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Zhao Dongmei (North China Electric Power University, P.R. China), Yuan Liuyang (North China Electric Power University, P.R. China), Zhang Xu (North China Electric Power University, P.R. China) 1934

Evaluation of Data Flow Control Performance for Architecture of Secondary Substation System

Xiang Li (University of Macau, P.R. China), Haiyu Li (University of Manchester, United Kingdom), Wen Huiqing (Xi'an Jiaotong-Liverpool University, P.R. China) 1940

Equivalent Analysis of MAF and CDSC applied In-loop SRF-PLL

Xie Menxi (Soochow University, P.R. China), Canyan Zhu (Soochow University, P.R. China), Yang Yong (School of Urban Railway Transportation, Soochow University, P.R. China) 1946

Status and Development of Overcurrent Protection Devices for More Electric Aircraft Applications

Ziyue Zhu (Nanjing University of Aeronautics and Astronautics & Center for More Electric Aircraft Power System, P.R. China), Haihong Qin (Nanjing University of Aeronautics & Astronautics, P.R. China), Xin Nie (Nanjing Research Institute on Simulation Technique, P.R. China), Dafeng Fu (Nanjing University of Aeronautics and Astronautics, P.R. China), Huajuan Xu (Nanjing University of Aeronautics and Astronautics, P.R. China) 1951

±1100kV UHVDC Computational Parameters Modeling and Effect on Receiving-end Grid

Xuchang Zhang (Anhui Electric Power Research Institute, P.R. China), Zhemin Lin (Anhui Electric Power Research Institute, P.R. China), Xun Mao (Anhui Electric Power Research Institute, P.R. China), Yong Zhan (Anhui Electric Power Research Institute, P.R. China), Xiaotao Peng (Wuhan University, P.R. China), Yun Xu (Wuhan University, P.R. China) 1958

Dynamic Power Distribution Strategy Based on Virtual Rotor Excitation Characteristic and Stator Impedance

Xiangwu Yan (North China Electric Power University, P.R. China), Yunfan Cheng (North China Electric Power University, P.R. China), Tiancheng Deng (North China Electric Power University, P.R. China), Weichao Zhang (North China Eletric Power University, P.R. China), Tianqi Hua (North China Electric Power University, P.R. China) 1964

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Lei Liu (Shanghai Maritime University, P.R. China), Tianzhen Wang (Shanghai Maritime University, P.R. China), Emmanuel Schaeffer (Nantes University, France), Haojun Ji (Shanghai Maritime University, P.R. China), Milu Zhang (Shanghai Maritime University, P.R. China) 1969

A Novel Power Calculation Method Based on Second Order General Integrator

Jiaxin Lu (Logistic Engineering University of PLA, P.R. China), Yingchao Zhang (Chongqing Communication Institute, P.R. China), Wusong Wen (Chongqing Communication Inistitute, P.R. China), Yadong Wen (Logistic Engineering University of PLA, P.R. China) 1975

Controller Hardware-in-the-loop (CHIL) Simulation of a Multi-functional Energy Storage System Based on Modular Multilevel DC/DC Converter (M2DC) for MVDC Grid

Ran Mo (Florida State Univerisity, USA), Mischa Steurer (Florida State University, USA), Hui Li (Florida State University, USA) 1980

<i>Fault section locating for distribution network with DG based on improved ant colony algorithm</i>	Weiqing Tao (Hefei University of Technology, P.R. China), Gang Yang (Hefei University of Technology, P.R. China), Junyu Zhang (Hefei University of Technology, P.R. China)	1985
<i>Analysis and Improvement of Damping Factor Based on Virtual Synchronous Generator Control</i>	Ningyi Xu (Xi'an Jiaotong University, P.R. China), Yue Wang (Xi'an Jiaotong University, P.R. China), Mingxuan Li (Xi'an Jiaotong University, P.R. China), Wenti Wang (Xi'an Jiaotong University, P.R. China), Hao Wang (Xi'an Jiaotong University, P.R. China), Hailong Zhang (Xuji Group Corporation, P.R. China)	1990
<i>Review of Energy Routers Applied for the Energy Internet Integrating Renewable Energy</i>	Hui Guo (Shanghai University, P.R. China), Fei Wang (Shanghai University, P.R. China), Jian Luo (Shanghai University, P.R. China), Lijun Zhang (Shanghai University, P.R. China)	1997
<i>Control of Three-Phase Grid-Connected LCL-Filtered Inverters with Adaptability to Non-Ideal Grid</i>	Jinming Xu (Nanjing University of Aeronautics and Astronautics, P.R. China), Lin Ji (Nanjing University of Aeronautics and Astronautics, P.R. China), Qiang Qian (Nanjing University of Aeronautics and Astronautics, P.R. China), Shaojun Xie (Nanjing University of Aeronautics & Astronautics, P.R. China)	2004
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