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PACW 2025

23 - 26 June, 2025, Glasgow, UK



**PROTECTION, AUTOMATION & CONTROL WORLD
CONFERENCE 2025
Glasgow, United Kingdom**



Monday, 23 June 2025

Technology and Innovation Center, University of Strathclyde, Glasgow

12:00 – 17:00 Conference registration

13:30 – 17:00 **Tutorial: "Digital Transformation of PAC Systems"** by Dr. Alexander Apostolov, member of National Academy of Engineering (NAE), IEEE Life Fellow, USA

Glasgow City Chambers in the city center

18:00 – 20:00 Welcome Civic Reception

Tuesday, 24 June 2025

Technology and Innovation Center, University of Strathclyde, Glasgow

8:15 - 8:30 Conference opening - Dr. Alexander Apostolov, Conference Chairman

8:30 – 9:00 Keynote address: "Rannveig Loken, CIGRE Vice-president Technical"
Rannveig Loken, CIGRE Vice-president Technical

Morning Session TUM Part 1:

Chair: Rannveig Loken, Norway

- 9:00 – 9:15 How to Obtain Reliable Process Bus Comply with IEC 61850 - S. Huante, K. Nowacki, Bitstream, Poland
- 9:15 – 9:30 Explainable AI for Sensorless Fault Prediction in Distribution Networks - K. Backstrom, Ebrahim Balouji, Eneryield, Sweden
- 9:30 – 9:45 Showcasing Applications of a Multi-Zone Distance Protection Relay Model Using a Digital Real-Time Simulator - D. Rangana Gurusinghe, J. Wijekoon, RTDS Technologies Inc., Canada
- 9:45 – 10:00 Enhancing Grid Reliability through AI-Powered Knowledge Sharing - J. C. Sánchez, Florian Fink, OMICRON electronics, Austria
- 10:00 – 10:15 Using a Disturbance Monitoring IED When in Transition to a Fully Digital Protection System - T. Yebra Vega, A. Oliveira, ERLPhase Power Technologies LTD, Canada; A. Gernhard, Duquesne Light Company, USA
- 10:15 – 10:30 Discussions
- 10:30 – 11:00 **Coffee break at the Exhibition areas at the Technology and Innovation Center**

Morning Session TUM Part 2:

Chair: Rannveig Loken, Norway

- 11:00 – 11:15 Enhancing Power System Reliability with High-Fidelity Digital Twins of Advanced PAC Schemes - O. Bagleybter, GE Vernova, United Kingdom
- 11:15 – 11:30 Testing and Monitoring Techniques for Commissioning Digital Substations - J. Ruiz, J. Verzosa, B. Gwyn, Doble Engineering, USA
- 11:30 – 11:45 High Channel Density Fault Recording with IEC61850 Sampled Values - Challenges and Benefits - A. Madhyastha, AMETEK Power Instruments, India
- 11:45 – 12:00 It's not Just a Game – Cybersecurity at the OVRAM Relay Protection Laboratory - A. Kiss, F. Rakoczi, R. Szedlak, A. Woynarovich, MAVIR, Hungary
- 12:00 – 12:15 Automatic Collection of Disturbance Records Through IEC61850 Using a Virtualised Platform - A. Karl, Swissgrid Ltd, Switzerland; A. de Gottrau, C. Aerschmann, CONDIS Ltd, Switzerland
- 12:15 – 12:30 Discussions
- 12:30 – 13:30 **Lunch break at the Exhibition areas at the Technology and Innovation Center**

Afternoon Session TUA Part 1:**Chair: Volker Leitloff, France**

- 13:30 – 13:45 Evolution to Centralized Protection Automation and Control - D. Verhulst, Nokia, Belgium; P. Hemmer, Grid to Great, The Netherlands
- 13:45 – 14:00 The IEC 61850 Engineering Process from an Eagle's View - F. Steinhauser, OMICRON electronics, Austria
- 14:00 – 14:15 Improving ERCOT's System Resiliency to Generation Shortages - M. Carpenter, Oncor Electric Delivery, USA
- 14:15 – 14:30 Automated Engineering and Testing Process for SPACS - E. Otaola, I. Ferrero, Z. Ojinaga, i-DE, Spain
- 14:30 – 14:45 Multi-Zone Differential Protection Applied to Offshore Wind Networks - S. Blair, A. Chandran, O. Oyewole, Synaptec, UK; B. Kasztenny, SEL, Canada; A. Tsylin, Orsted, Denmark
- 14:45 – 15:00 Concept Design Study: Bridging PACS Blueprints and IEC 61850 Engineering Workflows - G. Lisboa, Belden, Spain
- 15:00 – 15:15 Discussions
- 15:15 – 15:45 **Coffee break at the Exhibition areas at the Technology and Innovation Center**

Afternoon Session TUA Part 2:**Chair: Volker Leitloff, France**

- 15:45 – 16:00 Lessons Learned from Testing IEC61850 Systems Using Top-Down Engineering - D. Gasca, OMICRON electronics, Austria; H.-J. Gruber, Tennet, Germany
- 16:00 – 16:15 Leveraging IEC 61850 One Step at a Time: Practical Experience of Rolling Out Digital Substations - B. Heimisson, Landsnet, Iceland
- 16:15 – 16:30 Challenges Protecting MV Networks with Zig Zag Grounding Transformers - R. Cimadevilla, A. García, ZIV, Spain; J. Á. G. Viosca, C. A. Domínguez, i-DE, Spain
- 16:30 – 16:45 Automatic Fault Analysis & Fault Clearing Assessment for Transmission Line Protection - A. Shinde, A. Slupinski, PSI Neplan AG, Switzerland; Markus Suess, Axpo Grid AG, Switzerland
- 16:45 – 17:00 Edge to Power (E2P): Transforming Energy Systems with Digital Innovation - V. Choinière, S. M. Mohseni-Bonab, Hydro-Québec, Canada
- 17:00 – 17:15 Comparative Analysis of Virtualized, Centralized, and Conventional Protection Relays - T. Nascimento Carreiras, Schneider Electric, Spain
- 17:15 – 17:30 Discussions
- 17:30 – 19:30 **PAC Demo Hour+ at the Exhibition Areas**

Wednesday 25 June 2023**Technology and Innovation Center, University of Strathclyde, Glasgow****Morning Session WEM Part 1:****Chair: Rene Troost, The Netherlands**

- 8:30 – 8:45 Data Sources for AI Applications in IEC 61850-based Digital Substations - A. Apostolov, PAC World, USA
- 8:45 – 9:00 Improved Method to Validate the Secondary Wiring Using Sawtooth-based Polarity Detection with Integrated Phase Identification - J. Schmidbauer, F. Kolb, OMICRON electronics, Austria
- 9:00 – 9:15 Wide-Area Terrestrial Time-Distribution System for Resilient Process Bus-Based Line Current Differential Protection - A. Shrestha, M. Elshafi, A. Shetty, A. Hoorjandi, Schweitzer Engineering Laboratories, Inc., USA
- 9:15 – 9:30 Advanced Testing of Merging Units: Ensuring Reliability and Interoperability in Digital Substations - M. Achterkamp, M. Bivolaru, G. Montagna, KEMA Labs, The Netherlands; M. Heerze, E. Melenhorst, R. Woertman, Grid to Great, The Netherlands

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| 9:30 – 9:45 | Explainable AI-Driven Detection and Localization of Partial Discharges and Intermittent Faults in IEC 61850/61869 Digital Substations Using QMU 800 and CMPC 800 - E. Balouji, EcoPhi AB, Sweden; M. Khatib, Ithra United, Saudi Arabia and Basaksehir University, Turkey; J. Lindqvist, EcoPhi AB, Sweden |
| 9:45 – 10:00 | Implementing Protection Control Centre to Enhance the Acceleration of Unmanned Substations - A. Hendryan, Firdaus, Muhajir, Amad, I. Lewi Situmorang, R. Dasa Nanda Putra, PT PLN (Persero), Indonesia |
| 10:00 – 10:15 | Discussions |
| 10:15 – 10:45 | Coffee break at the Exhibition areas at the Technology and Innovation Center |

Morning Session WEM Part 2:

Chair: Chair: Rene Troost, The Netherlands

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| 10:45 – 11:00 | Feedback from CIGRE WG B5.69 Related to Deployment of PACS Based on IEC 61850 and Process Bus - R. Loken, Statnett, Norway |
| 11:00 – 11:15 | Enabling Full Integration of Ethernet Networks into IEC 61850 Systems: The First Steps Towards a Unified PACS Framework - G. Lisboa, Belden, Brazil |
| 11:15 – 11:30 | From Terminal to Control Center: Automated Signal Testing for Reduced Verification Time - O. Durak, B. Tahincioglu, OMICRON electronics GmbH, Austria |
| 11:30 – 11:45 | Negative Sequence Current Injection of IBRs - R. Cimadevilla, A. Castanon, ZIV, Spain; P. Eguia, E. Torres, A. Blazquez, UPV, Spain |
| 11:45 – 12:00 | Wide Area Controls in Iceland - B. Heimisson, Landsnet, Iceland |
| 12:00 – 12:15 | Operational Experience of a Major Blackout in Southern Regional Grid of India: Understanding Methodologies and Mitigating Techniques for Under-Frequency Relay Maloperation - N. J. Chitimireddy, V. Ballikonda, A. S. Rones V, M. Kumar T, Ramesh M K, B. Velury, Grid Controller of India Ltd, India |
| 12:15 – 12:30 | Discussions |
| 12:30 – 13:30 | Lunch break at the Exhibition areas at the Technology and Innovation Center |

Afternoon Session WEA Part 1:

Chair: Fred Steinhauser, Austria

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| 13:30 – 13:45 | Lessons Learned from a Slow Breaker Failure Operation in a POTT Scheme - M. Quinteros, M. Allen, Entergy Services, USA; J. Ruiz, Doble Engineering, USA |
| 13:45 – 14:00 | Experience Feedback from the Development of Interoperable IEDs for R#SPACE - V. Leitloff, M. Bedourian, C. Ghafari, S. Bongain, A. Azevedo, RTE, France; J. Peres, EFACEC, Portugal; J. Maincent, SCLE, France; P. Montaner, GE, France |
| 14:00 – 14:15 | UCA IEC61850 Interop Time Synchronization Testing Takeaways and Conclusions - G. Wrosinghert, W. Abt, Meinberg USA, USA |
| 14:15 – 14:30 | The Protective System Coordination for a Hospital Medium-Voltage Electrical Distribution Grid with Dynamic Uninterruptible Power Supply - M. Ambroggi, THYTRONIC S.p.A., Italy |
| 14:30 – 14:45 | Software Defined Protection and Control - B. Lakshmikanthan, Schneider Electric, Singapore; T. Carreiras, Schneider Electric, Spain |
| 14:45 – 15:00 | System and Maintenance of the Bekasi Digital Substation: An Overview of Indonesia's Largest Digital Substation - I. Firdaus, M. Muflih Nurfaizi, PT.PLN (Persero), Indonesia; B. Tahincioglu, OMICRON electronics GmbH, Austria; V. Lumban Tobing, A. Yoan Perwita, M. Azhar, PT.PLN (Persero), Indonesia |
| 15:00 – 15:15 | Discussions |
| 15:15 – 15:45 | Coffee break at the Exhibition areas at the Technology and Innovation Center |

Afternoon Session WEA Part 2:**Chair: Fred Steinhauser, Austria**

- 15:45 – 16:00 Communication Between Substations in Noise Conditions of GOOSE, R-GOOSE and Proprietary Messages - D. Gil Donate, Marco Senesi Ranaldi, ZIV, Spain
- 16:00 – 16:15 FLISR and IEC 61850 GOOSE Communications Over an LTE/5G Network Using QoS and IP/MPLS: Meeting Latency Requirements for Protection in the Electrical Distribution Grid - M. Subieta, Nokia, USA
- 16:15 – 16:30 A Unified Virtualized Platform for AI-Driven Centralized Monitoring and Fault Prediction using CMPC - E. Balouji, K. Backstrom, Ecophi, Eneryield, Sweden
- 16:30 – 16:45 Trust is Good, Causation is Better: Utilizing Explainable and Causal Artificial Intelligence in Time Series-Based Applications - R. Mubarak-Aberer, OMICRON electronics GmbH, Austria; B. Taetz, International University of Applied Sciences, Germany
- 16:45 – 17:00 Primavera do Leste II: Challenges, Innovations, and Benefits of Digitalization in Power Distribution Substations - J. L. Gambini Damasceno, D. Macek Ferreira, Siemens Brazil; J. F. Sanchez Hernandez, Siemens, Germany; C. E. Fernandes, G. de Mattos Golineli Marini, R. A. Caero Marquez, A. Oliveira Fernandes, L. José de Medeiros, Energisa, Brazil
- 17:00 – 17:15 The Role of IEC 61850 in the Digital Transformation of Electric Power Grids - A. Apostolov, PAC World, USA
- 17:15 – 17:30 Discussions
- 18:00 – 22:00 **Conference Gala Dinner at the Platform, 253 Argyle St - Glasgow G2 8D**

Thursday 25 June 2023**Technology and Innovation Center, University of Strathclyde, Glasgow****Morning Session THM Part 1:****Chair: Alex Apostolov, USA**

- 8:30 – 8:45 Reconstruction of a Cross-Country Fault in a Compensated Power System - F. Fischer, OMICRON electronics Deutschland GmbH, Germany; K. Molczan, M. Wiecha, OMICRON electronics GmbH, Austria
- 8:45 – 9:00 Validation of an Adaptive Protection Scheme in a Microgrid System with Hardware in the Loop - J. Gers, L. Palacios, GERS USA, USA
- 9:00 – 9:15 The Dutch Realtime Interface: An IEC 61850 reference implementation for DER control - R. Troost, Stedin, The Netherlands
- 9:15 – 9:30 Saturation Analysis of Current Transformers- Impact of CT Class and Cable Selection - I. Lewi, Muhajir, Amad, M. Azhar, A. Hendryan, I. Firdaus, PT. PLN (Persero), Indonesia
- 9:30 – 9:45 Intrusion Detection in Energy Systems: Insights from Substation Attack Simulations and Incident Response - V. N. Prebensen Norman, G. Nett, Norway; A. Klien, O. Dayanc, OMICRON electronics, Austria
- 9:45 – 10:00 Digitalization of Substation and AI Fault Prediction - E. Balouji, Eneryield, Sweden
- 10:00 – 10:15 Discussions
- 10:15 – 10:45 **Coffee break at the Exhibition areas at the Technology and Innovation Center**

Morning Session THM Part 2:**Chair: Alex Apostolov, USA**

- 10:45 – 12:30 **Interactive Session - Ask the Experts**

- 12:30 **Closing of the Conference**

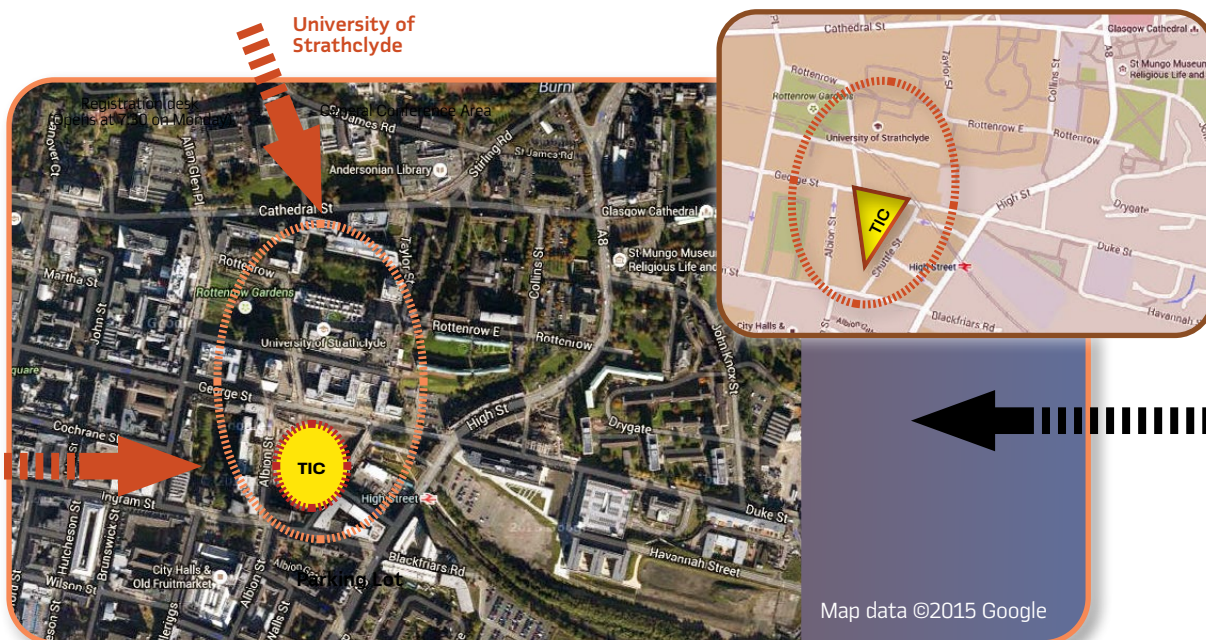


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PAC WORLD CONFERENCE 2025

23 - 26 June 2025, University of Strathclyde, Glasgow, UK

Technology and Innovation Center (TIC) - the Conference venue



Monday, 23 June 2025

18:00 – 20:00

Welcome Civic Reception at the Glasgow City Chambers



Join us at the Welcome Civics Reception hosted by the Lord Provost at the Glasgow



City Chambers (Town Hall.) We enjoy getting together to catch up and meeting others who are joining the conference.

The reception is included in your registration fee. You will need to wear your badge to attend the event.



The University of Strathclyde is a Scottish public research university. It is Glasgow's second university by age, being founded in 1796 as the Andersonian Institute, and receiving its Royal Charter in 1964 as the UK's first technological university. It takes its name from the historic Kingdom of Strathclyde. It is Scotland's third largest university by number of students, with students and staff from over 100 countries.



The institution was awarded University of the Year 2012 and Entrepreneurial University of the year 2013 by Times Higher Education.



The 2015 PAC World Conference will be held at the triangular, nine-story, steel-framed building of the Technology and Innovation Center at Strathclyde (TIC). It is a center for technological research whose construction was completed in early 2015, located in the heart of Glasgow.

Tuesday, 24 June to Thursday, 26 June 2025

8:15 – 17:30

Conference Paper and Poster Sessions at the Technology and Innovation Center (TIC). TIC is a center for technological research and is a part of the University of Strathclyde's campus in the heart of the city of Glasgow.

Tuesday, 25 June 2025

17:30 – 19:30 or later

PAC Demo Hour+ We are excited to invite you to visit the PAC World Conference exhibition area for a fantastic opportunity for you to spend quality time viewing detailed demos and information.

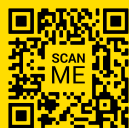


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Belden provides resilient networking, advanced cybersecurity, and precise time synchronization solutions for next-generation energy systems. Our portfolio supports secure, reliable modernization of power utilities and renewable assets, enabling mission-critical communications and control across substations, wind farms, solar sites, and control centers.

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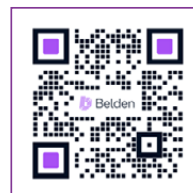
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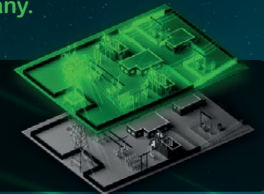
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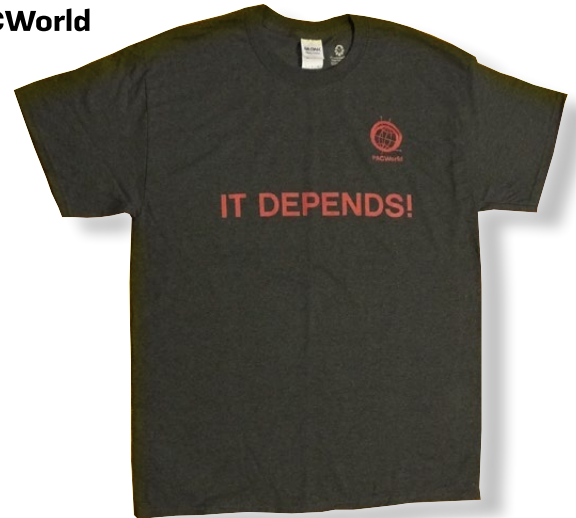
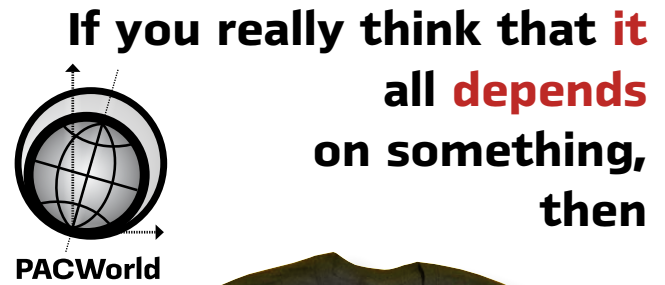
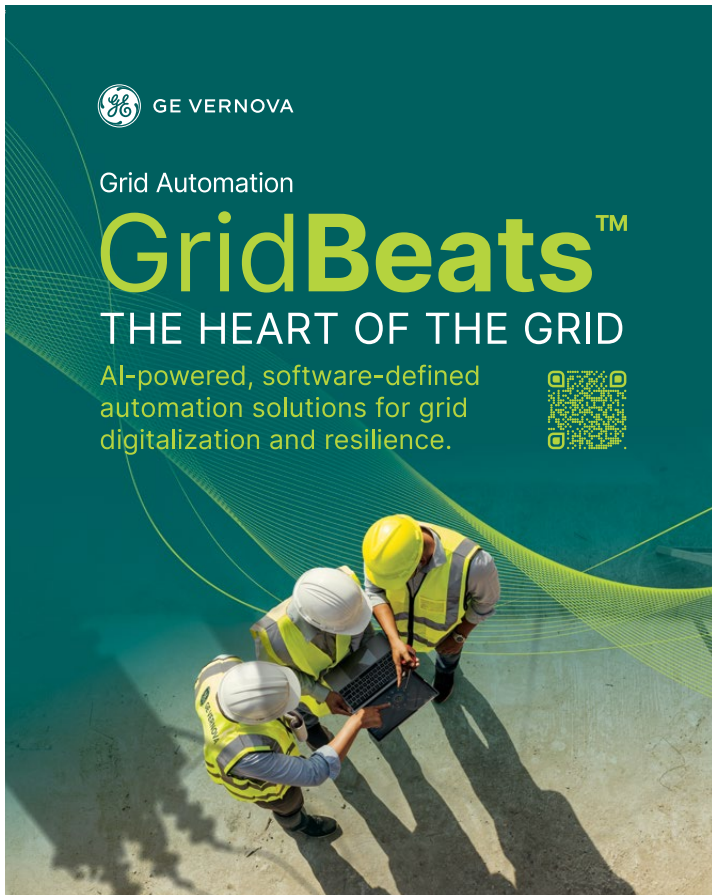
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Gala Dinner - at The Platform, 253 Argyle St - Glasgow G2 8D

The Platform, located under the historic arches of Glasgow Central Station, combines the station's rich history with modern elegance.



With seven years of experience, hosting dynamic experiential gatherings in Glasgow, Platform has become the city's most flexible venue.

Wednesday, 25 June 2025 - Drinks Reception starts at 18:00 - Dinner is at 19:00

Join us for our Conference Gala Dinner. It's the perfect time to enjoy a nice meal, good entertainment and the awards ceremony for the Photo Competition inside an amazing venue. We encourage everyone to register for this optional event and bring your spouse or guest to experience an entertaining evening.

6 pm arrive for welcome drinks - 6:30 pm dinner (Let's start a bit earlier so that we can offer more casino time at the end) - 8:00 pm photo contest awards - Open play at the casinos – award for most won.

The Platform was opened in August 1879, Central Station was a pivotal development built by the Caledonian Railway, later expanded between 1899 and 1906. You may visit the official website at: <https://platformgla.co.uk/>

the Gala Dinner is kindly sponsored by OMICRON electronics

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Organizing Committee:

Chairman: Campbell Booth (University of Strathclyde, UK), Priyanka Mohapatra (SP Energy Networks, UK), Angela Sayegh (PAC World, USA)

Advisory Committee:

To ensure that the PAC World magazine and conference are at a high level that meets the needs of the industry, we have invited world known experts in the field of electric power systems protection, automation and control as members of the magazine Advisory Board and the conference Advisory Committee.

They help us with their ideas, comments and suggestions to improve the content and quality of the magazine and the conference.

The members of the PAC World Advisory Board and the PAC World Conference Advisory Committee are (in alphabetical order):

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