EES-UETP
Electric Energy Systems

EES-UETP Course on:

IEC 61850 and Interoperability in SmartGrid

Organized by:

School of Electrical Engineering

KTH, Royal Institute of Technology, Stockholm

11-13 June 2012

Course coordinators:
Professor Lars Nordström
Dr. Arshad Saleem

Introduction

The development towards a sustainable energy system in the electric power industry has led to the emergence of a set of market models and new concepts for optimized operation and control of power systems, e.g. Virtual Power Plants and Microgrid. In these new concepts, the traditional stakeholders are complemented by new actors that take roles such as aggregator, prosumer, dispatchable load etc. Common to all these concepts is that they assume a more flexible and loosely coupled ICT system architecture. In such architectures, ICT components communicate to implement optimization, control and protection functions.
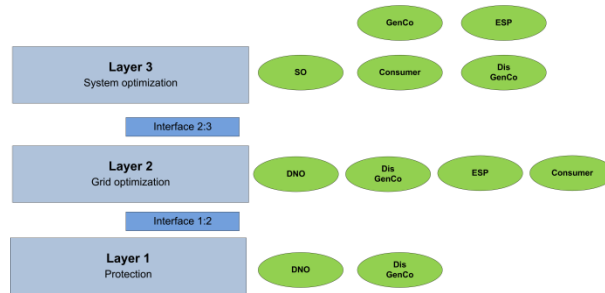

Figure1: layers with actors and stake holders in the Smartgrid

Interoperability is a necessary pre-requisite for such an environment. While standards are a fundamental mean, and provide necessary ingredients they are not sufficient for achieving interoperability. Challenges include insufficient specifications, alternate options for implementation, vendor specific tools, difficulty in cross standard harmonization, integration with high level control and automation systems and steep learning curves for the workforce.

This course will provide fundamental knowledge to the interoperability issues in the Smartgrid, introduction to state of the art systems and technologies, and hands-on practice with relevant industry standard tools.

Aims and Objectives

- Have an introduction and understanding of Interoperability issues in the Smartgrid
- Introduction to the state of the art systems, methodologies and frameworks for interoperability in the Smartgrid
- To perform hands-on practice and exercises on interoperability solutions in IEC 61850 based industry standard automation and control systems

    o Hands on IEC 61850 substation automation systems with introduction to software tools and IEDs
    o Interoperability in 61850 based environments with multi-vendor IEDs
    o Interoperability in 61850 based advanced Smartgrid use cases
    o KTH LAB hands-on/demo
- Overview and introduction to leading research projects in the field

Course Schedule and Instructors

Day 1, 11 June	
8:30 – 09:30 Registration + coffee + welcome	09: 30 – 11:00 Smartgrid Interoperability, challenges and solutions European and International activities Short introduction to activities at KTH **Professor Lars Nordström, KTH Sweden**
11:00 – 12:30 IEC 61850 Technical overview **Karlheinz Schwarz, Netted Automation Germany**	12:30 – 13:30 Lunch
13:30 – 15:30 IEC 61850 and CIM harmonization based on OPC-UA data integration layer **Dr. Mathias Uslar, OFFIS Germany**	15:30 – 15:45 Coffee break
15:45 – 17:30 IEC 61850 and CIM harmonization, Industrial perspective **Lars-Ola Österlund, ABB Sweden**	
Day 2, 12 June	
09:00 – 10:30 IEC 61850 applications overview, review of tools and technologies and demonostration **Karlheinz Schwarz, Netted Automation Germany**	10:30 – 12:00 Technologies and methodologies for testing in IEC 61850 based environments **Andrea Bonetti, Megger Sweden**
12:00 – 1300 Lunch	13:00 – 16:30 hands-on exercises and LAB demonstrations • IEC 61850 based substation design and IED configurations • Interoperability in IEC 61850 multivendor IED environments • Real time integration of multiagent based control system in IEC 61850 environement **Karlheinz Schwarz, Netted Automation Germany** **Arshad Saleem, Yiming WU, Nicholas Honeth, KTH Sweden**

16:30 – 21:00
Social program and course dinner

Day 3, 13 June	
9:00 – 10:15 Performance assessment of IEC 61850 based protection schemas **Professor Peter Crossley, University of Manchester, UK**	10:15 – 10:30 Refreshment break
10:30—12:30 Case study of IEC 61850 related activities in NZ, standardization, implementation and infrastructure **Dr. Nirmal-Kumar C.Nair, University of Auckland New Zealand**	12:30 – 13:30 Lunch
13:30—15:00 Virtual power plant for smart electric vehicle chrging based on IEC 61850 VPP server **Dr. Qiuwei Wu and Anders Bro Pedersen** **Technical University of Denmark**	15:00 – 17:00 IEC 61850 based substation implementation experiences and study visit to substation **Vattenfall Sweden**

| 17:00 – 17:15 |
|---|
| **Course wrap-up at KTH** |

Locatoin and Travel Information

By taxi:
You can go to KTH from Arlanda Airport directly with a taxi. It will take around 30 minutes and cost about 500 SEK.
or via Stockholm Central Station with:
By Airport coach (40 minutes): http://www.flygbussarna.se/
By Express trian: (20 minutes): www.arlandaexpress.se
By subway. If travelling by subway, go to the station Tekniska Högskolan/stra Station (red line towards Mörby Centrum from T-centralen). Exit the subway towards Östra Station and walk up Drottning Kristinas väg for approximately five minutes.
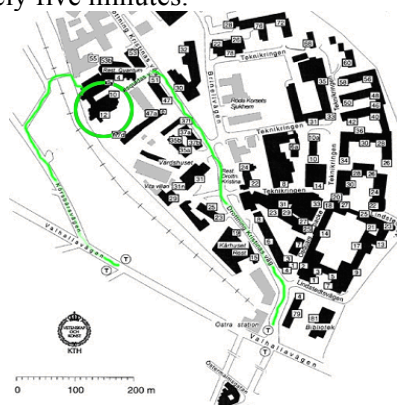
Accomodations

We recommend following hotels for conference participants.

1: *Elite Hotel Arcadia* **(very close to KTH campus, 5 minutes walk)**

Körsbärsvägen1

114 23 STOCKHOLM

Phone: 0046 771-78 87 89

Web: www.elite.se/sv/hotell/stockholm/arcadia

2: *Scandic Hotel Park* **(Close to KTH campus and city)**

Karlavägen 43

114 31 STOCKHOLM

Phone: 0046 851- 75 17 00

Web: www.scandic.se

3: *Crystal Plaza Hotel* **(Central location in the city)**

Birger Jarlsgatan 35

111 45 STOCKHOLM

Phone: 0046 840- 68 8 00

Web: www.crystalplazahotel.se

Course Fee and Payment

Course Fees:

Following are the fees for course:

- Members of the EES-UETP: 367.50 EUR
- University non members of the EES-UETP: 900 EUR
- Industry non members of the EES-UETP: 1500 EUR

Course fees will include lectures, course aids (lectures on CDs, leaflets, brochures, etc.), coffee breaks, three lunches and a dinner in a restaurant (12 June 2012). A receipt will be given to each registered participant during the Course. Payments are requested before the beginning of the Course.

Payment detail:

Bank: Nordea Bank AB Stockholm
IBAN no: SE05 9500 0099 6034 0015 6539
Account no: 156 53-9
SWIFT address: NDEASESS
Org no: EH/1516
Account holder: KTH Royal Institute of Technology

Note1: Participants must provide to course Secretariat the proof of course fees bank payment (i.e. invoice) by fax not later than 2 week before the starting date of the Course.

Note2: Due to practical requirements for hands-on sessions the number of seats in the course is limited. Registration will be done on *first-come* priority basis.

Registration Form of Participants

Please fill out and send the following form to the course secretariat:
Annica Johannesson

Email: annica.johannesson@ics.kth.se
Phone: 0046 8790 6930
Any queries regarding payment should also be sent to the above address.

Participant Name		
Organization Name		
Organization Type	University:	Compnay:
EES-UETP membership	Yes:	No:
Participant Position		
Participant main job functins		
Address		
Phone		
Fax		
Email		
Fees to be paid		
Signature		

Course Organization secretariat and addresses:

Dr. Arshad Saleem
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