2024 8th International Conference on Smart Grid and Smart Cities (ICSGSC 2024)

Shanghai, China 25-27 October 2024



IEEE Catalog Number: CFP24URA-POD ISBN:

979-8-3503-7741-5

Copyright © 2024 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:
 CFP24URA-POD

 ISBN (Print-On-Demand):
 979-8-3503-7741-5

 ISBN (Online):
 979-8-3503-7740-8

ISSN: 2768-007X

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



2024 the 8th International Conference on Smart Grid and Smart Cities (ICSGSC 2024)

Table of Contents

Preface Committees	
♦ Digital Electrical Equipment Design and Control	
A Credible Regulating Capacity Evaluation Method of Virtual Control Units in Frequency Response Haoran Wang, Dongqi Luo, Mingze Zhang, Qiang Zhang, Junjie Sun, Weidong Li	1
Research on ISOP Inverter System and Its Control Strategy that Can Work under Specific Loads	9
Research on Control Strategy of Non-isolated Low voltage Flexible Interconnected Converter	13
A Data Cleaning Method for Power Transformer Situational Awareness Based on RANSAC and I Algorithm	
Yanyan Bao, Feng Wang, Dingjun Wen, Tao Sun, Yongliang Yao, Wei Chen	
A Design Method of DC-link Capacitor for Three-Phase SPWM Rectifier Under Asymmetric Grid Fau Shuo Gao, Hong Cao, Jiaqi Liu, Bao Xie, Yong Shi	lts24
Multi-terminal Differential Protection Based on Composite Criterion for T-connected Distributio Inverter Interfaced Distributed Generator	
Feng Wang, Yanjun Wen, Jiangang Lu, Jia Zhu, Zhihan Yang, Wei Liu, Liangliang Huang, Li Qiao	
Early Warning Method for Overload of Massive Transformer Based on TL-LSTM Model	35
Design and Research of A Low-harmonic Marine Frequency Converter	40
Multi-Time Scale Voltage Distribution Characteristics Analysis of Distribution Transformers Based Technology	_
Fan Li, Ying jie Tian, Yun Su, Meng yuan Zhan, Xiu Yang, Ping ping Luo	
Control Strategy Based on Second-Order Linear Active Disturbance Rejection for Flexible DC grids Jiaqi Zhao, Hui Li, Kun Qi	51
Study on the Impact of SVG Active Harmonic Elimination on Inverter Side of LCC	57

∀ Power Transmission and Power Line Protection	
Transformer Intelligent Diagnosis Method Based on Multi-source Information Fusion	62
Ye Yuan, Zihao Wang, Yu Gong, Xuegang Tong	
Research on Lightning Protection Performance and Parameter Selection of Lightning Protection Insulator for ±5 DC Transmission Line	
Xin Shi, Zhenglong Jiang, Zhiyao Fu, Pengkang Xie, Bowen Wang, Jianping Hu	
Risk Prediction and Assessment of High Voltage Transmission Lines under Typhoon Conditions	73
Flexible Grounding Line Selection Based on Power Variation	70
Xiaoxing Sheng, Linyuan Sun, Honghua Jiang, Mingjun Liu, Xiaojun Liu, Haihui Jia	1)
Deep Learning-Based Risk Prediction Technology for Overhead Lines under Cold Wave Weather Using Line Technology	
Pi Junbo, Qi Shixiong, Wang Shangyu, Wu Huahua, Sun Wenduo, Huang Qihang, Zhang Zhixiong, Tian Xu	
Pilot Protection Based on Hamming Distance for Transmission Line Connected to Renewable Energy Station Lei Bao, Haiqing Huang, Pengfei Jin, Weitao Li, Yan Liu	91
Identification and Localization of Partial Discharge in Power Cable Based on Phase Space Vector and Energy Cri	
Jie Zhou, Ting Ye, Jiamin Xu, Jingjing Zhou, Yongchen Zhou, Chunhui Li, Guoming Wang	, ,
A New Method for AC Voltage Withstand Test of High-voltage Power Cable Based on Gas-insulated Lin Distribution Partial Discharge Measurement	
Wei Ding, Lvxuan Huang, Junrui Pan, Xu Wang, Zhenchang Wei, Hao Zhang, Guoming Wang	
The Study on the Influence of Electric Fields on Oil-paper Griffin Curve	107
Meng Gao, Kun Li, Sicheng Zhao, Jun Liu, Ran Zhuo, Guangze Ouyang, Yan Luo, Shengjun Fu, Feng Gao	
A Fast Diagnosis Method for Internal Short Circuit Fault in Energy Storage Batteries Based on Electroche Impedance Spectroscopy	
Changcong Xu, Pengfei Li, Dawei Wu, Siwen Chen, Xin Li, Jinlei Sun	
♦ Fault Diagnosis and Status Monitoring in Power System	
Analysis on Dynamic Characteristics of Corona Discharge in Low Concentration Methane-air Mixture at Micro Scale	
Li Cheng, Ming Sun, Shuyan Wang	
Market Compensation Mechanism for Industrial Loads Participating in Frequency Regulation	123
Yan Guo, Zhantao Fan, Pangxin Jiang, Yiping Chen, Deping Ke, Rong Yan	
A New Fault Location Method for Modern Distribution Network Based on System Parameters Estimation Self-correction	
Shanke Mou, Nan Yang, Hao Chen, Ziqiu Liu, Shujing Yang	

Fault Characteristics Analysis of the Modular Multilevel Converter-type Multi-Port Solid-State Transformer Different Grounding Methods				
Hong Cao, Jiaqi Liu, Yonghui Song, Shuyang Wang, Feiyang Dai, Lin Li, Jingyan Ma, Qingmin Sun				
A Fault Location Method for Modern Distribution Network Based on Fault State Estimation by Hybrid Measuremen				
Kanqin Zhuang, Shanke Mou, Hao Chen, Min Cui, Lijun Wang				
A Method for Small Current Grounding Fault Location Based on the Modified D-S Evidence Theor Multi-Criteria Basic Belief Assignment Adjustment	•			
Short-term PV Power Prediction Method Based on Weather Classification and TCN-Attention	153			
Research on Internal Short-circuit Fault Diagnosis Based on Correlation Coefficient Method	159			
Identification of Electrical Equipment Based on V-I Trajectory, Odd Harmonic Currents	164			
♦ Power Supply System and Digital Power Plant				
Optimization of Energy Interaction between air Conditioning Load and Electric Vehicle	170			
Study on Two-phase Optimized Scheduling of Virtual Power Plant Based on Scheduling External Encaps Standard				
Guihong Wu, Xin Jiang, Zhongyi Wan				
Optimization of Charging Station Deployment Based on Travel Chain Charging Load Prediction				
Energy Supply Scheme for UAV Relay Base Station Based on Power over Fiber Technology	189			
User Cost Differences under Five Capacity Adequacy Mechanisms Based on Equilibrium Analysis	194			
A Study on Detection of Pollution Status of Porcelain Insulators for Power Transmission Based on Im YOLOv8-seg	-			
Kai Gao, Huawei Huang, Shaojing Wang, Wendi Ding, Zhenyuan Li, Lijun Jin				
Integrating Fuzzy Chance Constraints with Operational Mechanisms in Concentrated Solar Power plants	204			
Review and Prospect of Research on Optimization Methods for Load Model Parameters	209			

Join	t Nest Deployment and Path Planning for Multi-UAV Power Inspection	215
	Weihui Wang, Jinli Sun, Yunfei Gao, Chen Yi, Jundong Huang, Chen Jin	
	Smart Grid System Control and Safety Management	
Sma	art Grid Power Load Prediction Method Based on VMD-TCN-BiGRU-TSAM	222
	Ye Yuan, Yu Gong, Zihao Wang, Xuegang Tong	
	ver Control Strategy for Bidirectional Interlinking Converter in Islanded Hybrid AC/DC Microgrid	228
Edge	e Computing for Microgrid via MATLAB Embedded Coder and Low-Cost Smart Meters	234
	Linna Xu, Jian Huang, Shan Yang, Yongli Zhu	
	ordinated Planning of Integrated Electricity and Hydrogen Microgrids Considering Hydrogen Storage Mingze Zhang, Fenghua Huang, Minhao Xia, Yanpeng Qi, Shenghui Hua, Jin Tan, Shunfu Lin	240
Opti	imal Operation of Low-Voltage Distribution Network Based on Photovoltaic Energy Storage Integrated Equ	-
••••	Shaohua Liu, Xiaoyan Zhang, Hao Ding, Qingsong Wang	2 10
	rage Characteristic Analysis and Operation Optimization of Distribution Network Considering Source certaint	
	Fan Li, Yingjie Tian, Yun Su, Mengyuan Zhang, Xiu Yang, Lei Wang	
	Integrated Energy System and Energy Management ormation Modeling of Distributed Electrochemical Energy Storage Shared Operation Based on Holographic F	`eatures
	mination Moderning of Distributed Electrochemical Energy Storage Shared Operation Based on Holographic 1	
	Qiongbin Lin, Fucong Xu, Yuge Chen, Weijun Zhang, Zhicheng Li	
	Iulti-temporal Deep Learning Architecture for Smart Retrofitting of Buildings in Service	263
	entralized Scheduling Strategy for Multi-Energy Stations Aggregating Large-scale Flexible Resources	269
	omparison of Model Predictive Control and Heuristics in Building Energy Management	275
	imal Dispatch for Receiving-End Power Grid with Offshore Wind Farm Clusters Considering Inpensation and Cost Allocation	
-	Xingang Yang, Yajun Zhang, Xuejun Xiong, Qian Feng, Yufan Zhang, Jiawei Zhang, Changhui Zhu, Xiaoyan	Bian
Opti	imized Scheduling of Integrated Energy Systems Considering P2G and Integrated Demand Response	292
,	Jiahong Lang, Yuqing Zhang, Shicheng Zheng, Jinyu Li	
Opti	imization Dispatch Method for Offshore Wind Farm Clusters Considering Wake Effect	298
	Yajun Zhang, Xingang Yang, Wei Bao, Yufan Zhang, Zhaoxin Du, Changhui Zhu, Jingwen Ling, Xiaoyan Bia	n

Junping Gui, Zheng Liu, Xueting Cheng, Haoran Wen, Botao Zhou, Yueshuang Bao, He Song
Improving Immediate Wind Forecast and Wind Power Generation
Orphy Miglesh Bavoukana, Shi Shuai, Dongmei Huang, Mingyao Zhao
Optimal planning of integrated electricity-hydrogen-heat energy system considering long-term low-output events of wind power
Mingze Zhang, Fenghua Huang, Minhao Xia, Yanpeng Qi, Shenghui Hua, Jin Tan, Shunfu Lin
♦ Photovoltaic Power Station Construction and Power Generation Forecast
Voltage prediction of substation users with photovoltaic based on weather classification
Tao He, Fan Yang, Jun Liu, Bingbing Lu, Xiaoyan Sun, Yao Song, Xiu Yang
Solar Photovoltaic Lighting for Community Service Improvement and Sustainable Renovation Design and Applicatio Case in Chengdu, China
Yan Bai, Wenyang Han, Yin Zhang
Equivalent Modeling and Real-time Simulation Research on Large-scale Photovoltaic Cluster Systems
Comparison of the operating economy of SVC and SVG based on accurate dynamic losses analysis
Dynamic Crowd Management through Potential Field-Based Simulations
♦ Green Power System and Power Trading
Research on the Evaluation of the Fit of Electricity Market Development Planning Based on Cloud Model
Low Carbon Economic Dispatch of Power System Based on Multi-point Grid Connection of Wind Farms
An Analysis Method for Recognizing and Analyzing Multi-type Documents in Electric Power Operation Site Based o PaddleOCR
Hao Qin, Jiajie Jin, Wei Sun, Yucheng Qian, Haigang Wang, Zhi Wang
Research on the Schedulability Prediction Method of Electric Vehicle Cluster Based on CNN-BiLSTM-Attention an Model Coupling Drive
Huaisheng Sun, Wenyi Li
Assessing the Security and Architectural Frameworks of Self-Driving Cars in Smart Cities
Developing Clean Coal Technology in Industrial Sector Toward Smart Grid Decarbonization

The Impact of Operational Constraints on the Uniqueness of Locational Marginal Price: Simulation and Analy Danning Lin, Ning Ma, Donghan Feng, Yun Zhou, Wenlong Li, Zihao Tian	ysis 388
Analysis of China's Green Electricity Trading Issues and a Market Clearing Model Considering Green Participation	•
Chenghui Tang	
♦ Data Analysis and Information Security in Power Information Network	
Risk Assessment of Distributed PV Microgrids Under Cyber Attacks based on CNN-AE	400
Shenjian Qiu, Shiang Guo, Zhipeng Shao, Jiaxuan Fei, Quan Liu, Kaikai Pan	
Wearable detection application of protective equipment for live working based on YOLOv9	406
Pan Tang, Bin Xiao, Ziming Su, Fangqun Gao	
Enhancing Port and Maritime Cybersecurity Through AI-Enabled Threat Detection and Response	412
Mary Jane C. Samonte, Ezekiel Nathan B. Laurenio, John Rick M. Lazaro	
Design and Implementation of Electrical Information System Network Security Verification Method	421
Minghui Gao, Xiangtao Yu, Bo Li, Xiaolei Ma, Yanjun Zhang, Li Ma, Hang Zhao, Wei Li	
Design of Front-end Power Supply for Lithium Battery Equalization Charging System	430
Shi-jie Zhou, Ying-long Cai, Ning Gao	
Remotely Accessible Cyber-Physical System Testbed for Power Grid's Security and Reliability	436
Mazharul Islam, Tahmid Ashraf Khan, Sunjare Zulfiker, A S M Jahid Hasan, Hafiz Abdur Rahman	
Graph Learning Method for Voltage Area Partition in Inaccurate Multiphase Distribution Networks	442
Lianren Zhu, Shengyi Wang, Hui Guo, Fei Wang	
Short-term Forecasting for Charging Pile and Photovoltaic Loads Based on LSTM-Seq2seq Model in Extrem	
Mengyuan Zhang, Yingjie Tian, Yun Su, Yingying Zhao, Yufan Zhang, Deyong Yu, Gaiping Sun	
Real-Time Exchange of IEC 61850 Sample Values over 5G for Grid Monitoring and Operation	454
Henrik Lundkvist, Tesfaye Amare Zerihun, Henrik Austad	
An Efficient Data Transmission Protection Method for IoT Terminals Based on Temporary Ciphertext Stream Pool	
Yuling Li, Zilong Han, Bo Zhang, Xinge Li, Chaoqun Kang, Huairen Yang	
A Critical Analysis on Cybersecurity of Internet-of-Things in System Integration and Architecture of Smart C	ities 466
Mary Jane C. Samonte, Kyle Dexter H. Panganiban, Lorenzo Miguel D. Laqueo, John Rick M. Lazaro, T. Ogaya	Lex Anilov
Non-functional electrical scene extraction method considering spatiotemporal correlation	472
Tao He, Jun Liu, Fan Yang, Bingbing Lu, Bingcheng Zhou, Xiu Yang, Gaiping Sun, Yao Song	

Author Index