



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

STUDY COMMITTEE D2
INFORMATION SYSTEMS AND TELECOMMUNICATIONS

Study Committee D2 Annual Report 2005

Mr. Maurizio MONTI – SCD2 Secretary

STRATEGIC DIRECTION

SCD2 mission is to facilitate and promote the interchange of technical knowledge, information and experience between all countries in the fields of Power Telecommunication, Information and Telecontrol Systems.

In this scope of work, the Strategic Plan (2003-2012) and Action Plan (2004-2006) define the following technical areas of activity:

- **T1: Internet and Information Systems:** Studying and considering the impact that new internetworking technologies, like Internet would have on all aspects of power utilities activities: from consideration of the functional requirements and typical provision of networks for market operations to specification of data bases, compatible for all internal users (technical) inside the utility, taken in special consideration the security related aspects.
- **T2: Transmission Media and Techniques:** Monitoring and development of new media, functions, technology and applications for its use as a transmission facility, including the networking.
- **T3: Telecontrol Systems:** Including investigation on common scheme for data modelling, security aspects, backup control centres and emergency dispatch, advanced system for the handling of alarms in Control Centres, in particular in the case of emergencies and the possibility of using AI (artificial intelligence) or ES (expert systems) to facilitate the presentation of information to human operators.
- **T4: Industry Deregulation:** Considering the effects on power utilities of deregulation of public telecommunication with special focus on the effect on telecommunications services of electricity industry deregulation.

In addition, two administrative directions are defined as follows:

- **A1: Improve Study Committee Practices:** Creating a clear communication policy between the members, documenting the rules and practices inside the SC. Adapting the organisation to the requirements of our customers.
- **A2: Widen Study Committee Influence:** Soliciting support from non-represented National Committees, increasing (and formalising when needed) the relationships with kindred organisations and with the other Study Committees and in particular, improving the Web page as a tool to effectively communicate with customers. Deploying communication and marketing plans.

Publications from SCD2 issued in 2005 were as follows:

- Two Papers published in Electra:
 - “Cyber security considerations in Power System Operations”, JWGD2B3C2.01 – February 2005.
 - “Web technology for the utility environment. Communication networks for web-based and non-web based applications”, WGD2.13 – August 2005.
- Two Technical Brochures:
 - TB267, “Strategies for utility companies seeking to move to improved mobility”, SCTFD2.09 - February 2005.
 - TB285, “White Paper on Medium Voltage Powerline Communication (PLC) Networks”, WGD2.14-December 2005.

The preferential subjects of the SCD2 2005 Colloquium, held in Cuernavaca (Mexico), were:

- The power utility as a player in the telecommunications market.
- Novel telecommunications solutions to support electric utility operations.
- Telecommunication and information systems for the monitoring and control of distribution networks.
- Automatic meter reading and other last mile applications.
- Information technologies to support the power utility operations and strategic management.

70 Papers were discussed and two Tutorials were held on:

- “Migration of Substations to IP Networks Technology –Substation Automation and Supervision Trends in Open Communications Platforms”.
- “Information Systems and Internet/Intranet Security in the Electric Industry”.

SCD2 contributed also to the Cigré/IEEE Symposium, “Congestion Management in a Market Environment” held in San Antonio (USA). A session was held on “Information Technology” and six papers were discussed.

The SCD2 Chairman and SCD2 Members contributed also in the XI ERIAC Meeting, “Encuentro Regional Ibero Americano del Cigré”, held in Hernandarias (Paraguay) and the IIIth EUTC, “European UTC”, in Vienna (Austria).

As well as the technical activity, significant work was carried out in the administrative directions including, development of relations with kindred organisations, and improvement in communications through the new SCD2 Web Site compliant with the Cigré Web Site standard.

TECHNICAL ACTIVITIES

T1 INTERNET AND INFORMATION SYSTEMS

Current Practices and Experiences

The Advisory Group, AGD2.02, is scrutinising the evolution of technologies and proposes to the SC Chairman possible new scope of work.

A survey was carried out by the Royal Institute of Technology of Stockholm to identify and address the CIOs in the EPI. The results of this survey are a presentation and a report (master thesis). This survey enabled AGD2.02 to identify 25 CIOs or IT Directors in the EPI. AGD2.02 target is to market Cigré SCD2 activities to the identified CIOs and IT Directors.

Security for Information Systems and Intranet in Electric Power Systems

JWGD2/C2/B3.01 is working on this highly sensitive subject. In order to issue as soon as possible valuable information, several papers will be published in Electra before issuing the Final Report:

- “Security work in progress” highlighting committee works in other organizations that deal with information and control systems security.
- “Threats and Vulnerabilities in a Multi-domain Security Model”.
- “Risk Mitigation – The Case for Cost Recovery”.
- “Operational Aspects of Security in Information Systems”.
- “Framework for managing Information- and Control Systems Security in an Electric Utility”.
- “Considerations for building secure Substation Automation (SA) systems”.

JWGD2/C2/B3.01 held a Workshop on “IT Security in the EPI” during the 2005 SCD2 Colloquium.

The JWGD2/C2/B3.01 is also collaborating with other organisations such as ISA (The Instrumentation, Systems and Automation Society), PCSFORUM (forum established by the US Department of Homeland Security), and IEC TC57 WG15.

Metering, Billing and CRM 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.

A new WG was created in 2004. However, due to the lack of membership (only 2 EPI provided Members), there were no significant activity carried out. Support from the Cigré NCs is expected.

Enterprise Application Integration (EAI)

Following the issue of an Electra paper, no significant work was carried out on this subject.

T2 TRANSMISSION MEDIA AND TECHNIQUES

Telecommunication Technologies

An Advisory Group, AGD2.01 on “Telecommunication Technologies”, has been created in 2002. Its mission is to monitor these technologies and to foresee its possible use and impact on power utilities.

Digital Power Line Carrier

SCTFD2.08, “Field experience and measuring methods for Digital Power Line Carrier Systems”, is finalizing a new Technical Brochure as it was assessed that TB164, “Digital PLC”, and IEC Publication 60663 did not deal with the planning aspect for Digital PLC.

SCTFD2.08 also proposed to IEC TC57 to revise IEC 60495 and IEC 60663 to include Digital PLC. The Technical Brochure should be made available early 2006.

Power Line Carrier

WGD2.14, “Broadband Power Line Communication” finalized the drafting of a Technical Brochure on “White Paper on MV PLC”, description of the current status of deployment of MV PLC including manufacturers and utilities involved.

Mobile Radio

SCTFD2.09 issued, a new Technical Brochure “Strategies for Utility Companies Seeking to Move to Improved Mobility”. This valuable work should enable managers of utilities to decide and plan the implementation of mobile radio.

To complement the work already carried out on “Mobile Radio”, a new SCTF, SCTFD2.13 was created. The scope of work is to consider and report on the issues involved in implementing new mobile services and systems that identify with the three major strategies described in the report of SCD2 TF .09. This will be carried out by research within the utility and emergency services sectors to identify real mobile projects that have been implemented in the last two years. The work will provide an analysis of systems currently being implemented by utility companies and will examine the issues associated with the delivery of working systems.

IP Networking Issue

Two main items are being dealt with by SCD2:

- “Power System Management and Maintenance using Internet Technology and Applications”, WGD2.17. A new Technical Brochure is being drafted focusing on the concept of Integrated Management, which includes not only the management of the communication devices but also the management of every asset with communication capabilities.
- “Operation Services Provision using IP VPN”, SCTFD2.10. A survey was carried out on the use of VPN technologies in the Power Utility environment. 23 answers were received. The final report will be based on the answers received to this survey and complemented with technological information and references in order to form a comprehensive document that combine real experiences with technical information to form a practical guide on the deployment of VPN in the Power Utility environment.

T3 TELECONTROL SYSTEMS

New architectures

The main activities are carried out by WGD2.16, “Impact of IEC 60850, Model on Telecontrol Systems”. WGD2.16 scope of work is to study the requirements of the new standard model of Telecontrol Systems and to establish a matrix between communication technologies and Power Electricity needs in communication, both at present time and in a prospective way. The Technical Brochure should be issued in 2006.

Control Centres in a liberalized market

The role of Control Centres is changing and new combinations of functions and services are needed to satisfy the regulatory as well as business requirements. New types of Control Centres targeting these new demands are emerging on different levels. On National Grid level, focus is on network operation and power balance services using sophisticated software functions for efficient and secure handling. Production control centres on a higher level are focusing on trading and market optimisation where dedicated SCADA systems operate the power plants. Control of low voltage distribution and high voltage networks are merged with functions for customer relations creating large systems focusing on customer satisfaction.

A new SCTF, SCTFD2.11 “Control Centres in a liberalized market “, was created to draft a report providing an overview and discussion of anticipated new Control Centre structures meeting the requirements of the liberalised market with modern technology

Conformance testing

Conformance Test procedures and systems has been prepared for different communication protocols, specially from IEC TC57, as well as for metering data transmission and for the ETSO Scheduling system ESS. By using these Conformance Test systems the supplier of products can prove the conformity according to the standards.

A new SCTF, SCTFD2.12 “Conformance Testing”, was created to draft a report based on different examples from the practice what Conformance Testing includes and how it is done for different applications. Different ways of testing possibilities will be reviewed. The final Technical Brochure shall demonstrate which experiences and results exist and how the conformity is confirmed. This Technical Brochure is expected by beginning of 2006.

T4 INDUSTRY DEREGULATION

Web-based Utility Applications

Recent years' penetration of Web technology has introduced "nice-to-have" technical features in our Utility IT systems: thin workplace clients based on Web browsers as well as data acquisition via IP networks are some examples, giving the impression of standardized and modular systems. A lot of standardization work has been done in the range of communication protocols and vertical integration, but most system architectures still involve centralized databases and proprietary software.

A new WG, WGD2.19 "Web-based Utility Applications", was created to continue this work and especially to focus on the application part, concentrating on "near real time" systems as well as maintenance- and engineering data systems.

Broadband PLC Applications

Following the work carried out by WGD2.14, a new WG, WGD2.21, "Broadband PLC Applications" was created.

The scope of work is to produce

- a Technical Brochure,
- Session/Colloquium papers for the technical staff for planning, designing, deploying and operating PLC systems,
- and ELECTRA papers for the Management.

Collaboration with other organisations such as CENELEC, PLC Forum, PUA (PLC Utilities Alliance), OPERA (Open PLC European Research Alliance) among others, directly involved in PLC technology development, is being seek.

ADMINISTRATIVE ACTIVITIES

A1 IMPROVE STUDY COMMITTEE PRACTICES

To "**Improve Communications**", with the delivery by Cigré of the tools to create and maintain web site, the SCD2 Webmaster has redesigned the former SCD2 web site which was the first Cigré SC web site put into operation by the former SC35 Chairman, Mr. Graham Vincent. The new web site, with updated information, is to be found at www.cigre-d2.org. Dr. J. Luque is in charge of the SCD2 site as Webmaster.

SCD2 is working with Cigré HQ in two areas, improving documentation on Cigré organisation (Practices & Guidelines) and standardisation of SC web sites.

To adapt SCD2 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:

- SCTFD2.08, "Field Experiences and Measurements Methods For Digital Power Line Carrier Systems", was dismantled.
- SCTFD2.09, "Strategies for Utility Companies seeking to move towards improved mobility", was dismantled.
- SCTFD2.12, "Conformance Testing", was dismantled.
- WGD2.14, "Broadband Power Line Communications", was dismantled.
- One new WG and one new SCTF were created:
 - WGD2.21 "Broadband PLC applications".
 - SCTFD2.13 "New Mobile Solutions within the Utility Sector".

In addition and to cope with Cigré Policy, fair warning letters were issued to one SCD2 Member and to three Observer Members asking them to attend the SCD2 Regular Meetings as well as contributing actively in AG/WG/TF or SCD2 or to provide members for these activities.

The following table provides for each technical area the Working Group in charge of carrying out the task.

Action Plan	Subject	AG/WG/TF and Convener
T1 Internet and Information Systems	Current practices and experiences	AGD2.02 Mr. E. Sandström
	Metering, Billing and CRM functions	WGD2.18 Mr. R. Baumann
	Security for Information Systems and Intranets in Electric Power Systems	JWGD2/B3/C2.01 Mr. A. Torkilseng
	Enterprise Application Integration (EAI)	WGD2.20 Mr. E. Sandström
T2 Transmission Media and Techniques	Telecommunication Technologies	AGD2.01 Mr. H. Spiess
	Mobile Radio	SCTFD2.13 Mr. P. Moray
	Power System Management and Maintenance using Internet Technology and Applications	WGD2.17 Mr. C. Samitier
	Operation Services Provision using IP VPN	SCTFD2.10 Mr. C. Samitier
T3 Telecontrol Systems	Control Centres in a liberalized market	SCTFD2.11 Mr. L. Björk
	New architectures	WGD2.16 Mr. A. Cadenas
T4 Industry Deregulation	Web-based Utility Applications	WGD2.19 Mr. H. Riis
	Broadband PLC applications	WGD2.21 Mr. J. Aguiar
A2 Widen Study Committee Influence	Identification of Customers	AGD2.03 Mr. P. Cristaudo
	Tutorial and Web Master	AGD2.04 Dr. J. Luque

A2 WIDEN STUDY COMMITTEE INFLUENCE

As concerning, “**Relationship with kindred organisations**”, SCD2 has been highly active:

- UTC Executive Members are active on the SCD2 and related WG.
- SCD2 Members are active on:
 - IEC TC57 WG,
 - IETF,
 - ATM Forum,
 - ITU-TC,
 - EUTC,
 - IEEE.
- Invitation to IEC TC57 Chairman to attend SCD2 meetings and vice versa.

As concerning, “**Communications**”, SCD2 has been highly active:

- Tutorial on “IP Technology”.
- Tutorial on “Internet/Intranet Security in the Electric Industry”.