

RISK and RESILIENCE Day 12 March 2024

EPSRC Supergen Energy Networks Hub Risk and Resilience Day 2024

The Catalyst, Newcastle University
Newcastle upon Tyne, UK

Programme Overview

09:00	Registration and refreshments
09:30	Welcome and kick-off
09:35	Keynote 1 Professor Liz Varga (University College London) Energy resilience in the context of infrastructure resilience
10:20	Oral session 1 Handling Hazards
11:05	Poster introduction session (speed round)
11:25	Poster session and refreshments
12:00	Oral session 2 Wild Weather
12:45	Lunch and posters
13:45	Keynote 2 Martin Queen (Ofgem) Risk and resilience: a regulators perspective
14:30	Oral session 3 Industrial Innovation
15:15	Poster session and refreshments
15:40	Oral session 4 System Security
16:25	Closing remarks
16:30	Drinks reception
17:30	

09:30 – 09:35 Welcome and kick-off

09:35 – 10:20 Keynote 1 | Professor Liz Varga (University College London)

Energy resilience in the context of infrastructure resilience

10:20 – 11:05 Oral session 1 | Handling Hazards

01.1 **Mires, Wires, and Fires: Securing the National Grid Against Future Wildfire Risks**

Joseph Preece, Daniel L. Donaldson, Nick Kettridge (University of Birmingham)

01.2 **Advancing the Cyber-Physical Resilience of Energy Infrastructures in Digital Era**

Mazaher Karimi, Petra Berg, Bahaa Eltahawy, Linda Turtola (University of Vaasa, Finland)

01.3 **Enhancing electricity network resilience to extreme windstorms in the UK**

Colin Manning, Sean Wilkinson, Hayley Fowler, Sarah Dunn (Newcastle University), Elizabeth Kendon (UK Met Office)

11:05 – 11:35 Poster introduction session (speed round)

See next page for a full list of all poster presentations

11:25 – 12:00 Poster session and refreshments

12:00 – 12:45 Oral session 2 | Wild Weather

02.1 **“EXTRASTRONG” (Resilience Evaluation by Experimental and Theoretical Approaches in Electrical Distribution Systems with Underground Cables)**

Andrea Mazza (Politecnico di Torino, Italy), Luigi Calcara (Università di Roma “La Sapienza”, Italy), Paolo Roccatò (Istituto Nazionale per la Ricerca Metrologica – INRiM, Italy)

02.2 **Rethinking Reserve Power Supply: Balancing Services Value from Weather-Sensitive Surplus**

James Fallon, David Brayshaw, John Methven (University of Reading), David Greenwood (Newcastle University), Kjeld Jensen, Louise Krug (BT Group plc)

02.3 **Advancing Power System Resilience through Enhanced Load Forecasting considering Extreme Weather Conditions**

Jinjie Liu, Hongjian Sun (Durham University)

12:45 – 13:45 Lunch and posters

13:45 – 14:30 Keynote 2 | Martin Queen (Ofgem)

Risk and resilience: a regulators perspective

14:30 – 15:15 Oral session 3 | Industrial Innovation

03.1 **CommsConnect – Resilient communication for the electricity network through improved data sharing with mobile network operators**

Ross McPherson, Kinan Ghanem (Power Networks Demonstration Centre), Scott Flynn (UK Power Networks)

03.2 **Resilience assessment of offshore wind to green hydrogen production systems**

Natalia-Maria Zografou-Barredo, Sara L Walker, Kandavel Manickam (Newcastle University), James Ferguson, James Withers (Offshore Renewable Energy Catapult)

03.3 **Risks and resilience of demand side response systems**

Andrew Larkins (Sygensys)

15:15 – 15:40 Poster session and refreshments

15:40 – 16:25 Oral session 4 | System Security

04.1 **Transforming Electricity Balancing: from proof of concept to implementation**

Waqquas Bukhsh (University of Strathclyde)

04.2 **Constraint-Driven Deep Learning for N-k Security Constrained Optimal Power Flow**

Bastien Giraud, Ali Rajaei, Jochen Cremer (Delft University of Technology, Netherlands)

04.3 **Revisiting Britain’s security standard**

Keith Bell (University of Strathclyde)

16:25 – 16:30 Closing remarks

16:30 – 17:30 Drinks reception

- P1 Energy risk from a changing climate over the coming decade**
Ben Hutchins, David Brayshaw (University of Reading), Len Shaffrey (National Centre for Atmospheric Science), Hazel Thornton, Doug Smith (Met Office Hadley Centre)
- P2 Uncertainty quantification and Sensitivity Analysis for Resilient Infrastructure Systems: application to national energy system modelling**
Hannah Bloomfield (University of Newcastle), Francesca Pianosi, Gemma Coxon, Saskia Salwey (University of Bristol)
- P3 Online Neural Dynamic Security Assessment**
Mert Karacelebi, Jochen Cremer (Delft University of Technology, Netherlands)
- P4 Quantifying the Effect of Renewable Transition on Cascading Failure Risk**
Yitian Dai, Robin Preece (The University of Manchester)
- P5 Uncertainty-aware resilient investment planning in local electrical energy systems under static and dynamic islanding security constraints**
Agnes Marjorie Nakiganda (Technical University of Denmark), Shahab Dehghan (Newcastle University), Petros Aristidou (Cyprus University of Technology)
- P6 Innovating substation basics, improving resilience—organising substation drawing management and facilitating easier consents for substation intrusive/non-intrusive works**
Tinashe E Chikohora, Jonathan Gray (National Grid Electricity Transmission)
- P7 Brokenwire: Wireless Disruption of CCS Electric Vehicle Charging**
Sebastian Köhler, Richard Baker (University of Oxford), Martin Strohmeier (armasuisse S+T), Ivan Martinovic (University of Oxford)
- P8 AI for Microgrid Resilience: A Data-Driven and Model-Free Approach**
Dawei Qiu, Yi Wang, Goran Strbac (Imperial College London)
- P9 Multiport power converters for distribution network soft open point applications**
Sam Harrison (University of Strathclyde), Marti Dominguez Hernandez, Marc Cheah (Universitat Politècnica de Catalunya, Spain), Agustí Egea Alvarez (University of Strathclyde)
- P10 Weather-Informed Adaptation for Grid Resilience Enhancement**
Misael Alpizar Santana, Hongjian Sun, Ashraf Osman (Durham University)
- P11 Data Driven Infrastructure Planning for Offshore Wind Farms**
Isha Saxena, Behzad Kazemtabrizi, Matthias Troffaes, Christopher Crabtree (Durham University)
- P12 HYDRA - Exploring co-occurring UK HYDRo-meteorological extremes that exacerbate risk**
John Hillier (Loughborough University), Hannah Bloomfield, Chris Kilsby (Newcastle University), Lee Chapman (University of Birmingham)
- P13 Producing storylines of flooding from future storms in the UK**
James Carruthers, Selma Guerreiro, Hayley Fowler, Colin Manning (Newcastle University), Daniel Bannister (Willis Towers Watson)
- P14 Security Digital Twin of a Distribution Network in Jordan**
Moath Qandil, Asma Alkhraibat, Hani Mohsen (German Jordanian University, Jordan), Adib Allahham (Northumbria University), Alaaldeen Alhalhouli (German Jordanian University, Jordan)
- P15 Optimisation Framework for Resilient Microgrid Planning incorporating stationary and mobile energy storage systems**
Mahir Oumaima (University Sidi Mohamed Ben Abdellah, Morocco), Bouthaina El Barkouki (Mohammed V University, Morocco), Ghennioui Hicham (Sidi Mohamed Ben Abdellah University, Morocco)
- P16 A Unified Cooperative Distributed Control of Inverters, Voltage Regulators, and Capacitors in Systems with High Penetration of DGs**
Shahzad Mahdavi, Aleksandar Dimitrovski (University of Central Florida, USA)
- P17 Batteries on congested “windy” networks: solution or problem? A Scottish case study**
Susan Brush, Graeme Hawker, Keith Bell (University of Strathclyde)
- P18 Probabilistic forecasting of solar production using gridded numerical weather predictions**
Ben Griffiths, Matteo Fasiolo (University of Bristol)
- P19 A Decentralized Investment Model for the Planning of Distribution Networks and PV Installations Considering Tariffs and Socio-Economic Constraints**
Miguel Sanchez-Lopez (Universidad de Chile, The university of Manchester), Andrey Churkin, Robin Preece (The University of Manchester), Rodrigo Moreno (Universidad de Chile), Eduardo A. Martinez Ceseña (The University of Manchester)
- P20 Toward a sustainable and resilient transition: Energy management of a grid-connected microgrid based on artificial neural networks**
Bouthaina El Barkouki, Oumaima Mahir, Mohammed Ouassaid (Mohammed V University, Morocco)
- P21 On the Resilience of Distribution Networks to Load-Altering Attacks**
Sajjad Maleki, Subhash Lakshminarayana (University of Warwick), E. Veronica Belmega (CY Cergy Paris University, France)
- P22 Managing Risks Associated with Net Zero with a Real-time Power System Simulation Facility**
Fabian Moore, Colin Foote, Asif Khan (The National HVDC Centre)
- P23 Learning latent dynamic interactions for better spatio-temporal characterisation of power system cascading events**
Tabia Ahmad (University of Strathclyde), Panagiotis N Papadopoulos (The University of Manchester)
- P24 Resilient by Design: Embedding Power Electronics into Grid-Scale Energy Storage**
Walid Nassar, David Greenwood, Matthew Deakin (Newcastle University), Jorn Reniers (Brill Power)
- P25 Adaptive and Resilient Electrical Grid Management with Smart Buildings**
Mischa Ahrens (FZI Research Centre for Information Technology, Germany)
- P26 Optimal siting of distributed generators in renewable-based community energy system for self-sufficient operation during prolonged outages**
Laiz Souto (University of Bristol)
- P27 Enhancing Cybersecurity Measures for Implementing Morello Hardware in Industrial Sectors**
Rabia Khan, Kinan Ghanem (Power Networks Demonstration Centre)