

4 DAYS IEC 61850 COURSE

WITH PRACTICAL DEMONSTRATIONS AND HANDS ON

MR. KARLHEINZ SCHWARZ (NETTEDAUTOMATION), MR. ANDREA BONETTI (FMTP)

With focus on protection and control in HV/MV substations
using GOOSE, SV, SCADA and SCL Language

All the presentations are supported by practical examples or demonstrations.

Please note: The following Program blocs may be re-dispatched at different time during the week.

The training schedule is from 9:00 to 17:30, Morning break 11:00 Lunch 13:00 to 14:00, afternoon break 15:30

Detailed Program:





	<p>Registration Welcome and introduction to the seminar. Presentation of the teachers and organizations.</p>
<p>A1 02:00 (Karlheinz Schwarz)</p>	<p>Smart Grid and IEC 61850 Status of Smart Grid Role of the Communication Structure in Smart Grid systems Role of IEC 61850 in Smart Grid systems</p>
<p>A2 04:30 (Karlheinz Schwarz)</p>	<p>Introduction to the IEC 61850 standard Introduction of basic concepts (information modeling, information models, information exchange, system configuration) History of the Standard: from the 90's to 2016 Structure of the IEC 61850 standard documentation, Edition 1, Edition 2, Edition 2.1, Edition 3... Lessons learned and what to expect in the near future</p> <p>Basics of IEC 61850 mapping and modelling, SCL language Modelling concept in IEC 61850, Logical Nodes, Logical Devices, SCL language, types of SCL files, type of IEC 61850 documents (PICS, PIXIT...).</p> <p>Communication services GOOSE, SV, File Exchange: Protocol understanding and encoding</p>
<p>A3 03:30 (Karlheinz Schwarz)</p>	<p>IEC 61850 Vertical Communication, Client/Server Communication services MMS, COMMANDS, REPORTS: Protocol understanding and encoding. Network analysis Testing Client/Server Publisher/Subscriber. Vertical communication, "engineering of SCADA System". Importance of event driven reporting. Signal list to the System. Report Control blocks. Communication between substations and remote control (IEC 60870-5-104, DNP3)</p>

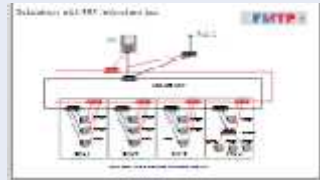
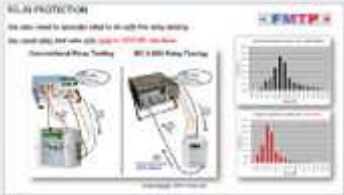
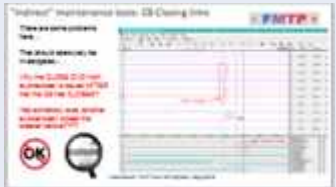




and
SCADA
center

**Lima, NM Lima Hotel, Av. Pardo y Aliaga N° 330,
 San Isidro 15073
 Del 27 al 30 de Noviembre del 2017.
 Horario: De 09:00 a 17:30 horas.**

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	<p>How to build and configure Gateways from IEC 61850 to IEC 60870-5-104</p>
<p>A4 1:30 (Karlheinz Schwarz)</p>	<p>Group Practical Exercise. Participants will have a chance to run practical exercises of IEC 61850 modelling, reporting, logging, retrieving self-description etc. An evaluation package will be provided to every participant in advance to the training course. This training requires a Windows PC with .net framework and the possibility to install and run communication software. We will help to install and run the package onsite (e.g., immediately after closing the first course day).</p> <p>SCL Language in details. Fundamentals of the SCL Language. cases for SCL language Different types of SCL files</p>
<p>A5 2:30 (Karlheinz Schwarz)</p>	<p>Use</p> 
<p>B1 2:30 (Andrea Bonetti)</p>	<p>Impact of IEC 61850 Standard on Substation Automation Protection and Control. Substation automation protection and control philosophy, vertical (MMS) and horizontal communication (GOOSE, SV), protection schemes, interlocking. 61850 engineering process.</p> 
<p>B2 3:00 (Andrea Bonetti)</p>	<p>Real time performances for protection schemes, horizontal communication. Different types of GOOSE messages for different types "substation signals." Protection security and dependability with IEC 61850 GOOSE and conventional technologies. What is important to remember to specify.</p>  <p>of</p>
<p>B3 2:30 (Andrea Bonetti)</p>	<p>Process Bus and implications for the protection community Process Bus (sampled values) today and expectations for the future. Interoperability, responsibility and testability. The role of different IEC committees: IEC TC 57 (Power systems management and associated information exchange), TC 95 (Measuring relays and protection equipment) and TC 38 (Instrument transformers).</p>  <p>Groups Practical Exercise. Investigate on process bus SV Streams. Understand time synchronization of the Merging Units</p>

<p>B4 1:30 (Andrea Bonetti)</p>	<p>IEC 61850 Network topologies and redundancy Redundancy YES or NO? When? PRP, HSR Examples from today's substations</p> <p>IEC 61850 Network topologies Communication Study Communication study to assist the design and validate the Quality of Service of the network topology. Network Study for Communication in the substation and between substations</p>		<p>RSTP,</p>
<p>B5 3:00 (Andrea Bonetti)</p>	<p>IEC 61850 Testing for commissioning and maintenance activities. Which kind of test equipment are available, test tools, use them. PROs and CONS, Feedback from IEC 61850 tests in substations.</p> <p>Group Practical Exercise. Measure the response time of protection schemes with messages.</p> <p>Interoperability problems and solutions. Feedback from commissioning activities in the substations: which types of problems have been met, how they have been discovered and which solutions have been found.</p> <p>Group Practical Exercise. Investigate (and solve) an interoperability problem in communication scheme</p> <p>Disturbance Recorder Logical Node. Maintenance substation tests based on post-fault</p>	 	<p>how to FAT</p> <p>GOOSE</p> <p>GOOSE</p> <p>analysis</p>
<p>B6 2:30 (Andrea Bonetti)</p>	<p>Engineering process with third party IEC 61850 Engineering Tools Specification process Top Down Engineering Bottom Up Engineering</p>		
<p>B8 1:30 (Andrea Bonetti)</p>	<p>Real time testing of power systems in IEC 61850 environment Introduction about OPAL-RT Real-time application and IED loop testing</p>		<p>closed-</p>
<p>Question & Answer time Discussion Forum End of the Seminar</p>			

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