

# **2021 Power System and Green Energy Conference (PSGEC 2021)**

**Virtual Conference  
21 – 22 August 2021**



**IEEE Catalog Number: CFP21Y80-POD**  
**ISBN: 978-1-7281-9096-9**

**Copyright © 2021 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:	CFP21Y80-POD
ISBN (Print-On-Demand):	978-1-7281-9096-9
ISBN (Online):	978-1-7281-9095-2

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# Table of Contents

## Chapter 1: Smart Grid

Hybrid Top-Down and Bottom-Up Approach for Residential Load Compositions and Percentages .....	1
<i>Ahmed S. Alahmed and Muhammed M. Almuahini</i>	
Design and Construction Integration Technology Based on Digital Twin.....	7
<i>Liang Zhou, Chao An, Jianyong Shi, Zhengyu Lv, and Haisheng Liang</i>	
A Fast Converged Voltage Control Method Based on Deep Reinforcement Learning.....	12
<i>Xinqiao Wang, Siyan Liu, and Bo Wang</i>	
Fault Interval Judgment of Urban Distribution Grid Based on Edge Computing of Distribution Internet of Things .....	18
<i>Hua Fan, Liguang Weng, Bin Yu, Xinglong Feng, Junliang Chen, Ting Shou, Wei Qi, and Dongju Wang</i>	
Transient Stability Assessment of Large-Scale AC/DC Hybrid Power Grid Based on Separation Feature and Deep Belief Networks.....	25
<i>Zihan Zhou, Shicong Ma, Guangquan Bu, Yiran Jing, and Guozheng Wang</i>	
Strategy of Orderly Power Utilization Based on Heavy Haul Lines in a Province .....	30
<i>Haotian Liu, Zhongwei Chen, Yun Zhang, Yefan Wu, Runxin Chen, and Leng Yang</i>	
A CNN Approach for Optimal Power Flow Problem for Distribution Network.....	35
<i>Yujing Jia and Xiaoqing Bai</i>	
Power System Transient Stability Assessment and Key Bus Set Selection Based on Multiple-Agent Cooperation .....	40
<i>Guozheng Wang, Shicong Ma, Jianbo Guo, Yiran Jing, Haotian Xu, and Zihan Zhou</i>	
Multi-Stage Planning Method for Distribution Network Considering Building Integrated Energy Station .....	45
<i>Yunman Li, Hongjun Gao, Shuaijia He, Haibo Li, Hongcai Zhang, Keng Weng Lao, and Jianglin Zhang</i>	
A New Non-Iterative Method for Collaborative Optimization Model Considering Coordination of Active Distribution Network and Multi Agents.....	51
<i>Yang Liu, Lisheng Li, Zhong Zheng, Mingyang Li, Hejing Liu, and Shihong Miao</i>	
Multi-Start Strategy Based Global Optimization Method for Ambient Signal-Based Load Modeling .....	57
<i>Peixuan Wu, Chao Lu, Ying Wang, Chengzhi Zhu, and Shujun Zhang</i>	
Integrating the Power Distribution Terminals into the Power Distribution Internet of Things.....	62
<i>Qiang Liu, Yue Zhu, and Guofeng Liu</i>	
Power System State Estimation Based on PMU under Linear Bayesian Theory.....	68
<i>Wenchao Song, Chao Lu, Junjie Lin, Chengzhi Zhu, and Shujun Zhang</i>	
Coordinated Recovery Method of Multiple DC Commutation Failure Based on Stability Constraint of Sending End System.....	73
<i>Hong Zhou, Li Jiang, Qing Wang, Jie Lei, Yu Wang, Liang Lu, and Yuxiao Yang</i>	
A Study of Transfer Entropy Network on Interprovince Dynamics in Industrial Electricity Consumption .....	79
<i>Bingxu Hou, Lu Gao, Lijie Guo, Jiayi Shang, Xuan Yang, Dengzheng Wang, and Zhen Li</i>	

Optimal Power Scheduling Strategy in Residential Distribution Network Based on Multi-Dimensional Network Integration.....	85
<i>Haojing Wang, Yipu Li, ShanShan Shi, Yun Zhou, Ting Lei, Donghan Feng, Chen Fang, and Zeyu Liu</i>	
Active and Reactive Power Coordinated Control of Active Distribution Networks Based on Prioritized Reinforcement Learning.....	91
<i>Xinming Wang, Haotian Liu, Xin Cao, Wenchuan Wu, Shihui Li, and Xiaobu Jia</i>	
Application Topology Configuration of Distributed Feeder Automation Based on IEC 61850 .....	97
<i>Jiangang Lu, Ruifeng Zhao, Bo Li, Wenxin Guo, Weinian Ouyang, and Yu Chen</i>	
Research on Ship-Applied Low-Voltage DC Smart Power Distribution Equipment with Current-Limiting .....	103
<i>Zhen Yang, Jiang-Feng Zhang, Fang-Yuan Jiang, Guo-Dong Wu, and Xiao-Feng Liu</i>	
Automatic Generation and Parameter Verification of Large-Scale EMT Simulation Models Based on TSP Projects .....	107
<i>Zhendong Tan, Yankan Song, Shilin Gao, Zhengyuan Liu, Ying Chen and Chen Shen</i>	
Feedback Linearization Control for MMC Considering Capacitor Voltage Harmonics.....	112
<i>Xiaojun Lu, Mengbo Li, Xiao Lei, Zhangbin Yang, Daixiao Peng, and Daijun Luo</i>	
Modeling and Analysis of Typical Generator Self-Starting and Research on Black Start Capability Index Evaluation System in Urban Power Grid .....	118
<i>Cheng Gong, Hongwei Cai, Baoqun Zhang, Wei Wang, Rui Zhao, Dongying Zhang, and Yudong Lin</i>	
Decoupling State Estimation for Microgrid Park of Integrated Energy .....	123
<i>Zhun Zhong, Xiaowei Yan, Xingzhi Li, Zhiyong Li, Bei Han, Guangyu He, and Guojie Li</i>	
Robot Path Planning Based on Improved Ant Colony Algorithm .....	129
<i>Yang Xue, Yuefan Chen, Zilong Ding, Xincao Huang, and Dongxiang Xi</i>	
The Real-Time Control Strategy of Double Layer and Double Time Scale for Combined Frequency Regulation of Thermal Power Energy Storage.....	134
<i>Huiqun Yu, Donghui Jin, Daogang Peng, and Yongsheng Shuai</i>	
Optimal Bidding Strategy for Energy Hub Incorporating Data Center Flexibility .....	139
<i>Chenchen Fu, Jianxiao Wang, Gengyin Li, Ming Zhou, Xuanyuan Wang, and Zhen Liu</i>	
Power Distribution Control Strategy of Energy Storage Unified Power Quality Controller with Fixed Power Angle.....	145
<i>Piao Xingye, Zou Jianlong, and Wang Pingfan</i>	
Power Grid Parameters Determining Based on Extended Sensitivity Matrix in Electricity Market.....	150
<i>Mengyuan Wang, Shuo Liu, Zhengfeng Wang, Xu Wu, Zheng Yan, and Xiaoyuan Xu</i>	
Evaluation Tags Calculation of Relay Protection Equipment Based on Improved Metric Learning Algorithm.....	155
<i>Lie Zhang, Guo-Sheng Yang, Hanfang Zhang, Li-Ming Ying, Xuan Liu, Shu-Sheng Tian, and Gui-Qi Zhu</i>	
Research on Customer Service Strategy of Electricity Retail Market Based on Diffusion of Innovations Theory.....	161
<i>Hai Hu, Jie Xu, and Jianli Yang</i>	

Optimization Dispatch Modeling for Demand Response Considering Supply and Demand Balance and Security Constraints.....	166
<i>Haijing Zhang, Chiyu Gong, Wenjie Ju, Guangxu Pan, and Weishuai Wang</i>	
Attention-Bidirectional LSTM Based Short Term Power Load Forecasting .....	171
<i>Zhangliang Wang, Li Jia, and Chang Ren</i>	
Operation Boundary Analysis of Multi-Energy Complementary Systems Considering the Uncertainties of Distributed Generations .....	176
<i>Guangyuan Yu, Xiaoxue Rong, and Xiaojie Wang</i>	
A CNN-LSTM Hybrid Model Based Short-Term Power Load Forecasting.....	182
<i>Chang Ren, Li Jia, and Zhangliang Wang</i>	
Intelligent Control of Energy Prosumer Based on NSGA-II-Interior Point Algorithm .....	187
<i>Yingshu Liu, Guo Cheng, Kun Lv, and Yanbo Che</i>	
Cooperative Scheduling of Power-Thermal Coupled System in Park Based on Chaotic Particle Swarm Optimization.....	194
<i>Wenbin Cai, Haixia Lv, Ye Li, Kaiyang Song, Jianan Nan, and Shuai Yang</i>	
Energy Saving Optimization of Internet Data Center Room Based on Computational Fluid Dynamics .....	202
<i>Zhenwei Liu, Wenhua Han, Yuchen Song, Yun Huang, and Haifeng Sun</i>	
Risk Assessment of PPP Waste to Energy Generation Based on Cloud Model.....	209
<i>Gaomei Xie, Wenhua Han, and Weihua Wang</i>	
Research on Cable High Frequency Passive Equivalent Circuit Model Based on Vector Fitting .....	214
<i>Dandan Zhang, Xiang Cai, Wenwu Pan, and Junzhe Peng</i>	
A Dynamic Investment Decision Model of Power Grid .....	219
<i>Haoyu Wang, Qian Zhou, Yuan Zhu, Chuan Jiang, Zheliang Zhang, Xiao Jin, and Yingqing Liu</i>	
Transient Stability Analysis and Control Strategy Considering DC Cascading Failure Time Interval.....	226
<i>Hongli Zhang, Fusuo Liu, Wei Li, and Yunsong Yan</i>	
The Research of Influence of TCPST on Subsynchronous Oscillation Based on Complex Torque Coefficient Method.....	231
<i>Ningyu Zhang, Qun Li, Xinyao Zhu, Qianyun Shi, Yan Wang, and Qian Zhen</i>	
Reactive Power Sharing Control Strategy of Multi-Inverter Based on Weak Communication .....	237
<i>Junfei Han, Lingyu Sun, Yuqiang Wang, Chaoyu Yu, Pengcheng Wang, and Feng Jiang</i>	
Application and Discussion of Key Technologies for the Integration of High-Temperature Electrostatic Precipitator + SCR Denitrification in the Cement Industry .....	242
<i>Xiaodong Shi, Xudong Ji, Jianjun Zhu, Licheng Zheng, and Shuai Zhang</i>	
Real-Time Co-Simulation Design of Micro-Grid and Information Communication System Based on Multi-Agent System .....	247
<i>Yang Gao</i>	
Intelligent Diagnosis and Recognition Method of GIS Partial Discharge Data Map Based on Deep Learning .....	253
<i>Jie Li, Peng Wang, Lingqi Lin, Wei Shi, Xiuwei Li, Jiangwei Wang, and Pipei Zhang</i>	

Experimental Study and Application Analysis of Pulsed Corona Discharge Plasma Technology for Odor Control.....	257
<i>Lingang Weng, Shuai Zhang, Xiaodong Shi, Licheng Zheng, Qing Ye, Keji Qi, and Yujie Liu</i>	
Overview and Analysis of Voltage Sag Mitigation Measures.....	262
<i>Lv Jinbing, Yang Guochao, Sun Zhezheng, Deng Siying, and Wang Yudan</i>	
Research on Power Supply of Monitoring Equipment Based on Adaptive Voltage Stabilization Control.....	269
<i>Zitong Huang, Xu Yonghai, Guo Chunlin, and Ma Huiyuan</i>	
Research on Control Strategy of New High and Low Voltage Switching Excitation Power Supply .....	276
<i>Meng Song, Zhengjun Shi, Guihua Mei, and Guangyi Zhang</i>	
Design of High and Low Voltage Switching High Precision Excitation Power Supply for Synchronous Condenser .....	281
<i>Guangyi Zhang, Weiyu Wang, Fan Zhou, Chun Song, Jie Gong, and Dayi Li</i>	
Frequency Domain Modeling and Analysis of DFIG Considering Power Control Loop .....	286
<i>Chuanyun Zhang, Hang Su, Maohai Wang, Lin Jia, Peng Zi, and Guojie Li</i>	
Simulation and Analysis of Economic Benefits of Different Types of PV Systems in Shanghai.....	291
<i>Nicholas Nhau, Jiarui Li, Wenli Wang, Wenyong Yu, Chunjiang Zhao, and Yongsheng Liu</i>	
Robust Allocation of Battery Energy Storage Considering Battery Cycle Life .....	296
<i>Yunfan Zhang, Yifan Su, Laijun Chen, Feng Liu, and Chenghao Li</i>	
Research on Frequency Modulation Control Strategy and Economic Dispatch Model Based on Multi-Source Fusion.....	302
<i>Lu Chen, Taiyu Fang, Min Lin, and Xiao Zhang</i>	
Operation Optimization of Regional Integrated Energy System Considering Demand Response of Cooling, Heating and Electricity Flexible Loads .....	309
<i>Fan Hu, Zihao Guo, Kai Xiao, Wen Xiong, Li Wang, and Yajun Li</i>	
A Novel UPQC Based on Variable Impedance.....	316
<i>Zhao Shaofeng, Gong Jie, Hu Zhiyuan, Li Dayi, Shi Huayuan, and Zhang Guangyi</i>	
Multi Objective Low Carbon Economic Dispatch of Power System Considering Integrated Flexible Operation of Carbon Capture Power Plant .....	321
<i>Cui Yang, Zhang Cong, Deng Guibo, Li Yicheng, Yu Shipeng, and Shen Zhuo</i>	
Smart Energy Management Model for Households Considering Incentive-Based Demand Response .....	327
<i>Zhihao Li, Xiangjin Wang, Da Lin, Ruonan Zheng, Bei Han, and Guojie Li</i>	
An Entity Recognition Approach of GIS Fault Text.....	333
<i>Junhua Hu, Jiapeng Tian, Shaohe Wang, Chen Li, and Xiaoxin Chen</i>	
Synchronization of Islanded Microgrid Cluster Based on Virtual Oscillator Control .....	338
<i>Zhen Wei, Shuhuai An, Peng Xu, Jin Xu, Keyou Wang, and Ming Chen</i>	
Fault Identification in Power Distribution Systems Based on Domain Adaptation Probabilistic Learning.....	343
<i>Xinliang Ma, Weihua Liu, Li Zhou, Jiuqin Zhou, and Menghui Xuan</i>	

A Coordinated Control Strategy of Reactive Power Compensation for Offshore Wind Power System with AC Transmission.....	349
<i>Minhui Qian, Dawei Zhao, Fubao Wu, Ning Chen, Lingzhi Zhu, and Yang Wang</i>	

## **Chapter 2: Green Energy and V2G**

Resonance Analysis and Suppression for Multiparallel Inverter System of V2G.....	354
<i>Shilian Zhou, Longfang Li, Shujun Ben, Bo Long, and Yong Chen</i>	

The Engineering Planning Method of Cloud Energy Storage System for Ancillary Service by Blockchain .....	360
<i>Jun-Fang Li, Xue-Jin Huang, Jia-Qi Li, and Xin-Lei Cai</i>	

Review of Seawater Desalination Load Characteristics and its Application Integrated with Clean Energy.....	368
<i>Wei Wang, Yanbo Wang, and Dawei Wang</i>	

Economic Analysis and Research on Investment Return of Energy Storage Participating in Thermal Power Peak and Frequency Modulation.....	373
<i>Zhicheng Liu, Daogang Peng, Jun Yao, and Jianfei Zhu</i>	

Risk Assessment for Renewable Energy Penetrated Power Systems Considering Battery and Hydrogen Storage Systems .....	379
<i>Li Li, Ziyu Zeng, Xinran He, Kang Wang, Fangde Chi, and Tao Ding</i>	

Analysis of the Influence of Fuel and Electric Car on Urban Thermal Pollution with Electric Energy Substitution .....	385
<i>Liang Junyu, Wang Xianlong, Li Qiushuo, Shu Jie, and Yang Jiaquan</i>	

Modeling and Control of an Energy Storage System for Peak Shaving in Industrial Pulsed Power Applications .....	390
<i>Yijun Lu, Raoul Laribi, and Alexander Sauer</i>	

Extreme Learning Machine Based Short-Term Wind Power Prediction Framework with Adaptive Variational Mode Decomposition .....	395
<i>Wei Yang, Li Jia, and Yue Xu</i>	

Optimal Operation Strategy for Concentrating Solar Power toward High Penetration of Renewables .....	400
<i>Muchen Chen, Jianxiao Wang, Gengyin Li, Ming Zhou, Zhenyu Chen, and Xiaoquan Lu</i>	

Research on the Impact of Re-Electrification in the Transportation Sector on Carbon Emission and Pollutant Emission in Yunnan Province.....	407
<i>Youfeng Xu, Junyu Liang, Beibei Cheng, Weizhi He, Jie Shu, Kangyan Li, and Yanjun Xie</i>	

The Planning Design of Cloud Energy Storage System for Vehicle-Grid by Blockchain .....	413
<i>Jun-Fang Li, Dong-Hui Zhang, Xun Lu, and Jie Sheng</i>	

Optimal Dispatch of Hydropower Stations Based on Chance-Constrained Programming .....	420
<i>Xuan Zhang, Hua Wei, Xianxin Su, Wei Gao, Danlei Chen, and Faxiang Hu</i>	

Optimal Scheduling of Cascaded Hydroelectric Plants Based on Primal-Dual Interior Point Theory .....	425
<i>Wei Gao, Hua Wei, Xuan Zhang, Xianxin Su, and Danlei Chen</i>	

Comparative Analysis of Simulation and Measurement of Photovoltaic Power Station Participating in Primary Frequency Regulation.....	430
<i>Peng Zhang, Guocheng Wang, and Fengkui Li</i>	

Bi-Level Optimal Control Strategy of Energy Storage Participating in Power Grid Frequency Regulation Based on Multi Objective Genetic Algorithm.....	437
<i>Huiqun Yu, Yongsheng Shuai, Daogang Peng, and Donghui Jin</i>	
Ultra-Short-Term Wind Energy Prediction Based on Wavelet Denoising and Multivariate LSTM.....	443
<i>Suwan Wu, Li Jia, and Yining Liu</i>	
Optimization of Operation Strategy of Electric Vehicle Charging Station in Multi-Station Fusion Scene .....	448
<i>Haojing Wang, Alexandre Monteiro Sanches, Chen Fang, Yipu Li, Yu Zhang, Donghan Feng, ShanShan Shi, and Yun Zhou</i>	
Optimal Battery and PV Sizing of Charging Stations Considering Battery Dynamic Characteristics.....	453
<i>Chen Fang, Xiaojin Zhao, Qin Xu, Yipu Li, Haojing Wang, Donghan Feng, Kaiyu Zhang, and Yun Zhou</i>	
Parity-Column Index Based Array Reconfiguration Scheme for Power Loss Reduction in Photovoltaic Systems under Partial Shade Conditions.....	460
<i>Zhongyang Yang, Nannan Zhang, Jun Wang, Yi Liu, and Lisi Fu</i>	
Optimization of Energy Sub Hub with Wind Power and Demand Response .....	468
<i>Yining Liu, Li Jia, and Suwan Wu</i>	
Influence of Wind Thermal Power Capacity Ratio on Transient Stability of AC / DC Transmission System.....	473
<i>Jianming Yu and Junbo Pi</i>	
Performance Evaluation of Si and SiC Based 27 kW DC-DC Converters with Ferrite Cores for Fuel Cell Hybrid Vehicles.....	478
<i>Noass Kunstbergs, Hartmut Hinz, and Nigel Schofield</i>	
Method for Estimating the Total Distributed Photovoltaic Generation Power in a Load Region .....	486
<i>Yuqing Jin, Jing Luo, Jingyu Wang, Jun Zhang, Huan Xie, and Ping Ju</i>	
Decentralized Distributionally Robust Dispatch of Multi-Regional Power Systems Considering the Correlated Variable Wind Power .....	491
<i>Fan Hu, Wen Xiong, Renbo Wu, Yongzhao Lao, Yunlong Li, Zhigang Li, and Jinyu Yu</i>	
Simplified Model of Distributed PV Generation and Influence Analysis on Load Characteristics .....	497
<i>Yidong Sun, Jun Zhang, Jing Luo, Huan Xie, Yuqing Jin, and Ping Ju</i>	
PSO-Based Risk Allocation in Waste-To-Energy Incineration Public-Private Partnership Model .....	502
<i>Yang Huang and Wenhua Han</i>	
Optimal Planning of Battery Energy Storage in the Wind-Thermal-Hydro Power System.....	507
<i>Qian Zhou, Haoyu Wang, Hongji Xiang, Chuan Jiang, Zheliang Zhang, Xiao Jin, and YingQing Liu</i>	
Price Prediction and Benefit Analysis on PV Power Generation Projects in the Carbon Trading Market .....	515
<i>Xu Zhang and Wenhua Han</i>	
Study on Establishment of Prognostics and Health Management System for Vessels .....	520
<i>Wang Chaowei, Zhou Guojin, Chen Boren, and Xu Tianfeng</i>	
A Data-Driven Analysis Method for Spatial Coupling of Renewable Energy.....	525
<i>Hongli Liu, XuXia Li, Qingyong Lang, Kaiying Li, Yingying Hu, and Yan Liang</i>	

Chance-Constrained Optimal Scheduling of Integrated Gas-Electric System .....	531
<i>Ye Shushan, Liu Tianqi, Zhang Qi, He Chuan, and Nan Lu</i>	
Research on Intelligent Diagnosis and Recognition Technology of GIS Partial Discharge Data Atlas Based on Deep Learning .....	537
<i>Zhicheng Ge, Jieyuan Chen, Xin Jin, Dong Wang, Xiaofei Shi, Meng Yu, and Chao Pan</i>	
Twenty-Seven Level Co-Phase Traction Power Supply System.....	542
<i>Jianyi Bu and Changzheng Zhang</i>	
Overview of Adjustable Reactor .....	548
<i>Fan Zhou, Guangyi Zhang, Chun Song, and Dayi Li</i>	
Summary of Research on Superconducting Synchronous Motor.....	553
<i>Guangyi Zhang, Fan Zhou, Chun Song, Jie Gong, Weiyu Wang, and Dayi Li</i>	
Experimental Study on Power Quality Disturbance Tolerance and Performance of SSTS .....	558
<i>Huo Xianxu, Lv Jinbing, Guo Bingwen, and Li Kangcheng</i>	
Experimental and Numerical Investigation of Ice Uniformity with Spoiler in the Icing Enviromental Test.....	565
<i>Chen Zhao, Panfeng Liu, Songfeng Liang, and Zhurong Dong</i>	
<b>Chapter 3: Equipment and Status Monitoring</b>	
Comparative Analysis of Basic Errors of High-Level Electric Energy Meter Verification Device.....	572
<i>Xu Kai, Liu Si, Wu Jianfang, Li Yilong, Xiao Tao, Wang Xiang, Zhu Lixin, and Len Xuedao</i>	
Application of Digital Twin in Operation and Maintenance of Power Transmission Project.....	577
<i>Haisheng Liang, Nazhaer Mulatibieke, Jianyong Shi, Zhengyu Lv, and Liang Zhou</i>	
Method for Detecting and Tracking Foreign Objects in Substation Videos Based on Embedded AI.....	583
<i>Chi Xiao, Hui Sun, Yingming Cai, Weidong Zhang, Fu Hong, Min Yang, Xiaodong Zheng, and Zhe Li</i>	
Vulnerability Analysis of High-Altitude Electromagnetic Pulse at System Level.....	588
<i>Liu Chunming, Hu Yiqiao, and Guan Xiyan</i>	
Seismic Vulnerability Analysis of High Voltage Power Transformer .....	593
<i>Hao Li, Jing Peng, Zhisong Xv, Jianhui Feng, and Huangbin Liang</i>	
Research on Voiceprint Recognition of Electrical Faults with Lower False Alarm Rate .....	599
<i>Yi Jiang, Hanwen Sun, Lezhou Hong, Rui Lin, Wei Yan, and Zhe Li</i>	
Seismic Performance and Vulnerability Analysis of High Voltage Capacitor.....	604
<i>Long Shen, Hao Li, Yuting Duan, Yun Zhang, Jiayi Wen, and Qiang Xie</i>	
A Novel Localization Method for the Partial Discharge of Transformer Based on UHF .....	610
<i>Chengzhen Li, Wensen Wang, Binyang Du, Mingxing Zhang, Youfei Sun, and Han Liu</i>	
Application of Sequential Hierarchical Signal Method in Online Monitoring of Partial Discharge in GIS .....	619
<i>Yong Cui, Da Zhang, Xinyan Feng, Hui Tian, Yanzhi Zhao, and Shuai Xue</i>	
A Fault-Line Detection Method in Non-Effective Grounding System Based on Bidirectional Long-Short Term Memory Network.....	624
<i>Xianxin Su, Hua Wei, Xuan Zhang, and Wei Gao</i>	

A Spatial-Temporal Electric Vehicle Charging Load Forecasting Method Considering the Coordination among the Multiple Charging Behaviors.....	629
<i>Shuyi Tang, Yunfei Mu, Yu Zhou, Xiaohong Dong, and Hongjie Jia</i>	
A New Method for Testing the Performance of UHF Sensors.....	635
<i>Jie Li, Jingwen Sun, Yandi Sun, Chenghai Sun, Xiuwei Li, and Chao Gu</i>	
Liquid Leakage Detection of Power Plant Pipelines Based On Improved Vibe Algorithm.....	640
<i>Peng Daogang, Liu Weiwei, Qi Erjiang, and Hu Jie</i>	
Overvoltage Analysis of Submarine Cables Based on Detailed Electromagnetic Transient Model .....	645
<i>Zhaorui Zhang, Dawei Zhao, Minhui Qian, Ziyu Liu, Chenghan Zhao, and Xitian Wang</i>	
Mechanical Faults Diagnosis of HVCB Based on Auditory Features and Sparse Representation Classification .....	650
<i>Yan Shuai, Li Pengyu, Wang Gaojie, Feng Dou, Tan Yong, and Sun Yuwei</i>	
DC Arc Fault Risk Degree Evaluation Based on Back Propagation Neural Network .....	655
<i>Ting Li, Qing Xiong, Rui Li, Hanchao Liu, Shengchang Ji, and Jisheng Li</i>	
An Investigation on Deformation Behavior of Lithium-Ion Battery Based on the Electrochemical-Thermal-Mechanical Coupling Model.....	660
<i>Ziqing Guo, Qing Xiong, Chen Zhang, Lingyu Zhu, and Shengchang Ji</i>	
A Fault Diagnosis System for GT Control System Based on DB and Separation of Front and Back Ends .....	665
<i>Zhang Teng, Peng Daogang, Shen Bin, Xu Chao, and Zhang Hao</i>	
Power Distribution Transformer Fault Diagnosis with Unbalanced Samples Based on Neighborhood Component Analysis and k-Nearest Neighbors.....	670
<i>Jian Fang, Fan Yang, Chuangsheng Chen, Yanlong Yang, Biao Pang, Jiaying He, and Haobo Lin</i>	
Operation and Maintenance Recommendation Based on Probability Matrix Factorization with Tags for Relay Protection Equipment.....	676
<i>Lie Zhang, Guo-Sheng Yang, Haiyan Hu, Li-Ming Ying, Xuan Liu, Shu-Sheng Tian, and Gui-Qi Zhu</i>	
A Sensor Fault Diagnosis Method for Gas Turbine Control System Based on EMD and SVM .....	682
<i>Daogang Peng, Shihao Yun, Debin Yin, Bin Shen, Chao Xu, and Hao Zhang</i>	
Dynamic Resistance Measurement Based on the Whole Lifetime of Breaker Arcing Contact .....	687
<i>Gong Chen, Lingteng Ma, Zheng Zhu, Xiaojun Lu, Mengbo Li, and Weiwen Zeng</i>	
Analysis of Unbalanced Current Malfunction of Series Complement Capacitor Bank .....	693
<i>Wanghao, Lina, Lushun, Yutiantian, Liaoaihua, and Chenliliang</i>	
Study on Thermal Effect Analysis Method of Heat-Resistant Fiber Composite Low-Voltage Cable under Different Working Conditions.....	697
<i>Lina Fu, Jing Yu, Yi Guo, Qi Wang, Jiawei Yang, and Shiqi Li</i>	
Adaptive Window Singular Value Decomposition Method Based on Particle Swarm Optimization for Partial Discharge Denoising.....	702
<i>Bowen Zhang, Haibao Mu, Yiming Zheng, Jiangyang Zhan, Shao Xianjun, Chen Li, Chi Zhang, and Guanjun Zhang</i>	

Simulation of Ultrasonic Wave Propagation of Partial Discharge in Converter Transformer .....	708
<i>Xiaochang Hua, Haibao Mu, Yiming Zheng, Jiangyang Zhan, Xianjun Shao, Lingfeng Jin, Ping Qian, and Guanjun Zhang</i>	
A Novel Identification Method of Power System Oscillation Based on Dynamic Mode Decomposition.....	713
<i>Chuanyun Zhang, Zhitong Chen, Maohai Wang, Lin Jia, and Peng Zi</i>	
A Multi-Dimensional Evaluation Method for Power Generation Characteristics of Renewable Energy Stations with Energy Storage Systems .....	718
<i>Xuxia Li, Yan Liang, Kaiying Li, Qingyong Lang, Yongming Jing, and Yingying Hu</i>	
Application of AI Technology on Power Dispatching Automation System .....	726
<i>Qingzhi Jian, Yimu Fu, Kun Li, Guangfeng Zhao, Yi Zhu, and Wei Zhu</i>	
A Study on Winding MMF Harmonic and Vibration of Polyphase Motor .....	732
<i>Jiaolong Wu, Qiang Xu, and Lei Xu</i>	
Comprehensive Performance Evaluation of Frequency Control of Pumped Storage Units Based on Actual Operating Data Analysis.....	738
<i>Yuhong Chang, Congxiao Yao, Min Wei, Lei Wang, and Yan Luo</i>	
Research on Voiceprint Recognition of Power Transformer Anomalies using Gated Recurrent Unit .....	743
<i>Julaiti Abulizi, Zhen Chen, Peng Liu, Hanwen Sun, Changwei Ji, and Zhe Li</i>	
Research on Voice Print Recognition of Electrical Faults Based on Attention-MFCC Algorithm.....	748
<i>Lin Chen, Ronghao Wang, Fei Hu, Zhe Li, Liang Liang, and Chenhao Lei</i>	
Exploring the Benefit of CSP to Serve Both Electrical Load and Heat Load .....	752
<i>Ershun Du, Yanghao Yu, Ning Zhang, and Jianxiao Wang</i>	
Multi-Source Flexible Grid Disaster Recovery Smart Plan Optimization Evaluation .....	757
<i>Lu Chen, Guoqing Yu, Jie Song, and Xiao Zhang</i>	
Coordinated Wind Power Dispatch Model for an Integrated Heat and Power System by a Novel Scenario-Dependent Algorithm.....	765
<i>Xueting Cheng, Chunchi Gu, Ning An, Xinyuan Liu, Liming Bo, Huiping Zheng, and Yang Cui</i>	
Market Power Assessment of the Central America Regional Electricity Market .....	775
<i>Silvia Chacon and Donghan Feng</i>	
A Time Synchronization Method for Wireless Sensors Array of Power Internet of Things.....	784
<i>Chen Dalin, Liu Guofeng, Zhang Can, Wang Xuyan, and Xu Tongqing</i>	
Incipient Fault Identification in Power Distribution Systems Based on Siamese Temporal Graph.....	789
<i>Wei Li, Enxin Xiang, and Ke Wang</i>	