MEEPS 2020

PROGRAMME

Manchester Energy and Electrical Power Systems Symposium 2020
Envisioning the Power and Energy Systems in an Industry 4.0 era
4th-6th November 2020, 2pm-5pm, Online

Organised by

The IEEE PES
Student Branch Chapter
The University of Manchester

IEEE Power & Energy Society
Women in **Power**

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MANCHESTER 1824
The University of Manchester

Welcome

Manchester, the birthplace of the industrial revolution, has a proud history in science, politics, music, arts and sport. The city combines this heritage with a progressive vision to be a city that delivers surprise and delight in equal measures.

The University of Manchester (UoM) traces its roots to the formation of the Mechanics' Institute in 1824. The university is now the second largest in the UK, with more than 40,000 students and 10,000 staff. 25 Nobel laureates are among its past and present members.

We are one of the largest **Electrical and Electronic Engineering (EEE)** Departments in the UK, and we are renowned for our theoretical and applied research. The power and energy group work closely with the industry to solve the energy challenges, aiming at providing low-carbon affordable energy and embracing the coming industry 4.0 era.

The IEEE PES Student Branch Chapter at The University of Manchester was officially launched on 28 June 2012. The Chapter is driven by PhD students in EEE and an academic advisor. It is the first IEEE PES Student Chapter in the UKRI Section and boasts more members than any other UK university-based student branch.

During the coronavirus pandemic, we shift our activities to online forms. We are active as usual and have been hosting educational and technical events.

Achievements:

- 2019 IEEE Region 8 Chapter of the Year Award (for Medium Size Student Branch)
- 2019, 2018, 2017 and 2016 IEEE PES High Performance Student Branch Chapter
- 2019 IEEE Region 8 Student Branch Website Contest – 4th Place
- 2015 IEEE Darrel Chong Student Activity Award – SILVER
- 2014 IEEE Darrel Chong Student Activity Award – BRONZE

North Campus, The University of Manchester

Current committee members, IEEE PES SBC at UoM

Programme—Day 1

*Presenters please check in between 13:30 and 14:00

Opening

14:00 – 14:05	**Welcome** Siwei Liu, IEEE PES Student Branch Chapter at the University of Manchester	
14:05 – 14:20	**Opening Address** Dr Robin Preece, the University of Manchester	

Presentation Session 1

Planning and Operation of Future Power Networks

14:20 – 14:50	**Keynote Speech: The Optionality Value of Flexibility When the Future is Highly Uncertain** Dr Gruffudd Edwards, TNEI
14:50 – 15:10	**Expectations, Risks, and Regrets When Planning Smart Distribution Systems under Uncertainty** Carmen Bas Domenech, the University of Melbourne
15:10 – 15:30	**Comparing Dynamic and Static Modelling of Cascading Failures in Power Systems** Yitian Dai, the University of Manchester
15:30 – 15:40	**Break**
15:40 – 16:00	**Low-Cost Distributed or Mobile Thermal Condition Monitoring for Substations** Alastair Straker, the University of Manchester
16:00 – 16:20	**Impact of Fast Frequency Response on Power Systems Transient Stability** Zaichun Zhang, the University of Manchester
16:20 – 16:40	**Analysis of Distribution System to Build Models for Voltage Control Applications** Carlo Viggiano, the University of Sheffield
16:40 – 17:00	**Analysis of the Impact of Changes in Network Structure on the Stability of Modern Power Systems** Jaime Trivino, the University of Manchester

Judges of Presentations: Dr Gruffudd Edwards, Dr Jianing Li

Programme—Day 2

*Presenters please check in between 13:30 and 14:00

Women in Power

14:00 – 14:10	**IEEE PES Women in Power Introduction** Dr Jelena Ponocko, IEEE PES WiP UKRI
14:10 – 14:30	**Lessons Learned from Energy Storage Projects** Dr Angeliki Loukatou, EDF Energy
14:30 – 14:50	**Harnessing Flexibility: Opportunities and Challenges** Dr Ivana Kockar, the University of Strathclyde

Presentation Session 2

Achieving Sustainable Development Goals

14:50 – 15:10	**Towards a Cost-Effective Operation of Low-Inertia Power Systems** Luis Badesa, Imperial College London
15:10 – 15:30	**Domestic Building Models for Thermal Energy Demand Estimation** Nzube Ntube, the University of Manchester
15:30 – 15:40	**Break**
15:40 – 16:00	**Distributed Management of DFIG-based Grid-connected Wind Farm** Zhen Dong, the University of Manchester
16:00 – 16:20	**Experimental Investigation of High Frequency Arcs to Inform Future High Voltage Aerospace Systems** Prem Ranjan, the University of Manchester
16:20 – 16:40	**Impact of PLL Control on Small-Signal Stability of Wind DFIGs connected to a Weak Grid** Régulo Enrique Ávila Martínez, Comillas Pontifical University
16:40 – 17:00	**A Study of Advanced OHL Conductor Life Expectancy under the Implementation of Renewables** Haoji Liu, the University of Manchester

Judges of Presentations: Dr Jelena Ponocko, Dr Angeliki Loukatou

Programme—Day 3

*Presenters please check in between 13:30 and 14:00

Advanced Technologies Applied to Power Systems

14:00 – 14:30	**Keynote Speech: Using HVDC to Integrate Offshore Wind into the AC Grid** Mr Carl Barker, GE
14:30 – 14:50	**Assessing the Impact of Electrolysers on VPP Flexibility in a Power-to-Gas Framework** Antonella Maria De Corato, the University of Melbourne
14:50 – 15:10	**Potential Benefits and Challenges in Providing Frequency Stability and Resilience from Flexible Technologies** Mehdi Ghazavi Dozein, the University of Melbourne
15:10 – 15:30	**Day-Ahead and Week-Ahead Forecasting of Total and Disaggregated Demands Using a Novel Bayesian Optimised Long Short Term Memory Neural Network Approach** Shuyang Zhu, the University of Edinburgh
15:30 – 15:45	Break
15:45 – 16:05	**Machine Learning for Ranking Day-Ahead Decisions in the Context of Short-Term Operation Planning** Laurine Duchesne, the University of Liege
16:05 – 16:25	**Small-Signal Interactions Between Synchronous Generators and Virtual Synchronous Machines** Luke Benedetti, the University of Strathclyde

Judges of Presentations: Mr Carl Barker, Mr Steve Potts

16:25 – 16:55	**Closing Remarks: Technologies which Underpin Power Systems of the Future** Mr David Thornton, PPM Power
16:55 – 17:00	**Announcement of Presentation Awards**

Guests

Dr Robin Preece
Senior Lecturer in Future Power Systems, the Department of Electrical and Electronic Engineering at the University of Manchester

Dr Preece received his PhD degree from the University of Manchester in 2013 with thesis published by Springer. Following 18 months of post-doctoral work as a Research Associate, he became a Lecturer in July 2014. He has experience of DNOs and TSOs - primarily on the dynamic impact of integrating new technologies into large systems. He is an active member of the IET, IEEE and Cigre and regularly review papers for conferences and leading academic journals.

Dr Gruffudd Edwards
Senior Consultant, TNEI

Dr Edwards' background spans statistics, electrical engineering and physics, and his research has often bridged these disciplines. He has strong expertise in stochastic power system modelling and the application of operational research methods to power system problems. As a consultant for TNEI, he has worked on the modelling of flexible demand responses, the optimal use of smart data for statistical modelling of peak demands on LV feeders, and the potential contribution of renewable generators to system restoration.

Dr Jianing Li
Lecturer in Smart Energy Systems, University of Birmingham

Dr Li's research interests include electricity market modelling, energy policies, smart grid, distributed energy systems, internet of things and machine learning technology. He has delivered a world-leading distributed micro virtual power plant system with industrial partners. In 2019, he delivered a First of its Kind project with Riding Sunbeams funded by the InnovateUK in the integration of renewable generation in Rail power systems.

Dr Jelena Ponocko
Lecturer in Distance Learning, the University of Manchester

Dr Ponocko is a Lecturer in Distance Learning at the Department of Electrical and Electronic Engineering, The University of Manchester, UK. Her research focuses on data analytics and the analysis of the effects of wide-scale demand side management on distribution and transmission network performance.

Dr Angeliki Loukatou
Research Engineer, EDF R&D UK Centre

Dr Loukatou is a research engineer in the Smart Energy Systems team of EDF R&D UK centre, developing optimisation tools for optimal valuation of battery storage. Prior to that, she was working as a Modelling Analyst at Energy Systems Catapult, and previously, she pursued her PhD in battery storage co-located with renewable generation at the University of Manchester.

Guests

Dr Ivana Kockar
Reader, Institute for Energy and Environment at the University of Strathclyde

Dr Kockar received her MEng from University of Belgrade, and MSc and PhD degrees from McGill University (Canada), all in Electrical Engineering. She is a Reader within the Institute for Energy and Environment at the University of Strathclyde, Glasgow, UK. She is the past chair of the IEEE Power and Energy Society Computing and Analytical Methods Subcommittee (CAMS). Currently, she is a member of the Advisory Board for ENA Open Network project.

Mr Carl Barker
Consulting Engineer, GE Grid Solutions

Mr Barker joined GE's Grid Solutions in Stafford, the UK in 1989, initially working on the design and development of individual HVDC and SVC projects then becoming System Design Manager, responsible for all technical aspects of HVDC projects. He is a Chartered Engineer in the UK, a member of the IET (UK), a Senior Member of the IEEE, a distinguished Member of CIGRE, a visiting lecturer at Birmingham University and an honorary visiting professor at Cardiff University.

Mr David Thornton
Business Development Manager, PPM Power

Mr Thornton worked as a Test Engineer for 13 years before moving into technical sales and business development for Test Equipment manufacturers 25 years ago. Now he brings his knowledge to PPM Power - a specialist distributor of components, systems and software for power electronics, high voltage and pulsed power applications.

Mr Steve Potts
Centre for Doctoral Training in Power Networks, the University of Manchester

Mr Potts is a Chartered Electrical Engineer with extensive experience of protection and control equipment for electrical power systems. He returned to Academia full-time in 2016 at the University of Manchester where he is studying for a protection related PhD. He has a particular technical interest in the application of differential protection and tele-protection to electrical power systems, and the challenges of interfacing telecommunications systems. He is a Member of the IET and contributes to CIGRE for whom he was a corresponding member on joint working group B5/D2.

Awards and Prizes

All oral presentations will be assessed by guest judges from academia and industry.
- **£200** for the Best Presentation Award
- **£100** for the runner-up
- **£50** for the third place
- **£100** for the Research for Industry Award

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Virtual Exhibition Booth

TNEI: 2-5pm, 4th Nov
GE: 2-5pm, 5th Nov
PPM Power: 2-5pm, 4th-6th Nov
(link to these sessions will be distributed on the day)

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