung, Jun Wu

A3-O-7 A New Black-start Path Optimization Algorithm for Isolated Grid (No. 479).....99
Qiwei Chen, Ping Jiang, Haifeng Li, Kaiming Luo, Lin Liu

Oral Session A4: Operation and Management

A4-O-1 Optimal Power Flow with Series Static Voltage Restorer (SSVR) in Distribution Systems Considering PV Integration (No. 496).....104
Shiyu Liu, Yang Hong, Tao Ding, Zhaohong Bie, Yanlin Wu

A4-O-2 The DC Circuit Breaker with Necessary Bidirectional Interruption Capability (No. 561).....110
Lian Liu, Marjan Popov, Mart van der Meijden, Vladimir Terzija

A4-O-3 Optimization of Uncertainty Load Restoration Strategy Based on Assessment of Conditional Value-at-Risk (No. 599).....115
Jin Zhao, Hongtao Wang

A4-O-4 Distribution System Reconfiguration for Power Loss Minimization and Voltage Profile Improvement Using Modified Particle Swarm Optimization (No. 619).....120
Firas M. F. Flaih, Lin Xiangning, Samir M. Dawoud, M. Amer Mohammed

A4-O-5 PSO Algorithm for Optimal Placement of Multiple SPV Based Distributed Generators in Microgrids (No. 620).....125
Samir M. Dawoud, Firas M. F. Flaih, Merfat I. Okba

A4-O-6 Static Voltage Stability Analysis for Multi-Infeed HVDC Systems Based on Multivariate Regression (No. 659).....130
Echang Li, Xiaodong Chu, Minghui Yang

A4-O-7 Customized Optimal μPMU Placement Method for Distribution Networks (No. 744).....135
Xuebing Chen, Tengpeng Chen, King Jet Tseng, Yuhao Sun, Gehan Amaratunga

A4-O-8 A Short-Term Dynamic Thermal Rating for Accommodating Increased Fluctuations in Conductor Current due to Intermittent Renewable Energy (No. 755).....141
Bonface Oduor Ngoko, Hideharu Sugihara, Tsuyoshi Funaki

Oral Session A5: Operation and Management

A5-O-1 State-of-Health Estimation Algorithm of Li-Ion Battery Using Impedance at Low Sampling Rate (No. 784).....146
Taedong Goh, Minjun Park, Gyogwon Koo, Minhwan Seo, Sang Woo Kim

A5-O-2 Differentiated Planning in Disaster Ensuring Power Supply for Special Loads (No. 793).....151
Lijuan Li, Jun Wu, Hai Bai, Zheng Gong, Biman Ma, Hongliang Liu

A5-O-3 Electric Vehicle Charging Managenent Algorithm for a UK Low-Voltage Residential Distribution Network (No. 807).....156
Zhi Qiao, Jin Yang

A5-O-4 Application of Information-Gap Decision Theory to Robust Optimization for Electricity Retailers (No. 873).....161
Miliang Xue, Chen Zhao, Shaohua Zhang

A5-O-5 Reserve Evaluation with Wind Considering Dynamic Characteristics and Power Network Constraints (No. 852).....166
Yiwei Zhai, Wen Zhang, Kai Wang

A5-O-6 Constrained Load Flow Model with Two-terminal HVDC (No. 775).....171
Lu Gao, Jingting Lei, Zhengchun Du, Yi Wang

Oral Session A6: Operation and Management

A6-O-1 Influence of Floating Dust Concentration on AC Breakdown Voltage of Short Rod-rod Air Gap (No. 874).....177
Li Jiangtao, Li Tao, Sun Yi, Gu Yue, Li Zheng, Cao Hui, Zhao Zheng, Zheng Minjun

A6-O-2 Electricity Market Equilibrium Analysis for Strategic Bidding of Wind Power Producer with Demand Response

Resource (No. 879).....181
Wang Liuhui, Wang Xian, Zhang Shaohua

A6-O-3 Artificial Intelligence based Techniques for Remaining Useful life Assessment of Electrical Power Distribution & Transmission Equipment: Comparative Study (No. 957).....186
Jamshaid Iqbal Janjua, Usman Munawar, Jawadullah, Zubair Ahmad Khan

A6-O-4 A Busbar Differential Protection Based on Fuzzy Reasoning System and Rogowski-Coil Current Sensor for Microgrid (No. 979).....194
Ali Hadi Abdulwahid, Shaorong Wang

A6-O-5 Reliability Analysis on Main Connection Taking Fault Clearance and Switching Operation into Account (No. 831).....200
Wenwen Liu, Yong Wang, Ying Ding

A6-O-6 Voltage Fluctuations and Very Low Voltage Profile Problems in Distribution System Under Extreme Load Growth (No. 1038).....205
Anis Ur Rehman, Muhammad Abid Mengal, Ishtiaq Ahmad, Atiq Ur Rehman, Sheharyar Mehmood

Oral Session A7: Operation and Management

A7-O-1 Power Supply Capability Analytical Method Based on Sensitivity Analysis for HV Distribution Networks (No. 1016).....211
Yu Zhang, Di He, Zhi Li, Chuangxin Guo, Shi Gao, Ning Gan

A7-O-2 Optimal Capacitor Placement in a Distribution Network with Wind Generators by Improved Hybrid Particle Swarm Optimization Method (No. 1026).....217
Shuheng Chen, Xiaoqiang Dang

A7-O-3 Identification of Realistic Scheduling Opportunities and Base Loads in Smart Homes using Dynamic Pricing and Standard Deviation of Load Profiles (No. 1037).....222
Ugonna R. Anuebunwa, Haile-Selassie Rajamani, Prashant Pillai

A7-O-4 Three Approaches to use Cross-Entropy in Reliability Evaluation of Composite System with High Peneration Wind Energy (No. 1066).....227
Giambattista Luca Lucarelli, Chao Yan, Zhaohong Bie, Can Wang, Tao Ding, Fei Xiong

Oral Session B1: Smart Grid

B1-O-1 Effects of geometrical parmeters on the performance of Rogowski coil for current measuring (No.6).....232
Pang Fubin, GAO Lei, YUAN Yubo, BU Qiangsheng, JI Jianfei

B1-O-2 Optimal Design Method of Passive LCL Filters for Grid-Connected Inverters (No.111).....237
Zhiding Wu, Mohammad Aldeen

B1-O-3 Estimating the price elasticity of residential power demand using a bottom-up approach (No. 131).....243
Meng Song, Mikael Amelin

B1-O-4 Research of new method about the closed-loop test in smart substation (No. 145).....248
Chen FAN, Yimin NI, Guoqing ZHAO, Hao YUAN

Oral Session B2: Smart Grid

B2-O-1 A New Virtual Relay Protection Simulation System of Substation Based on IEC61850 Standard (No. 245).....252
Yao Zhao, Zhanjun Gao, Yi Zhu, Tao Wang, Rui Mu

B2-O-2 A New Protection Scheme Based on Distributed Decision in Smart Distribution Grid (No. 252).....257
Xin Huang, Qing Chen, Xinyue Si, Ji Si

B2-O-3 Harmonic Analysis in Microgrid and Distributed Energy System Using Harmonic Balance Method (No. 317).....262
Junwei Lu, Hui Li

B2-O-4 Improvement of smart grid reliability considering various cyber network topologies and direct interdependency (No. 318).....267
Amirreza Hassani Ahangar, Hossein Askarian Abyaneh

B2-O-5 Processing Synchrophasor Data Using a Feature Selection Procedure (No. 361).....273
Xiaodong Liang, Scott A. Wallace

B2-O-6 Automatic Voltage Control Based on Adaptive Zone-Division for Active Distribution System (No. 425).....278
Yushi Feng, Yong Li, Yijia Cao, Yicheng Zhou

B2-O-7 An Assessment Method of Wind Power Receiving Ability of System Considering Demand Response (No. 446).....283
Mao Wenbo, Li Yaping, Liu Jiantao, Dong Bei

B2-O-8 Research on Designing Methods of the Secondary System in Digital Substation (No. 386).....289
Siyuan Li, Zhanjun Gao, Yi Zhu,Tao Wang,Mu Rui

Oral Session B3: Smart Grid

B3-O-1 Impulsive Noise Recovery Based Interleaving in Power Line Communication (No. 472).....294
Li Bai, Tao Zheng, Chang Liu, Wei Ba

B3-O-2 Research of Practical Expert System for Transformer Fault Diagnosis Based on Multidimensional Data Fusion (No. 481).....300
XU Yang, XIE Tianxi, ZHOU Zhicheng, LU Yuncai, JIA Jun, CHEN Shu, LI Jiansheng, MA Yong, JIANG Chao

B3-O-3 The Flexibility of Thermostatically Controlled Loads for Regulation (No. 495).....305
Yaping Li, Juan Zuo, Wenbo Mao, Xiaorui Guo

B3-O-4 Vehicle-to-Grid Profitability Considering EV Battery Degradation (No. 505).....310
Christian F. Calvillo, Karolina Czechowski, Lennart Söder, Alvaro Sánchez-Miralles, José Villar

B3-O-5 Novel Individual Phase Current Control with Self-adaption Unbalanced-voltage Handling Capability for Power Electronics Transformer (No. 668).....315
Yue Zhang, Chuang Liu, Liang Sun, Yuemei Zhi

B3-O-6 Load Sharing Improvement Between Parallel-Connected Inverter based DGs Using a GA based Optimization Control Strategy in Microgrids (No.87).....320
Mahdi Zolfaghari, Hossein Bahramian Habil, Hossein Askarian Abyaneh, Mehrdad Abedi

Oral Session B4: Smart Grid

B4-O-1 A Fault Location Method in Distribution Networks with Fault-tolerant Ability Based on the Wrong-logic Region Detection (No. 756).....324
Pan Zhang, Yanxia Zhang, Gaopeng Meng

B4-O-2 Robust Control Design of a DC Micro Gird Comprising Photovoltaic and Battery Systems (No. 230).....329
Majid Fard, Mohammad Aldeen

B4-O-3 Research on the reconstruction method of PV module based on the door connection (No. 972).....337
Fangfang Dong, Meiyi Hou, Han Feng, Zhen Jin, Jia Tian

B4-O-4 Efficient Fault Diagnosis in Smart Grid Using Non Conventional Mother Wavelet Function (No. 1005).....342
Mnagal Hemant Dhend, Rajan Hari Chile

B4-O-5 User Demand Prediction and Cloud-Based Smart Mobile Interface for Electric Vehicle Charging (No. 1012).....348
Tianyang Zhang, Xiangyu Wang, Chi-Cheng Chu, Rajit Gadh

Oral Session C1: Renewable Energy

C1-O-1 Modeling of Wind Farm Combined with PEM Electrolyzer and Combustion Turbine (No. 7).....353
Shihua Xuan, Weihao Hu, Nuri Gökmen, Zhe Chen

C1-O-2 Sub-Synchronous Interaction Analysis between DFIG Based Wind Farm and Series Compensated Network (No. 83).....359
Yun Wang, Qiuwei Wu, Shaoli Kang

C1-O-3 Virtual Synchronous Machine Method in Renewable Energy Integration (No. 88).....364
Xiaodong Liang, Chowdhury Andalib Bin Karim

C1-O-4 A study on hybrid solar thermal and geothermal power plant as a key development for Shaanxi province in China (No. 92).....369
Mostafa Kheshti, Browh Serge Tekpeti, Xiaoning Kang

Oral Session C2: Renewable Energy

C2-O-1 Economic Dispatch in an Offshore Island System with High Wind Power Penetration (No. 216).....374
Yuan-Kang Wu, Guan-Ting Ye, Ting-Yen Hsieh, Bo-Shiung Jan

C2-O-2 Research on Portable Balance Devices and Balancing Strategy for Batteries (No. 227).....379
Dan Liu

C2-O-3 Optimal Scheduling of Energy Consumptions for Air Conditioners in a Smart Community with Renewables (No. 238).....385
Ying-Yi Hong, Wen-Chun Chang, Yung-Ruei Chang, Yih-Der Lee, Pang-Wei Liu

C2-O-4 Comparative Analysis of Generic and Complex Models of the Type-3 Wind Turbine (No. 321).....392
Yi-Liang Hu, Yuan-Kang Wu

C2-O-5 Development of AC Microgrid Test Bench with Hydrogen Fuel Cell and Renewable Sources (No. 426).....397
Alben Cardenas, Cristina Guzman, Mohamed Chemsi, Kodjo Agbossou

C2-O-6 New Breed of Solid-State Transformer Distribution Tail System for Flexible Power Conversion between Medium-Voltage Distribution and Low-Voltage Customer Side (No.434).....403
Chuang Liu, Yuemei Zhi, Yue Zhang, Guowei Cai

C2-O-7 A New MBF-PSO for Improving Performance of DFIG Connected to Grid under Disturbance (No. 499).....408
Mohammed Kdair Abd, S. J. Cheng, H. S. Sun

Oral Session C3: Renewable Energy

C3-O-1 Short-Term Wind Power Forecasting Based on T-S Fuzzy Model (No. 514).....414
Fang Liu, Ranran Li, Yong Li, Yijia Cao, Daniil Panasetsky, Denis Sidorov

C3-O-2 Model Predictive Control for Reactive Power Management in Transmission Connected Distribution Grids (No. 538).....419
David Sebastian Stock, Andreas Venzke, Tobias Hennig, Lutz Hofmann

C3-O-3 Photovoltaic Integration Capacity of Grid Considering Peak Load Regulation Capacity and Operating Economy (No. 554).....424
Anqi Guo, Ying Sun, Jian Zheng, Pengpeng Yang, Mingliang Xu, Dongxia Li

C3-O-4 An overview of wind power probabilistic forecasts (No. 194).....429
Yuan-Kang Wu, Po-En Su, Jing-Shan Hong

C3-O-5 A New Control Strategy of DC Microgrid with Photovoltaic Generation and Hybrid Energy Storage (No. 684).....434
Zhen Jin, Meiyi Hou, Fangfang Dong, Ying Li

C3-O-6 Short-term Wind Speed Forecasting Based on an EEMD-CAPSO-RVM Model (No. 718).....439
Haixiang Zang, Zhi Liang, Mian Guo, Zeyu Qian, Zhinong Wei, Guoqiang Sun

C3-O-7 Study on Residual Current Protection in Low-voltage Network with Distributed Generators (No. 767).....444
LI Botong, JIA JianFei, CHEN XiaoLong, XUE ShiMin

Oral Session C4: Renewable Energy

C4-O-1 Research of Generator-tripping Strategy for Wind-thermal-bundled Power Transmission System in Emergency State (No. 885).....449
Runqing Bai, Yankai Zhang, Fubo Liang, Zhen Shen, Yi Tang, Kang Chang, Chenlong Li

C4-O-2 Performance of ROCOF Protection in PV System (No. 903).....454
Bohan Liu, Xiangping Ni, Guozeng Yan, Bo Li, Ke Jia

C4-O-3 Unit Commitment Model Considering Shiftable Load and Base-load Cycling Contraints (No. 982).....458
Hongjiang Du, Jingjie Ma, Shaohua Zhang

C4-O-4 Sa-Based Localization Algorithm for Wireless Sensor Network (No. 1009).....463
LI Jie, WANG Tian-zheng, ZHAO Ya-ning

C4-O-5 Operational Optimization of Wind Energy Based Hydrogen Storage System Considering Electricity Market's Influence (No. 9).....466
Peng Hou, Weihao Hu, Zhe Chen, Peter Enevoldsen

Oral Session D1: Analysis and Control

D1-O-1 Design and Implementation of a New DC/DC Converter with zvs and High Gain (No. 37).....472
Mehdi Radmehr, Venus Tahmasebi, Iraj Yousefian

D1-O-2 Simulation and Laboratory Investigation of Ionic Wind Induced by Corona Discharge (No. 737).....478
Fanghui Yin, Masoud Farzaneh, Xingliang Jiang

D1-O-3 Analyses and Judgment Methods of Single-Phase Broken-Line Fault for Loaded Distribution Line (No. 82).....482
Qibao KANG,Wei CONG,Mengxia WANG,Guofu XIAN, Guoqing LIU, Zengmin GUO, Ruipeng YI

D1-O-4 Direct Fuzzy Based Modulation Wave Control of the Cascade STATCOM for Balancing the DC Voltage (No. 105).....487
Sun Yuangang, Huang Jingjing, Tong Xiangqian, Zhang Hang

D1-O-5 Operational Analysis of Zero-Sequence Inverse-Time Overcurrent Protection in Parallel Double-Circuit Transmission Lines (No. 127).....491
Zijin ZHANG, Wei CONG, Wuyang GAI, Anning WANG, Jing XIAO

Oral Session D2: Analysis and Control

D2-O-1 Characterizing the Tolerance Performance of PLCs to Voltage Sag Based on Experimental Research (No. 297).....496
Yapen Wu, Chenyi Li, Yonghai Xu, Pengfei Wei

D2-O-2 Fault Diagnosis for Power Electronic Circuits Based on Mixed Logic Dynamic Model and Identification Vector (No. 420).....502
Han Jian-ding, Qi Rong, Zhang Jian-Ye, Lei Xiao-Ben, Wu Chen

D2-O-3 Estimation of Electromechanical Modes under Ambient Condition through Random Decrement Technique and PRCE Algorithm (No. 436).....509
Jian Xie, Xiaoru Wang

D2-O-4 Voltage Division Control in AC / DC Hybrid Distribution Network Based on Model Predictive Control (No. 497).....515
Lei Dong, Jie Ming, Ting Yu, Shixiong Fan, Tianjiao Pu

D2-O-5 Coordinated Control of a Grid Connected DC Micro-Grid with Multiple Renewable Sources (No. 1077).....520
Surya Prakash, Sukumar Mishra, Narayana Prasad Padhy

D2-O-6 A Fast Directional Comparison Pilot Protection for UHV Transmission Line (No. 197).....526
Yueyang Ma, Guibin Zou, Zhanjun Gao, Tao Du

D2-O-7 A Hybrid Fault Location Method for Power Distribution Systems (No. 200).....583
Ji Si, Qing Chen, Kongming Sun, Xin Huang

Oral Session D3: Analysis and Control

D3-O-1 A controlled islanding scheme considering stability margin of sub-systems after splitting (No. 508).....531
Qian Liu, Lei Ding, Yichen Guo, Zhenbin Ma, Daonong Zhang

D3-O-2 Probabilistic Load Flow of Islanded Microgrid with Droop-Controlled Distributed Generations (No. 1069).....536
Zhongmei Pan, Meng Shi, Yanlin Wu, Jian Liu, Xiangqian Tong

D3-O-3 Calculation and Analysis of Electromagnetic Radiation from VSC-HVDC Converter System (No. 560).....541
Haifeng Sun, Bingxin Du

D3-O-4 Dispatch of Wind-Thermal Power System by using Aggregated Outputs of Virtual Power Plants (No. 1055).....546
Ming-yang Li, Jie Hou, Yu-guang Niu, and Ji-zhen Liu

D3-O-5 Calculation of Penetration Level for Inverter Interfaced Distributed Generator Considering Protection Constraints in Distribution Network (No. 594).....552
Yujin Wang, Ke Jia, Chenxi Li, Yaoqi Lin, Bohan Liu

D3-O-6 Current Limiting Ability and Overvoltage Analysis of Variable Impedance Transformer (No. 699).....557
Jiangtao Li, Minjun Zheng, Hui Cao, Zheng Zhao, Yue Gu, Tao Li, Zheng Li, Yi Sun, Yuhao Liu, Shaogui Ai, Lin Wang

D3-O-7 Model Predictive Current Control of Third-Harmonic Injection Two-stage Matrix Converter (No. 726).....561
Hua Han, Zhongting Tang, Guanguan Zhang, Xin Li, Qi Zhu

Oral Session D4: Analysis and Control

D4-O-1 A Parallel Algorithm of Optimal Power Flow on Hadoop Platform (No. 733).....566

Bing Liang, Song Jin, Wei Tang, Wanxing Sheng, Keyan Liu

D4-O-2 Induced Transient Currents on Stationary Vehicles under Power Lines Hit by Lightning (No. 959).....571
S. Ladan, A. Aghabarati, R. Moini, S. Fortin, Y. Li and F. P. Dawalibi

D4-O-3 On Parallelizing Analysis of Power Systems in Cloud Environment (No. 783).....576
Wanxing Sheng, Keyan Liu, Song Jin, Weiyue Zhao, Wei Tang

D4-O-4 Analysis on the problems of three-phase short circuit current over-limited of 500kV bus when UHV connected to Beijing power grid (No. 818).....581
Haiyun Wang, Fangchen Xu, Dongsheng Jiao, Kelei Hu, Le Yu,Yan Zhang

D4-O-5 Control Strategy Based on Sliding Mode Variable-structure Control of VSC-MTDC Transmission System (No. 579).....586
Yi Hu, Xiaoru Wang, Feng Shen, Dalin Chen

D4-O-6 Study on the Network Suppressing Measures of the DC Bias Current in AC Power System (No. 974).....594
Zhao Dandan, Fu Chenzhao, Su Lei

D4-O-7 A Blocking Filter Design Method of Effective Suppression of Three Forms of SSR (No. 1003).....599
Shudong Ren, Shaode Wang, Yun Zhu, Qingxue Wang, Xiaofeng Huang

D4-O-8 The Optimal Coordination of Over-current Relay Protection in Radial Network Based on Particle Swarm Optimization (No. 80).....604
Mostafa Kheshti, Browh Serge Tekpeti, Xiaoning Kang

Oral Session D5: Analysis and Control

D5-O-1 Investigation of Grid-connected Voltage Source Converter Performance under Unbalanced Faults (No. 1020).....609
Jundi Jia, Guangya Yang, Arne Hejde Nielsen

D5-O-2 Solving Coordinated Voltage Optimization in Distribution Network based on a Robust Sequential Quadratic Programming Algorithm (No. 1053).....614
Keyan Liu, Wanxing Sheng, Yongmei Liu, Feng Gao

D5-O-3 A Comprehensive Reliability Assessment Index System for Regional Grid with a Large Renewable Energy Penetration (No. 1067).....619
Chao Yan, Zhaohong Bie, Yanling Ling, Gengfeng Li, Fei Xiong, Jing Wen

D5-O-4 Power Grid's Intelligent Stability Analysis Based on Big Data Technology (No. 1068).....623
Wei HU, Le ZHENG, Xianzhang LIU, Peng ZHANG, Xialing XU, Chunming WANG

Oral Session E1: Transmission

E1-O-1 Substation Grounding System Optimization with Utilizing a Novel MATLAB Application (No. 33).....628
Xuan Wu, Qianzhi Zhang, Jiahong He

E1-O-2 Efficiency Evaluation of Offshore Power Systems with Power Electronics Based on SiC Technology (No. 515).....634
Tobias Hennig, Denis Mende, Lutz Hofmann

E1-O-3 A Novel Model of MMC-VSC for Simulating Multi-scale Transients in MTDC Transmission Systems (No. 307).....640
Hua Ye, Yanan Tang, Zhiping Qi

E1-O-4 Enhancement the overhead transmission lines' capacity by modifying the bundle geometry usin heuristics algorithms (No. 396).....646
Jhair Stivel Acosta Sarmiento, Maria Cristina Tavares

E1-O-5 Influence of Actual Transposition Representation and Adequacy of AC Link based on Half Wavelength Properties for Long Distance Transmission (No. 453).....651
Javier Arturo Santiago Ortega, Maria Cristina Dias Tavares

E1-O-6 Analysis of Energy Efficiency Measurement Scheme for Flexible HVDC Transmission System (No. 492).....656
Yang YaoJia, Li Yonghui, Zhu Haiyu

E1-O-7 A Simplified Loss Mathematical Model of Modular Multilevel Converter (No. 504).....661
Limin Yang, Yaohua Li, Zixin Li, Ping Wang, Fanqiang Gao

Oral Session E2: Transmission

E2-O-1 Trans-Australian HVDC Interconnection Investigation (No. 377).....666
Simon Bartlett

E2-O-2 Comparison between Back-to-Back MMC and M3C as High Power AC/AC Converters (No. 512).....671
Shenquan Liu, Xifan Wang, Biyang Wang, Pengwei Sun, Qian Zhou, Yong Cui

E2-O-3 Studies of the Polarization/Depolarization Current Characteristics of XLPE Cable (No. 201).....677
Wei Li, Xing Zhang, Aixuan Zhao, Linlin Wu, Zhigang Ren, Junbo Deng, Guanjun Zhang

E2-O-4 A low-order ac-frequency and dc-voltage response model of HVDC grid connected with wind farms (No. 549).....681
Hua Ye, Yao Liu, Zhiping Qi, Ting an, Xiao Zhou

E2-O-5 Influence of Space Charge Distribution around the Conductor Surface on Ionized Field Computation (No. 652).....687
Donglai Wang, Tiebing Lu, Qinyuan Li, Bo Chen, Li Xie

E2-O-6 Fault Tolerant Design for Electronic Power Transformer (No. 654).....692
Shaoxiong Nie, Chengxiong Mao, Dan Wang

E2-O-7 A Study of Thermal Model of the Discrete Type Transformer Based on Finite Element Method (No. 815).....697
Yuying Zhang, Jie Lou, Anqi Guo, Kejun Li, Bengang Wei, Hua Huang

E2-O-8 Coordinated Control of Multi-terminal DC Grid for Wind Power Integration (No. 1070).....702
Yu Hao, Haoran Zhao, Qiuwei Wu

Poster Session

Poster Session P1:

A: Power System Operation and Management

P1-1 **A Novel Analysis and Forecast Method of Electricity Business Expanding Based on Seasonal Adjustment (No. 16).....707**
Yumin Zhang, Xueshan Han, Guangsen Yang, Yong Wang, Li Zhang, Xiaofeng Miao

P1-2 **Research on Limitation of the Multi-Infeed Short Circuit Ratio (No.39).....712**
Chen Xing-wang, Guan-Lin

P1-3 **A Setting Method of Frequency Bias Coefficient for Interconnected Power Grid Based on Shapley Value (No.74).....716**
Meng Liu, Hong Wang, Binchao Zhao, Jun Wang, Kuan Li, Yudun Li

P1-4 **Transmission Network Including VSC-HVDC Expansion Planning Based on Genetic Algorithm with Shift Operation (No.79).....722**
Zece Zhang, Jiankang Liang, Xiuli Wang, Rong Ye, Zhangsui Lin

P1-5 **Transformer Inrush Current Restraining Scheme Based on Closing Voltage Amplitude Controlling Method (No. 81).....727**
WANG Weixu, CONG Wei, SHENG Yaru, XIAO Jing, CAO Jianmei, HAO Qingshui

P1-6 **On the Influence of the Backlash Governor Settings on the Frequency Response in Power Systems (No.94).....732**
Jiangnan Xi, Harold R. Chamorro, Jonas Persson, Andreas Westberg, Daniel Wall, Mehrdad Ghandhari

P1-7 **A Novel Method of Power Cable Fault Monitoring (No. 139).....738**
Kangda Wang, Zhengyuan Li, Baohui Zhang

P1-8 **Study on Optimization of Sampling Inspection Strategy for Distribution Transformer (No. 149).....743**
Jinmeng Chen, Yi Li, Jingqing Zhang, LingtianChen

P1-9 **The Reasonable Transmission Efficiency of Power Grid Considering to the Security Constraint (No. 161).....748**
Wangcheng Long, Dong Peng, Hui Li, Xiao wang, Yawei Xue, Pengfei Zhang

P1-10 **Spatial Estimation of Electricity Consumption Using Socio-demographic Information (No.188).....753**
Jiali Mei, Yannig Goude, Georges Hebrail,Nicolas Kong

P1-11 **A Mixed Interval Power Flow Analysis Based on Affine Arithmetic (No. 196).....758**
Cong Zhang, Haoyong Chen, Manlan Guo, Jia Lei, Hailin Ge, Chulin Wan

P1-12 **On-line Transient Stability Assessment and Preventive Control Based on Power System Steady State (No. 212).....763**
Chuyao HE, Weike MO, Lin GUAN, Yiping CHEN

P1-13 **Research on new series compensation technology in distribution network (No.219).....768**
Lijun QIN, BoYANG, Xiongfei ZHAI

P1-14 **A Sequential Power Flow Algorithm for AC/DC Networks Incorporating Hybrid HVDC (No. 231).....773**
Jingming Dou, Baohui Zhang, Runze Chai

P1-15 **Co-Planning of Generation and Transmission Capacity Based on Portfolio Theory (No. 236).....780**
Yue Zhang, Xiuli Wang, Wentao Zhang, Zechen Wu, Zece Zhang ,Cui Qiang

P1-16 **Optimal Allocation Method of Dynamic Var Compensation Based on A Novel Transient Voltage Stability Index (No.242).....785**
Pu Zhang, Sudan Teng, Yi Chen, Yanbo Chen, Kai Zhang, Xiaoxiao Yu

P1-17 **Study on the Key Factors of Regional Power Grid Renewable Energy Accommodating Capability (No. 263).....790**
LI Yan, WEI Linjun, CHI Yongning, WANG Zhen, ZHANG Zhankui

P1-18 **On-line Incipient Faults Detection in Underground Cables Based on Single-end Sheath Currents (No. 267).....795**
ZHANG Chao, KANG Xiaoning, MA Xiuda, JIANG Shuai, QU Xiaoyun

P1-19 **Effective Short Circuit Ratio Including Impact of STATCOM (No. 283).....800**
Chen Xing-wang, GuanLin, Lei Sheng, Zhou Bao-rong

P1-20 **Partial discharge pattern recognition using random matrix theory (No.291).....805**
SHI Lei, ZHANG Chen, DONG Fangzhou, YU Tong, LUO Lingen, SHENG Gehao, JIANG Xiuchen

B: Smart Grid Technologies

P1-21 Pilot polarity comparison protection for serial multiterminals DC grid (No.53).....809
Kai Liu, Youyi Li, Jianping Wang, Xiaobo Yang

P1-22 Virtual Impedance Design for Virtual Synchronous Generator Controlled Parallel Microgrid Inverters Based on a Cascaded Second Order General Integrator Scheme (No.60).....815
Rongliang Shi, Xing Zhang, Chao Hu, Jun Gu, Haizhen Xu, Yong Yu, Hua Ni

P1-23 Distributed Power Service Restoration Method for Smart Distribution Grid (No. 710).....820
XIAN Guofu, CONG Wei, KANG Qibao, SHENG Yaru

P1-24 The study of comprehensive transmission line fault location method for smart substations (No. 91).....825
Lixin Cui, Saisai Ni, Yong Zhi, Mostafa Kheshti, Rong Cheng, Yini Xu, Xiaoning Kang

P1-25 Novel Power Transformer Differential Protection Scheme Based on Improved Short-window Algorithm (No. 124).....830
Jun Guan, Zhiguo Hao, Wenzhe Chen, Zhiyuan Liu, Xiaojun Yu

P1-26 An Optimization Model of EVs Charging and Discharging for Power System Demand Leveling (No.132).....835
Guanhao Du, Wenping Cao, Jin Yang, Bowen Zhou

P1-27 Benefits Comprehensive Evaluation of Demand Response in SDN Based on Distant Grey Relational Analysis-Technique for Order Preference by Similarity to Ideal Solution (No.133).....843
Bai Jingmeng, Zeng Bo, Zhang Jianhua, Liu Dunnan, Zeng Ming

P1-28 Decentralized Multi-Agent Algorithm for Voltage Control (No.176).....852
Daniil Panasetsky, Nikita Tomin, Denis Sidorov, Viktor Kurbatsky, Alexey Osak

P1-29 Challenge and Evolution of Cyber Attacks in Cyber Physical Power System (No.182).....857
Yi Tang, Qian Chen, Mengya Li, Qi Wang, Ming Ni, Xiangyun Fu

P1-30 Construction and Application Research of Active Distribution Network Situation Awareness System (No.399).....863
Liang Chen, Mengmeng Jia, Xiaodong Yuan, Huang Qiang

C: Renewable Energy and Energy Internet

P1-31 Stochastic Load Flow of Active Distribution Network Based on Hybrid Monte Carlo Method (No.44).....870
Zece Zhang, Xiuli Wang, Yushen Hou, Zechen Wu

P1-32 Effect of Electricity Feed-in Tariff on the Planning of CCHP Micro-Systems (No.46).....875
Peng Chen, Zetao Jiang, Zongshun Tang, Lin Guan

P1-33 A Two-Stage Ensemble of Diverse Models for Recognition of Abnormal Data in Raw Wind Data (No.69).....880
Kaiyuan Hou, Deming Xia, Qun Li, Xingwei Xu, Han Yue, Kefei Wang, Lei Chen, Le Zheng

P1-34 Forecasting and Simulation Method Research for Solar Energy Resource (No. 116).....885
Zhao Mingzhi, Kang Xiaobo, Song Li, Wang Yahui

P1-35 Combined Deload and Kinetic Energy Control of Variable Speed Wind Turbines for Frequency Support (No.118).....890
Guoyi Xu, Dandan Ge, Tianzhi Cao

P1-36 Comparisons on State Space Models of Doubly Fed Induction Genertors (DFIG) for Power System Research (No. 120).....895
Hao Jiang, Hui Liu, Linlin Wu, Yunhong Li

P1-37 Optimal Planning Method of CCHP Systems Considering the Energy Supply Pipe Network (No. 135).....901
Zongshun Tang, Zetao Jiang, Peng Chen, Lin Guan

P1-38 The Study on Wave Characteristics of Wind Power under Multi-time Scale (No.146).....907
YAN Huan, ZHANG Yi-yang, ZHANG Xiao-qing, ZHANG Zhi-hua

D: Power System Analysis and Control

P1-39 Comprehensive Optimization for Power System with Multiple HVDC Infeed (No.22).....912
Dong Yang, Kang Zhao, Linlin Ma, Liang Wang, Qinyong Zhou

P1-40 Electromagnetic Transient Study on Single ±800kV UHVDC and Double 500kV EHVAC Lines on Same Tower

(No.30).....918
Zhu yiying, Guo hu, Sun xu

P1-41 Many-objective Reactive Power Optimization Using Particle Swarm Optimization Algorithm Based on Pareto Entropy (No.31).....923
Zhuansun Xu, Anming Zhu, Jielong Wu, Tong Han, Yanbo Chen

P1-42 Multi-objectives OPF of AC-DC Systems Considering VSC-HVDC Integration (No.32).....929
Yanjun Zhang, Kai Gao, Zijiao Han,Puyao Yu, Yanbo Chen, Jin Ma

P1-43 A Fault Location Method Based on the Waveform Discriminator Means and RBF Neural Networks (No.43).....934
Congcong Li, Qing Chen, Ye Zhang

P1-44 Nodal Load Forecast Model Considering Network Topology Constraints (No.47).....939
Aoyang Han, Bin Zhang, Zhongliang Sun, Zhiqiang Niu, Junxiong Wang

P1-45 Inrush Current Discrimination in Power Transformer Differential Protection Using Wavelet Packet Transform Based Technique (No.49).....944
Muhammad Farasat Abbas, Liu Zhiyuan, Hao Zhiguo, Zhang Guanjun

P1-46 Dynamic interactions between VSC-HVDC and power system with electromechanical oscillation modes-a comparison between the power synchronization control and vector control (No.70).....949
Q Fu, W J Du, G Y Su, H F Wang

P1-47 Assessment of Impact of Unbalancing Power Allocation on Calculating Maximum Loading Point (No.72).....957
Xiaoming Dong, Yiming Wang, Yuanyuan Ding, Chengfu Wang, Hua Sun, Xiaoyan Qin, Chao Jiang, Feng He

P1-48 Power System Dynamic Economic Dispatch with Controllable Air-conditioning Load Groups (No.75).....962
Wen Liang, Meng Liu, Fangchao Song, Wencheng Wu, Kai Zhou, Aimin Jin

E: Advanced Transmission Technology

P1-49 Sag-Tension Calculation Program for Power Substations (No.52).....968
J. Quintana, V. Garza, C. Zamudio

P1-50 A Novel High-Power AC/AC Modular Multilevel Converter in Y Configuration and Its Control Strategy (No.73).....973
Bo Liu, Yongqing Meng, Senge Bai

P1-51 Damping Torque Analysis of a UPFC Installed in a Real Chinese Power Grid (No.98).....978
Jianpeng Zhang, Wenjuan Du, Haifeng Wang, Xu Wang, Lingling Fan

P1-52 Statistical Law for Parameters of Very Fast Transient Overvoltage in UHV Substations (No. 103).....983
Zihao Zhang, Huamao Zhan, Yuhui Ma

P1-53 Circulating Current Suppressing Strategy for MMC-HVDC in the Stationary Frame (No. 126).....987
Jinyu Wang, Jun Liang, Chengfu Wang, Xiaoming Dong, Zhuodi Wang, Zhengtang Liang

P1-54 Hybrid Simulation of AC-DC Power System Based on Analytical Method for Computing Transient Response of HVDC (No. 154).....993
Jingfan Zhang, Xiao Lin, Chongtao Li, Zhengchun Du, Yong Zhao, Ligang Zhao

P1-55 Fast Electromagnetic Transient Simulation Models of Full-Bridge Modular Multilevel Converter (No.183).....998
Fan Xinkai, Zhang Baohui, Wang Yanting

P1-56 Fault Identification Method Based on Forward Traveling Wave Amplitude Feature for HVDC Transmission Line (No. 237).....1003
Shuai Jiang, Xiaoning Kang, Xiuda Ma, Xiaoyun Qu, Chao Zhang

P1-57 A Single-Terminal Traveling Wave Fault Location Method for VSC-HVDC Transmission Lines Based on S-transform (No. 250).....1008
Chuanxin Xi, Qing Chen, Lei Wang

P1-58 Study on the Characteristics of AC/DC Hybrid System under UHVDC Hierarchical Connection Mode(No.251).....1013
Ning Jia, Wang Qi, Tang Yi, Chen Bin

P1-59 A Decentralized Adaptive Droop Based Power Management Scheme in Autonomous DC Microgrid (No. 1078).....1018
Subham Sahoo, Sukumar Mishra, Narayana Prasad Padhy

P1-60 **Static and Dynamic Behavior Studies for UHVDC Separation Pole Connection to AC Grid (No. 562).....1023**
Jing WANG, Minxiao HAN, Shunjun YAO, Chunzheng TIAN, Ruihua SI, Xiaojun TANG

P1-61 **Electromechanical Transient Modeling without Coupling Terms for VSC-HVDC (No. 649).....1029**
Jiahui Chen, Minxiao Han, Shujun Yao, Xuhui Shen

Poster Session P2:

A: Power System Operation and Management

P2-1 **Study on Identification of Winding Material in Distribution Transformer Based on Computed Tomography (No. 292).....1034**
Kuilong Yin, Jinmeng Chen, Fan Wang, Xuewu Sun, Wei Ren, Yizhe Wang

P2-2 **Application of Improved Point Estimate Method on Multi-objective Transmission Network Expansion Planning (No.293).....1038**
Yuan Hu, Zhaohong Bie, Gengfeng Li, Tao Ding

P2-3 **Research on the Comprehensive Evaluation Method and Index System of Power Network Planning (No.305).....1043**
Haoran Lian, Zhaohong Bie, Yuan Hu, Peng Qin, Yangyang Liu

P2-4 **An Improved Approach on Static Security Constrained OPF for AC/DC Meshed Grids with MMC-HVDC (No. 28).....1048**
Yi Lin, Zhangsui Lin, Liuqing Qiu, Mingye Zhang

P2-5 **Building Power Demand Forecasting Using K-Nearest Neighbors Model - Initial Approach (No.312).....1055**
Oleg Valgaev, Friederich Kupzog

P2-6 **Multiobjective Optimization in Congestion Management Considering Technical and Economic Aspects (No.315).....1061**
Denis Mende, David Sebastian Stock, Tobias Hennig, Lothar Löwer, Lutz Hofmann

P2-7 **Analysis of Behavior Game between Suppliers and Their Retailers in Electricity Market By z-Tree (No.330).....1067**
Manlan Guo, Haoyong Chen, Chulin Wan, Zhuoling Guo

P2-8 **Comprehensive Evaluation on Incentive Policy in Renewable Energy Promotion Based on Improved Matter-Element Model with Entropy Weight (No. 340).....1072**
Can Dang, Xifan Wang, Tao Ding, Yunpeng Xiao, Benhui Gong

P2-9 **Cost Compensation Mechanism for High Wind Power Integration Considering Demand Respond (No.349).....1077**
Xuechun Wang, Hongkun Chen, Xin Jiang

P2-10 **Study on Influence and Countermeasures of Coupling Transformer Charging Inrush Current to Hami-Zhengzhou UHV DC Project (No. 354).....1082**
ZHENG Bin, TENG Wentao, HAN Yanan, LI Yanjun, YANG Peng, XIANG Zutao, BAN Liangeng, ZHANG Huamao

P2-11 **A novel method for locating power system out-of-step center on the basis of oscillation energy flow (No.358).....1087**
Yangzi Wang, Wenjie Jin, Shengzhou Ke, Yanbo Chen, Jin Ma

P2-12 **Transient Vibration Study of GIS Bus Based on FEM (No.365).....1092**
Jinggang Yang, Yuan Liu, Degui Hu, Bang Wu, Junhao Li

P2-13 **Solution of Interval Reactive Power Optimization Using Genetic Algorithm (No. 366).....1096**
Cong Zhang, Haoyong Chen, Jia Lei, Zipeng Liang, Yiming Zhong

P2-14 **An Improved Droop Controller for Eliminating Control Error in Microgrid (No. 370).....1101**
Zhang Xiaobo, Wang Kangda, Zhang Baohui

P2-15 **A Master Slave Peer to Peer Integration Microgrid Control Strategy Based on Communication (No. 371).....1106**
Xiaobo Zhang, Jun Guan, Baohui Zhang

P2-16 **Analysis of an abnormal GRTS transfer in DC double circuit transmission system (No. 387).....1111**
LI Jinbin, HU Ran, WEN Yuexiu, LI Yuanlin

P2-17 **Fault diagnosis for power grid based on adaptive improved FCM algorithm (No. 403).....1115**
Zheng Zhou, Xiaoyang Tong

P2-18 **Risk Assessment of the Secondary System of Smart Substation Based on Function Decomposition (No. 411).....1120**
Xinghua Diao, Xiaoyang Tong, Hongbin Wang, Yongkang Zheng

P2-19 **Research on the Convergence of Economic and Electricity Consumption Growth of China (No. 414).....1125**

Lei Zhang, Kai Wang, Jun Xia, Laite Dang,Qian Li , Dongsheng An

P2-20 Research on Economic Dispatch of Large Power Grid Based on Granular Computing (No. 418).....1130
Xueping Li, Liangxing Fang

P2-21 Day-ahead Economic Optimization dispatch of Multi-microgrids With Single/Three Phase Structure Considering Unbalance Constraint (No. 422).....1134
Zhirong XU, Ping Yang, Yujia ZHANG, Xiafei LONG, Qunru ZHENG, Yingqi LIANG

B: Smart Grid Technologies

P2-22 Economic Losses Risk Assessment of Industrial Users due to Voltage Sags Based on Uncertainty of Process Immunity (No.214).....1139
Wang Xi, Li Chunhai, Li Huaqiang

P2-23 Fault Location Algorithm for Partial Coupling Four-parallel Lines under Different Voltage Levels (No. 239).....1143
Wenzhe Chen, Zhiguo Hao, Jun Guan, Wei Ba, Xingguo Wang, Xianguo Jiang

P2-24 Short-Term Prediction of Wind Power Based on Deep Long Short-Term Memory (No.247).....1148
Qu Xiaoyun, Kang Xiaoning, Zhang Chao, Jiang Shuai, Ma Xiuda

P2-25 Hierarchical Coordination Control in DC Distribution System (No. 281).....1153
Kang Xiaoning, Ma Xiuda, Qu Xiaoyun, Wang Xinzhu

P2-26 Economic dispatch for microgrid with electric vehicles in plug-in charging and battery swapping modes(No. 332).....1158
Chunyang Liu, Xiuli Wang, Xiong Wu, Yuntao Zou, Haitao Zhang, Li Yao, Yue Zhang, Qiang Cui

P2-27 Reliability Evaluation of the New Generation Smart Substation Considering Relay Protection System (No.336).....1164
Ji Zhang, Qiaoping Kang, Dawei Huang, Xiuwen Xiong, Yang Liu, Jin Ma, Yanbo Chen

P2-28 Improved SEC Model Based Evaluation Approach for Design Scheme of the New Generation Smart Substation (No.337).....1169
Ji Zhang, Zhi Du, Dong Xie, Shouxia Jiang, Yang Liu, Jin Ma, Yanbo Chen

P2-29 Coordinated Charging Strategies for Electric Bus Fast Charging Stations (No. 348).....1174
Huimiao Chen, Zechun Hu, Zhiwei Xu,Jiayi Li, Honggang Zhang, Xue Xia, Konghong Ning, Mingwei Peng

P2-30 Study of Demand as Frequency Controlled Reserve in Nordic Power System (No.372).....1180
Haoran Zhao, Qiuwei Wu, Shaojun Huang, Zhaoxi Liu

P2-31 Improved Glowworm Swarm Optimization for Planning of Distributed Generations based on the Interactive Fuzzy Decision Technique (No. 430).....1185
Li Jun, Yan Hui, Zhang Yangfei, Zhang Yuqiong, Hao Sipeng, Lü Ganyun, Jin Huafeng

C: Renewable Energy and Energy Internet

P2-32 An uncertainty reduction strategy to schedule and operate microgrids with renewable energy sources (No. 165).....1191
Ge Fenglei, Xie Tao, Xu Hao, Wu Chong, Ni Jingmeng

P2-33 Method of Energy Storage System Sizing for Wind Power Generation Integration (No.177).....1200
Wei Wang, Ruiguang Ma, Hao Xu, Haiyan Wang, Kaijiang Cao, Lipin Chen, Zhichao Ren

P2-34 Research on Economy and Technology Feasibility for Centralized Solar Power Development in Qinghai-Tibet Plateau (No. 179).....1204
WEI Linjun, LI Yan, SU Yuanyuan, CHI Yongning

P2-35 Study on the Generation System by Thermal Cycle of Gas Hydrate Using a Carbon Cloth Supported Catalysts (No. 213).....1209
Ryo Kawai, Shinya Obara

P2-36 Research on Optimal Capacity of Wind Power Based on Coordination with Pumped Storage Power (No. 223).....1214
Huiling Li, Chao Zheng, Sizhuo Lv, Shuanbao Liu, Chao Huo

P2-37 Rolling coordination control of the wind-storage hybrid system based on the ultra-short term wind forecast (No. 224).....1219
Yanhong Wang, Nengling Tai, Wentao Huang, Shuo Liang

P2-38 Innovative Electic Vehicles Energy Supplement System and Its Application Analysis in Dynamic System (No. 256).....1224

Zuo Yihui, Tianhao Liu, Jiahui Chen

P2-39 Fault Ride Through Characteristics of Connection of Large Wind Power Island to VSC-HVDC Grid (No. 261).....1230
Li Yan, Liu Chao, Chi Yongning, Tang Haiyan

P2-40 Optimum Feed-forward Control for UPFC Converters in Large-Scale Wind Power Application (No. 262).....1235
Ni Jingmeng, Xie Tao, Ge Fenglei, Wu Chong

P2-41 Reactive Power Compensation and DC link Voltage Control using Fuzzy-PI on Grid-connected PV System with d-STATCOM (No.286).....1240
Hui Li, Yaomei Huang, Junwei Lu

P2-42 Optimal Distributed Generation Placement and Size under Uncertainties and Contingencies in Active Distribution Networks (No. 960).....1245
Jia Liu, Haozhong Cheng, Qian Xu, Zhou Lan, Pingliang Zeng, Liangzhong Yao

D: Power System Analysis and Control

P2-43 A Simplified Equivalent Method of Wind Farm for Reliability Evaluation (No.90).....1250
Zece Zhang, Xiuli Wang, Zechen Wu, Tianshi Shen

P2-44 A Circuit Approach for the Propagation Analysis of Voltage Unbalance Emission in Power Systems (No.97).....1254
Diego Bellan, Sergio A. Pignari

P2-45 A Weighted Random Forest Approach to Improve Predictive Performance for Power System Transient Stability Assessment (No. 117).....1259
Chun ZHANG, Yansong LI, Zhihong YU, Fang TIAN

P2-46 Feature Selection of Power System Transient Stability Assessment Based on Random Forest and Recursive Feature Elimination (No. 119).....1264
Chun ZHANG, Yansong LI, Zhihong YU, Fang TIAN

P2-47 Research on Distributed Wide-Area Back-Up Protection System for High-Voltage Transmission System (No. 128).....1269
Wuyang GAI, Wei CONG, Zhiming ZHANG, Zijing ZHANG, Jing XIAO, Yingchun FENG

P2-48 An Analytic Method of Calculating Rotor and Stator Short-Circuit Current of DFIG with RSC Control (No.158).....1274
Jinhua Zhang, Baohui Zhang, Bingqing Wu, Jin Wang

P2-49 A simple method of coordinated design of multiple PSSs in multi-machine power systems (No.162).....1279
Yifu Lin, Wenjuan Du, Tianyu Su, Haifeng Wang

P2-50 Evaluation of Security and Stability Risk of AC/DC Grid under Extreme Contingencies (No. 169).....1284
CUI Yong, FENG Nan, FENG Yuyao, YU Yinghui, WANG Weihong

P2-51 RTDS-based Modeling for Full-process Simulation of Two Types of HVDC Systems (No.170).....1291
Yong Cui, Zenghui Yang, Yinghui Yu, Qiang Guo,Tugang Shen

P2-52 Coordinated Corrective Voltage Control Considering Regional Regulation Ability Retention (No. 174).....1296
Yan Zhang, Meng Liu, Wen Zhang, Gaofeng Zhang, Qingqing Zhang, Qingyu Wang

P2-53 Research on Protection Scheme Based on the High Capacity for DG Interconnection with the Power System (No. 198).....1301
Xia Lin, Hui Xue, Anning Wang, Guibin Zou, Yueyang Ma

E: Advanced Transmission Technology

P2-54 An Improved CPS-SPWM and Unified Modulation Strategy for Multilevel Converter (No. 255).....1306
Haitao Zhang, Yongqing Meng, Xiuli Wang, Yuntao Zou, Xiong Wu, Chunyang Liu , Qian Zhou, Weiping Zhu

P2-55 Study on the Transmission Line Boundary Characteristics of the Hybrid HVDC System (No. 259).....1311
Yanting Wang, Baohui Zhang

P2-56 Analytical Method for Computing Electromagnetic Transient Models of FACTS in Hybrid Simulation (No.272).....1316
Song Zou, Chongtao Li, Zhengchun Du, Yong Zhao, Ligang Zhao

P2-57 Modeling and Control of a Novel Three-phase Series-connected Modular Multilevel Converter in T Configuration (No. 275).....1322
Senge Bai, Yongqing Meng, Bo Liu, Haitao Zhang, Hao Ma

P2-58 **Research on the Calculation of Temperature Field of Typical ±800kV Valve Hall Fitting (No. 278).....1327**
Haifeng Sun, Weimin Zong, Yuan Yang

P2-59 **Research on Lightning Performance of 220 kV Splitlevel Cross Arm Tower in Mountainous Area (No. 308).....1332**
Sun Haifeng, Wang Pei, Fang Zhenggang, Yang Zhen

P2-60 **Study on a Coordinate Control Strategy of Multi-HVDC Links to Improve Transient Stability in China Southern Power Grid (No. 310).....1337**
Huang Zhenlin, Guan Lin, Chen Xingwang, Shen Peng, Zhang Jie

P2-61 **Cross-layer information based Routing Protocol for Power Line Communication (No. 314).....1343**
Wei Ba, Tao Zheng, Keyuan Fu, Li Bai, Chang Liu

P2-62 **The analysis of non-electrical parameter accumulative effect under transformer external fault (No. 324).....1349**
Yiqi Dang, Zhiguo Hao, Baohui Zhang, Zhengyuan Li, Hongxiang Xu, Chenguang Yan,Xian Yang, Dan Zhou

P2-63 **Analysis for Measurement Errors of DC Current Sensor in HVDC Based on Finite Element Method (No. 326).....1354**
Rundong Han, Tianzheng Wang, Qi Wang, Yaxuan Zheng, Like Dong

Poster Session P3:

A: Power System Operation and Management

P3-1 **A Particle Swarm Optimization Method for the Capacity Configuration of Wind & Hydropower &Coal for the Energy Base Delivering to the Load Center (No. 465).....1359**
Qian Dai, Pingliang Zeng, Yujiao Sun, Yichi Zhang, Feng Zhao

P3-2 **RSSI Fingerprinting-based UHF Partial Discharge Localization Technology (No. 486).....1364**
ZHANG Weidong, BI Kai, LI Zhen, LUO Lingen, SHENG Gehao, JIANG Xiuchen

P3-3 **Cyber Security Vulnerability Assessment for Smart Substations (No. 503).....1368**
Jiwen Chai, Shanmei Liu

P3-4 **Transmission Capability study of Multi-infeed HVDC in East China Power Grid (No. 534).....1374**
Kanqing Zhuang, Liang Wang, Yuangchen Miao, Zhiguang Huang, Yingbei Yao, Zhaowei Li

P3-5 **Study on the Data Synchronization Mechanism of Dispather Training Simulator (No. 539).....1380**
Weizheng Gong, Zhaoqiang Ge, Wenkai Zhao

P3-6 **A New Method of Evaluating Dispatchable Potential for Aggregated Residential Loads (No. 544).....1384**
Junyu Wang, Haodong Shen

P3-7 **Hierarchical Optimal Scheduling Strategy of the AC / DC Distribution Network Based on Model Predictive Control Method (No. 551).....1389**
Lei Dong, Dandan Lu, Naishi Chen, Tianjiao Pu, Ye Li, Zhiheng Xu

P3-8 **Multi-source Information Based Comprehensive Condition Evaluation Model for Power Transformer (No. 566).....1394**
Yiming Zheng, Wenlin He, Wenhao Wang, Haojun Liu, Xiang Sun, Jiangyang Zhan, Guoping Zou

P3-9 **Power Management of Solid State Transformer in Microgrids (No. 583).....1399**
Huiqing Wen, Runze Yang

P3-10 **Transmission network expansion based on reference network concept (No. 604).....1405**
Hong Fan, Mingqiang Wang, Xingyao Ning, Yuan Liu

P3-11 **Spinning reserve optimization based on unit commitment with loss-of- load-probability constraint (No. 606).....1409**
Pengpeng Yang, Chunping Zhu, Long Zhao, Mingqiang Wang, Yuan Liu, Xingyao Ning

P3-12 **Clustering Algorithm of Power Load Curves in Distribution Network Based on Analysis of Matrix Characteristic Roots (No. 614).....1413**
Yuqi Ji, Keyan Liu, Lingzhi Lu, Dongli Jia, Kaiyuan He, Guangfei Geng

P3-13 **Distribution Network Reconfiguration Method Considering Loop Closing Constraints (No. 638).....1419**
Liu Jun, Yang Fan, Wu Peng

P3-14 **Analysis and Treatment of Harmonic in Power Network with Railway based on ETAP Software (No. 651).....1424**
Yan Pang, Yonghai Xu

P3-15 A Fault Cause Identification Methodology for Transmission Lines Based on Support Vector Machines (No. 663).....1430
Linan Li, Renfei Che, Hongzhi Zang

P3-16 Low-Carbon Economic Dispatch Considering Carbon Capture Unit and Demand Response under Carbon Trading (No. 664).....1435
Renjun ZHOU, Yishu Li, Jiagan SUN, Hao ZHANG, Duli LIU

P3-17 Loading Balance of Distribution Network by Applying Immune Algorithm (No. 674).....1440
KANG Xiaoning, MA Xiuda, WANG Hao, HUANG Qiyue

P3-18 Deformation Simulation and Analysis of Power Transformer Windings(No. 681).....1445
Zhengyuan Li, Zhiguo Hao, Chenguang Yan, Yiqi Dang, Hongxiang Xu, Baohui Zhang

P3-19 Study on Contact Resistance of 10kV Switch Cabinet (No. 246).....1450
Yang Li, Jiandong Duan, Jianfeng Liang, Binglin Li, Yu He

P3-20 Peak-regulation Compensation Mechanism for Large-scale Wind Power Integration based on improved Shapley value allocation (No. 1071).....1455
Fu Yishu, Chen Hongkun, Jiang Xin

B: Smart Grid Technologies

P3-21 Distributed Coordination of Internet Data Centers for Energy Cost Minimization (No. 441).....1460
Shifeng Lin, Yinliang Xu

P3-22 Design of an Intelligent Energy Gateway for Energy Internet (No. 462).....1465
Deng Feng, Liu Junjun

P3-23 Modeling and Simulation of Energy Control Strategies in AC Microgrid (No. 480).....1469
Huiqing Wen, Runze Yang

P3-24 Design and Implementation of Real-time Monitoring System for Surge Protection Devices in Smart Grid (No. 518).....1475
Chenguang Wang, Wanglong Lei, Lin Hai, Cheng Li

P3-25 Analysis of Natural-frequency Components in Parallel Transmission Lines with Shunt Reactors (No. 526).....1480
Wenzhe Chen, Zhiguo Hao, Yiqi Dang, Chang Liu, Zexin Zhou, Dingxiang Du

P3-26 A New Method to Improve Fault Location Accuracy in Transmission Line based on Fuzzy Inference Data Fusion Technology (No. 548).....1486
Rundong Wu, Zaibin Jiao, Tuan Liu, Xiangming Dong, Xiang Lei

P3-27 Self-healing resilience strategy to active distribution network based on Benders decomposition approach (No. 573).....1491
Junhong Guo, Longjun Wang

P3-28 Voltage/Frequency Control of Microsources Considering Response Characteristics of Prime Mover (No. 600).....1496
Jun Zhang, Ke-Jun Li, Mingqiang Wang

C: Renewable Energy and Energy Internet

P3-29 Research of Voltage Stability Analysis Method in Distribution Power System with Plug-in Electric Vehicle (No.287).....1501
Yu Zhang, Xiaohui Song, Fei Gao, Jianfang Li

P3-30 Optimal Scheduling of Combined Heat and Power Units with Heat Storage for the Improvement of Wind Power Integration (No.299).....1508
Hongkun Chen, Yanjuan Yu, Xin Jiang

P3-31 Optimization of Energy Storage System Capacity for Wind Farms based on Cost-Benefit Analysis (No.309).....1513
Hongkun Chen, Xin Jiang, Yanjuan Yu, Yayi Wu

P3-32 Evaluation of Power Grids' Renewable Energy Accommodation Capacity Considering Wind Power and Photovoltaic Power (No. 343).....1518
Can Wang, Zhaohong Bie, Chao Yan, Zewen Li, Fan Liu, Kun Ding, Ningbo Wang

P3-33 Power Quality Assessment of Current Electrical Vehicle Charging Processes (No. 356).....1523
J.C. Hernandez, A. Medina, F. Jurado

P3-34 Effect of AC voltage control on the stability of weak AC grid connected DFIG system (No.367).....1528

Dong Wang, Yunhe Hou, Jiabing Hu

P3-35 A New Islanding Detecting Method of Three-phase Grid-connected Photovoltaics System (No. 381).....1534
Wenhao Li, Shuping Gao, Jing Xie

P3-36 Research on Characteristics of Electric Vehicle Charging Load and Distribution Network Supportability (No. 395).....1539
Xin Tong, Chunlin Guo, Xiaoyan Yang, Chenchen Chen

P3-37 Coordinated optimization of district electricity and heating system based on genetic algorithm (No. 455).....1543
Hailin Ge, Haoyong Chen, Fei Liu, Cong Zhang

P3-38 Sizing battery energy storage for wind farms basd on wind power forecast uncertainty in the bulk power system (No. 148).....1548
Tingting HOU, Yanzhao CUI, Yujia LI, Wei ZHANG, Xiaobing ZHOU

D: Power System Analysis and Control

P3-39 A Decoupled Three-phase Power Flow Algorithm for Distribution Networks Containing Multi-transformer-branches (No.199).....1553
Xiong Yang, Weiping Zhu, Bing Chen, Xiaodong Yuan

P3-40 Analytical Method for Computing Steady-State Response of HVDC (No.205).....1560
Chongtao Li, Xiao Lin, Jingfan Zhang, Zhengchun Du, Yong Zhao, Ligang Zhao

P3-41 A Study on Installation Planning for Interconnected Renewable Energy Facilities in Hokkaido, Japan (No. 208).....1565
Yuji ITO, Shin'ya OBARA

P3-42 Development of the control system for gas-hydrate power generation systems (No. 209).....1570
Daisuke MIKAWA, Shin'ya OBARA

P3-43 Research on Evolvement Approach of Multiple Stability Forms and AC/DC Coordinated Control Strategy in Large Power Grid (No. 215).....1575
Zhang Hongli, LIU Fusuo, Li Wei, LI Xi

P3-44 Study of the Micro-grid for The Cold Climates Island (No. 235).....1580
Katsuaki SATO, Shin'ya OBARA

P3-45 Model Predictive Based Automatic Generation Control with Participation of the Output-constrained Wind Farms (No. 241).....1584
Haocheng Luo, Zechun Hu, Xu Xie

P3-46 Large Photovoltaic Systems Providing Frequency Containment Reserves (No. 254).....1589
J. C. Hernandez, F. Sanchez-Sutil, P. G. Bueno

P3-47 Impacts of Island Load Shedding and Restoration Strategies on Reliability of Microgrid in Distribution System (No. 686).....1594
Jie Zhang, Lin Guan, Xiaogang Wang

P3-48 Study on the Fuel Consumption in the Antarctica Showa Base Microgrid (No. 357).....1599
Ryo Hamanaka, Shin'ya Obara

E: Advanced Transmission Technology

P3-49 Research on Modular Electromechanical Transient Modeling of UPFC based on VSC (No.355).....1604
Dong Yifeng, Hou Junxian, Wang Yi, Li Haifeng, Luo Jianyu

P3-50 An Optimal Control Strategy for VSC-HVDC System Considering Transient Stability (No. 391).....1608
Shuai Tao, Xu Zhuansun, Anming Zhu,Yanbo Chen,Jin Ma

P3-51 The analysis of frequency spectrum of oil pressure signal in transformer external fault (No. 394).....1613
Yiqi Dang, Zhiguo Hao, Baohui Zhang, Zhengyuan Li, Hongxiang Xu, Chenguang Yan,Wezhe Chen, Xian Yang, Dan Zhou

P3-52 The Harmonic Analysis and the Arm Capacitor Parameters Selection of Module Multilevel Matrix Converter (No. 427).....1617
Pengwei Sun, Xifan Wang, Yaoshi Hu,Chunxiao Xie,Lianhui Ning

P3-53 Research on AC Line Distance relay in The Presence of Modular Multilevel Converter Based HVDC (No. 442).....1622
Yuchao Liu, Guoqing Li, He Wang, Zhenhao Wang

P3-54 **Reliability Comparison of Two Types of Converters for Fractional Frequency Transmission System (No. 469).....1627**
Biyang Wang, Xifan Wang, Shenquan Liu, Chengcheng Shao, Huiyuan Bai, Weiping Zhu, Feng Yuyao

P3-55 **Probabilistic Forecasting for the Ampacity of Overhead Transmission Lines Using Quantile Regression Method (No. 580).....1632**
Zhiqing Wei, Mengxia Wang, Xueshan Han, Haicheng Zhang, Qiang Zhang

P3-56 **Research of DC Circuit Breaker Applied on Zhoushan Multi-terminal VSC-HVDC Project (No. 593).....1636**
Jie Zhou, Rui Xie, Haibin Li, Li Liu, Kun Song, Feiyang Huo

P3-57 **Fault record detection with random forests in data center of large power grid (No. 266).....1641**
Jian Zhou, Zhaoqiang Ge, Shang Gao, Yanli Xu

P3-58 **Development of a small temperature difference generator by using the dissociation and expansion characteristics of a CO2 hydrate (No. 273).....1646**
Masamitsu TAKABATAKE, Shin'ya OBARA

P3-59 **Traveling-Wave Based Fault Location with High Grounding Resistance for HVDC Transmission Lines (No. 288).....1651**
Yuntao Zou, Xiuli Wang, Haitao Zhang, Chunyang Liu, Qian Zhou, Weiping Zhu

Poster Session P4:

A: Power System Operation and Management

P4-1 **The Influence of insulator shapes to the UHF signal propagation in GIS (No. 692).....1656**
Bo Niu, Bang Wu,Zeming Sun,Junhao Li, Guoqiang Huang, Weidong Qi, Jingfeng Wu, Yu Shang, Xuefeng Zhao

P4-2 **Stochastic Response Surface Method Addressing Correlated Wind Power for Probabilistic Evaluation of Voltage Stability (No. 695).....1660**
Haibo Bao, Hua Wei, Xiaoxuan Guo

P4-3 **Axial Stability Analysis and Simulation of Power Transformer Windings (No. 705).....1665**
Zhengyuan Li, Zhiguo Hao, Chenguang Yan, Kangda Wang, Yiqi Dang, Hongxiang Xu, Baohui Zhang

P4-4 **Cooperative Scheduling for Supply/Demand Side Reserves with Renewables Considering Load Recovery (No. 715).....1670**
Qiao Fang, Wen Zhang, Kai Wang

P4-5 **The development and operation of integrated automatic meter reading system in Shanghai (No. 725).....1675**
Deng Xuzhi, Li Zhijuan, Zhang Jin, Huang Lu

P4-6 **Optimal Over-Voltage Control of AC Power Grids near Converter Station during Low Power Operation of HVDC(No. 765).....1679**
Xiangming Dong, Zaibin Jiao, Rundong Wu, Tuan Liu

P4-7 **Hybrid-Waveform Recognition for Magnetizing Inrush Current (No. 770).....1684**
Xiaoning Kang, Qiyue Huang, Xiuda Ma,Hao Wang, Xueze Zhang

P4-8 **Composite Generation and Transmission Expansion Planning With Second Order Conic Relaxation of AC Power Flow (No. 773).....1688**
Shaoyun Hong,Haozhong Cheng, Pingling Zeng, Jianping Zhang ,Jianzhong Lu

P4-9 **An Assessment Method of Power System Harmonic Impedance Based on Mixed Total Least Squares(No. 802).....1694**
Li Pengfei, Tao Shun, Yao Liting , Qian Yeniu,Sun Jian

P4-10 **Two-Stage Uncertain Optimal Scheduling of Active Distribution Network Considering Operational Risk (No. 808).....1699**
Lei Dong, Can Zhao,Naishi Chen, Ye Li,Tianjiao Pu

P4-11 **The Output Planning Model of the Electric Vehicle Charging Stations Based on Game Theory(No. 828).....1704**
Hongliang Liu, Biao Zhang, Mengying Cui, Peng Xiao, Lijuan Li, Jun Wu

P4-12 **Study on optimal power flow in a wind-storage system (No. 841).....1709**
Yang Pan, Libao Shi, Yajie Liu, Jinqing Luo, Ren Wang

P4-13 **Optimal Distribution Network Expansion Planning Incorporating Distributed Generation (No. 843).....1714**
H.H.Wang,L.B.Shi

P4-14 **Research on Current Distribution Test of Neutral-bus Arresters Multicolumn Parallel Connected in Converter Station (No. 855).....1719**

Lu Wenhao, LIU Wanying, LI Weiguo, CHEN Wei, ZHU Jiaxi

P4-15 Crew Dispatch for Commercial and Supply Restoration Services in an Electricity Utility Using Ant Colony Optimization Method (No. 898).....N/A
Paulo H. Baumann, Tiago Milagres Miranda, Fabio Romero, Dário Takahata, Alden Uehara Antunes, João Castilho Neto, Leonardo H. T. Ferreira Neto,Ângelo C. Lorenzo Alves, Luísa Morais Azevedo, Sérgio L. P. de Castro Valinho

P4-16 Fraud Detection in Low Voltage Electricity Consumers Using Socioeconomic Indicators and Billing Profile in Smart Grids (No. 900).....N/A
Jonatas Pulz, Renan B. Muller, Fabio Romero, Tiago M. Miranda , Alvaro F. Garcez Neto; Aldo S. Jesus

P4-17 Application of Graphic Centrality on Survivability Evaluation in Distribution Power Network (No. 904).....1737
Xiaohui WANG, Yadong GAO

P4-18 Research on the development trend of fossil energy power generation and non-fossil energy power generation in China (No. 940).....1742
Yanan Zheng, Dongming Ren, Zhaoguang Hu, Quan Wen, Mengyuan Ren

P4-19 Future Power Grid Dispatch and Control Mode with Large-scale Clean Energy Integration in China (No. 950).....1749
CAI Zhi, DAI Sai, ZHAO Kun, YANG Junfeng

P4-20 Collaborative Generation Scheduling Optimization Strategy for Multi-source Power (No. 951).....1755
ZHU Zelei, LIU Fang, DING Qiang, DAI Sai

P4-21 A Related Line Set Based Preset Fault Set Search Algorithm in Reliability Assessment (No. 110).....1760
Qi Zhao, Lin Guan, YaoTangLv, Tao Wang

B: Smart Grid Technologies

P4-22 Identification of Active Distribution Network Island Based on Graph Theory (No. 602).....1767
Hui Hui, Mingxin Zhao, Wei Zhang, Lin Yu, Ying Sun, Mingqiang Wang

P4-23 Coordinated Charging Strategy of Electric Vehicle Charging Station Based on Combination of Linear Power Flow and Genetic Algorithm (No. 632).....1772
Xiaoxue Rong, Bo Wang, Chuanjun Shao, Guangyuan Yu, Yan'an Wang, Qiming Sun , Zhaohong Bie

P4-24 Charging Load Forecasting of Electric Vehicle Charging Station Based on Support Vector Regression (No. 633).....1777
Qiming Sun, Jihong Liu, Xiaoxue Rong, Meng Zhang, Xiangqian Song , Zhaohong Bie,Zhaorui Ni

P4-25 Compressed Sensing Based Real-time Control in a Smart Grid (No. 697).....1782
Hui Tang, Yinliang Xu,Zhicheng Li

P4-26 Real-Time Countermeasures Preventing Power System Instability by using PMU data from RTDS simulation (No. 698).....1787
Bahtiyar Can Karatas, Hjörtur Jóhannsson, Arne Hejde Nielsen

P4-27 Controlled Islanding Strategy of Central China Power Grid Based on Branch Potential Energy (No. 746).....1792
Dejun Shao，Youping Xu，Jianghui Xi, Shun Zhang, Yicong Wang, Chenying He

P4-28 A New Simulation Method of Zero Crossings for Power Line Communication Systems(No. 749).....1797
Chang Liu, Tao Zheng, Li Bai, Wei Ba, Jingming Dou

P4-29 Improved WABP Based on Direction Comparison Principle and Fault Current Component Distribution (No. 763).....1802
Tuan Liu, Zaibin Jiao, Rundong Wu, Jiliang Jin, Xiangming Dong

P4-30 Research on the Analysis Method of the Relationship between Alarm Signal Action and Sequential Logic in Smart Substation (No. 771).....1807
Hao Ren, Renhui Dou, Xiaoqing Ma, Zhiqiang Yao

P4-31 The Design of Overvoltage Testing System for Communication Equipment in Smart Grid (No. 791).....1812
Hai Lin，Chenguang Wang, Wanglong Lei

P4-32 The research on the integrated test system for the secondary devices and system in Smart Substation (No. 812).....1817
Guoqing Zhao,Chen Fan,Hao Yuan,Hui Ren

C: Renewable Energy and Energy Internet

P4-33 Protection for Distribution Network with Photovoltaic Integration (No. 458).....1822

Zhang Zhikui, Zheng Tao, Xie Ruirui,Zhang Peizhong

P4-34 Capacity Planning of Battery Energy Storage System within Wind Farm (No. 464).....1827
Qian Dai, Xiaohui Qin, Jingqi Yang, Pingliang Zeng, Qinyong Zhou, Feng Zhao

P4-35 Research on Multi-objective Optimal Joint Dispatching of Wind-thermal-hydro Power in Multi Time Scales (No. 471).....1832
Guanqun Liu, Yongshen Feng, Dagong Qian, Guangmin Shen, Xiaoqing Shen

P4-36 Power Supply Reliability Indices Computation with consideration of Generation Systems, Transmission Systems and Sub-Transmission Systems' Load Transfer Capabilities (491).....1840
Youzhong MIAO, Wei LUO, Weimin LEI, Pei ZHANG , Ruimin JIANG , Xiaoyang DENG

P4-37 Distributed Consensus Control in an Autonomous Inverter-Based Microgrid (No. 520).....1845
Zicong Deng, Yingliang Xu , Houde Liu

P4-38 A Novel Principle of Directional relay for Wind Power Integration Based on Model Recognition in Time-domain (No. 545).....1851
Chenqing Wang, Guobing Song, Jinhua Zhang

P4-39 The research on adaptability evaluation of wind power integration capacity in power grid considering wind-solar hybrid complementary characteristics and flexible loads interference (No. 553).....1856
Wenbo Hao, Chengzhi Sun, Zhao Leilei

P4-40 Probabilistic Load Flow Calculation in Distribution System Considering the Stochastic Characteristic of Wind Power and Electric Vehicle Charging Load (No. 563).....1861
Wei Chen, Hongqiang Yan, Xiping PEI, Butuo WU

P4-41 Adequacy Assessment of Generation System Based on Time-sequential State Transition Matrices of Wind Speeds (No. 591).....1867
Li Yao, XiuLi Wang, Yang Chen, JingLi Guo, ZeChen Wu, Han Xiao, Bin Li

P4-42 Locating and Sizing of Dispersed Wind Generation in Active Distributed System (No. 735).....1872
Zhang Xiaozhao,Duan Jiandong, Han Yuhui, Tian Xiaojiang

D: Power System Analysis and Control

P4-43 Research on High-Precision Fault Location Based on PMU for Multi-source Distribution Network(No.300).....1877
Mengsheng Zhang,Yi Wang Zhiguo Zhou, Zufu Li

P4-44 The Research of Sub Synchronous Oscillation in PMSG Wind Farm (No.302).....1883
Gao Feng, He Qifei, Hao Zhiguo, Zhang Baohui

P4-45 Dependence of Over-Voltage Level of Different Voltage Class Surge Arrestors on Grounding Device Papameters. Experimental Study and Simulation(No.346).....1888
Adamian Y.E., Krivosheev S.I., Korovkin N.V., Monastyrsky A.E., Bocharov Y.N., Kolodkin I.S., Kuligin P.I., Titkov V.V

P4-46 Load Shedding Strategy Coordinate Optimization Based on Sensitivity Analysis(No. 351).....1893
Dandan Zhang, Wenbo Li, Zhe Jiang, Naihu Wu,Yanwen Hou

P4-47 Distribution Substation Planning Method Based on Weighted Voronoi Diagram (No.362).....1898
ZHU Xiaojun, TANG Wenzuo, LIU Yumin, YANG Hongqin, CONG Wei, GAI Wuyang

P4-48 Wrong Data Identification and Correction for WAMS(No. 378).....1903
Chulin Wan, Haoyong Chen, Manlan Guo, Zipeng Liang

P4-49 Residual Flux Estimation Method for Three-phase Transformers without zero-sequence Circuit on the Switch-off Side(No. 379).....1908
Tingyue Tan,Zhiguo Hao,Duo Wang,Zhiyuan Liu,Xiaojun Yu

P4-50 An Improved Power Flow Algorithm using Equation Changing Method for AC/DC Power System with VSC-HVDC (No. 397).....1913
Wang Jianming,Li Chuandong,Wang Qi

P4-51 A Method of Synthesizing Coordinated Optimization between FACTS and HVDC for Curbing Large-scale Wind Turbine Tripping (No. 402).....1918
CHANG Haijun, HOU Yuqiang,LI Wei, SUN Zhongqing, WANG Yanjun, LV Yazhou,KE Xianbo, NIU Shuangbao,WEI Ping, ZHANG Huiling

P4-52 Application of extended fractional Kalman filter to power system dynamic state estimation (No. 556).....1923
Zigang Lu, Shihai Yang, Yonghui Sun

E: Advanced Transmission Technology

P4-53 Modeling of three-terminal Flexible Ring Power Network Equipment for Power Dispatch (No. 609).....1928
ZHAO Guopeng, HE Yanliang

P4-54 Transformer Top-Oil Temperature Combination Modeling Based on Thermal Circuit and Support Vector Machine (No. 612).....1933
Xiaowu Qi, Kejun Li, Jingshan Wang, Kaiqi Sun

P4-55 VSC-HVDC Transmission Line Protection Based on Current Natural Frequency (No. 642).....1938
Zhao Zhao, Duan Jiandong, Liu Jing

P4-56 Study on the Traveling Wave Differential Protection and theImprovement Scheme for VSC-HVDC Transmission Lines (No. 643).....1943
Lei Wang, Qing Chen, Chuanxin Xi

P4-57 DC Voltage Control Strategy Research in Multi-Terminal HVDC System Based on Optimal AC/DC Power Flow (No. 650).....1948
He Wang, Yutong Liu, Ruifang Ji

P4-58 Research on Seamless Switching of DC Voltage Control Methods of MTDC System (No. 660).....1953
He WANG, Rukong JIN,Jing BIAN,Hongwei ZHOU

P4-59 Topology, Control and Fault Analysis of a New Type HVDC Breaker for HVDC Systems(No. 717).....1959
Feng Xu, Haihong Yu, Yi Lu, Peng Qiu, Kai Tong, Jiazhuo Xuan, Qian Chen, Xiaoming Huang, Daozhuo Jiang

P4-60 Detail Time-domain Characteristics of Audible Noise from Single Corona Source under AC Voltage (No. 722).....1965
Jing Wang, Xuebao Li, Tiebing Lu, Bo Chen, Yijia Zhu, Haibing Li

P4-61 Simulation of the Electric Field on the Surface of the Sub-conductor of ±1100kV UHVDC Transmission Lines(No. 752).....1970
Haoyu Lu

P4-62 Research on Modeling and Control Strategy of Modular Multilevel Matrix Converter Supplying Passive Networks (No. 1000).....1974
Shuonan Shang, Yongqing Meng, Jian Wang, Huixuan Li, Wei Ren, Xifan Wang, Yong Cui

Poster Session P5:

A: Power System Operation and Management

P5-1 **A Novel Quantitative Spectral Analysis Method Based on Parallel BP Neural Network for Dissolved Gas in Transformer Oil (No. 969).....1979**
Zhenxin Zhong, Songping Tang, Gang Peng, Yun Zhang

P5-2 **A new Protection Approach for Microgrid Based upon Combined ANFIS with Symmetrical Components (No. 980).....1984**
Ali Hadi Abdulwahid, Shaorong Wang

P5-3 **On the Accuracy of the State-Queuing Model for the Thermostatically Controlled Loads (No. 981).....1990**
Yu-Qing Bao, Jia-Qi Ju, Qi Wang, Gang Ma

P5-4 **Load Shedding Considering Transient Security and Overload Constraints (No. 994).....1995**
Yun Chai, Hengxu Zhang

P5-5 **Gini Coefficient Constraint Method for Making Monthly Trade Schedule of Directly Dispatched Thermal Power Generation Units (No. 1002).....2000**
Jiye Yang, Jiakai Shen, Ye Han, Yi Wang, Li Jiang, Cuicui Jin, Weidong Li

P5-6 **Optimal Reserve Model with Risk and Emergency Power Control Constraint (No. 1011).....2007**
Jibo Sun, Yanwei Wang, YinguoYang, Yu Kou, Jiangfeng Jiang, Fan Liu,Tao Ding, Zhaohong Bie, Yanlin Wu

P5-7 **A Novel Inversion Evaluation Method for Transformer DC Magnetic Bias Treatment (No. 1014).....2012**
Tianzheng Wang, Kangning Wang, Hua Yu, Nan Cao, Dongqing Wang, Shuzhong Wang, Bing Li, Yu Zhao

B: Smart Grid Technologies

P5-8 **The layered control strategy for the converter dominated DC Microgrid (No. 819).....2017**
Xiaotong Xu, Huiqing Wen, Kai Zheng

P5-9 **Research on the Direct Current Control Method and Simulation of Flexible HVDC(No. 850).....2023**
Cunping Wang, Jian Sun, Qiankun Chang, Dongqiang Jia

P5-10 **Customized Residential Load Scheduling Based on Data-Driven Appliance Modeling Strategy (No. 854).....2028**
Yuan Zhang, Ke Meng, Zhaoyang Dong

P5-11 **A Method for Similarity Analysis of Power System State (No. 863).....2033**
Han Wei, Fan Shixiong, Wei Zechen,Wang Wei

P5-12 **Countermeasures on Abnormal Data in the Signal Acquisition System of Digital Substations (No. 928).....2037**
Chi Zhang, Xiaoning Kang, Zaibin Jiao, Jianfei Ji

P5-13 **The Development of the Unidirectional Blocking Based Pilot Protection for the T-connection Lines (No. 934).....2041**
Haosheng Huang, Xiangping Kong, Peng Li, Hao Wang

P5-14 **Research on Mechanical Fault Diagnosis of Ultra High Voltage GIS Based on the Combination of Neighbor Algorithm and FCM (No. 968).....2045**
Xinping Shen, Zhiming Lin, Gang Peng, Songping Tang, Yun Zhang

P5-15 **The Comprehensive Optimal Scheduling Model of Power Supply and Demand Considering Network Constraints (No. 1006).....2050**
Wang Gang, Wang Ke, Liu Jun, Ji Wenlu, Zhu Hong

P5-16 **The Simplified Topology of Three-phase SST based on 15kV SIC Devices and the Control Strategy under Unbalanced Grid Voltage (No. 1049).....2055**
Chenghao Yu, Yubin Wang, Houzhi Li

P5-17 **A Method for Online Relay Coordination Verification Using Setting Comparison (No. 1052).....2061**
Lin Zhu, Dongyuan Shi

P5-18 **Reliability Estimation of Distribution Components-Contactors (No. 1073).....2066**
Sonam Kumari, Pavan Kumar-M, M Muralidhar

C: Renewable Energy and Energy Internet

P5-19 **A New Control Strategy to Mitigate the Impact of a Battery Swap Station Utilizing V2G Technology on the Feeder**

Automation System (No. 616).....2071
ZHANG Yingda, XIE Bangpeng, ZHANG Hua, ZHENG Yuxiang

P5-20 Day-ahead Generation Scheduling for Variable Energy Resources Considering Demand Response (No. 628).....2076
Hao Gong, Hongtao Wang

P5-21 The Optimal Capacity Determination Method of Energy Storage System with Different Applications in Wind Farm (No. 630).....2081
Tianmeng Yang

P5-22 A Novel Protection Method of Collecting Power Lines in PMSG Wind Farm (No. 661).....2086
Guobing Song, Xiaobo Wang, Zhongxue Chang, Jisi Tang, Peiyao Liu

P5-23 Production Simulation of Power Systems Considering the Forecast Error of Renewable Energy (No. 671).....2091
Kun Ding, Ningbo Wang, Haipeng Xie, Zhaohong Bie

P5-24 The Wind Model Based on Markov Process to Determine the Capacity for Wind Farm (No. 672).....2096
GONG Benhui, WANG Xiuli, DANG Can, XIAO Yunpeng, WU Zechen, XIE Xiaofei, CUI Qiang

P5-25 Control Strategy Research on Frequency Regulation of Power System Considering Electric Vehicles (No. 700).....2101
Chenchen Chen, Chunlin Guo, Zhou Man, Xin Tong

P5-26 Model of Energy Alternative in Spatial Load Forecasting (No. 720).....2106
Li Zhang, Ji Feng, Xuehui Jian

P5-27 Study on Modeling Method of Renewable Energy Generation System Based on Control Mode and Strategy Switching (No. 743).....2111
Fang LUO, Libin YANG, Lei ZHANG, Xiangyan WANG, Dawei ZHAO, Yanzhang LIU

P5-28 A Novel Directional Relay Applicable to Power System With Wind Farms (No. 747).....2117
Jisi Tang, Guobing Song, Xiaobo Wang, Chenqing Wang

P5-29 Coordinated Voltage Optimal Control between Active Distribution Network and Microgrids Considering the Integration of PVs (No. 779).....2122
Xiaopeng Jin, Hao Yang, Wen Zhang

P5-30 Impact of Grid Side Converter of DFIG on Sub-synchronous Oscillation and its Damping Control (No. 810).....2127
Haiyan Tang, Wei He, Yongning Chi, Xinshou Tian, Yan Li, Yukun Wang

P5-31 Value Assessment of Energy Storage to Support Large Scale PV Integration (No. 825).....2131
Huang Bibin, Wang Caixia

P5-32 Study on a Plug and Play Control Method for Renewable Energy Source (No. 839).....2137
Xiongwei Hu, Fang Shi, Guiting Xue

P5-33 Clustering of Large Costumer Based on Characteristics of Price Response (No. 847).....2143
Ning Yifei, Chen Xingying, Liao yingchen, Yan Guoqing, Xu Shiming

P5-34 Applicability Analysis of Differential Protection for Dispersed Wind Generation in Distribution Network (No. 849).....2148
Chang Ying, Duan Jiandong, Sun Lei, He Yu, Cui Shuaishuai

P5-35 Study on the Dynamic optimal allocation of distribution network switches considering the uncertainty of source-network-load(No. 858).....2153
Yu Kun, Zheng Xinyi, Chen Xingying, Wu Lijie

P5-36 Study on the Optimal Proportion of Wind and Solar Capacity in Transmission Constraint Area based on Copula Theory (No. 861).....2158
Haixiang Xu, Linlin Wu, Hui Liu, Zhengpai Cui, Ruoyang Wang

P5-37 Research on the load transfer strategy of smart distribution grid considering the important power customers (No. 864).....2164
GU Xuenan, CHEN Xingying, YU Kun

P5-38 Coordinative Control Strategy of Virtual Inertia and Primary Frequency of DFIGs Based Wind Farms (No. 870).....2169
Xinshou Tian, Weisheng Wang, Yan Li, Haiyan Tang, Yongning Chi, Yukun Wang, Zhen Wang

D: Power System Analysis and Control

P5-39 Connectivity for Home Energy Management Applications (No. 428).....2175

Zhen Zhao, Kodjo Agbossou, Alben Cardenas

P5-40 Security Check for Scheduling Plans Based on Contingency Screening and Parallel Computation for Multi-period Cases (No. 433).....2181
Wei Xu, Haifeng Zhou, Jingjing Ruan, Yanhong Bao

P5-41 Negative Effect and Principle of TCSC to Traditional Emergency Control (No. 435).....2187
Zhen TAN, Ya-zhou LV, Yan-jun WANG, Jian-bo LUO, Wei LI, Xiao-dan CUI

P5-42 Index System and Methods for Urban Power Grid Operation Risk Assessment (No. 438).....2192
Chao PEI, Zhe ZHANG, Xianggen YIN, Xinyu LIANG, Yong WANG, Guoyan CHEN

P5-43 Research Of the Optimization Processing on Initial Data in Smart Substation Based on Data Mining (No. 460).....2198
YAO Zhi-qiang, DU Qi-wei, Ren Hao, Xu Xin, Geng Ming-zhi

P5-44 Analysis of the Transient Voltage Stability of AC/DC System Based on Numerical Energy Function Method (No. 467).....2204
Fujun Zhan, Zhaobin Du, Fang Zhao, Yao Zhang

P5-45 Research of Transformer Modeling Considering the Influence of Tap Positions on Original Parameters (No. 494).....2209
Jun Liu, Ahmad Asad, Kejian Nie, Wanliang Fang, Junxian Hou, Zutao Xiang

P5-46 Coordinated optimization control method of transmission and distribution network (No. 513).....2215
Shiguang Li, Ting Yu, Tianjiao Pu, Jie Ming, Shixiong Fan

P5-47 Hierarchical Voltage Control Strategy Based on Typical Scenes in AC/DC Hybrid Distribution Network with Operation of Multiport Flexible DC Looped Network (No. 519).....2220
Zechen Wei, Ting Yu, Zian Wang, Shixiong Fan, Tianjiao Pu, Wei Han, Shiguang Li, Yongquan Zhao

P5-48 Research on Oscillation Center Identification And Its Application in Distance Relay Protection (No. 542).....2225
Wensen Wang, Xiaoning Kang, Zaibin Jiao

P5-49 Suppression of Numerical Oscillations in Power System Electromagnetic Transient Simulation via 2S-DIRK Method (No. 555).....2230
Liu Jun, Tianhang Wei, Jiayu Liu, Zhanhong Wei, Junxian Hou, Zutao Xiang

P5-50 The Application of SVC for Damping Inter-area Oscillations (No. 558).....2236
Zhengchao Liu, Xia Cheng, Deyu Cai, Lei Ding

P5-51 Review on Over-frequency Generator Tripping for Frequency Stability Control (No. 559).....2240
Zhiming Song, Yong Lin, Chen Liu, Zhenbin Ma, Lei Ding

P5-52 Commutation Failure Analysis in Single- and Multi-infeed HVDC Systems (No. 567).....2244
Zhanhong Wei, Jun Liu, Wanliang Fang, Junxian Hou, Zutao Xiang

P5-53 A Hybrid Cloud Platform for Diversified Real-time Demand in Transformation Equipment Monitoring (No. 569).....2250
Liuwang Wang, Yongli Zhu, Yafei Jia

P5-54 A Direct Method to Determine the Stability of Power Systems During Transients (No. 572).....2255
Yulin Zhao, Wei Zhang, Ruiye Liu

P5-55 An Optimal Scheme for PMU Placement based on Generators Grouping (No. 577).....2260
Songhao Yang, Baohui Zhang, Masahide Hojo, Kenji Yamanaka

P5-56 Adaptive Detection and Correction Method for Anomalous Wind Speed (No. 578).....2265
Wei Chen, Butuo Wu, Xiping Pei, Hongqiang Yan

P5-57 Analysis of Influencing Factors in Hybrid State Estimation (No. 727).....2271
Xueliang Yu, Hengxu Zhang, Jianmei Cao

P5-58 Design LQG/LTR Controller for Higher Order Systems Based on the Reduction Model (No. 985).....2276
Hadeel Nasrat Abdullah, H. S. Sun, Mohammed Kdair Abd

E: Advanced Transmission Technology

P5-59 A Simulation Study of the Influence of Magnetizing Inrush Current and Sympathetic Inrush Current of Converter Transformers (No. 837).....2282
Rui Li, Shuyong Song, Zhenguo Ma, Han Jiang, Biyue Huang, Haishun Sun, Chenying He

P5-60 Aging State Assessment of 110kV XLPE Cable Based on IRC and AE (No. 958).....2287
Zipeng Liang, Haoyong Chen, Cong Zhang, Zijie Liang, Peizheng Xuan

P5-61 Compensation Current Detection Method of Three- Level STATCOM under Unbalanced Grid Voltage Condition (No. 1023).....2292
Xulong Zhang, Feng Wang, Shuyun Qiao, Wen Ji

Poster Session P6:

A: Power System Operation and Management

P6-1 Study of Lightning Stroke Trip-out Fault Analysis for Transmission Line (No. 1017).....2296
Xiaolan Li, Jiahong Chen, Shanqiang Gu

P6-2 Variable Frequency based Relay Protection for Isolated Micro Grid constructed with VSCs (No. 1033).....2301
Guangwei Chen, Qian Chen, Lin Xu, Yuye Lu, Heng Wu, Lei Huang, Meng Jiang

P6-3 An Evaluation Method on the Comprehensive Benefit of Hybrid Series Compensation (No. 1042).....2305
Qi Huang, Yiping Yu, Shikai Liu, Qian Chen, Yazhou Lu, Wei Li, Lei Huang, Lin Xu

P6-4 Scheduling Wind Power Flexible Electricity Contracts (No. 1054).....2309
Zechen Wu, Xiuli Wang, Zece Zhang, Yunpeng Xiao, Benhui Gong, Yue Zhang, Xiaofei Xie

P6-5 An Approach of Data Sharing Applied to Production Simulation Software (No. 1057).....2314
Fangdi Zeng, Jia Shi, Yanping Xu

P6-6 Study of HVDC Voltage Survivability Index Basing on AC-DC continuation power flow (No. 1060).....2319
Liu Yongmin, Huang Jinghui,Li Tiantian, Cheng Yuming, Guo Ziyu , Lin Tao, Bi Ruyu, Hong Wen

P6-7 Optimizing Spinning Reserve Requirement of Power System with Transmission Line Fault (No. 1061).....2323
Peng Qin, Zhaohong Bie, Haoran Lian, Yangyang Liu, Chao Yan

P6-8 Electromechanical transient modeling of AC/DC hybrid system incorporating VSC based DC grid (No. 1063).....2328
Jingming Dou, Baohui Zhang, Runze Chai

P6-9 A Hybrid Forecasting Method of Electricity Consumption Based on Trend Extrapolation Theory and LSSVM (No. 1072).....2333
Yanlin Wu, Zhongmei Pan, Xuan Luo, Jian Gao, Yuhan Zhang

P6-10 Researches on the Optimization Model and Strategies against Low Voltage in Power Distribution Network (No. 1065).....2338
Yang Hong, Gengfeng Li, Chenlin Gu, Fangdi Zeng, Shiyu Liu

C: Renewable Energy and Energy Internet

P6-11 An Enhanced Microgrid Power Sharing Strategy based on Multiple Second Order Generalized Integrators Harmonic Detection and Adaptive Virtual Impedance (No. 872).....2343
Xiaofei Xie, Yaoqin Jia, Changhua Hu, Xumeng Yan, Zechen Wu, Benhui Gong

P6-12 Perspectives on Inter-state Transmission Interconnection between China and Arab States (No. 875).....2348
Junrong XIA, Chun WANG, Xiaohui XU, Maosheng DING, Pei ZHANG, Yunfei MU, Xiaoming LI, Shu WANG

P6-13 Distributed Photovoltaic Power Generation Policies Assessment (No. 912).....2353
Jing Hu, Bibin Huang

P6-14 Optimal Sizing of the Hybrid Energy Storage System Aiming at Improving the Penetration of Wind Power (No. 916).....2358
Tianmeng Yang

P6-15 Research on the System Protection for Enhancing the Accommodation and Transmission of Large Scale Wind Power(No. 919).....2363
He Shien, Lu Liang, Li Jin, Dong Xinzhou, Shi Shenxing, Wang Bin

P6-16 Stochastic Multi-objective Dynamic Optimal Dispatch for Combined Heat and Power Microgrid (No. 920).....2369
HONG Bowen, ZHENG Zhanghua

P6-17 Optimal Operation of Microgrid Based on Chaotic Simulated Annealing Particle Swarm Algorithm (No. 930).....2374

CHUN WANG, JUNRONG XIA, WENYI YAN

P6-18 **Generation and Transmission Investment Decision Framework under the Global Energy Internet (No. 954).....2379**
Jichun Liu, Yi Niu, Junyong Liu, Wenjiao Zai, Pingliang Zeng, Haobo Shi

P6-19 **Study on Optimal Dispatch and Control of Active Power for Wind Farm Cluster Based on the Fusion Information (No. 956).....2385**
Wei Gang, Wu Xingquan, Li Xiaohu, Wang Chengfu

P6-20 **A Method for Optimal Sizing Hybrid Energy Storage System for Smoothing Fluctuations of Wind Power (No. 997).....2390**
Ming Pang, Yikai Shi, Wendong Wang, Xiaoqing Yuan

P6-21 **An adaptive protection to single-line-to-ground fault in teed lines with wind power based on measuring impedance characteristic (No. 1004).....2394**
Tao Zheng, Yutong Zhao, Jing Li, Xuhui Wei, Zengping Wang, Qing Li, Ziyu Chen

P6-22 **A Novel PV Micro-inverter with Parallel Decoupling Circuit on DC side (No. 1030).....2399**
Yong-gao Zhang, Nan Zong, Junxiang Ge, Jia-bin Kang, Peng He

P6-23 **Research on Output Characteristics and Control Scheme of VSC During External Short Circuit Fault (No. 1032).....2405**
Lidan Hua, Zuchen Dong, Xiangping Kong, Peng Li, Xiaoxu Chen, Beibei Qi, Qian Chen

P6-24 **A Very Short Term Wind Power Prediction Approach Based on Multilayer Restricted Boltzmann Machine (No. 1046).....2409**
Xiaosheng Peng, Lei Xiong, Jinyu Wen, Yuan Xu, Wenhan Fan, Shuanglei Feng, Bo Wang

P6-25 **Risk Assessment of Wind Power Ramp events based on Prospect Theory (No. 1048).....2414**
Yawei Kong, Hongtao Wang, Chengming He

P6-26 **Study on Wind Power Utilization Technology by Thermal Storage Heating in Demand-side (No. 1059).....2419**
Hao Zha, Wenhui Shi, Jixian Qu, Lin Zhu

P6-27 **Proportion Optimization of Wind and Solar Power Capacity for Regional Power Network (No. 1062).....2424**
Pai Li, Gaofeng Fan, Weisheng Wang, Yuehui Huang, Lin Zhang

P6-28 **Voltage Based Protection for10kV Distribution Network with Photovoltaic Integration (No. 373).....2429**
XIE Rui-rui, ZHENG Tao, ZHANG Zhi-kui, ZHANG Pei-zhong

P6-29 **Reliability Assessment of Micro-grid Based on Markov Model (No. 780).....2434**
Xiaoxian Liu, Yong Wang, Changwei Song, Hanbing Qu

D: Power System Analysis and Control

P6-30 **Iterative Infinitesimal Generator Discretization-Based Eigen-Analysis of Large Power System Considering Wide-Area Communication Delays (No. 589).....2438**
Weikang Gao, Hua Ye, Yutian Liu, Liang Wang, Baoling He

P6-31 **Direct Power Control Strategy of Three-level SVG Used in Power System (No. 635).....2443**
LAI Xiaoping, PEI Yunqing, LI Ning

P6-32 **Power System First-swing Transient Stability Detection Based on Trajectory Performance of Phase-plane (No. 658).....2448**
Fu Su, Baohui Zhang, Songhao Yang, Huaiyuan Wang

P6-33 **Principle Investigation and Simulation of Directional Pilot Protection Based on Super-imposed Components (No. 662).....2452**
Jiakai Huang, Houlei Gao, Lei Chen

P6-34 **A Novel Calculating Algorithm for Measuring Impedance in Distance Protection (No. 676).....2456**
Lei Chen, Houlei Gao, Jiakai Huang

P6-35 **Power Load Forecasting Based on GOM(1,1) Model Under the Condition of Missing Data (No. 677).....2461**
ZHU Ji-ran, Xu Yuan-can, LENG Hua,TANG Hai-guo, Gong Han-yang, Zhang Zhi-dan

P6-36 **Development of Power Grid Web3D GIS based on Cesium (No. 679).....2465**
Bing He, Wen-xiong Mo, Ge Yang, Guo-jun Lu, Yu-quan Liu

P6-37 **A Fault Line Selection Method for Small Current Grounding System Based on Big Data (No. 680).....2470**

Zheng Shao, Liancheng Wang, Han Zhang

P6-38 Parameters Optimization of DC Voltage Droop Control Based on VSC-MTDC (No. 702).....2475
Xiaoning Kang, Hao Wang, Xiuda Ma, Qiyue Huang, Xuze Zhang

P6-39 One Quick-Action Protection Scheme for VSC-HVDC Transmission Lines with Considering the Frequency-Dependent Characteristics of Cables (No. 740).....2480
Peiyao Liu, Guobing Song, Xu Chu, Ting Wang

P6-40 Study on huge power grid online operation trend assessment system (No. 758).....2485
Lu Guangming, Xie Chang, Lv Ying, Niu Linlin, Dai Hongyang, Yan Jianfeng,Yu Zhihong, Cai Shunyou

P6-41 Locating and Sizing of UPFC Based on Hybrid Intelligent Algorithm (No. 761).....2490
J.Chen, J.K.Liu, Q.Zhou, J.G.Tao, H.X.Zang

P6-42 Effects of Fault Current Limiter on the Safety and Stability of Power Grid and Its Application: A Research Review (No. 764).....2494
Cui Xiaodan, Lv Yazhou, Li Wei, Li Bijun, Sun Zhongqing, Wu Chenxi, Hu Yang,Li Xi

P6-43 An Engineering Applicable Dynamic Equivalent Method for Large-scale AC System Connected to VSC-HVDC (No. 766).....2499
Lin Zhu, Xueguang Wu, Dong Liu

P6-44 An Associative Classification Method for the Operation Rule Extracting Based on Decision Tree (No. 782).....2504
Xiongwei Hu, Fang Shi, Zhihong Yu, Yanhao Huang, Guangming Lu

P6-45 Research on the Influence of Fault Current Limiters on Commutation Failure and Transient Stability in AC/ DC Power System (No. 788).....2509
Li Xi, Yin Minghui, Li Wei, Cui Xiaodan, Lv Yazhou, Hu Yang

P6-46 Flywheel energy storage UPS power supply vehicle and its application in Beijing security of power supply (No. 799).....2514
Yeniu Qian,Zonghui Yuan,Jian Sun,Dongqiang Jia,Yan Zhang, Peng Li, Yan Zhang

P6-47 A Novel Adaptive Zero-sequence Current Protection for Low Resistance Grounding System (No. 804).....2523
Xiaobin Guo, Jinyong Lei, Bowen Han, Gang Wang

P6-48 An Improved Time-domain Fault-location Algorithm for HVDC Transmission Line (No. 805).....2529
Yingdan Qiu, Haifeng Li, Jiyang Wu, Yanxun Guo, Gang Wang

P6-49 Simulation and Analysis of Fault Characteristics of the MMC-HVDC System under Bipolar Connection Mode (No. 816).....2534
Jikai Chen, Binghui Li, Bo Dong, Qiang Ren, Xiaobin Qi

P6-50 Reactive Power Coordinated Control Strategy Based on PSO for Wind Farms Cluster(No. 821).....2539
Mengxi Yu, Jikai Chen, Dou Yanhui, Xiuwei Ma, Yuchao Liu, Chuan Sun, Binghui Li, Qiang Ren, Xiaobin Qi

P6-51 Harmonic Research of Electric Vehicle Fast Chargers(No. 822).....2545
Aiqiang Pan, Yongwei Zhu, Lijia Ren, Tiantian Chen, Sun Wen, Wang Yun

P6-52 DC fault characteristic simulation analysis of MMC-HVDC system(No. 823).....2550
Jikai Chen, Chuan Sun, Mengxi Yu, Bo Dong, Yanhui Dou, Binghui Li

P6-53 An Improved Pilot Protection for Distribution Network With Inverter-Interfaced Distributed Generations (No. 844).....2555
Bowen Han,Gang Wang,Haifeng Li, Dehui Zeng

P6-54 Experimental Study on Black-Start Capability of VSC-HVDC for Passive Networks (No. 857).....2560
Bo Feng, Xiaojuan Zhai, Yang Li, Zhenhao Wang

P6-55 Loss Analysis Simulation of SVC / DC Deicer under SVC Mode (No. 867).....2564
LI Haisheng, LIU Bin

P6-56 Decentralized Adaptive Overcurrent Protection for Medium Voltage Maritime Power Systems (No. 869).....2569
Catalin Iosif Ciontea, Claus Leth Bak, Frede Blaabjerg, Catalin Iosif Ciontea, Kjeld Kilsgaard, Claes Høll Sterregaard

P6-57 Modeling and Fault Analysis of Doubly Fed Wind Power Generation Systems (No. 871).....2574
Liang Dong, Shiming Liu, Ruisheng Liu, Yu Guo

P6-58 Study on the Characteristics of XiMeng 1100kV Transformer at Extremely-low Temperature (No. 902).....2580

Bohan Liu, Xiangping Ni, Guozeng Yan, Bo Li, Zhentao Liu

P6-59 Numerical and Experimental Simulation Researches on Effectiveness of Anti-ferroresonance Measures in Distribution Power Grid (No. 923).....2584
Zhang Tianlong, Tian Shijin, Liu Xuezhong, Liu Hongwen, Li Ruigui

P6-60 Numerical and Experimental Simulation Researches on Characteristics of Ferroresonance Based on Distributed Power Grid Parameters (No. 925).....2588
Tian Shijin, Zhang Tianlong, Liu Xuezhong, Liu Hongwen, Li Ruigui

P6-61 Research on the Selection Method of Phase Sequence Arrangement of Double-circuit Transmission Lines on the Same Tower (No. 1007).....2592
Ning Zhou, Zhan Shu, Yongchun Su, Bo Chen, Zheng Cheng

P6-62 Distributed Model Predictive Control Algorithms for Emergency Voltage Stability Control of Power Systems (No. 1019).....2597
Shuiping Liu, Yong Li, Yijia Cao, Xingyu Shi

P6-63 Application of MMC-UPFC and its Performance Analysis in Nanjing Western Grid (No. 36).....2601
Li Peng, Lin Jinjiao, Kong Xiangping, Wang Yuting

P6-64 Optimal power flow based control of microgrids providing Volt/VAR services (No. 1024).....2606
Xinyu Zhang, Hervé Guéguen, Zhaohong Bie

P6-65 Design of a Novel Multi-Input Fuzzy Logic Power Stabilizer for a Reduced Order Power System (No. 35).....2611
M. A. Masrob, M. A. Rahman, C. B. Butt, and G. H. George

P6-66 Preparation and Breakdown Properties of Transformer Oil Based Magnetic Nanofluids (No. 331).....N/A
Muhammad Rafiq, Chengrong Li, Yuzhen Lv, Kai Yi

P6-67 Power Management Strategy Combining Energy Storage and Demand Response for Microgrid Emergency Autonomous Operation (No. 1058).....2620
Riyasat Azim, Hantao Cui, and Fangxing Li