



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

STUDY COMMITTEE D2
INFORMATION SYSTEMS AND TELECOMMUNICATION

Study Committee D2 Annual Report 2017

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Introduction

Study Committee D2 focuses on the study of information systems and telecommunication technologies and their application in the power utility environment. Its scope is:

- ICT applied to digital networks from UHV to distribution (smart meter, IoT, big data, EMS, etc...).
- Communication solutions for information exchange in the smart delivery of electrical energy
- Interoperability and data exchange (file format, frequency, etc.) between network operators, market players, off-grid premises
- Cyber security issues from field equipment to corporate IT (Governance constraints, system design, implementation, testing, operation and maintenance...)
- Technologies and architecture to ensure business continuity and disaster recovery

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. 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 Study Committee which means that its purpose 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.

We value the support from our experts from across the globe. There are about 245 experts from 38 countries contributing to the working bodies (3 advisory groups, 3 working groups and 3 joined working Groups) 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”.

Strategy and Direction

The Study Committee strategy and direction is continuously reviewed to ensure it is meeting the needs of our stakeholders. A new Strategic Plan has been approved in 2017. Its long term strategic directions are:

- **TD 1: Telecom network technologies and management.**

Studying and considering telecommunication technologies and architecture evolution. Assessment of technologies and architecture to ensure business continuity and disaster recovery. Telecommunication network management when deploying new technologies and architectures.

- **TD 2: Implementation of the networks of the future.**

Monitoring of on-the-field experiences and proof of concepts of smart technologies, impact on the existing ICT systems such as telecommunication network and equipment, SCADA, enterprise business functions (SGAM domain)

- **TD 3: New digital trends used by EPU and new business services.**

Monitoring on the field experiences on the deployment of digital equipment such as IEDs, PMUs, IoT, as well as the processing of large quantity of information (big data) in the domains of asset health, system operation, metering...

- **TD 4: Cyber Security.**

Assessment and promotion of best practices of cyber security from field equipment (protection) to corporate IT: system design, implementation, testing, operation and maintenance.

- **AD 1 Work Organisation**

The organisation of the Study Committee and its way of working will be adapted and streamlined for the changing environment, to give increased flexibility and short response time, including encouraging and promoting the ongoing recruitment of new engineers. Management of the SC activities should ensure that the appropriate deadlines for Technical Brochures publication will be respected.

- **AD 2 Enhanced Communication**

- Increased international profile: Regular publications and contributions to CIGRE Symposia, Paris Sessions and Electra. Strengthen cooperation with CIGRE Regions (presentations during regional conferences); organisation of Colloquia and tutorials in conjunction with Study Committee meetings; organisation of workshops and tutorials in conjunction with WG-meetings; selection of venues to maximise the benefit and international profile of CIGRE and SC D2.
- Improved Internal and external communication: Improve communication with customers, CIGRE members, non-members and other potential “customers”, including Distribution customers. Improve feedback from the Target Groups and develop

communication with decision makers. Maximise and develop use of the KMS and SC D2 web site.

- Development of Tutorials: Tutorials will be organised in conjunction with Colloquia, Symposia or other CIGRE events with SC D2 involvement.

- **AD 3 Enhance CIGRE members' involvement by demonstrating business value.**

Enhancing and demonstrating the value of membership and participation in CIGRE activities by members and experts in business terms. This will be achieved by focusing efforts to maximise benefits, and helping members and experts convincing their management on the strategic and business value of CIGRE participation.

Workstreams

Our working groups are arranged in 3 key work streams supported by the 3 advisory groups:

- **AG D2.01: Core business information systems and services.**

This advisory group is ITS' users oriented. It monitors the needs and the stakes of the users in their core business which is linked with ITS like Telecontrol, asset management, customer relationship etc.

- **AG D2.02: Cybersecurity.**

This Advisory Group fosters the adoption of specialized cybersecurity measures to protect Operational Systems

- **AG D2.03: Telecommunication networks, services and technology.**

This Advisory group focuses on pure telecommunication issues like transmission media, protocols, network architecture, service provision, etc.

Preferential subjects

The 2018 preferential subjects (adopted in 2016) demonstrate our commitment to continue assist transmission system operators to leverage on IT cutting edge technology in order to achieve both energy transition and digitalization.

PS 1 - Opportunities and challenges in ICT applied to microgrid and DER

- Communication solutions to remotely monitor and operate off-grid premises.
- Facilities for control, monitoring, physical security and safety.
- Standards, interoperability and cyber security issues.

PS 2 - Potential applications and implementation of network and infrastructure virtualization

- Opportunities and benefits using software defined networking and network function virtualization.
- Issues identified in implementation and operation of virtualization architectures.

- Strategies to operate a secure SDN / NF V deployment.

PS 3 – Maintaining reliable and secure operation in an evolving environment

- ICT to support asset management and maintenance.
- Life cycle management and integration of legacy and new devices.
- Situational awareness, risk management and cyber incident responses.

Events

SC D2 held a very successful colloquium in Moscow (RU) in September 2017. The week included the following:

- **Study Committee meeting** - with 15 members and 10 observers
- **Colloquium** – this included 35 papers and 150 attendees
- **Poster session of the Russian National Committee youth section** – 12 posters were presented by 20 students, bachelors and masters of Russian technical universities studying electric power as well as PhD students and young specialists doing scientific research.
- **Tutorials** – 2 tutorials were held : “Assessment of cyber security standard IEC 62351” and “Use case of Wide Area Measurement System (WAMS) in Indian Transmission System”;
- **Visit of the control centre of the national system operator.**

The preferential subjects for the colloquium were:

PS1 - Software platforms for control of distributed energy resources

- Optimized interaction of distributed generation and distribution grids
- Tools providing economically efficient use of DER and Micro grid technologies
- Micro grid control in emergency and post-emergency conditions

PS2 - Resilience to cyber threats of information and telecommunication systems in the power industry

- Cybersecurity of DER control systems
- Cloud computing and IoT technologies: application limits from the view of cybersecurity provision
- Certification of information systems and telecommunications for resistance to cyber threats
- Modelling tools for cyber threats and cybersecurity measures

PS3 - Highly reliable communication infrastructure for traditional and new applications in EPI

- Digital communication systems in transmission and distribution grids
- Modern telecommunication networks for protection and control in EPI
- Developing secure and reliable ICT systems infrastructure

Mr. Alexei A. Nebera (RU) acted as special reporter for PS1, **Mr. Dennis K. Holstein** (US) as special reporter for PS2 and **Mr. Lhoussain Lhassani** (NL) as special reporter for PS3.

Working groups

The total number of Working Groups at the end of 2017 was 6. New working groups include:

- **D2.42** – Synchronization and time distribution in communication networks for time-sensitive distributed operational applications in the power grid
- **D2.43** – Enabling software defined networking for EPU telecom applications
- **D2.44** – Usage of public or private wireless communication infrastructures for monitoring and maintenance of grid assets and facilities
- **D2.45** – Impact of governance regulations and constraints on EPU sensitive data distribution and location of data storage

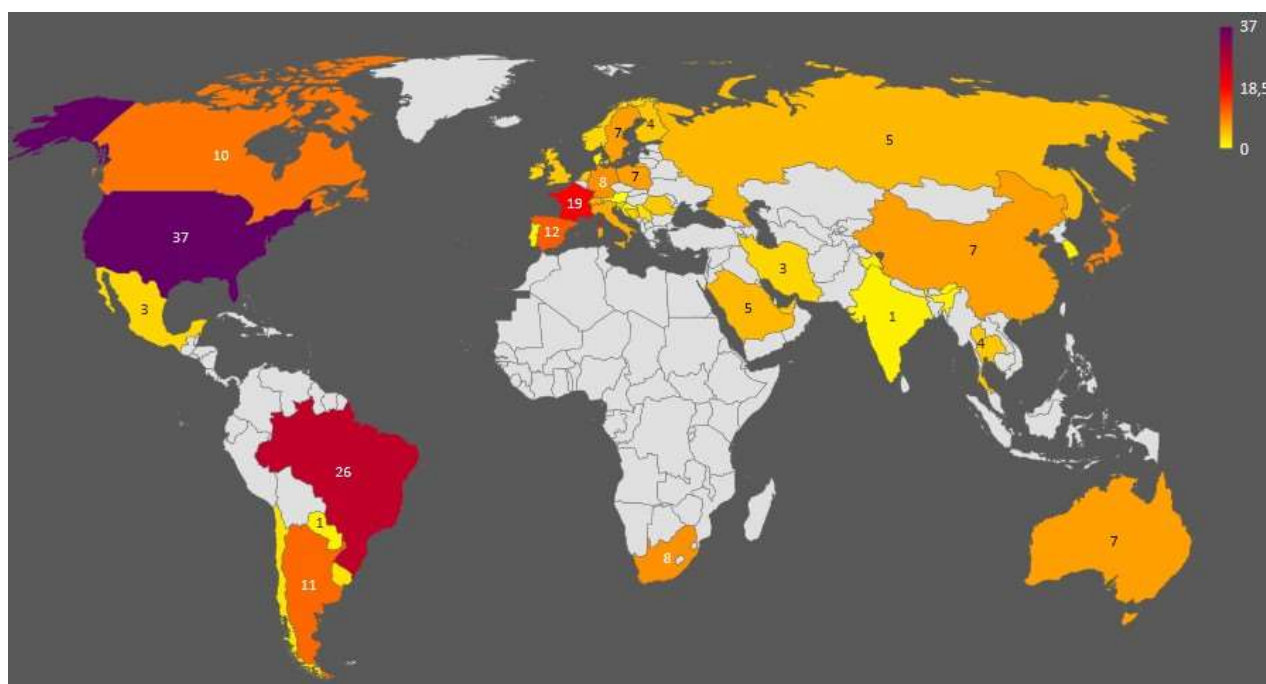


Figure 1 – SC D2 members and experts global diversity

Publications

Recent publication for Study Committee D2 include:

- **TB 685** – Communication solutions for information exchange in the smart delivery of electrical energy.
- **TB 698** – Framework for EPU operators to manage the response to a cyber-initiated threat to their critical infrastructure

Conclusion

This year, Study Committee D2 continues its work in addressing the needs of EPU operators around the globe. We are extremely grateful for the on-going support of members and experts as we continue towards the development of our part in the network of the future.