
National smart grid key R&D program session guide

Session Name	Topic	Session Number	Time	Location
National Smart Grid Key R&D Program Session 1	Key Technology of Power Distribution System Based on Multi-user Interaction	SG1	Oct. 23rd, Saturday 13:00-15:00	Trading Hall
National Smart Grid Key R&D Program Session 2	Research on Superconducting DC Fault Current Limiter	SG2	Oct. 23rd, Saturday 13:00-15:00	Nanlao Hall
National Smart Grid Key R&D Program Session 3	Technology and Application of Wind Power / Photovoltaic Power Prediction for Promoting Renewable Energy Consumption	SG3	Oct. 23rd, Saturday 13:00-15:00	Jiaxiang Hall
National Smart Grid Key R&D Program Session 4	Key Technology and Application of Medium and Low Voltage DC Power Distribution System	SG4	Oct. 23rd, Saturday 15:00-17:00	Trading Hall
National Smart Grid Key R&D Program Session 5	Planning and Operation of Complementary Generation of Cascaded Small-Hydropower, Photovoltaic and Pumped Storage	SG5	Oct. 23rd, Saturday 15:00-17:00	Taihang Hall
National Smart Grid Key R&D Program Session 6	Key Technologies of Power Internet of Things	SG6	Oct. 23rd, Saturday 15:00-17:00	VIP Hall
National Smart Grid Key R&D Program Session 7	Safe Operation and Risk Assessment Methods of UHV Equipment	SG7	Oct. 24th, Sunday 8:00-10:00	VIP Hall
National Smart Grid Key R&D Program Session 8	Synchronous Phasor Measurement Technology and its Applications for Smart Distribution Network	SG8	Oct. 24th, Sunday 8:00-10:00	Trading Hall
National Smart Grid Key R&D Program Session 9	Key Technologies of Digital Power Grid	SG9	Oct. 24th, Sunday 8:00-10:00	Jinyang Hall
National Smart Grid Key R&D Program Session 10	Optimization and Control of Bulk Power Grid Dispatch and Operation in the Context of "New Power System"	SG10	Oct. 24th, Sunday 10:00-12:00	Trading Hall

National Smart Grid Key R&D Program Session 11	Power Terminal Special Chip and Information Security Protection	SG11	Oct. 24th, Sunday 10:00-12:00	Jinyang Hall
National Smart Grid Key R&D Program Session 12	Multi-Physics Analysis, Reliability Evaluation and Optimized Design of Large Capacity Power Electronic Equipment	SG12	Oct. 24th, Sunday 10:00-12:00	VIP Hall
National Smart Grid Key R&D Program Session 14	Key Technologies for Reliable Operation of Offshore Multi-platform Interconnected Power Systems	SG14	Oct. 24th Sunday 13:00-15:00	VIP Hall
National Smart Grid Key R&D Program Session 15	Foundational Research on Silicon Carbide High Power Electronic Devices and Applications	SG15	Oct. 24th Sunday 13:00-15:00	Jiaxiang Hall
National Smart Grid Key R&D Program Session 16	Complementary Coordinated Dispatch and Control of Multi-energy Power System	SG16	Oct. 24th Sunday 13:00-15:00	Trading Hall
National Smart Grid Key R&D Program Session 17	Grid Friendly Control Technologies for Large Wind Turbines	SG17	Oct. 24th Sunday 13:00-15:00	Shuyu Hall

National smart grid key R&D Program Session Details

National Smart Grid Key R&D Program Session 1: Key Technology of Power Distribution System Based on Multi-user Interaction

Oct. 23rd, Saturday 13:00-15:00, Trading Hall
Project Number: 2016YFB0901300

Project Introduction:

In recent years, China's industrial electricity consumption accounted for more than 65% continuously. It has important strategic significance to achieve national "carbon neutral, carbon peak" goal to fully excavate industrial park, a variety of user interaction capability, comprehensive utilization of energy and to build a new type of electrical system with flexible and efficient, and to improve comprehensive utilization of new energy. Relying on the national key projects such as research and development program for 5 years, through multidisciplinary collaborative innovation, systemic solved the industrial park of multiple user interaction with the electric system key technologies. This session will focus on the new trends and key technologies of multi-user interaction.

Chair(s):

Qian Ai
Professor
Shanghai Jiao Tong University

Panelist:

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|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 13:00-13:30 | SG1-01
<i>Data-driven situation awareness for electrical power systems</i>
Manyun Huang
Associate Professor
Hohai University |
| 13:30-14:00 | SG1-02
<i>Optimal Operation of Smart Distribution System Using Stochastic Dynamic Programming</i> |

Zhenning Pan
Post-doc
South China University of Technology

14:00-14:30 SG1-03
The Study of Multi-type Virtual Power Plants Supported by Artificial Intelligence and Other Novel Technical Frameworks
Tao Chen
Lecturer
Southeast University

14:30-15:00 SG1-04
DT-based Spatial-temporal Data Utilization in EIoT
Xing He
Associate Researcher
Shanghai Jiao Tong University

National Smart Grid Key R&D Program Session 2:

Research on Superconducting DC Fault Current Limiter

Oct. 23rd, Saturday 13:00-15:00, Nanlao Hall
Project Number: 2017YFB0902300

Project Introduction:

The team based on the national key research and development plan, had developed was born claimed yesterday the highest voltage level operation of superconducting DC current limiter and screening. The seminar will discuss all aspects from material research, system simulation, prototype design, key components development, test, and network operation.

Chair(s):

Shaotao Dai
Director
Beijing Jiao Tong University

Panelist:

13:00-13:30 SG2-01
High temperature superconducting materials and its FCL application
Zhiyong Hong
Professor

- 13:30-14:00 SG2-02
Design of current limiting unit of superconducting DC fault current limiter
Tao Ma
Associate Professor
Beijing Jiaotong University
- 14:00-14:30 SG2-03
The low temperature system for 160kV DC high Tc-FCL
Guo Yan
CTO
Western Superconducting Technologies Co., Ltd
- 14:30-15:00 SG2-04
Superconducting Fault Current Limiter Grid-Connected Operation
Pandian Luo
Senior Engineer
Guangdong Power Grid Co. Ltd

National Smart Grid Key R&D Program Session 3:
Technology and Application of Wind Power / Photovoltaic
Power Prediction for Promoting Renewable Energy

Consumption

Oct. 23rd, Saturday 13:00-15:00, Jiaxiang Hall
Project Number: 2018YFB0904200

Project Introduction:

Based on the National Key R&D Program of China, the project mainly focused on two key technologies, the first one is Multi-scale wind power / photovoltaic power prediction based on the spatial-temporal correlation of Numerical Weather Prediction data, the other is Multi-stage electricity system optimal scheduling and risk control methods considering wind power / photovoltaic power prediction uncertainty. The main research results which have been applied in pilot projects are presented here.

Chair(s):

Chun Liu
Chief Technical Expert
China Electric Power Research Institute

Panelist:

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|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13:00-13:20 | SG3-01
<i>Introduction to IAP seasonal wind and photovoltaic resources prediction system</i>
Jingjing Xu
Assistant Researcher.
Institute of Atmospheric Physics, Chinese Academy of Sciences |
| 13:20-13:40 | SG3-02
<i>Optimization on annual maintenance and generation scheduling considering flexibility of high renewable penetration power system</i>
Zongxiang Lu
Associate Professor.
Tsinghua University |
| 13:40-14:00 | SG3-03
<i>Short-term wind power probabilistic forecasting technology</i>
Ming Yang
Professor.
Shandong University |
| 14:00-14:20 | SG3-04
<i>Ultra-short-term power prediction of wind farm cluster based graph machine learning</i>
Hang Fan
Postdoc.
Tsinghua University |
| 14:20-14:40 | SG3-05
<i>Optimal curtailment strategy and uncertainty pricing of renewable energy for risk-based economic dispatch</i>
Wenchuan Wu
Professor. |

Tsinghua University

14:40-15:00 SG3-06
*Risk-based reserve optimization and emergency control
incorporating the uncertainty of new energy*
Shiyang Li
Engineer
Huazhong University of Science and Technology

National Smart Grid Key R&D Program Session 4:

Key Technology and Application of Medium and Low Voltage

DC Power Distribution System

Oct. 23rd, Saturday 15:00-17:00, Trading Hall
Project Number: 2018YFB0904700

Project Introduction:

For massive distributed optical, storage, charging and other new source load access, the distribution network presents a state of regional density and unbalanced load distribution. In order to improve the consumption capacity of distributed new energy, reduce transformation links, improve energy efficiency and improve the utilization efficiency of distribution network equipment, it is urgent to break through the new distribution network technology suitable for active and AC / DC power distribution interconnection, and provide solutions for large-scale distributed photovoltaic access to the power grid.

Chair(s):

Yubo Yuan
Chief Engineer
Electric Power Research Institute of State Grid Jiangsu
Electric Power Company

Panelist:

15:00-15:24 SG4-01
Reliability evaluation of DC distribution system
Dingkang Liang
Associate Professor.
Taiyuan University of Technology

- 15:24-15:48 SG4-02
Application and Future Prospect of Medium Voltage DC Power Electronic Transformer
Fang Zhuo
 Professor.
 Xi'an Jiaotong University
- 15:48-16:12 SG4-03
An Advanced System-level Model Reduction Method for Multi-converters MVDC Power System
Lin Zhu
 Lecturer.
 Tianjin University
- 16:12-16:36 SG4-04
Research on protection method of DC distribution system based on control and protection cooperation
Shouxiang Wang
 Professor, Deputy director of smart grid Key Laboratory of Ministry of Education.
 Tianjin University
- 16:36-17:00 SG4-05
Challenges and Thoughts of New Distribution System Under The Promotion Policy of Photovoltaic in Whole County
Mingming Shi
 Senior Engineer, Deputy director of distribution network center
 Electric Power Research Institute of State Grid Jiangsu Electric Power Company

National Smart Grid Key R&D Program Session 5:

Planning and Operation of Complementary Generation of Cascaded Small-Hydropower, Photovoltaic and Pumped Storage

Oct. 23rd, Saturday 15:00-17:00, Taihang Hall
 Project Number: 2018YFB0905200

Project Introduction:

The complementary generation technology of the cascaded

hydropower-PV-storage system closely combines cascaded small-hydropower, photovoltaic and pumped hydro storage, and fully exploits the regulation capacity of cascade small-hydropower to realize the complementary optimization of various renewable energy sources. In this panel, the latest research progress in the planning, operation, control and dispatch of the complementary generation of cascaded hydropower-PV-storage system is introduced.

Chair(s):

Xiaoyan Han
Assistant Chief Engineer
State Grid Sichuan Electric Power Company

CoChair(s):

Lijie Ding
Chief Engineer
State Grid Sichuan Electric Power Research Institute

Panelist:

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|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15:00-15:24 | <p>SG5-01
<i>Analysis and optimization of cooperative control strategy for variable speed pumped storage unit with full size converter</i>
Huabo Shi
Level III Technical Expert
State Grid Sichuan Electric Power Research Institute</p> |
| 15:24-15:48 | <p>SG5-02
<i>Stability analysis and optimal stochastic control of cascaded hydro-solar systems considering the uncertainty of photovoltaic generation</i>
Zhipeng Yu
Doctor Student
Tsinghua University</p> |
| 15:48-16:12 | <p>SG5-03
<i>Optimized Sizing of a Hybrid Energy System Considering Renewable Energy and Energy Storage System</i>
Xiao Xu
Doctor Student
University of Electronic Science and Technology of China</p> |

- 16:12-16:36 SG5-04
Research on complementary power station joint intelligent operation of PV-Hydro-PHS
Shijun Chen
assistant researcher
Sichuan University
- 16:36-17:00 SG5-05
Evaluation and Decision-Making of Regional Multi-Renewable Energy System Based on Steady-Transient Integrated Simulation
Xiuning Zhou
Doctor Student
Shanghai Jiao Tong University

National Smart Grid Key R&D Program Session 6:

Key Technologies of Power Internet of Things

Oct. 23rd, Saturday 15:00-17:00, Interview Hall
Project Number: 2020YFB0905900

Project Introduction:

The new-type electric power system will accelerate the transformation process of the traditional grid to the Energy Internet. As one of the important supporting technologies, the power Internet of Things is the specific practice of Internet technology in the field of energy and electricity. By researching key technologies such as sensing, networking, platform and applications, the power Internet of things can improve the holographic perception and ubiquitous interconnection capabilities of the power grid. In the meantime, it can also realize the dynamic acquisition, real-time perception and online monitoring of the status of the grid, equipment, and consumers. The above methods will enhance the observability, measurability and controllability of the power system, promote the coordinated interaction and optimized operation of the source-network-load-storage, and further support the safe, green, low-carbon and economic development of the grid.

Chair(s):

Dongxia Zhang
Senior Engineer
China Electric Power Research Institute Co., Ltd

Panelist:

- 15:00-15:30 SG6-01
Optimizational design of power internet of things' architecture considering edge computing and data intelligence
Jie Tong
Research Director
China Electric Power Research Institute Co., Ltd
- 15:30-16:00 SG6-02
Development of self-controllable and high-performance "Sensing Transmitting computing" device for power Internet of things
Shuhua Zhang
Senior Engineer
China Electric Power Research Institute Co., Ltd
- 16:00-16:30 SG6-03
Research on Key Technologies for Electric Power Internet of Things Management Platform
Ke Xie
Vice President
State Grid Information & Telecommunication Group Co.,Ltd
- 16:30-17:00 SG6-04
Research on intelligent applications of power internet of things
Sheng Chen
Senior Engineer
China Electric Power Research Institute Co., Ltd

National Smart Grid Key R&D Program Session 7:

Safe Operation and Risk Assessment Methods of UHV

Equipment

Oct. 24th, Sunday 8:00-10:00, Trading Hall

Project Number: 2017YFB0902700

Project Introduction:

UHV projects have a large transmission capacity and have extremely high

requirements on the reliability of power equipment, and there is an urgent need to improve the operation and maintenance level of UHV equipment. Focusing on two key scientific issues that are “multi- factor discharge characteristics and failure model at gas-solid interfaces of UHV equipment” and “multi-physics coupling of UHV equipment, dynamic evolution of oil-paper insulation performance, and failure models”, and a key technology that is “Multi-parameter risk assessment method for UHV equipment under complex working conditions”, we discuss the safe operation and risk assessment methods of UHV equipment.

Chair(s):

Jian Hao
Associate Professor
Chongqing University

CoChair(s):

Daomin Min
Associate Professor
Xi'an Jiaotong University

Panelist:

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| 8:00-8:24 | <p>SG7-01
<i>Broadband electromagnetic transient characteristics of UHV equipment and its components</i>
Jun Deng
Senior Technical Expert of China Southern Power Grid</p> |
| 8:24-8:48 | <p>SG7-02
<i>Discharge Characteristics and Flashover Probability of Gas-Solid Interface of UHV Equipment</i>
Hongwei Mei
Associate Professor of Tsinghua Shenzhen International Graduate School</p> |
| 8:48-9:12 | <p>SG7-03
<i>Modelling and simulation on the coupling of multi-physics fields in UHV equipment</i>
Li Cheng
Associate Professor of Chongqing University</p> |

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- 9:12-9:36 SG7-04
Dynamic Evolution Rule of Dielectric Performance and Fault Simulation of Oil-paper Insulation under Operation Conditions
Meng Huang
Associate Professor of North China Electric Power University
- 9:36-10:00 SG7-05
Life prediction and operational risk assessment of UHV equipment under long-term service conditions
Shengtao Li
Professor of Xi'an Jiaotong University

National Smart Grid Key R&D Program Session 8:
Synchronous Phasor Measurement Technology and its
Applications for Smart Distribution Network

Oct. 24th, Sunday 8:00-10:00, Interview Hall
Project Number: 2017YFB0902800

Project Introduction:

The large-scale distributed power supply is connected to the distribution network, the rapid growth of electric vehicle charging load, and the increasingly frequent interaction between grid and the load make the distribution network have new features such as bi-directional power flow, intelligent source and load, and the emerging of the power electronic device, etc. The source, network and load of the distribution network have stronger spatial and temporal uncertainty, which shows normalized random fluctuation and intermittency. The development and application of synchronous phasor measurement technology provides an important and new method to ensure the safe and reliable operation of the distribution network. This session focuses on the National Key R&D Project "Research on Key Technologies of Smart Distribution Network Operation Based on Micro Synchronous Phasor Measurement", and introduces the latest technical achievements in the development of the micro synchronous phasor measurement devices for smart distribution network, and discusses the issues of optimal deployment, state estimation, fault diagnosis, coordination control and operation analysis.

Chair(s):

Hengxu Zhang
Professor
Electrical Engineering College of Shandong University

CoChair(s):

Zheng Yan
Professor
Electrical Engineering Department of Shanghai Jiao Tong University

Panelist:

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| 8:00-8:20 | <p>SG8-01
<i>High precision synchrophasor measurement techniques in distribution network</i>
Chao Lu
Professor
Department of Electrical Engineering, Tsinghua University</p> |
| 8:20-8:40 | <p>SG8-02
<i>Distribution system operating state awareness based on synchronous phasor measurement</i>
Xiaoyuan Xu
Assistant Professor
Electrical Engineering Department of Shanghai Jiao Tong University</p> |
| 8:40-9:00 | <p>SG8-03
<i>Coordinated control for islanded distribution networks based on Micro-PMU</i>
Xiangyu Wu
Associate Professor
School of Electrical Engineering, Beijing Jiaotong University</p> |
| 9:00-9:20 | <p>SG8-04
<i>Fault Diagnosis and precise location based on synchronous phasor and waveforms for distribution networks</i>
Hengxu Zhang
Professor</p> |

Electrical Engineering College of Shandong University

- 9:20-9:40 SG8-05
Optimal Micro-PMU Placement for Distribution Network
Zhi Wu
Associate Professor
School of Electrical Engineering, Southeast University
- 9:40-10:00 SG8-06
Demonstration and operation analysis of synchrophasor measurement techniques in distribution network
Chen Fang
Senior Engineer
State Grid Shanghai Electric Power Research Institute

National Smart Grid Key R&D Program Session 9:

Key Technologies of Digital Power Grid

Oct. 24th, Sunday 8:00-10:00, Jinyang Hall

Project Number: 2020YFB0906000

Project Introduction:

The presentation will explore the independent and controllable specific chip technology for power equipment, introduce the concept and technical features of digital distribution networks (DDS), and how edge computing is used in DDS. The presentation will introduce the technical solution on security of edge side and terminal side in digital power grid, focus on the key technologies and difficult issues in middleground construct, and implement the deep learning-knowledge graph fusion technology to enhance the instantaneity and accuracy.

Chair(s):

Peng Li
General Manager
Digital Grid Research Institute, China Southern Power Grid

Panelist:

- 08:00-08:24 SG9-01
Exploration and Practice of Independent and Controllable

Specific Chip Technology for Power Equipment

Hao Yao

Level III Technical Expert

Digital Grid Research Institute, China Southern Power Grid

08:24-08:48

SG9-02

Edge Computing for Digital Distribution Networks

Peng Li

Professor

Tianjin University

08:48-09:12

SG9-03

Security Technology of Edge Side and Terminal Side in Digital Power Grid

Tiantian Cai

Level III Technical Expert

Digital Grid Research Institute, China Southern Power Grid

09:12-09:36

SG9-04

Key Technique Research of construction in digital power grid middleground

Yang Yang

Senior Manager

Digital Grid Research Institute, China Southern Power Grid

09:36-10:00

SG9-05

Smart operation technology of digital grid based on the fusion of Deep Learning and Knowledge Graph

Ye Guo

Associate Professor

Tsinghua University

National Smart Grid Key R&D Program Session 10:

Optimization and Control of Bulk Power Grid Dispatch and

Operation in the Context of “New Power System”

Oct. 24th, Sunday 10:00-12:00, Trading Hall

Project Number: 2017YFB0902600

Project Introduction:

In order to solve the optimization and control problems of bulk power grid dispatch and operation considering bilateral uncertainties of source and

load, the 2017 national smart grid key R&D program project "research and application of key technologies for intelligent dispatching and security risk warning of bulk power grid" has developed an intelligent dispatch and control platform with the characteristics of "physically distributed and logically unified" based on cloud computing concept. In this panel, the latest research progress in the system architecture and development trend, basic support, dispatching optimization, prevention and pre-control, supporting platform will be introduced.

Chair(s):

Hongqiang Xu
Deputy Director
National Electric Power Dispatch and Control Center

Panelist:

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| 10:00-10:24 | SG10-01
<i>Challenges and Development Trends of Intelligent Dispatch and Control Technologies for Bulk Power Grid with High Proportion of Renewable Energy</i>
Shengchun Yang
Deputy Director
Electric Power Automation Research Institute, CEPRI |
| 10:24-10:48 | SG10-02
<i>Key Supporting Technologies of the Business Middle Platform in Bulk Power Grid Dispatch and Control System</i>
Xuewei Shang
Deputy General Manager
State Grid NARI Technology Co., Ltd. |
| 10:48-11:12 | SG10-03
<i>Steady-state Automatic Cruise Method for Bulk Power System Considering Source-load Uncertainties</i>
Chuangxin Guo
Professor
Zhejiang University |
| 11:12-11:36 | SG10-04
<i>Fast Situational Awareness and Early Warning of Security Risk for Bulk Hybrid AC/DC Power Grids</i> |

Yutian Liu
Professor
Shandong University

11:36-12:00 SG10-05
*Cloud Concept Based Supporting Platform of Intelligent
Dispatch and Control System for Integrated Bulk Power
Grids*
Mingyu Zhai
Vice President
NARI Research Institute of NARI Group Co.

National Smart Grid Key R&D Program Session 11: Power Terminal Special Chip and Information Security Protection

Oct. 24th, Sunday 10:00-12:00, Interview Hall
Project Number: 2018YFB0904900

Project Introduction:

At present, the embedded components and control units of power terminals have failed to achieve active immunity, and power terminals are difficult to identify and resist diversified attacks, and there are blind spots in the security protection of edge computing, it seriously threatens the operational safety of power systems and smart energy. The interactive power supply and demand of multiple power end users in an open environment is about to surpass the existing hierarchical partition information security protection pattern of vertical encryption and horizontal isolation of the power grid. Once the threat invades and attaches itself to the terminal equipment and breaks through the boundary protection, it is unhindered and prone to major grid security incidents. Focusing on the two scientific issues of native security protection mechanism of power terminals and system-level full-dimensional security protection mechanism of power terminals in open environment, this topic intends to include the latest research progress in the application research of special chips for power system terminals and the application research of security protection, anti-penetration monitoring and edge computing of power system terminals, including (but not limited to): (1) Circuit-level security protection theory and technology of power monitoring system chip; (2) Evaluation method of power monitoring system chip attack; (3) Research of open ecological power dedicated CPU and chip and internal embedded operating system; (4) Design and development of power terminal internal embedded components and control unit with active immunity; (5)

Research of security monitoring and anti-infiltration technology of power industrial control terminal and embedded control unit; (6) Security protection technology of power system edge computing; (7) Application engineering practice of power dedicated chip.

Chair(s):

Xiangjun Zeng
Provost
Changsha University of Science & Technology

Panelist:

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| 10:00-10:30 | SG11-01
<i>Domestic Power Dedicated System-on-Chip</i>
Xiaowen Jiang
Assistant Researcher
Zhejiang University |
| 10:30-11:00 | SG11-02
<i>Autonomous controllable RTOS SylixOS security container supports smart grid</i>
JiaWei Yan
Industry Technical Manager
ACOINFO |
| 11:00-11:30 | SG11-03
<i>Design of Low Voltage Protection Device Integrated with Measurement and Control Function Based on Power Dedicated Multi-Core Heterogeneous Chip Architecture</i>
Yi Ding
Deputy Director
Guodian Nanjing Automation Co.,Ltd |
| 11:30-12:00 | SG11-04
<i>Data and Knowledge driven advanced threat detection in digital substation</i>
Sheng Su
Changsha University of Science & Technology |

National Smart Grid Key R&D Program Session 12:
Multi-Physics Analysis, Reliability Evaluation and Optimized
Design of Large Capacity Power Electronic Equipment

Oct. 24th, Sunday 10:00-12:00, Jinyang Hall
Project Number: 2018YFB0905800

Project Introduction:

Large capacity power electronic equipment plays a core role in smart grid and new energy power generation, and has an increasingly significant impact on the safe and reliable operation of grid and the cost of energy utilization. The panel provides a forum to exchange most recent research results on the methods and techniques for multi-physics analysis, reliability evaluation, and optimized design of large capacity power electronic equipment.

Chair(s):

Jinjun Liu
Professor
Xi'an Jiaotong University

Panelist:

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| 10:00-10:20 | SG12-01
<i>Strategies of research on methods for multi-physics comprehensive analysis, reliability evaluation and optimized design of large capacity power electronic equipment</i>
Jinjun Liu
Professor
Xi'an Jiaotong University |
| 10:20-10:40 | SG12-02
<i>Modeling and analysis with high resolution in time and space for short term stresses on power semiconductor devices and capacitors</i>
Laili Wang
Professor
Xi'an Jiaotong University |
| 10:40-11:00 | SG12-03
<i>Mission profile emulator and reliability test for power</i> |

	<i>electronic device and equipment</i> Ke Ma Research Professor Shanghai Jiao Tong University
11:00-11:20	SG12-04 <i>Characteristic parameter selection and online extraction method for aging state of key components in large capacity power electronic equipment</i> Li Ran Professor Chongqing University
11:20-11:40	SG12-05 <i>Modeling and simulation analysis for short- and long-time scales of power electronic devices</i> Yunhua Liu Doctor Student South China University of Technology
11:40-12:00	SG12-06 <i>Optimization design method of large capacity power electronic equipment based on reliability evaluation</i> Wanjun Lei, Chang Yuan Associate Professor Xi'an Jiaotong University, North China Electric Power University

National Smart Grid Key R&D Program Session 13:
Basic Theory and Application Practice of Optimization and
Operation for Energy Internet

Oct. 24th, Sunday 13:00-15:00, Shuyu Hall
Project Number:2016YFB0901900

Project Introduction:

With the development of Energy Internet, the basic theory and practice of its optimization and operation have received more and more attention. This panel will focus on the optimization theory, optimization algorithm and operation practice for various Energy Internet, such as data center, micro energy grid, building energy system and park energy internet.

Chair(s):

Gengfeng Li
Associate Professor
Xi'an Jiaotong University

CoChair(s):

Haipeng Xie
Lecturer
Xi'an Jiaotong University

Panelist:

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|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13:00-13:24 | SG13-01
<i>Event-based Optimization for Green and Reliable Data Centers</i>
QingShan Jia
Professor
Tsinghua University |
| 13:24-13:48 | SG13-02
<i>Distributed Economic Dispatch for Micro Energy Grids</i>
Shanying Zhu
Associate Professor
Shanghai Jiao Tong University |
| 13:48-14:12 | SG13-03
<i>Randomized-Difference Based Gradient-Free Algorithm for Distributed Resource Allocation</i>
Wenxiao Zhao
Researcher
Academy of Mathematics and Systems Science Chinese Academy of Science |
| 14:12-14:36 | SG13-04
<i>Hydrogen-based New Structure for Building Energy Systems with Supply-Demand Coordination</i>
Zhanbo Xu
Professor
Xi'an Jiaotong University |

14:36-15:00 SG13-05
Thoughts and practices on the IHARBOR smart energy system
Haipeng Xie
Lecturer
Xi'an Jiaotong University

National Smart Grid Key R&D Program Session 14:
Key Technologies for Reliable Operation of Offshore
Multi-platform Interconnected Power Systems

Oct. 24th, Sunday 13:00-15:00, Jinyang Hall
Project Number: 2018YFB0904800

Project Introduction:

In response to the characteristics and requirements of offshore oil and gas development, this project aims to build a highly reliable operation system for offshore multi-platform interconnected power systems, and comprehensively improve system reliability and energy efficiency in terms of component equipment, system planning, stable and reliable, and economic operation. The project focuses on two key scientific issues: "Electromagnetic transient characteristics analysis and operation stability control of offshore multi-platform heavy-load weakly interconnected independent power grids" and "Open multi-coupling dynamic model and stress characteristics analysis of key components of offshore multi-platform power systems". And a key technology of "Structural Optimization and Comprehensive Energy Optimization of Offshore Multi-Platform Interconnected Power System", establish an open multi-coupling dynamic model of key power components and an interconnected power system reliability evaluation model, and propose a distributed flexible frequency assisted by energy storage Control algorithms, self-healing control and protection methods, build a multi-condition super real-time simulation analysis platform, and comprehensively apply it in demonstration projects, laying the foundation for future offshore platform power system planning, simulation analysis and control operation, and providing technology for the national ocean strategy support.

Chair(s):

Xiuli Wang
Professor

Xi'an Jiaotong University

Cochair(s):

Ji Xiang
Professor
Zhejiang University

Panelist:

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| 13:00-13:30 | SG14-01
<i>The whole system reliability assessment method and application of offshore oil platform power grid</i>
Xiuli Wang
Professor
Xi'an Jiaotong University |
| 13:30-14:00 | SG14-02
<i>Flexible Generator: Synchronous Generator Enhanced by the Energy Storage System</i>
Ji Xiang
Professor
Zhejiang University |
| 14:00-14:30 | SG14-03
<i>Research on Failure and specific mechanical stress of submarine cable and the related mechanisms in offshore oil-gas platform</i>
Weiwang Wang
Associate Professor
Xi'an Jiaotong University |
| 14:30-15:00 | SG14-04
<i>Integrated Energy Optimization Management Technology and Control System of Offshore Multi-platform Interconnected Power System</i>
Xuechun Wang
Doctor
Wuhan University |

National Smart Grid Key R&D Program Session 15:
Foundational Research on Silicon Carbide High Power
Electronic Devices and Applications

Oct. 24th, Sunday 13:00-15:00, Jiaxiang Hall
Project Number: 2018YFB0905700

Project Introduction:

Silicon carbide high-power electronic devices will play an important role in the future smart grid. In the National Key R&D Program Project " Foundational Research on Silicon Carbide High Power Electronic Devices and Applications", the theories and application technologies on SiC materials, chips, packaging, reliability and flexible DC converter valves applications are investigated. This research has focused on breaking through the technical bottlenecks related with the 18kV SiC IGBT devices, i.e., materials, chips and packaging, etc.

In this project, the ultra thick multilayer SiC epitaxial materials and 18kV/12.5A SiC IGBT chip were developed for the first time in China. The 18kV/125A SiC IGBT devices were packaged, which had the maximum power capacity in the world. Besides, the 24kV converter valve half bridge power module by suing the 18kV/125A SiC IGBT in series was developed for the first time in the world.

Chair(s):

Junmin Wu

Professor

Global Energy Internet Research Institute Co., Ltd

Panelist:

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|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13:00-13:20 | SG15-01
<i>The Research progress of 6.5kV SiC MOSFET devices</i>
Fei Yang
Professor
Global Energy Internet Research Institute Co., Ltd |
| 13:20-13:40 | SG15-02
<i>Development progress of high-voltage and high-power devices in 4H-SiC</i>
Xiaolei Yang |

R & D Engineer
The 55th Research Institute of China Electronics
Technology Corporation

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|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13:40-14:00 | SG15-03
<i>Method of Insulation and Current Sharing of High Voltage and High Power SiC Device Packaging</i>
Zhibin Zhao
Professor
North China Electric Power University |
| 14:00-14:20 | SG15-04
<i>Research on reliability of sic power devices</i>
Qing Guo
Associate Professor
Zhejiang University |
| 14:20-14:40 | SG15-05
<i>Device Model of SiC IGBT and Verification of Voltage Sharing in Series</i>
Lin Liang
Professor
Huazhong University of science and technology |
| 14:40-15:00 | SG15-06
Test Technology and Challenges of High Voltage SiC Device
Jinyuan Li
Professor
Global Energy Internet Research Institute Co., Ltd |

National Smart Grid Key R&D Program Session 16:
Complementary Coordinated Dispatch and Control of
Multi-energy Power System

Oct. 24th, Sunday 13:00-15:00, Trading Hall
Project Number:2017YFB0902200

Project Introduction:

This panel is focused on multi-energy complementation to improve the accommodation capacity of renewable energy. The content included complementary characteristics analysis of multiple energy power sources, technologies of coordinated planning, dispatching and controlling of

multi-energy power system, and their applications in Qinghai power grid. The associated technologies and applications aimed to improve the flexibility of power system operations and the utilization of renewable energy, and explore new ways for sustainable development of renewable energy for China.

Chair(s):

Weisheng Wang
Deputy Chief Engineer
China Electric Power Research Institute

Panelist:

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|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13:00-13:24 | SG16-01
<i>Intelligent construction and complementary characteristics analysis of multi-energy power system operation</i>
Wei Hu
Associate Professor
Tsinghua University |
| 13:24-13:48 | SG16-02
<i>Coordination planning methods for power sources of multi-energy power system</i>
Kaigui Xie
Professor
Chongqing University |
| 13:48-14:12 | SG16-03
<i>Day-ahead/intra-day stochastic optimal scheduling of multi-energy power system</i>
Yuehui Huang
Senior Expert
China Electric Power Research Institute |
| 14:12-14:36 | SG16-04
<i>Multi-energy power system complementary coordinated control technology</i>
Haotian Zhang
Senior Engineer
NARI Technology Co., Ltd. |
| 14:36-15:00 | SG16-05
<i>All-clean energy power supply practice based on</i> |

multi-energy complementation in Qinghai province

Ling Dong

General Manager

Qinghai Green Energy Data Co., Ltd.

National Smart Grid Key R&D Program Session 17:

Grid Friendly Control Technologies for Large Wind Turbines

Oct. 24th, Sunday 13:00-15:00, Interview Hall

Project Number: 2018YFB0904000

Project Introduction:

The session aims to explore the development of grid-friendly wind power technologies in the future scenarios of high-proportional renewable energy power systems, which transforms wind power from passively adapting to actively supporting the power grid. The key technologies include inertia response and primary frequency regulation, fault ride through and transient support, oscillation suppression and active damping, mechanical load stabilization and optimal control, and self-synchronous voltage source control etc.

Chair(s):

Shiyao Qin

Deputy director of New Energy Research Center

China Electric Power Research Institute

Panelist:

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|-------------|--------------------------------------------------------------------------------------------------------------------------|
| 13:00-13:40 | SG17-01
<i>Research and practice of voltage-controlled grid-connected inverter</i>
Xing Zhang
Professor. |
| 13:40-14:20 | SG17-02
<i>Grid support strategy of DFIG-based wind turbines during grid fault</i>
Lei Ding
Professor |
| 14:20-15:00 | SG17-03
<i>Grid friendly wind turbine and its key technologies</i>
You Ying |

Director of Technology Center.