ROD HUGHES Consulting

IEC 61850 Training

Essential Technology – 2 Days Course

23-24 March 2013

Location: LE Meridein Hotel-khobar – Saudi Arabia

جاسو JASO

Realize the Benefits of IEC 61850

Course Overview: IEC 61850 is now the essential standard for substation engineering and systems deployment. It can significantly reduce labor intensive engineering and commissioning processes and eliminate extensive risks through the introduction of Reusable and Reliable Engineering. Furthermore it is a key Standard for the deployment of Smart Grids, distributed Renewable Energy Resources, Hydro plants, Wind Farms, Solar Systems and Electric Vehicles. The technology even applies to domains such as water, gas and even industrial process control systems.

As more than just a "mere communication protocol", IEC 61850 also defines function data structures, commands, engineering methods and processes. It also defines the different types of IEC 61850 communication protocols available within the Standard that must be chosen correctly to achieve different aspects of building a complete system.

It is a complete new jargon and process of engineering which must be fully understood as to what the Standard is, what it is not, the principles and intent of the Standard before more detailed application of the Standard can be considered.

This 2 days course will go thoroughly into the technical aspects of IEC 61850 as essential pre-requisite knowledge to the ability to undertake more detailed training of how to apply that knowledge.

Outcomes of this course are that attendees will understand

- The correct intent and use of the Standard,
- What is required to correctly specify equipment and systems
- What it means to and is required to implement a design throughout the engineering process,
- What is not included in the IEC 61850 engineering process
- What it means to choose architectures
- What it means to choose data models
- What it means to choose different types of IEC 61850 communication.
- What product Conformance Certificates mean (and more importantly does NOT mean),
- What is the considerations for function creation using IEC 61850 objects and communication
- What is required for operational mechanisms in service
- What is required for maintenance and testing of IEC61850 based systems and hybrid IEC 61850-wire based systems
- What is required in organizational and project deployment programs
- What migration paths are available now
- What consideration of future migration/enhancement paths must be incorporated now

Who Should Attend?

This course is designed for:

- Utility P&C Engineers
- System Integrators, Consultants
- Maintenance Staff
- Substation Automation Designers
- Commissioning Engineers

Instructor: Rodney Hughes

Registeration Fees

- **$ 2850** per Sear before 15th of Jan, 2013
- **$ 3000** per Seat before 27th of Feb, 2013
- **$ 3300** per Seat after 27th of Feb, 2013
- **Final Registration**: 15th of March 2013.
- **Payment Terms:** 100% in Advance
- **Payment Method: T/T 100% in Advance to:**
  Beneficiary : شركة جاسو المحدودة للصناعات والمقاولات والتجارة

  Or: JASO Limited For Industry Contracting And Trading
- **Beneficiary IBAN:** SA0380000513608010019552
- **Bank Name & Address**: AlRajhi Bank, Dammam, KSA

For Registration send email to
Fadi: busmgr@jaso.com.sa or
Call:+966555013732

Instructor Background

Rod is Managing Director of Rod Hughes Consulting Pty Ltd based in Australia and has thirty years' experience in the Australian and international power industry. He is a protection engineer who is well known for his experience in providing leading industry training courses over many years and thought leadership within Australia on IEC 61850 for more than 8 years.

Rod brings a deep knowledge of advanced substation secondary systems associated with 'conventional' technology combined with the enthusiasm to enable the organizational change required to successfully deploy new technology. He has over 30 years' experience covering strategic concept through to detailed implementations in all areas of transmission, distribution and generation. He has worked with leading power system equipment vendors up to senior management roles in Australia and Europe; has been responsible for all engineering specifications for an Australian transmission utility and has been commercially responsible for consulting inside and outside of the power industry covering civil, structural and environmental engineering. These combinations giving him an exceptional balanced perspective of power system asset management and development.

Course Topics

1. **Overview**
    a. Objectives
    b. Benefits
2. **IEC 61850 Fundamentals**
    a. SCADA vs. SAS (more than DNP3)
    b. Using the whole Standard – understanding each part
    c. What is Logical Node and associated elements
        i. LN Groups and names
        ii. Common LN items
        iii. LLN0
        iv. Data Objects
        v. Attributes
        vi. Common Data Classes
        vii. Say No to GGIO
        viii. Logical Devices
    d. What is GOOSE & what to use it for
    e. Sample Values
    f. Merging Units and NCIT
    g. ACSI
    h. Understanding Compliance vs. Interoperability
    i. Beyond just substation protection & control
3. **SCL Engineering**
    a. Creating and using SSD/SCD/CID/IID/ICD/SED files
        i. Vendor-centric bottom up
        ii. System-centric top-down
    b. System specification
    c. IED Specification
        i. Meaning and Use Conformance Certificates
        ii. PICS, MICS, PiXIT
    d. Re-usable Engineering
    e. Datasets
    f. Commands
    g. Reports
4. **Function implementation and modeling**
    a. Protection – O/C, Rev Block, Distance, Diff, CBF, PTRC
    b. SCADA
    c. Control
    d. Automation – VR, A/R, Synchrocheck
    e. Condition Monitoring
    f. Substation Metering & Recording
    g. Smart Grid domain applications
        i. Wind Farm
        ii. Hydro
        iii. Distributed Energy Resources
        iv. Electric Vehicles
        v. Photo-voltaic
        vi. Revenue Metering and Billing

5. **The Ethernet Substation**
    a. Architectural Considerations
        i. Duplication vs. Redundancy
        ii. Complying with National Electricity Rules
        iii. Star/Ring
        iv. RSTP
        v. PRP
        vi. HSR
        vii. VLAN
        viii. Priority Tag
    b. Security vs. Operation
    c. Time Synchronization
    d. Testing IEC 61850 systems
6. **Organizational Development Activity**
    a. Intellectual Property – policies, specifications, standardization
    b. Intellectual Capability – tools, processes, documentation
    c. Intellectual Capacity – training and roll out
    d. SAS scope evolution – technology impact plans

About Rod Hughes Consulting:

Substation engineering is facing some of its greatest challenges:

- Increased number of projects to meet demand growth and new renewable energy sources
- Increased requirements for flexible and innovative automation and control solutions
- Decreasing life of automation equipment in the substation
- Skills shortage and faster turnover of staff career duration

To meet these challenges Rod Hughes Consulting offers you a pathway for your organization to do what it has traditionally done (utility, contractor, consultant, vendor) but in an exciting and dynamic new way in what we have coined as:

"More, Faster, Less, Less, Higher, Lower"

More projects, **Faster** time frame, **Less** money, **Less** resources, **Higher** reliability, **Lower** operational cost.

About JASO Ltd:

Jaso Ltd is an industrial services provider located in Al-Khobar city on the eastern coast of Saudi Arabia. Jaso Ltd offers extensive network of control and automation systems such as Programmable logic controllers, Distributed Control Systems, Supervisory Control and Data Acquisition System and Substation automation solutions; in addition to the experienced training programs by partnering with world class trainers around the world in the fields of IEC 61850, Solar Energy, and Smart Grid Solutions.

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