

**IEC 61850  
 Global  
 2018**

**Achieving IEC 61850 Interoperability within  
 the Substation and across the wider Smart Grid**

3-Day Conference, Exhibition & Networking Forum

**16-18 October 2018 | Berlin, Germany**



**Hear In-depth Insights on:**

- ✓ **IEC 61850 Standards Update:** Outlining updates to Edition 2.1 of IEC 61850-6 to address interoperability challenges and ensure efficient engineering in a multi-vendor, multi-edition system
- ✓ **Tendering and specification process:** Developing a new tendering and specification process to overcome the interoperability challenges of multi-edition systems
- ✓ **Edition 1 to Edition 2 transition:** Determining the optimum transition strategy from Edition 1 to Edition 2 depending on your current substation implementations
- ✓ **Engineering configuration tools:** Addressing current tool limitations and developing methodologies for configuring and testing the different IEC 61850 features
- ✓ **Maintenance testing:** Successfully implementing testing tools to ensure effective operation and maintenance in a multi-edition, multi-vendor system
- ✓ **Cyber security:** Ensuring cyber-security in the implementation of feature rich multi-edition multi-vendor IEC 61850 systems that include GOOSE, MMS and other messaging
- ✓ **GOOSE Messaging:** IEC 61850 for GOOSE and R-GOOSE for messaging in the LAN and WAN
- ✓ **Beyond the substation:** Integrating IEC 61850 with data management systems and the CIM and extending its application to the control centre
- ✓ **IEC 61850 for DER:** Making the business case for using IEC 61850 as the communication protocol to effectively integrate DER into the power grid

**14+ Utility Case Studies From:**

**Peter Rümenapp**  
 Team Leader, Control & Automation Technology  
**Amprion**

**Rannveig Loken**  
 Senior Specialist Control and Protection  
**Statnett**

**Priyanka Mohapatra**  
 Senior Project Manager  
**SP Energy Networks**

**David MacDonald**  
 System Monitoring Lead Engineer  
**Iberdrola**

**Zigor Ojinaga**  
 Industrialisation Project Leader  
**Iberdrola**

**Sander Jansen**  
 Data Architect  
**Alliander**

**Ronald Poosen**  
 Team Leader, Distribution Protection and Substation Automation  
**Fluvius**

**Paul Hayes**  
 Smart Networks Engineer  
**ESB Networks**

**Anders Johnsson**  
 Power System Specialist  
**Vattenfall Distribution Nordic**

**Nikolay Ignatovski**  
 Automation Engineer  
**Electricity System Operator Bulgaria**

**Abhinav Sadu**  
 Research Associate  
**E.ON Energy Research Centre**

**René Troost**  
 Specialist AM Network Intelligence  
**Stedin**

**Anne van der Molen**  
 Technology Officer  
**Stedin**

**Deepak Maragal**  
 Manager, System Integration & Testing  
**New York Power Authority**

**Mohd Iqbal Ridwan**  
 Principal Researcher, Utility Automation  
**TNB Research Sdn Bhd**

**Byung Tae Jang**  
 Principal Researcher  
**KEPCO**

**Expert Advice From:**

**Christoph Brunner**  
 President of it4power & Convenor  
**IEC TC 57 WG10**

**Grégory Huon**  
 Head of Engineering Governance at Elia & Group IEC 61850  
 Convenor  
**ENTSO-E**

**Alex Apostolov**  
 Principal Engineer at OMICRON & Editor-in-Chief  
**PAC World Magazine**

**Roberto Zangrandi**  
 Secretary General  
**EDSO for Smart Grid**

**Charles Newton**  
 President  
**Newton-Evans Research Company**

**Sebastian Krause**  
 Group Leader Security Audits  
**GAI NetConsult**

**Technology Innovations From:**

**Gerardo Rebollar**  
 Executive Product Line Leader  
**GE Energy**

**Leandro Henrique Monaco**  
 Global Product Manager, Electrical Control Systems  
**ABB**

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Dear Colleague,

We are delighted to bring you the 5th annual **IEC 61850 Global 2018** conference, exhibition and networking forum.

This year's programme draws together 150+ IEC 61850 experts and implementation leaders for a review of the latest utility implementation case-studies and supplier technology innovations.

We are including several international presentations and inviting a more global delegation to facilitate a wider exchange of end-user experiences and ensure the optimal development of the standard for the global power grid community.

Highlights of this year's programme includes:

- ✓ **Case-Study Programme** - hear from 14+ international utility IEC 61850 experts and implementation leaders on the lessons learnt from actual deployments of the standard across smart grid infrastructures
- ✓ **Utility Heavy Speaker Line-Up** - selected on the strength of the projects they are involved in, their pivotal roles in implementation decision making, and their insights into lessons learnt and future roadmaps
- ✓ **Roundtable Discussions** - the opportunity to brainstorm and problem solve with peers from across the IEC 61850 ecosystem
- ✓ **Fundamentals Workshop** - run by Christoph Brunner, Convenor of IEC TC57 WG10, taking place the day before the main conference, this workshop demystifies the fundamental building blocks and provides a comprehensive yet in-depth understanding of IEC 61850
- ✓ **Solution Zone** - running alongside the conference, the solution zone provides a focused display of IEC 61850 products and services, with experts on hand to discuss your specific challenges and provide tailored advice to help propel your implementation plans to the next level
- ✓ **Live Demo Labs** - a 1:1 private demonstration, providing you with the opportunity to gain hands-on experience of the most advanced and forward-looking IEC 61850 solutions and services
- ✓ **Evening Networking Reception** - taking place the evening of conference day one, this networking event is open to all participants enabling you to relax and unwind, allow new ideas to cement and new partnership opportunities to emerge

We look forward to welcoming you to the event in October 2018!

Kind Regards,



**Mandana white**  
Director | **Phoenix Forums**

*PS: Very Early Bird Rates - Save €400 on delegate places by booking before Friday 29th June 2018!*

*PPS: Group Booking Discounts - Save a further 10% on 3+ delegates booked from the same organisation at the same time - Call us on +44 (0)20 8349 6360 to arrange!*

# Workshop

## Tuesday 16th October 2018

### Fundamentals of IEC 61850 Workshop

#### Workshop Leader



**Christoph Brunner**  
President of  
**it4power**  
& Convenor  
**IEC TC 57 WG10**

#### Workshop Format

The IEC 61850 standard is an extensive and complex set of international standards specifically designed for substation automation and the smart grid. Now universally recognised as the de-facto standard for power utility compliance, it presents as many challenges as it does opportunities.

During this workshop Christoph Brunner, Convenor of IEC TC57 WG10 provides a comprehensive and in-depth insight into the building blocks, key applications, and optimal operations of the standard within the substation environment and beyond. Whether you are just at the start of your IEC 61850 investigations or have several years' practical implementation experience, this workshop will provide you with a much-needed update on the fundamentals of this evolving standard.

- 09:30 Registration & Welcome Refreshments
- 10:30 **Session 1: Introduction to IEC 61850 - key benefits, alternatives and implications for the utility engineer**  
Gain clarity on how IEC 61850 was conceived, its key objectives and features, and how it has evolved to support interoperability, free configuration and long-term stability. A comparison with other communication standards will be made, and the impact on engineering processes will be clarified. Edition 1 will be reviewed in relation to its application in different domains. Key functions such as Process Bus, Goose Messaging, Sampled Values, Data Models and Data Attributes will also be discussed.
- 11:15 **Session 2: Evolution to Edition 2 - product introductions, utility implementation experiences, interoperability advancements**  
Understand how Edition 2 builds up from Edition 1, the backward compatibility aspects, new features and functionalities, the rate of take up within vendor products and feedback from utility implementations. In this session, the major new features such as Common Data Classes, ACSI, and SCL will be discussed, as well as the benefits of the new Testing Capabilities and Diagnostic Features.
- 12:00 **Session 3: Data Modelling Fundamentals**  
Deep-dive into the function of IEDs, Logical Nodes, and Data and Logical Node Groups. Examples of Logical Nodes and Logical Node Instances will be given. Insights will also be shared into Common Data Classes, CDC Measured Values, Hierarchical Data Models, Specification Methods, acquisition of Current and Voltage and Modelling examples such as Control.
- 12:45 Lunch
- 13:45 **Session 4: Communication Fundamentals**  
Various communication concepts will be discussed based on practical examples including Datasets, Reporting, Goose Object Oriented Events and Goose Repetition.
- 14:30 **Session 5: Quality Assurance - how to specify IEC 61850 to ensure your automation system works effectively**  
Understand how the IEC 61850 requirement specification could look like, learn how to assure your automation system will work as early in the project as possible and what kind of test tools are required for optimal performance validation.
- 15:15 Afternoon Refreshments
- 15:45 **Session 6: Future Directions and New Activities - further improvements, wider smart grid applications, and suitability for new domains**  
Get up to speed with the latest IEC 61850 implementations across the wider smart grid, as well as in new domains such as hydroelectric power plants, distributed energy resources, and wind turbines. Understand how to work around current gaps in the standard, and how to ensure true multi-vendor interoperability and effective future proofing.
- 16:30 **Session 7: Practical Group Exercise and Q&A**  
In this final session a series of practical exercises will bring to life the application of IEC 61850 and provide attendees with the chance to have all their questions answered in great depth and detail by the workshop leader.
- 17:00 Close of Workshop

## Sponsorship & Exhibition Opportunities



Would you like the opportunity to raise your brand profile, demonstrate your products and services, and share your expertise with a highly concentrated and influential group of utility IEC 61850 implementation leaders and decision makers? Our adjoining exhibition area provides the perfect platform for you to do this and more! Capped at 20 stands we ensure a focused and relevant display of the latest tools, technologies and services for our audience and maximum visibility for each exhibitor.

To find out more about the various sponsorship and exhibition opportunities:

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08:00 Registration & refreshments

08:50 **Opening remarks from the Chair**  
**Christoph Brunner**, President of **it4power** & Convenor of **IEC TC 57 WG10**

09:00 **IEC 61850 Standards Update: Outlining updates to Ed 2.1 of IEC 61850-6 to address interoperability challenges and ensure engineering efficiency in a multi-vendor multi-edition system**

- Ensuring that IEC 61850 can support mixed edition and multi-vendor environments for both communication and engineering with the development of Ed 2.1
- Meeting the need for engineering tools to exchange files conformed to different versions of the standard
- Assessing vendor independent tools to support engineering testing and maintenance and ensure an ability to work with multiple standards
- Building into the standard future compatibility with later editions of IEC 61850
- Identifying potential challenges in upgrading edition 2 devices to 2.1 to meet future conformance standards
- Detailing the latest work progressing towards edition 3

**Christoph Brunner**, President of **it4power** & Convenor of **IEC TC 57 WG10**

09:30 **Market Overview: Examining the current state of substation modernisation and IEC 61850 implementation and forecasting IEC 61850 product development and market growth in the next 5 years**

- Examining the status of substation automation and integration programs in electric utilities around the world
- Detailing the global implementations of IEC 61850 protocols, within substations, for communication and control, for both TSOs and DSOs
- Understanding how international utilities are procuring substation automation systems and equipment and the integration support they require
- What are the leading challenges that are slowing down and inhibiting IEC 61850 implementations?
- Forecasting spending in the next 5 years for new and retrofit substation automation
- Detailing the trends in the IEC 61850 market:
  - Number of IEC 61850 protection relays sold?
  - Number of 61850 data gateways/RTUs applied?
  - Forecasting the market of SCADA end-users who potentially need IEC 61850

**Charles Newton**, President - **Newton-Evans Research Company**

10:00 **Tendering and Specification Process: Developing a new tendering and specification process to address the challenges of ensuring interoperability for multi-edition systems in the immediate and long term**

- Identifying the challenges of accurately defining end user requirements in a way that drives suppliers to provide the right system at the right cost
- Addressing the specific challenges of specifying SCL files in the tender process to ensure interoperability
- Outlining the need for tools that streamline and automate the specification process and verify results from the different vendors
- Building testing pass rates into the contract: cyber security, IOP testing, conformance testing and a final test and SAT (Site Acceptance Test)

**Ronald Poosen**, Team Leader, Distribution Protection and Substation Automation - **Fluvius**

10:30 Morning refreshments, networking and exhibition

11:00 **System Interoperability Panel Discussion: Outlining the challenges vendors face in achieving interoperability and the steps they are taking to address these**

- Detailing plans for product upgrades to support the latest standards
- Assessing the case for enabling flexibility in prefixes for logical nodes and dynamic data sets to give utilities the opportunity to effectively manage IEDs and limit the need for continual retesting
- Outlining the challenges in achieving interoperability between the IED and SCADA
- Addressing the challenges interoperability between mixed merging units from different vendors within substations#

**Simon Rodriguez**, Vice President of Business Development - **SUBNET Solutions Inc**  
**Gerardo Rebolgar**, Executive Product Line Leader - **GE Energy**  
**Leandro Henrique Monaco**, Global Product Manager, Electrical Control Systems - **ABB**

12:30 Lunch, networking and exhibition

14:00 **The Digital Substation: Successfully implementing IEC 61850 for the next generation digital substation**

- Evaluating the advantages of a fully digital sub-station in terms of cost benefits, and safety
- Implementing IEC 61850 in a digital sub-station using station bus and process bus
- Examining how the control and protection functions can be combined for more bays in a common PCU
- Assessing the pros and cons of implementing an all-digital process bus with NCIT, MU and SAMU
- Outlining the design of the future Digital substation

**Rannveig Loken**, Senior Specialist Control and Protection - **Statnett**

14:30 **Testing and Maintenance: Outlining TNBR's latest research into effective testing and maintenance of IEC 61850 based substation protection, automation and control systems**

- Outlining the projects covered in the system verification and simulation process in the TNB labs:
- Functional and Interoperability Test for IEC 61850 compliant IEDs, SCADA Gateway, Station HMI and Proxy servers
- Time Synchronization protocol accuracy and performance test
- Comparing the relative benefits of developing in house testing or working with a consultancy or integrator
- Designing and testing process bus network architecture in the lab and in field trials

**Mohd Iqbal Ridwan**, Principal Researcher, Utility Automation - **TNB Research Sdn Bhd**

15:00 **In House Testing: Developing in-house testing tools to improve IEC 61850 implementation, operation and maintenance in substation fields**

- Outlining the benefits of developing in house versus using third party testing tools
- Detailing projects covered in the system verification and simulation process:
- Virtual Server based IEC 61850 Ed 2.0
- SCL Checker based IEC 61850 UML Information Model & Rule
- IED Conformance Verifier based graphic test case modelling & IEC 61850 Ed 2.0
- Ensuring full compliance with IEC61850 testing procedures

**Byung Tae Jang**, Principal Researcher - **KEPCO**

15:30 Afternoon refreshments, networking and exhibition

16:00 **EDSO for Smart Grid: Addressing DSO specific requirements for IEC 61850 and outlining the latest trials and implementations**

- Outlining the work of EDSO for smart grid in relation to IEC 61850 and the implications for DSOs and suppliers in achieving the long-term goal of the flexible smart grid
- Examining DSO drivers for IEC 61850 implementation, how they differ from TSO's and the implications of this for utilities and suppliers
- Detailing the limitations which are currently holding back IEC 81850 deployment in DSOs and the steps being taken to overcome them
- Factoring the DSO requirement to extend IEC 61850 beyond the substation across the distribution network into the implementation strategy
- Evaluating the latest DSO IEC 61850 trials and implementations across the smart grid

**Roberto Zangrandi**, Secretary General - **EDSO**

16:30 **Future Proofing IEC 61850: Determining how IEC 61850 can evolve to meet user needs to be more cost effective and highly functional**

- Modifying tools and practices to use existing standards and future proof design and specifications for next generation substation automation system
- Addressing the challenges of multi editions, multi-vendor interoperability
- Improvements needed in process, parameter identification, documentation capabilities and configuration & test tools
- Optimizing vendor community and standard development (IEC WG10) to ensure IEC 61850 is future proofed for the long term
- Evaluating new developments in computer networking and cyber security beyond the current scope of IEC 61850 and examining their potential role in future proofed implementation

**Deepak Maragal**, Manager, System Integration & Test - **New York Power Authority**

17:00 **Grid Edge Trials: Planning and conducting IEC 61850 trials as part of a long-term strategy for the roll out of smart grid model management and communications across the grid**

- Outlining the long-term goal of having 61850 as standard across all IT systems and measuring devices across the distribution network, including DER
- Planning an effective trial of IEC devices including: solar sensors, battery storage, EV chargers
- Evaluating the relative benefits of working with an independent systems integrator to plan the trial and invite device vendors
- Making the case for the deployment of a live test bed to optimise the configuration of the implementation
- Addressing the challenge of getting internal buy in to 61850 for the smart grid and cost justifying the long-term requirement for the replacement of all devices

**Paul Hayes**, Smart Networks Engineer - **ESB Networks**

17:30 **Roundtable Discussions** - during this session the audience breaks out into several smaller working groups, each focused on specific themes that arose during the day's presentations. Each working group will comprise of representatives of the entire IEC 61850 community to ensure a well-rounded and holistic discussion. Key issues raised, and solutions proposed will be collated for presentation to the wider group at the end of the session.



19:00 **Networking Reception** - time to relax and unwind after an intensive day of presentations and discussion! All participants are invited to join this networking reception where you will have the opportunity to enjoy the company of colleagues from across the European smart grid technical community.



21:00 Close of conference day one

*"The conference has really expanded my knowledge of IEC 61850 which will allow me to inform my colleagues and assist our DNO/ DSO based approach to outlining our smart network strategy."*  
**Sean Stack, UK Power Networks**

*"A very useful time, open exchange of ideas and information. Excellent real-world presentations."*  
**Allan Wales, SP Energy Networks**

- 08:00 Registration & refreshments
- 08:50 **Opening remarks from the Chair**  
**Alex Apostolov**, Principal Engineer at **OMICRON** & Editor-in-Chief at **PAC World Magazine**
- 09:00 **Cyber Security: Ensuring cyber security in the implementation of feature rich multi-vendor IEC 61850 that includes GOOSE**
- Setting proper security requirements for vendors during the tendering process and implementing cyber security acceptance in digital substations – real life experiences
  - Vulnerability testing at FAT / SAT phase to evaluate security risks – is IEC 62351 enough?
  - Robustness tests of substation protocols like IEC 61850 and IEC 60870-5-104 – speaking the wrong language
  - Examining the top ten vulnerabilities in IEC 61850 based substations during FAT / SAT
- Sebastian Krause**, Group Leader Security Audits, **GAI NetConsult**  
**Peter Rümenapp**, Team Leader, Control & Automation Technology - **Amprion**
- 09:30 **Industrializing IEC 61850: Designing an interoperable system which will reduce routine engineering, commissioning and maintenance effort**
- Defining an automated engineering process for the configuration of the substation automation system
  - Using a third-party configuration tool to create multivendor CID and one-click configuration with the ICT
  - Ensuring effective integration of software systems to automate engineering processes
  - Enabling single data origin for the substation HMI and SCADA telecontrol system
  - Verifying configuration files and management of firmware to assure correct SAS Performance
  - Implementing condition monitoring and ensuring easy replacement to reduce maintenance effort
- David MacDonald**, System Monitoring Lead Engineer - **Iberdrola**  
**Zigor Ojinaga**, Industrialisation Project Leader - **Iberdrola**
- 10:00 **Multi-Vendor Interoperability: Outlining the latest trial results for the design, deployment and operational control of an interoperable multi-vendor digital substation, using IEC 61850**
- Examining the drivers for ensuring that that new protection and automation solutions, based on IEC 61850-9-2 process bus standard are interoperable and suitable for established transmission networks
  - Ensuring interoperability with existing conventional systems to optimise asset replacement
  - Achieving interoperability with a mixture of protection and control equipment from different manufacturers at process and station bus, as well as Substation Control System (SCS)
  - Achieving interoperability between mixture of technologies (conventional and digital)
  - Assessing the reliability of IEC61850-9-3 (Power Profile) Precision Time Protocol (PTP)
  - Detailing the latest results of off line interoperability testing
- Priyanka Mohapatra**, Senior Project Manager - **SP Energy Networks**
- 10:30 Morning refreshments, exhibits & networking
- 11:00 **Tool Interoperability Panel Discussion: Meeting the need for multi-edition and multi-vendor interoperability for configuration and testing tools**
- Quantifying the impact, the lack of tool interoperability is having on maintenance efficiency
  - Ensuring that configuration tools can manage a hybrid environment – standardising SCL files
  - Reducing the need for multiple software programmes to configure one device
  - Testing multiple device systems effectively to reduce retest requirements
  - Future proofing tools for IEC 61850 Edition 3 and 4
- Jürgen Resch**, Industry Manager Energy – **COPA-DATA**  
**Eric Xu**, Lead Simulation and Automation Engineer – **RTDS**  
**Bas Mulder**, Senior Consultant – **DNV GL**  
**Joe Stevens**, Marketing Manager – **Triangle MicroWorks**  
**Claudio Silva**, Lead Product Manager – Software and Systems – **Efacec**
- 12:30 Lunch, networking and exhibition
- 14:00 **Utility Maintenance Panel: Sharing experience on how utilities are addressing the on-going, practical challenges of managing and maintaining IEC 61850 networks**
- Comparing the relative benefits of using the vendor for IED maintenance
  - Addressing the practical challenges of managing the system upgrade /modification process when new devices are added to the network
  - Assessing the software tools available to assist with system modification
  - Determining how to effectively document the development of the substation: documenting SCL, IED configurations
  - Developing effective documentation approval processes
  - Maintaining and validating ongoing firmware revisions for IEC 61850
  - Making the case for centralised substation protection as opposed to it being distributed across all relay devices
- René Troost**, Specialist AM Network Intelligence - **Stedin**  
**Priyanka Mohapatra**, Senior Project Manager - **SP Energy Networks**  
**Nikolay Ignatovski**, Automation Engineer - **Electricity System Operator Bulgaria**
- 14:30 **Beyond the Substation: Integrating IEC 61850 with data management systems and the CIM and extending its application to the control centre and beyond**
- Identifying the synergies between and 61850 and CIM and the drivers for integration beyond the substation
  - Addressing the specific challenges of achieving effective integration of IEC 61850 and CIM: examining areas of overlap and determining where each is most effective
  - Comparing the suitability of IEC 61850 for the control center environment with other protocols such as IEC 60870-5-104 and DNP 3
  - Outlining the drivers for making data from IEC 61850 available enterprise wide to improve decision making, asset investment planning, operations and maintenance
  - Stedin's initiatives towards IEC 61850-90-2 for control center integration and its project to connect the 61850 substation data to the PI infrastructure
  - Evaluating the implications of 61850-90-2 for the substation, control center and data infrastructure
- Anne van der Molen**, Technology Officer - **Stedin**  
**René Troost**, Specialist AM Network Intelligence - **Stedin**
- 15:00 **Combining IEC 61850 with CIM: Results from two proof-of-concept and pilot projects at Vattenfall**
- Case 1:** Going down in voltage level: Increasing the efficiency of secondary substation monitoring using CIM and IEC 61850 engineering process
- Utilizing CIM to populate SCL with network and component information for RTU and HMI
  - Secondary substation configuration in the field and automatic HMI configuration using auto-generated SCL from Network Information System database
- Case 2:** Beyond the substation: Utilizing substation IEC 61850 data to drive predictive and remote maintenance in the wider enterprise
- Supporting the information exchange between components at central level based on CIM and substation protocols
  - Enabling configuration and use of IEC 61850/CIM gateway to transfer data from substation automation systems to central systems
- Anders Johnsson**, Power System Specialist - **Vattenfall Distribution Nordic**
- 15:30 Afternoon refreshments, networking and exhibition
- 16:00 **ENTSO-E Roadmap & OSMOSE Project: Outlining ENTSO-E's action plan and role in specifying IEC 61850 and the OSMOSE (Optimal System-Mix Of Flexibility Solutions for European electricity) Horizon 2020 project to enable the integration of renewables into a flexible smartgrid**
- Outlining the aims of the OSMOSE Horizon 2020 project
  - Outlining the status of the global ENTSO-E profiling roadmap
  - Upgrading the ENTSO-E profile ensuring interoperability, with a specific focus on storage devices
  - Developing an interoperability framework based on the IEC 61850 ENTSO-E requirements for the engineering process
  - Presenting the architecture of tools for profiling, specifying, comparing and configuring functionalities within an interoperable framework
  - Outlining timescales for practical end to end demonstrators of the interoperability framework for IEC 61850 engineering by manufacturer partners in OSMOSE
- Grégory Huon**, Head of Engineering Governance at **Elia** & Group IEC 61850 Convenor at **ENTSO-E**  
**Christoph Brunner**, President of **it4power** & Convenor of **IEC TC57 WG10**
- 16:30 **IEC 61850 for DER Environments: Determining the optimum design and implementation of substation automation unit for future active distribution grids**
- Examining the challenges faced by DSOs in managing the incremental growth of DERs connected to the grid
  - Making the case for developing a new framework for network automation, moving part of the grid control logics into the substation
  - Decentralising monitoring and control functionalities and bringing them near to the field in the Substation Automation Unit reduce complexity increasing the network controllability and system performance
  - Effectively ensuring cyber security in the integration of DER to the power grid
  - Outlining the current status of standardisation for IEC 61850 and DER integration
- Abhinav Sadu**, Research Associate - **E.ON Energy Research Centre**
- 17:00 **Enabling DER Generators to Connect to the Grid: Developing a IEC61850 basic application profile to meet EU RfG (Requirements for Generators) and effectively integrate DER into the power grid**
- Quantifying and addressing the challenge of monitoring and controlling growing DER resources such as wind / hydro power, solar panels, battery storage, now and as future smart grids evolve
  - Outlining the drivers for creating an IEC 61850 profile to control and monitor distributed energy resources
  - Detailing the use cases such as reducing load and predicting congestion
  - Overcoming the technical challenges of aligning infrastructure and data models
  - Determining the different IEC 61850 standards required
- Sander Jansen**, Data Architect - **Alliander**
- 17:30 Closing remarks and end of conference

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For more information visit: [www.rtds.com](http://www.rtds.com)



Triangle MicroWorks, Inc. provides software libraries and PC-based tools to help implement and maintain systems using industry-standard communication protocols such as IEC 61850 [including: -9-2 (Sampled Values); -7-410 (Hydro); -7-420 (DER); IEC 61400-25 (Wind); and GOOSE]. We also support IEC 60870-6 (TASE.2/ICCP); IEC 60870-5 (-101, -102, -103, & -104); DNP3; and Modbus. Our Protocol Test & Verification Tools make it easy to test, troubleshoot and configure communication protocols and devices. Our Software Libraries help equipment vendors cost-effectively implement communication protocols in any device. We also offer OPC Drivers/Translators, Protocol Gateways, Visualization Tools, Web-based Training, and Implementation Services.

For more information visit: [www.trianglemicroworks.com](http://www.trianglemicroworks.com)



Efacec is a Portuguese company with a strong exporter profile and geographical footprint in more than 65 countries. Efacec is present in the development of infrastructures for important sectors of economic activity: Energy, Environment & Industry, Mobility & Transportation. Part of Efacec Group, Efacec Automation focuses on engineered solutions for protection, control and management of electric power networks. Through the development of its own advanced technology and the expertise gained through over 30 years of system implementation experience, Efacec Automation operates globally, focusing strongly on Europe, North and South of Africa, Middle East, India and Latin America.

For more information visit: [www.efacec.com](http://www.efacec.com)



SUBNET is a software products company dedicated to serving the needs of the electric utility industry. SUBNET provides innovative interoperability solutions that combine the latest SUBstation technologies with modern day NETWORKING and computing technologies enabling electrical utilities to build a smarter, more efficient electricity grid. We create products that make your substations- and your overall power grid- more intelligent; allowing you to more reliably and safely deliver power to your customers.

SUBNET Solutions has recently expanded its operations into South American, African, Australian and European markets. With steadfast campaigns focusing on IEC 61850, DNP3 and other communication protocols and architectures, SUBNET continues its proud 25-year history of conducting in-person training courses for utilities and energy vendors worldwide.

As a software-oriented firm and as a Microsoft Certified Partner, SUBNET also has a clear comprehension of the technologies and possibilities available in a world defined by the information economy. In an industry where most device management providers are equipment/device manufacturers themselves, SUBNET's standout feature lies in the fact that we provide unbiased device management solutions. SUBNET vendor-agnostic solutions give energy and utility firms the freedom of choice in collaborating with diverse suppliers and third-party vendors.

Driving interoperability and multi-function integration through its technology, SUBNET is raising the bar for energy management and distribution standards, with its display of comprehensive grid solutions. Integration solutions offered to energy and utilities used to lag behind IT technology by 10 to 15 years. SUBNET's goal is to create products that keep pace with technology, and the company will continue to leverage the best of breed new IT technologies into operational technologies.

For more information visit: [www.subnet.com](http://www.subnet.com)



COPA-DATA is the technological leader for ergonomic and highly-dynamic process solutions. The company, founded in 1987, develops the software zenon and is headquartered in Austria. zenon is sold through its own offices in Europe, North America and Asia, as well as partners and distributors throughout the world. Customers benefit from local contact persons and local support thanks to a decentralized corporate structure. As an independent company, COPA-DATA can act quickly and flexibly, continues to set new standards in functionality and ease of use and leads the market trends. zenon Energy Edition is the industry-specific SCADA solution from COPA-DATA for power plant automation and substation automation, grid control technology and wind park management. The drivers developed by COPA-DATA guarantee adherence to international standards such as IEC 61850/IEC 61400-25, IEC 60870 and DNP3.

For more information visit: [www.copadata.com](http://www.copadata.com)



The Artech Group, with over 70 years of experience designing, engineering and manufacturing equipment and systems for the electric power industry, focused on generation, transmission and distribution grids, offers a complete range of solutions for the IEC61850 Digital Grid.

As an international benchmark with equipment operating in over 150 countries, with companies in Europe, America, Asia and Oceania, Artech offers new approaches to measurement in HV grids with some differentiating features that are not only interesting for digital substation applications, but also new approaches to solve challenging application scenarios.

For more information visit: [www.artech.com/en](http://www.artech.com/en)



TEKVEL is IEC 61850-focused company, providing solutions and services for digital substations worldwide.

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# Sponsors & Exhibitors

## Live Demo Lab Sponsors:



OMICRON is the leading supplier of testing tools for power utility communication systems utilizing the IEC 61850 standard. OMICRON's products support the whole lifecycle of IEC 61850 installations from design verification, evaluation, factory testing, commissioning, to operation and maintenance. The applications in protection, automation & control of electrical power systems in connection with IEC 61850 GOOSE, Sampled Values, and C/S communication are covered by a diverse portfolio of tools. The products range from pure software tools to protection test sets and distributed test, measurement and recording systems. Timing products for PTP (IEEE 1588) cover the needs for precise time synchronization of IEDs and testing tools. With OMICRON subsidiaries and service centers on every continent, the OMICRON team serves customers world-wide.

For more information visit: [www.omicronenergy.com](http://www.omicronenergy.com)



Kalkitech is a leader in solutions that securely bridge the data communications gap between utility field devices, substations and head-end systems across vendors and protocols, including IEC 61850. By transforming and accelerating interoperability and accessibility to real-time data and analytics, our solutions aid utilities in improving system reliability and operational efficiencies. Kalkitech's products are used throughout the lifecycle of IEC 61850 installations from design, test, simulation and commissioning, to operation and maintenance. Solutions are used by utilities, test houses and product vendors: test tools, data concentrators, protocol translators, gateways, energy IoT platform, IED protocol modules and embedded edge gateway software.

For more information visit: [www.kalkitech.com](http://www.kalkitech.com)

## Exhibitors:



DOBLE Engineering Company offers diagnostic instruments, services, and the world's premier library of statistically significant apparatus test results for the benefit of energy generation and delivery companies and industrial power users worldwide. Now in 110 countries, DOBLE Engineering Company has been helping clients in the electric power industry improve operations and optimize system performance for nearly a century. Doble is a world leader in diagnosis and testing of protection, control and automation systems, including IEC 61850-based PACS. DOBLE delivers test instruments and software to help power companies meet the challenges of protection testing in today's time sensitive regulatory environment.

For more information visit: [www.doble.com/en](http://www.doble.com/en)



JPEmbedded is a company located in Kraków, Poland. Founded in 2006 by software enthusiasts Paweł Filipek and Jan Mazan, currently employs 30+ software, hardware and test engineers, who are passionate about embedded systems development and technology in general. The initial focus of the company was offering embedded systems design, implementation and testing services. Today our primary interest is development of state of the art products for energy market. Currently we offer the following software and hardware solutions:

IEC-61850 library for embedded devices (MMS server, GOOSE, SV, control model) ICCP/TASE.2 library for embedded devices (client & server, compliant with security standard IEC-62351) IEC 60870-104 library for embedded devices hardware module allowing integration of IEC-61850 with products like protections, relays, current transformers or power meters We believe that beside our knowledge, competences and experience another important advantage is our location, which is nowadays recognized as one of the most important IT hubs in Europe.

For more information visit: [www.jpembedded.eu/en](http://www.jpembedded.eu/en)



SAE IT-systems GmbH & Co. KG develops and produces highly innovative and reliable products in the fields of substation automation, telecontrol and automation. We offer compact and modular systems with state of the art technology and outstanding performance for application areas like energy, natural gas, water or infrastructure. We proudly look back on more than 40 years of experience and are considered as one of the leading manufacturer in the market. Our new product line "series5+" provides the IEC 61850 client version (Edition 2) e.g. for the coupling of protective equipment.

For more information visit: [www.sae-it.com](http://www.sae-it.com)



OPAL-RT TECHNOLOGIES is the leading provider of open Real-Time Digital Simulators to design, test and validate complex controls for electrical, electro-mechanical and power electronic systems. OPAL-RT simulators are used by engineers and researchers at leading manufacturers, utilities, universities and research centres around the world.

For more information please visit: [www.opal-rt.com](http://www.opal-rt.com)



SISCO provides standards based, real-time communications and integration solutions to end users and OEMs in the energy industry. We specialize in the application of IEC 61850 and CIM to manage the complexity of electric power systems while building a flexible Smart Grid integration architecture that is robust and scalable. Products include source code, off-the-shelf interfaces, remedial action systems, and special protection systems. Services available include use case and model consulting, systems integration, application development, training, support and maintenance.

For more information visit: [www.cisco.com](http://www.cisco.com)



With the introduction of IEC 61850 new system designs are enabled that allow creating of fully digital substations. In such substations, primary and secondary equipment will exchange information based on serial communication networks using Ethernet. Testing such integrated systems, however, requires serious consideration. How to verify correct implementation of a function when it uses multiple Intelligent Electronic Devices communicating over network? How to test it in the factory but also in service? The answer is simple with advanced simulators and support tools provided by GridClone!

For more information visit: [www.gridclone.com](http://www.gridclone.com)

## Speaker Biographies



**Christoph Brunner**  
President of it4power & Convenor  
**IEC TC 57 WG10**

Christoph Brunner graduated as an electrical engineer at the Swiss Federal Institute of Technology in 1983. He is a Utility Industry professional with over 25 years of industry experience with both knowledge across several areas within the Utility Industry and of technologies from the Automation Industry. He is president of it4power in Switzerland, a consulting company to the power industry. He has worked as a project manager at ABB Switzerland Ltd in the business area Power Technology Products in Zurich / Switzerland where he was responsible for the process close communication architecture of the substation automation system. He is convenor of the working group (WG) 10 of the IEC TC57 and member of WG 17, 18 and 19 of IEC TC57. He is IEEE Fellow, member of IEEE-PES and IEEE-SA. He is active in several working groups of the IEEE-PSRC (Power Engineering Society - Relay Committee) and member of the PSRC main committee and the subcommittee H. He is international advisor to the board of the UCA international users group.



**Grégory Huon**  
Head of Engineering Governance at  
Elia & Group IEC 61850 Convenor  
**ENTSO-E**

Grégory Huon received degrees of Master of Engineering (Electrical Engineering, Institut Supérieur Industriel de Mons, Belgium - 2000) and Master of Science (IT and Management, Faculté Polytechnique de Mons, Belgium - 2003). Grégory began his career in the Transmission field in 2000. After an experience as Project Leader (2001-2006) and Team Leader (2006-2008) in infrastructure projects, Gregory was between 2008 and 2012 head of Secondary Systems department (technical governance & expertise level) within Elia TSO in Belgium. In 2013 Grégory took on responsibility for the infrastructure replacement projects - primary and secondary systems - for the Elia network in Belgium. In 2015, Grégory took on responsibility for the Engineering Governance department. Grégory is specialised in infrastructure project management, asset management and secondary systems expertise. Since 2012 Grégory has been leading the ENTSO-E WG on IEC 61850 standard and the Cigré Working Group B5.50 "IEC 61850 Based Substation Automation Systems - Users Expectations and Stakeholders Interactions". Grégory is also active within IEC TC57 WG10 as liaison D for ENTSO-E and he convenes the Belgian mirror committee of IEC TC57. In 2017, Grégory took on the leadership of the Task 7.1 Interoperability of the European Commission funded project "Osmose".



**Alex Apostolov**  
Principal Engineer at OMICRON &  
Editor-in-Chief  
**PAC World Magazine**

Alexander Apostolov received MS degree in Electrical Engineering, MS in Applied Mathematics and Ph.D. from the Technical University in Sofia, Bulgaria. He has more than 35 years experience in power systems protection, automation, control and communications. He is presently Principal Engineer for OMICRON electronics in Los Angeles, CA. He is IEEE Fellow and Member of the Power Systems Relaying Committee and Substations C0 Subcommittee. He is the past Chairman of the Relay Communications Subcommittee, serves on many IEEE PES and CIGRE B5 Working Groups. He is member of IEC TC57 and Convenor of CIGRE WG B5.27 "Implications and Benefits of Standardised Protection Schemes". He holds four patents and has authored and presented more than 400 technical papers. He is IEEE Distinguished Lecturer. He is Editor-in-Chief of PAC World.



**Charles Newton**  
President  
**Newton-Evans Research Company**

Charles W. (Chuck) Newton is the President of Newton-Evans Research Company, a firm focused on electric power industry marketing

research and technology consulting. Newton-Evans conducts research on grid-related automation and modernization trends, control systems and infrastructure topics. Key publications provide coverage of trends in control systems, substation automation and grid modernization topics and systems protection each with content which includes coverage of cyber and physical security issues. Prior to launching Newton-Evans Research in 1978, Chuck had been a senior product planner with General Electric Information Systems and earlier with Control Data Corporation. Chuck began his SCADA work with early military deployment of SCADA technology while serving in the U.S. Army. Chuck received an MBA in Marketing from Loyola University in Maryland and an undergraduate degree in Economics from Fordham University in New York City. Chuck is a life member of IEEE PES and an active CIGRE member, serving on several working groups related to electric power grid modernization and cyber security efforts.



**Ronald Poosen**  
Team Leader, Distribution Protection  
and Substation Automation  
**Fluvius**

Ronald Poosen has a Bachelor in Process control automation, and a Master in Automation, electrical power networks. In 2008 Ronald undertook a research project on Automation in Smart Grids, Microgrids at the University of Hasselt. In 2010 he explored Automation - Industrial networks (profibus-profinet) at ACRO, a spin off company related to University Hasselt. In 2012 he became an Engineer for secondary systems in electrical networks (RTU, IED, SCADA, IEC61850) at Infrac (DSO in Belgium). In 2018 he became the Teamleader for secondary systems in electrical networks (RTU, IED, IEC61850, IEC 60870-5-104 at Fluvius.



**Gerardo Rebollar**  
Executive Product Line Leader  
**GE Energy**

Gerardo Rebollar is currently Executive Business Development Leader within Grid Automation, having completed a seven-year cycle as Substation Automation general manager from 2010. He was leading the operation & development of innovative products, concepts and architectures in the domain of protection and control systems for Digital Substation solutions. Gerardo has 30 years' experience in both electrical and industrial automation industries. He graduated as Electronic and Communications Engineer and joined Telemecanique in 1988 in the field of power electronics and motor controls. He moved to France in 1992 leading the road map of speed drive controllers. In 2005 he obtained his Executive MBA. In 2007 he was appointed Innovation Vice President in Schneider Toshiba Joint Venture, last position before moving to Areva T&D by 2009 as Gas Insulated Substations marketing and project director. Gerardo is married with two kids and likes aircrafts, sport flying and automotive car design. He enjoys also playing theater, travel in natural open spaces and visiting historical cities.



**Leandro Henrique Monaco**  
Global Product Manager, Electrical  
Control Systems  
**ABB**

Leandro Monaco is graduated in Electrical Engineering with an emphasis on Automation and Control and holds a Master's Degree in Systems Engineering from the University of São Paulo, Brazil. He is also post-graduated in Business Management and Marketing by the Administration Institute Foundation, in São Paulo, Brazil. Leandro has more than 10 years' experience in Process Automation, and since 2009 he has been focused on Electrical Control Systems (ECS) applied to industrial plants, with special attention in the IEC 61850 standard. Having worked as Process Control Engineer at the start of his career and thereafter to Electrical Control Engineer, he led and commissioned more than 25 ECS projects since then, in Oil & Gas and Mining plants. He was Engineering Manager for ECS in ABB Brazil and also was globally responsible for the IEC61850 Center of Excellence for Mining projects in ABB. His experience of both Process and Electrical

Control allows him to perfectly understand the needs of an industrial plant regarding electrical systems. In 2014, he joined ABB Sweden to act as Global Product Manager for Electrical Control Systems in the Industrial Automation division. Leandro has published several articles in the area of Electrical Control Systems and IEC 61850 standard.



**Rannveig Loken**  
Senior Specialist Control and Protection  
**Statnett**

Rannveig Loeken's special field of interest is protection and control for the transmission system. She is currently the project manager in Statnett for an R&D project related to Digital substation. She has many years' experience from her position as Head of the Control and Protection section in Statnett. Since 2012 Rannveig has been the secretary of CIGRÉ Study Committee B5. In addition, the work in CIGRÉ Working groups is of great interest, she is currently a member of WG B5.53. In addition, she is in the Advisory board of PAC world, Committee member of DPSP, and Member of International Advisory Committee APA.



**Mohd Iqbal Ridwan**  
Principal Researcher, Utility Automation  
**TNB Research Sdn Bhd**

Mr. Mohd Iqbal bin Ridwan is currently Principal Researcher (System Automation) in TNB Research Sdn Bhd. He received his Bsc. Degree from Keio University, Tokyo, Japan in 2005 and MBA from University Tenaga Nasional in 2018. He has been with Tenaga Nasional Berhad for 13 years. His research interests include; IEC 61850 based Substation Protection, Automation and Control; Smart Grid; Reliability Engineering. He is involved as corresponding member in the following international technical committees; CIGRE WG B5.59 "Requirements for Near-Process Intelligent Electronic Devices"; CIGRE WG B5.53 "Test Strategy for Protection, Automation and Control (PAC) functions in a full digital substation based on IEC 61850 applications"; North America IEC 61850 Process Bus User Task Force. He received the Best Promising Researcher award by TNB Research Sdn Bhd in 2013. He also has authored and presented more than 25 technical papers and journals throughout his career.



**Byung Tae Jang**  
Principal Researcher  
**KEPCO**

Byungtae Jang received his B.S degree in electrical engineering from Busan National University, Korea in 1990. His research interests are protective relaying, Substation Automation System. He has been working in KEPCO since 1990. He is currently a Principal researcher at KEPCO research institute. He is in charge of development of testing tools for IEC 61850 system and substation restoration.



**Roberto Zangrandi**  
Secretary General  
**EDSO for Smart Grid**

Roberto Zangrandi has joined EDSO for Smart Grids as a Special Adviser on secondment from Enel Group of Italy in 2014 and has been appointed as Secretary General in March 2017. He has been running the European Public Affairs office in Brussels for Enel between 2007 and 2014. Previously with Enel he had been Head of Corporate Social Responsibility, Identity and Image, Corporate Communication Plans. In his background 12 years with Fiat (Director of External Relations in Frankfurt and Head of International Media Relations) and 15 years an economic and financial journalist (last position, chief editor with Il Mondo, in Italy) are to be found. In addition, he worked as organisational communication expert for a prime consulting company over some years. He studied Political Science and Sociology and held the postgraduate chair of Public Relations at Udine University, the first one teaching the practice in Italy.



**Paul Hayes**  
Smart Networks Engineer  
**ESB Networks**

Paul Hayes holds a primary degree in Electrical Engineering from the University College Cork. In previous roles within ESB, Paul has worked in the areas of Load Research, Power Procurement, Wholesale Electricity and Gas Trading, Regulation, Electricity and Gas Demand forecasting, Wholesale Electricity Price Forecasting. Prior to working in ESB Paul worked for Southern Electric (now SSE) in Use of System Charging section and for SEEBOARD in the post privatisation Power purchasing department. Paul is currently a team member of the Smart Networks function within ESB Networks, responsible for all R&D activities and strategic guidance to the utility.



**Sebastian Krause**  
Group Leader Security Audits  
**GAI NetConsult**

Sebastian Krause, worked for more than 20 years for different consulting companies in the areas of information security and IT forensics after his study of communications engineering. Since 2010, Mr. Krause is working with GAI NetConsult GmbH as senior consultant and head of security audits. In this role, he is responsible for technical security audits with a major focus on process control and automation technologies as well as consulting services in terms of information security managements systems based on ISO/IEC 27001. Mr. Krause has conducted security audits of substation automation systems (IEC 60870-5-104 and IEC 61850) as well as SCADA systems of all major vendors in the D-A-CH market based on the BDEW Whitepaper and ISO/IEC 27019.



**Peter Rügenapp**  
Team Leader, Control & Automation Technology  
**Amprion**

Mr. Rügenapp studied electrical engineering with specialization in automation at the University of Applied Sciences Hagen. He has more than 35 years' professional experience in power generation and transportation. Mr. Rügenapp is an employee of the secondary technology department at Amprion GmbH. Within the department, he is team leader for the field of control and automation technology. He is also Information Security Manager for the area of secondary technology. Mr. Rügenapp has been involved in information security for more than 10 years as part of his work. Amprion has been operating an ISMS in accordance with ISO / IEC 27000 since March 2010. One of the many rules outlined is, that all new technologies of secondary systems that are integrated into the process network must be audited according to BDEW white papers. In this respect, Amprion has formulated a separate chapter "IT Security" for the tendering of a new substation automation system based on IEC 61850 in 2014.



**David MacDonald**  
System Monitoring Lead Engineer  
**Iberdrola**

David works for Iberdrola Distribucion, a leading distribution network operator in Spain and early adopter of substation automation systems. His role is to provide technical and asset management support to the Protection team, where he specializes in disturbance analysis and is also involved in the standardization of IEC 61850 across the business. He received his MEng degree in Electrical and Mechanical Engineering, from the University of Strathclyde, before joining Scottish Power in 2009 and consequently Iberdrola Distribucion in 2012



**Zigor Ojinaga**  
Industrialisation Project Leader  
**Iberdrola**

Zigor Ojinaga joined Iberdrola Distribucion (IBDE) in 1997 and has worked in different distribution areas, such as, Remote Control Systems (SCADA, DMS) and MV automation. Since 2009 he has been technical responsible of the Star project, an ambitious deployment that has successfully transformed technology in the field of Smart Grids. He is currently leading the definition of the Substation Automation System within the Processes & Technologies department at IBDE.



**Priyanka Mohapatra**  
Senior Project Manager  
**SP Energy Networks**

Priyanka Mohapatra is currently working as RIIO T2 Innovation Lead at SP Energy Networks. She previously led, and was involved in, the conceptualisation of several innovation projects enhancing grid observability, controllability and standardisation of digital technologies. Prior to joining SPEN, Priyanka was working with Siemens AG for 8 years. She started at Siemens Ltd., India as an electrical engineer before moving to Siemens AG Global R&D, Germany working as a software developer and project manager for SCADA, EMS, DMS systems. She then worked with Siemens Protection Devices Ltd., UK as a product owner and senior engineer designing and developing protection devices. Priyanka holds a B.Tech in Electrical Engineering and an MSc. in Renewable Energy Systems Technology.



**René Troost**  
Specialist AM Network Intelligence  
**Stedin**

René Troost, graduated as an Electrical Engineer, and started his career in Telecommunications. He has an extended experience of over ten years in the modern Substation Automation business. In 2014 René joined Stedin, the DSO in the Rotterdam, The Hague, Utrecht area of The Netherlands. René oversees the Substation Automation policy at Stedin and is an active member of the Dutch mirror committee of the IEC TC57 (NEC57) and the TC57 WG10 dealing with power system IED communication and associated data models. He is an expert in the domains of Protection, Automation, Control and Telecommunication and fulfils several roles.



**Nikolay Ignatovski**  
Automation Engineer  
**Electricity System Operator Bulgaria**

Nikolay Ignatovski received his MS degree in Electrical Engineering and Automatics from the Technical University in Sofia, Bulgaria. He has more than 15 years' experience in the maintenance and testing of operation, control and protection equipment in power distribution and transmission substations in Bulgaria. In 2001, he started to work as Relay protection and Automation engineer and later he joined the Distribution network operating regimes analysis group at the Sofia city DSO Company. In 2007, he became a member of the "Electrical Power Substations Operation & Maintenance" department at the Bulgarian TSO company "ESO" EAD where he worked as a Power transmission engineer. From 2012, he works as an engineer in Automation - substation automation systems in the TSO's National Dispatching Center.



**Anne van der Molen**  
Technology Officer  
**Stedin**

Anne van der Molen is grid strategist for the Dutch DSO Stedin He joined Stedin in 2011

to help develop Stedin's emergence as digital DSO. In the past five years, he has been involved in strategy planning and asset management, distribution automation programs and programs around digital asset lifecycle management, analytics and digital grid operations. Anne has represented Stedin in several national task forces and is member of EDSO's technology committee. Previously, Anne worked as solution manager and strategic product manager for a major telecoms equipment and services company. He holds a Msc degree in Electrical Engineering.



**Nicholas Etherden**  
Senior R&D Engineer  
**Vattenfall Distribution Nordic**

Nicholas Etherden works at Vattenfall in Stockholm, Sweden as senior R&D engineer. He is a specialist in power utility automation and renewable energy generation. He has an MSc in Engineering Physics from Uppsala University, 2001 and a PhD in Electric Power Engineering from Luleå University of Technology, Sweden, 2014. He has 15 years' experience as relay application engineer at ABB and consultant at ABB subsidiary STRI. Nicholas is also convener of the IEC Technical Committee 88 working group 25 that maintains the variant of IEC 61850 used in the wind domain.



**Anders Johnsson**  
Power System Specialist  
**Vattenfall Distribution Nordic**

Anders Johnsson has more than 20 years' experience in substation automation, with a focus on IEC 61850 communication. He is the Swedish representative in Cigré study committee B5 Protection and Automation as well as in IEC TC57 and earlier also as convener of TC88/TC57 joint working group 25 that develops IEC 61850-based standards for wind power. Since 2015 he has, as Power System Specialist at Vattenfall Eldistribution, a coordinating role in the roll-out of a tool-based process based on IEC 61850. Anders Johnsson has a Master of Science in Electrical Engineering from the Royal Institute of Technology in Stockholm."



**Abhinav Sadu**  
Research Associate  
**E.ON Energy Research Centre**

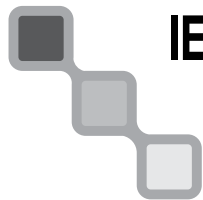
Abhinav Sadu received his M.S. degree in electrical engineering and information technology from RWTH Aachen University, Aachen, Germany in 2014, where he is currently working toward his Ph.D. degree with the Institute for Automation of Complex Power Systems, E.ON Energy Research Center. Abhinav is currently employed as Research Associate at E.ON Energy Research Centre, RWTH Aachen. His current research interests include design of monitoring and automation systems for active distribution grids, IEC 61850 based automation, grid resiliency studies and modelling of complex power systems.



**Sander Jansen**  
Data Architect  
**Alliander**

At the Alliander IT department, Sander takes a role as data architect and is involved in the use of IEC CIM and IEC 61850. Sander had multiple positions within Alliander on the edge of electrical technology and IT/OT. Being a strong open source believer, Sander consults in the use of open source within the energy world. He is convinced that open source can help to make the energy grid more reliable, innovative, secure, flexible and sustainable, all resulting in a lower cost for society.





**IEC 61850**  
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**Exhibitors:** the exhibition is located in the networking and catering area alongside the conference room to ensure maximum footfall and visibility for all exhibitors. Each exhibitor will be allocated a 3m x 2m space with table, 2 chairs, power sockets and WiFi access. The exact location of each exhibitor will be determined 4 weeks Terms

& Conditions prior to the conference.

Exhibitor set-up commences at 7am on the first day of the conference, and break-down takes place after 4pm on the last day of the conference. Exhibitor packages include 2 conference passes. Additional passes may be purchased at 10% discount on the published rates.

**Cancellations:** regretfully cancellations cannot be facilitated but transfer to a future conference is permissible. We will provide the speaker presentation materials to any delegate who has paid but is unable to attend for any reason. If we have to cancel an event for any reason, we will make a full refund immediately, but disclaim any further liability.

**Alterations:** it may be necessary for us to make alterations to the content, speakers, timing, venue or date of the event compared with the original programme.

**Data Protection:** Phoenix Forums gathers personal data in accordance with the UK Data Protection Act 1998 and we may use this to contact you by post, email, telephone, fax, sms to tell you about other products and services. We may also share your data with carefully selected third parties offering complementary products or services. If you do not wish to receive information about other Phoenix Forums events or products from selected third parties please write to us at: [database@phoenix-forums.com](mailto:database@phoenix-forums.com)