



CONSEIL INTERNATIONAL DES GRANDS RÉSEAUX ÉLECTRIQUES  
INTERNATIONAL COUNCIL ON LARGE ELECTRIC SYSTEMS

**STUDY COMMITTEE D2**  
INFORMATION SYSTEMS AND TELECOMMUNICATION

# Study Committee D2 Annual Report 2010

Mr. Maurizio MONTI – SC D2 Secretary

## STRATEGIC DIRECTION

SC D2 mission is:

- to facilitate and promote the progress of engineering and the international exchange of information and knowledge in the field of information systems and telecommunications for power systems;
- to add value to this information and knowledge by means of synthesizing state-of-the-art practices and drawing recommendations.

The Strategic Plan (2007-2016) defines the organization of the SC D2 to cope with the following objectives:

- To be more customer oriented;
- To foster the participation in the working bodies;
- To be well balanced between information systems, telecommunications, telecontrol and automation;
- To draw the interest of the customers for the work done in the SC.

SC D2 publications issued in 2010 were as follows:

- One Paper published in Electra:
  - 2009 SC D2 Colloquium General Report – August 2010.
- Four Technical Brochures:
  - TB 419 - WGD2.22 – “Treatment of Information Security for Electric Power Utilities (EPUs)” – June 2010.
  - WGD2.23 – “The use of Ethernet Technology in the Power Utility Environment”, approved by SC D2 and in publication process.
  - WGD2.24 – “EMS for the 21<sup>st</sup> Century – System Requirements”, approved by SC D2 and in publication process.
  - WGD2.26 – “Telecommunication Service Provisioning and Delivery in the Electrical Power Utility”, approved by SC D2 and in publication process.

The Preferential Subjects of the 2010 SC D2 Paris Session were:

- **“Practical Implementation of IEC 61850 in Electric Power Systems”**:
  - ✓ Advantages for implementation outside the substation;
  - ✓ Impact on substation automation (security, WiFi, teleprotection requirements);
  - ✓ Architecture and information technology aspects between substation automation and remote communication;
  - ✓ Communication needs for system protection schemes and wide area measurements (WAMS).
- **“Information and Information Technology (IT) security for electric power utilities (EPUs)”**:
  - ✓ Convergence of physical and logical security;
  - ✓ Frameworks for management of information security;
  - ✓ Cyber security for SCADA systems;
  - ✓ Assessment and management of the risk in information and IT security.

The first preferential subject was dealt within a common session with SC B5 “Protection and Automation”. This common session attracted more than 200 persons and highly interesting discussions were held on the future of IEC 61850 not only within substation but also outside substations.

The second preferential subject was more focusing on SC D2 activities; this session attracted more than 100 persons. Spontaneous contributions enabled to have a very interesting session.

## TECHNICAL ACTIVITIES

### INTERNET AND INFORMATION SYSTEMS

#### Metering, Revenue Protection, Billing and CRM/CIS functions

Metering, Billing and CRM are important functions in the liberalized electricity market process. Metering and billing were already basic functions for the electricity supply chain before the liberalization, while CRM in his complete functionality entered in this sector since the market opening.

WGD2.18, “**Metering, Revenue Protection, Billing and CRM/CIS functions**”, carried out:

- A bibliographic investigation on “Standards and Recommendations, State of the Art, Practices and Trends” (more than 50 reviewed documents);
- The drafting and analysis of a technical questionnaire;
- The drafting of the Technical Brochure.

The Technical Brochure should be finalized by the end of 2010 and submitted to SC D2 for approval early 2011.

#### Treatment of Information Security for Electric Power utilities (EPUs)

The scope of work of WGD2.22, “**Treatment of Information Security for Electric Power utilities (EPUs)**”, is to study the following three items, striving towards a common understanding and terminology for handling of information security:

- Frameworks for EPUs on how to manage information security.
- Risk assessment: Common models and methods for treating vulnerabilities, threats and attacks.
- Security technologies for SCADA/control systems including real time control networks.

Intermediate deliveries were published as separate papers in Electra and the final Technical Brochure was approved at the 2010 SC D2 Regular Meeting.

Following the publication of the Technical Brochure, AGD2.01 supported the creation of a new WG to carry out the following activity, “**Security Architecture Principles for Digital Systems in Electric Power Utilities (EPUs)**”. The scope of this work should deal with general Security Architecture principles for digital systems, but should also focus on certain aspects:

- Defence in Depth and Graded Approach methodology (zoning principles) in EPUs.
- Smart Grid relevant Security Architecture principles.
- Developments of Security Architecture for digital systems in regards to upcoming threats scenarios as well as business demands.
- Supporting technical control structure of the Information Security Architecture.

#### EMS Architectures for the 21<sup>st</sup> Century

The scope of work of WGD2.24, “**EMS Architectures for the 21<sup>st</sup> Century**”, is to:

- Develop the vision for the architecture of the next generation of Energy Management and Market Management Systems.
- Gain broad adoption by the industry, and in particular to draft a road map for the vendors of SCADA/EMS/MMS.

The Technical Brochure on System Requirements has been drafted and was approved by SC D2. However, work on SCADA/EMS/MMS systems is not finished and further investigations will be carried out within the AGD2.01 “**Information Systems**” to assess the issues of most concerns.

## TRANSMISSION MEDIA AND TECHNIQUES

### Telecommunication Networks, Services and Technology

The mission of Advisory Group, AGD2.03 “**Telecommunication Networks, Services and Technology**”, is to monitor these technologies and to foresee its possible use and impact on power utilities.

AGD2.03 has identified the following potential issues of concerns:

- Telecom Service Delivery Model, Architecture, Management and Support in the Electrical Power Utility;
- Power Line Carrier Channel Modelling, Planning and Usage;
- Communications for HV Substation Protection & Wide Area Protection Applications;
- Communication Architecture for IP-based Substation Applications;
- Communication access to Electrical Energy Consumers and Producers.

Five Working Groups have been formed in 2009 and since then AGD2.03 ensured:

- The WGs activities coordination;
- The review with WG Conveners of their scope of work for mutual apprehension;
- The review of possible domains of interaction and/or of cooperation

WGD2.23, “**The use of Ethernet Technology in the Power Utility environment**”, finalised its work by drafting a Technical Brochure on the concept of Ethernet, both as an access interface and as a network service. This Technical Brochure explores new opportunities and applications of Ethernet technology as well as in substation environment (LAN) or in control network (WAN).

The Technical Brochure was approved during SC D2 Regular Meeting.

The scope of work of WGD2.26, “**Telecommunication Service Delivery, Architecture, Management and Support in the Electrical Power Utility**”, is to analyze and to provide a new insight into the delivery of communication services associated with Operational applications of the Electrical Power Utility. Today, more and more applications although not considered as “operational” ones are critical and necessary for operational purposes.

A Technical Brochure is to be drafted by mid 2010 and was approved by SC D2 end of 2010.

As more and more IP-based applications are used in substations, a new Working Group was started in 2009, WGD2.28, “**Communication Architecture for IP-based Substation Applications**” to investigate into the performance requirements of these services, and to organize them into a single coordinated communication architecture covering:

- Existing applications evolving into IP communications (Substation Automation Systems and their extension beyond the perimeter of the substation, TCP/IP SCADA, voice communications, etc.);
- New applications necessitating IP connectivity to the substation (Substation Security and Video surveillance, Substation Asset Condition Monitoring and Management, etc.).

Several utilities have faced severe problems with non-adequate function when installing modern communication and teleprotection systems due to inadequate coordination between Protection and communication equipment. Thus, JWGB5/D2.30, “**Communications for HV Substation Protection & Wide Area Protection Applications**”, was set up and its main objective is to explore the issues related with the correct association of protection and communication equipment and in particular the performance troubles.

The Technical Brochure is to be drafted by the end of 2010.

## Power Line Carrier (PLC)

A lot of work was already achieved within SC D2 on the subject of PLC. However, not so much was carried out related to the modelling.

The scope of work of WGD2.27, “**Power Line Carrier Channel Modeling, Planning and Usage**”, is to review and evaluate the existing modelling work and standards, to focus on PLC securities issues as well as to assess the pros and cons of digital/analogue HV PLC communications.

The Technical Brochure is expected by the end of 2010.

## INDUSTRY DEREGULATION

### Information and Communication Systems in the deregulation of the electricity sector

The scope of work of WGD2.25, “**Information and Communication Systems in the deregulation of the electricity sector**”, was to focus on the impact of deregulation on Information and Communication System in all parts of value chain (generation, transmission, distribution and sales), with a special attention to interfaces between actors.

However, due to the lack of membership within WGD2.25 (only two active members), the initial scope of work was no longer feasible.

It appeared that some subjects are considered as too commercially sensitive to be dealt in within Cigré.

A new Working Group, WGD2.29, “**Communication Access to Electrical Energy Consumers and Producers**”, was created to examine the different solutions for providing communication access to consumer and producer premises in different urban, sub-urban and rural environments with an eclectic approach, through a multi-technology group, allowing to deliver a solution-oriented rather than a technology-focused analysis of the appropriate solutions.

## ADMINISTRATIVE ACTIVITIES

### IMPROVE STUDY COMMITTEE PRACTICES

To adapt SC D2 structure to on-going activities and where necessary “**Restructure Working Groups**” and “**Use of Ad-hoc Groups for Special Tasks**”, the following decisions have been implemented:

- Four WGs having published their work are dismantled:
  - WGD2.22, “Treatment of Information Security for Electric Power Utilities (EPUs)”.
  - WGD2.23, “The Use of Ethernet Technology in the Power Utility environment”.
  - WGD2.24, “EMS Architectures for the 21st Century”.
  - WGD2.26, “Telecom Service Delivery Model, Architecture, Management and Support in the Electrical Power Utility”.
- One dismantled WG as no longer active contribution:
  - WGD2.25, “Information and Communication Systems in the deregulation of the electricity sector”
- One WG was created:
  - WGD2.31, “Security Architecture Principles for Digital Systems in Electric Power Utilities (EPUs)”
- Two Advisory Groups were monitoring the evolutions and the needs of utilities:
  - AGD2.01 “Information Systems”. This Advisory Group is ITS’ users oriented. Its main mission is in particular to monitor the needs and the stakes of the users in their core businesses which are linked with ITS (telecontrol, asset management, customer relationship, etc.);

- AGD2.03: “Techniques and Management of the Information and Telecommunication Systems”. This Advisory Group focuses on the needs of the ITS specialists (organization, techniques used, implementation, feedback, etc.).
- A new Advisory Group, AGD2.02 “Communication with other SCs and Cigré Stakeholders”, was created during the 2010 SC D2 Regular Meeting; this AG shall improve the communication with the other Study Committees and Cigré stakeholder as per the requirements of the Technical Committee.

The table provides for each technical area the Working Body in charge of carrying out the tasks.

Title	AG/WG Convener
Advisory Group on “Information Systems”	AGD2.01 Mr. G. Ericsson
Advisory Group on “Communication with other SCs and Cigré Stakeholders”	AGD2.02 Mr. G. Galarza
Advisory Group on “Telecommunication Networks, Services and Technology”	AGD2.03 Mr. M. Mesbah
Metering, revenue protection, billing and CRM/CIS functions	WGD2.18 Mr. G. Vidrio
Power Line Carrier Channel Modelling, Planning and Usage	WGD2.27 Mr. G. Vrabic
Communication Architecture for IP-based Substation Applications	WGD2.28 Mr. H. Riis
Communication access to Electrical Energy Consumers and Producers	WGD2.29 Mr. P. Moray
Communications for HV Substation Protection & Wide Area Protection Applications	JWGD2/B5.30 Mr. M. Mesbah
Security Architecture Principles for Digital Systems in Electric Power Utilities (EPU)	WGD2.31 Mr. J. Zerbst

## A2 WIDEN STUDY COMMITTEE INFLUENCE

SC D2 Members are active in the following organizations:

- IEC TC57, “Power System Management and Associated Information Exchange”,
- IEEE Power Engineering Society, “Power System Communication Committee” (PSCC),
- IETF, “Internet Engineering Task Force”,
- EUTC, “European UTC”.