



CONSEIL INTERNATIONAL DES GRANDS RESEAUX ELECTRIQUES
INTERNATIONAL COUNCIL ON LARGE ELECTRIC SYSTEMS

STUDY COMMITTEE D2
INFORMATION SYSTEMS AND TELECOMMUNICATION

Study Committee D2 Annual Report 2015

Mr. Maurizio MONTI – SC D2 Secretary

INTRODUCTION

SC D2 is focused on the study of information systems and telecommunication technologies and their application in the power utility environment.

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 evolution of the power utilities in all their activities has been linked to the evolution of the information and telecommunication systems, offering new opportunities, new capabilities, new capacities thereby allowing the utilities to be more efficient in their core business. In fact, ICT play a capital role in the evolution of power systems. The deployment of new advanced functionalities such as the smart grid architecture, distributed generation, power system efficiency optimization, etc. will only be possible with the latest generations of information systems and telecommunication technologies.

As defined by Cigré structure, SC D2 is a horizontal SC which means that its goal is to interact with the rest of SCs in order to gather their specific requirements and disseminate the knowledge and capabilities in the field of information and telecommunication technologies.

The members of the SC D2 come from power utilities, manufacturers, consultants and research institutes. The balance between information technology and telecommunication specialist guarantees a seamless approach to the power utility challenges.

Currently, there are about 150 experts contributing to the working bodies (3 advisory groups and 7 working groups and 3 joint working group) of SC D2.

SC D2 has a liaison of type A with IEC TC 57 on “Power System Management and Associated Information Exchange”. Other organisations of interest for SC D2 activities are also monitored, i.e. “IEEE Power Engineering Society, “Power System Communication Committee” (PSCC), “Internet Engineering Task Force” (IETF) and “World Wide Web Consortium” (W3C).

STRATEGIC DIRECTION

The SC D2 Strategic Plan (2012-2021) 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.

The following technical and administrative directions have been defined in the SC D2 strategic plan:

- TD 1: Core telecom network technologies to cope with new requirements.
 - Studying and considering telecommunication technologies and architecture evolution and how these changes may respond to the challenges and requirements of the new generation of ITS.
 - Technologies and architecture to assure business continuity and disaster recovery is an issue that has to be considered when a new architecture or technologies is being assessed.
- TD 2: New operational and maintenance concepts and requirements.
 - Maintenance scope, techniques and tools when deploying new technologies and architectures implementing new services.
- TD 3: Strategies to deploy the network of the future.
 - Detailed analysis of the numerous challenges introduced by the smart grid.
- TD 4: IT Security.
 - Overcoming security threats is a key issue in the deployment of the networks of the future and especially in the future Smart Grids.
- AD 1: Widen study committee influence.
 - Attracting members from non-represented NCs, vendors and Universities.
 - Improving relationship with related organizations.
 - Producing position papers on key issues will position SC D2 in a leading position in our field of influence.
- AD 2: SC D2 member's involvement.
 - Members required
 - Volunteers to collaborate in well-defined tasks, position papers, technology reports, etc.

These directions are aligned with the strategic directions defined by Cigré:

- Networks of the future.
 - Core telecom network technologies.
 - Strategies to deploy new technologies.
 - New IT operational architecture.
- Energy efficiency support
 - New applications to improve efficiency.
 - New telecom architectures and technologies.
- Common aspects
 - New operational and maintenance concepts and requirements.
 - Technologies and architecture to assure business continuity and disaster recovery.

TECHNICAL ACTIVITIES

The activities carried out by the SC D2 are aligned with the strategic directions and can be classified into the following four technical activities:

TD 1 - Core telecom network technologies to cope with new requirements.

The power system of the future will massively require information sharing between different stakeholders. The implementation of such new approach will require the adoption of new generation of information system and telecommunication networks. The adoption of new network architectures and telecommunication technologies should consider the application of optical multiplexing, the deployment of all optical networks and new networking technologies.

Technologies and architecture to assure business continuity and disaster recovery is an issue that has to be considered when a new architecture or technologies is being assessed.

TD 2 - New operational and maintenance concepts and requirements

Deploying new technologies and architecture and implementing new services will require the revision of maintenance scope, techniques and tools. New operational concepts and technologies will introduce the need for information and telecommunication technologies able to support these new concepts.

TD 3 - Strategies to deploy the network of the future

Building new telecom infrastructure in a sustainable way introduces many challenges that have to be carefully analysed. Sharing infrastructures is a feasible way but requires thoroughly analyse regulations, new operational modes, new management schemes, etc. Service modelling to provide a straightforward integration of new Information technologies and the new operational architecture required by the networks of the future is also a relevant topic to be considered.

TD 4 - IT security

Overcoming security threats is a key issue in the deployment of the networks of the future and especially in the future smart grids. Assessing security risks, defining the proper security framework, architecture and best practices in the scope of legal requirements and other internal practices of the power utilities is a key topic to be developed. Deploying security over all the aspects of power system protection, control and operation is a strategic issue included in this technical direction. The study of international standards and their applicability to power utilities is also an aspect to be considered.

AD 1 and AD 2 - Widen SC influence and member's involvement

As part of its mission, the SC D2 maintains relationship with a number of different international organisations. Thanks to this, power utilities IT and telecom requirements and practices can be shared in other forums contributing to a better understanding and communications outside Cigré.

MEETING AND EVENTS

SC D2 regular meeting and colloquium (Lima – Peru)

The SC D2 regular meeting was held on the 13th of October 2015 in Lima, Peru. It was followed up by a tutorial and round tables on the 14th of October and a colloquium from the 15th to the 16th of October 2015.

It should be pointed out that this event was organised by the Cigré Andean National Committee (Comité Andino del Consejo Internacional de Grandes Redes Elécticas or CANCigré), composed of Bolivia, Colombia, Ecuador and Peru. It is the first time that a SC hold an event in one of those countries.

The preferential subjects of the 2015 SC D2 discussion meeting were:

PS1: Telecommunication networks for time-critical applications.

As more of the critical business processes are being automated and new devices being added to achieve the smart grid vision of the future, the challenge rapidly becomes one of having too much data from a variety of new sources but too little facilities to collect them in an appropriate time delay. The papers for this preferential subject focus on the following items:

- Local and wide area networks for IEC 61850 applications;
- Synchrophasors for protection and automation;
- Network synchronisation and time distribution techniques;

- Performance aspects and impact of impairments.

PS2: Disaster recovery and business continuity.

Disasters generated by human acts or by natural events in the earth's environment, such as earthquakes, rainstorms and snowstorms, continued to cause a lot of damage around the world. Moreover, recent changes in the pattern of seasons (rainy period, wind strength, flood inundation, etc.) are also tremendously affecting the bulk power system.

What have been the improvements since the 2009 SC D2 Colloquium in Japan where the subject "Information and Telecommunication systems available in emergencies at electric utilities" was discussed? The papers for this preferential subject focus on following items:

- Network resilience techniques and architectures;
- Maintenance techniques to assure business continuity;
- Information system restore strategies;
- Maintaining disaster recovery capability

PS3: Best practices and experiences for cost-effective cyber security.

To face the new requirements for a more efficient and resilient power system operation and management, development of ICT in electric power industry is a must. This automation of processes induces higher requirements for data privacy, confidentiality and access security. The papers for this preferential subject focus on the following items:

- Planning cyber security deployment;
- Leverage operational strategies and procedures;
- Effective monitoring, and automating incident response;
- Enabling technologies and security architectures.

Mr. Lhoussain Lhassani (NL) acted as special reporter for PS1, Mr. Marcelo Costa de Araujo (BR) for PS2, and Mr. Maurizio Monti (FR) for PS3.

The tutorial session was carried out on various subjects of interest to Andean members:

- Optimizing the operation and maintenance of the telecommunication system by Mr. Mehrdad Mesbah (AGD2.03 convenor);
- Disaster recovery and service continuity across the information system by Mr. Herwig Klima (WGD2.34 convenor);
- Cyber security in the electrical power system by Mr. Lhoussain Lhassani (Special reporter);
- Deploying standard information exchange in the power system, IEC 61850, by Mr. Thierry Lefèbvre (IEC TC 57 Chairman), Mr. Jaume Darne and Mr. Carlos Rodriguez;
- European market design, flow based market coupling by Mr. Maurizio Monti.

RECENTLY COMPLETED WORK

SC D2 published in 2015 three technical brochures:

- TB 603, JWGD2/B5.46 – "Application and management of cyber security measures for protection and control systems", February 2015.
- TB 615, WGD2. 31 – "Security architecture principles for digital systems in electric power utilities", June 2015.
- TB 618, WGD2.35 – "Scalable communication transport solutions over optical network", August 2015.

SC D2 issued the following technical reports in Electra:

- "Status of cyber security" – Electra, October 2014
- 2013 SC D2 Annual report – Electra, December 2014

The following WGs, having completed their tasks, i.e. issuance of a technical brochure, have been dismantled as per decision of the SC D2 Chair:

- WGD2.31 “Security architecture principles for digital systems in electric power utilities (EPUs)”.
- WGD2.33 “Operation & maintenance of telecom network and associated information systems in the electrical power utility”.
- WGD2.35 “Scalable communication transport solutions over optical networks”.

FUTURE ACTIVITY

Two new WGs aligned with the above-mentioned strategic direction have been launched in 2015:

- JWGD2/C2.41 “Advanced utility data management and analytics for improved situational awareness of EPU operations”.
- JWGC6/D2.32 “Utilization of data from smart meter system”.

SC D2 can provide tutorials and workshops on information technology and telecommunication. Such events are typically organized by Cigré national Committees. Please contact the SC Chairman Carlos Samitier, or the SC Secretary Maurizio Monti for further information. Contact details can be found on D2 web page d2.cigre.org.