

MASTER CLASS IN IEC 61850 SYSTEMS COMMISSIONING AND MAINTENANCE TESTING



MASTER CLASS OBJECTIVES

The objective of this course is for participants to learn:

- How to safely, reliably and efficiently test, commission, place into service and maintain protection and automation systems based on IEC 61850.
- How to:
 - Validate the substation protection and automation system against stakeholder requirements.
 - Verify that the substation protection and automation system meets the design intent.
- How to work in a multi-vendor environment using test tools and equipment from different suppliers.
- How to verify and validate IEC 61850 GOOSE message functionality and timing used in primary plant protection schemes and System Integrity Protection Schemes (SIPs).
- How to verify and validate high availability substation Ethernet network architectures.
- How to verify and validate local and Master Station SCADA functionality based on IEC 61850 MMS.
- How to verify and validate time synchronisation schemes.
- About the various requirements for protection scheme isolations and how these are impacted by the use of IEC 61850 GOOSE messages for inter-tripping between devices.
- How IEC 61850 configuration files are managed using the Substation Configuration Language (SCL) and how configuration management and version control impacts verification and validation.
- About the typical design inputs of an integrated IEC 61850 substation protection and automation system and how these relate to verification and validation.
- How to informatively witness, inspect and vet other companies IEC 61850 based installations.



PRESENTERS

James Stokes is the Director of Jarrah Solutions Pty Ltd, a company specialising in Engineering and technology solutions. James graduated from the University of Western Australia with a first class honours Bachelor of Electrical and Electronic Engineering. James has over 18 years of power industry experience; working in private and public sectors across transmission, distribution, power generation, oil & gas and water treatment. As Principal Engineer at Western Power, James led the introduction of IEC 61850 into transmission substations from business case writing to on-site commissioning. James is a member of Australian Standards Technical Committee EL-050 "Power System Control and Communications."

Pascal Schaub is the Director of D.T. Partners Pty Ltd, a specialist provider of products and consultancy services in the domains of substation and grid automation. Pascal received a Bachelor degree in Computer Science from the University of Applied Sciences and Arts North-Western Switzerland. Pascal has over 20 years of experience in the electricity industry, having worked in research and development of substation automation product and the design and commissioning of substation automation solutions based on IEC 61850. Pascal is a member of Standards Australia Technical Committee EL-050 "Power System Control and Communications" and the international Working Group IEC/TC57 WG10 "Power System IED Communication and Associated Data Models."



TARGET AUDIENCE

This Master Class is designed for Engineers and Technical Officers that are involved in either the scoping, design, vetting, commissioning, testing, maintenance or operation of power system protection and automation systems. Due to the course content, participants are expected to bring more than four years of substation protection, SCADA or control systems related experience.





COURSE OUTLINE

The international standard IEC 61850 'Communication and Systems for Power Utility Automation' is revolutionising the world of electrical power systems. IEC 61850 enables business improvements by defining standardised methods of communication between devices. New integrated systems are being built from multi-vendor products, networked together to perform high criticality protection, monitoring, automation, metering and control functions. A number of major Australian power utilities and large industrial customers have now placed into service new IEC 61850 based substation protection and automation systems; many more are currently being developed.

This Master Class will provide participants with a working knowledge of how to verify and validate IEC 61850 based systems and solutions based on today's technology, demonstrated with today's products.

Demonstrations will be performed using a multi-vendor test rack and independent test tools. These demonstrations will supplement course material to help participants learn how to safely, reliably and efficiently verify and validate IEC 61850 based systems. The test system will consist of protection relays from different vendors communicating with a SCADA HMI and Gateway over an Ethernet network.

As the course is based on current working technology, it will be limited to IEC 61850 Edition 1 and 'Station Bus' only. 'Sampled Values' and 'Process Bus' will be outside of the scope of this Master Class. The presenters, from opposite sides of the country, have independently led the creation and implementation of IEC 61850 substation systems. Real life experiences will be shared with the participants to show how IEC 61850 can provide a real and working substation protection, automation and control system.

COURSE PRICE

\$1450 + GST for API members.

\$1750 + GST for non-API members.

Course fees include catering and course material.

COURSE DATE

The course will be held in the following cities with the following dates:

Brisbane – THU/FRI 27th & 28th November

Sydney – MON/TUE 1st & 2nd December

Melbourne – THU/FRI 4th and 5th December

Perth – THU/FRI 11th + 12th December

Adelaide – MON/TUE 15th + 16th December

COURSE NUMBERS

Each Master Class will have a minimum of 12 participants and up to a maximum of 30 participants.

AGENDA

Start	Finish	Day 1 – Theory	Day 2 – Practical
8:00	8:15	Welcome & Introduction	Welcome & Introduction
8:15	9:15	Systems approach to testing	GOOSE timing testing
9:15	10:15	Risk management approach to testing	GOOSE isolations & functioning
10:15	10:30	Morning Tea	Morning Tea
10:30	11:30	IEC 61850 and Ethernet theory	Ethernet network testing
11:30	12:30	IEC 61850 design documentation	SCADA and time sync testing
12:30	1:30	Lunch	Lunch
1:30	2:15	GOOSE configuration and mappings	Whole of system demo
2:15	3:00	Ethernet network impacts	Whole of system demo
3:00	3:15	Aternoon Tea	Aternoon Tea
3:15	4:00	Test tools and equipment	Workshop/interactive session
4:00	4:45	Test documentation	Workshop/interactive session

TESTIMONIALS

From previous Master Class on IEC 61850 Systems Integration

91% of participants stated they would be extremely likely to recommend this course to their colleagues.

“This Master Class covered a broad spectrum of technical knowledge. The case studies were practical and the presenters were great facilitators. I strongly recommend these courses.”

“A fast paced intensive course led by well-spoken, experienced engineers. I am very grateful for them sharing personal experiences with design insights with implementation of 61850 systems.”

“Outstanding course! The presenters had a very high level of technical expertise and a fantastic presentation style.”

REGISTRATION, ACCOMMODATION AND FURTHER INFORMATION

Registration available from Engineering Education Australia (EEA) Website at www.eeaust.com.au (www.eeaust.com.au/API-IEC61850-Systems)

Accommodation if required is the responsibility of participants.

Technical Enquiries on course content may be addressed to Australia Power Institute (API) Chief Executive, Mike Griffin, mgriffin@caloundra.net.au