



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

STUDY COMMITTEE D2
INFORMATION SYSTEMS AND TELECOMMUNICATION FOR POWER SYSTEMS

Study Committee D2 Annual Report

by Mr. Maurizio MONTI – SCD2 Secretary

STRATEGIC DIRECTION.

Following the issuance of the Cigré Master Plan, the mission of the former SC35 has been enlarged to include Internet and Information Systems and the Study Committee changed its name as SCD2 “INFORMATION SYSTEMS AND TELECOMMUNICATION FOR POWER SYSTEMS”. SCD2 has changed accordingly its organisation.

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 (2001-2010) defines the following technical areas of activity:

- **T1: Transmission Media and Techniques:** Monitoring and development of new media, functions, technology and applications for its use as a transmission facility, including the networking.
- **T2: Operation and Management:** Identification of development and trends in the field of control of telecommunication networks and services, in particular studying TMN (Telecommunication Management Networks) as a tool to improve the performance (and to decrease the management costs) of such systems, with special focus in the integration of legacy system.
- **T3: 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.
- **T4: 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.
- **T5: 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.
- **T6: Overview:** Analysing the devices, media and networks used in power utilities (technical versus economic reasons, and evolution trend as a function of time and country) and designing a marketing and publicity plan.

In addition, the Action Plan (2001-2003) includes two administrative directions as follows:

- **A1: Improve Study Committee Practices:** Improving communication between all members, documenting the rules and practices and adapting the organisation to the changing needs, trying to increase our flexibility.
- **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.

Publications from SCD2 issued in 2002 were as follows:

- Two papers for 2002 Paris Session by WGD2.07, “Substation Migration into an IP Network” and “Potential Applications of the Resilient Packet Ring Technology for Power Utilities”.
- One Position Paper, “Information Systems and Internet”, by AGD2.02.
- One Position Paper for the Technical Committee on IT Security by AGD2.02.
- “SCD2 Practices and Guidelines”, by SCD2 Secretary (August 2002).
- One article submitted for publication in Electra on “IS/IT Security” by AGD2.02 (early 2003).
- One Technical Brochure:
 - TB217, “The Benefits of Mobile Data” by SCTFD2.07 (December 2002).

The preferential subjects for SCD2 Paris Session Colloquium were:

- Telecommunications as support for deregulation and new electricity market.
- The use of mobile technology for functions traditionally provided by fixed lines connections.
- Telecommunications as an opportunity to leverage assets and generate new sources of revenues for power utilities.

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 SCD2 Web Site.

TECHNICAL ACTIVITIES.

T1 TRANSMISSION MEDIA AND TECHNIQUES.

Telecommunication Technologies

An AG, 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. Deliverables of the AG D2.01 are:

- Annual Report on Telecommunication Technologies and Services (status update, state of the art, survey)
- Bi-annual Report on Forecast on Telecommunication Services in a future, encompassing a 5 to 10 years period ahead

Fibre Optics

As more and more electric utilities are looking after benefits from telecommunications investments, SCD2 is finalising studies in the field of Fibre Optics. After issuance of Technical Brochures TB131, TB132 and TB133 on fiber optics by WG35.04, WGD2.15 is studying the advances of all-optical backbone network, new optical access network and their applications in the Power System Communication and in the Public Telecommunication Services.

In 2002, WGD2.15 has almost carried out its main task. The work is being compiled into two Technical Brochures, “All-Optical Backbone Technology” and “New Optical Access Technology”. The drafts of the two Technical Brochures should be completed by March 2003 and published in 2003.

Digital Power Line Carrier and Power Line Carrier

A Working Group and a SC Task Force are dealing with these subjects.

WGD2.14, “Broadband Power Line Communication” is currently drafting the following documents:

- A White Paper on MV PLC, description of the current status of deployment of MV PLC including manufacturers and utilities involved.
- A Report, “Requirements for transmission and installation of MV PLC”, providing a set of transmission and installation requirements including electrical safety such that MV PLC should become a mass-market commercial solution.
- A Work plan of the process of standardization of MV PLC reflecting which organizations are to be contacted with which information to achieve standardization of the requirements specified by the WG.

SCTFD2.08, “Field experience and measuring methods for Digital Power Line Carrier Systems”, is preparing 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 is finalizing a questionnaire dealing with Maintenance, Operation, Applications and Future Plans. This questionnaire will be an input to the new Technical Brochure.

Mobile Radio

To complement the Technical Brochure on “Use of GSM phase 2+ as a Mobile Radio System for Power Utilities”, SC35 launched a Task Force, SCTFD2.07, to carry out the following tasks:

- To examine the capability of existing analogue and new digital mobile systems to support mobile data technologies.
- To identify, which “back office” systems and applications, will be needed by electricity organizations within the medium term.
- To consider the interfaces for system access, the new WAP/browser technologies and any appropriate alternatives.
- To identify those business processes that would benefit from the implementation of data services to the field force and how the benefits could be delivered within the business.
- To provide practical examples of where mobile data has produced significant business benefits.

The draft of the Technical Brochure was approved at the 2002 Paris Session and the TB217 on “The Benefits of Mobile Data” was published in December 2002.

SCADA/EMS Protocols and Applications

Following the publication of TB168, “Communication concepts for Control Centres”, this subject is being monitored.

IP Networking Issue

Valuable work was carried out on “ATM” and “Internet Protocol Technology”.

Work is carried on a new Technical Brochure on “Broadband Networks for Utilities”. This Technical Brochure will cover the whole design process from network specifications to design, implementation and performance monitoring.

AGD2.04 is currently drafting two **Tutorials** one on “IP Technology” in collaboration with WGD2.07 and one on “Telecommunication Networks Management”. These Tutorials should be ready for the next SCD2 Colloquium in Brazil.

T2 OPERATION AND MANAGEMENT.

There is no work currently in progress on this subject.

T3 INTERNET AND INFORMATION SYSTEMS.

Current Practices and Experiences

This new subject was included in SCD2 tasks. An Advisory Group, AGD2.02, was created having for scope of work:

- Position Paper on current practices in power utilities.
- Report on the use of Internet as a tool to communicate with the outside world (and inside).
- Security aspects on information systems in an integrated scenario.
- Time-schedule to reach an integrated scenario. Economics versus Technical constraints.
- Report on other options: advantages and disadvantages.
- Definition of data bases and interface with applications programs.

An internal Task Force, AGD2.02_TF.2 is investigating the field of Enterprise Application Integration (EAI) in electricity utility.

Security for Information Systems and Intranet in Electric Power Systems

Following the work initiated both by AGD2.02 and WGD2.13 on IS/IT Security, a JWGD2/B3.01 was created to review “Security for Information Systems and Intranets in Electric Power Systems”.

AGD2.04 is drafting a **Tutorial** on “Information systems security” for July 2004.

T4 TELECONTROL SYSTEMS.

New Architectures

The main activities are carried out by WGD2.16, “Impact of IEC 61850, 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.

T5 INDUSTRY DEREGULATION.

WGD2.13 is focusing on the “real-time” market applications and the use of different technologies. The most significant change in the activity of WGD2.13 is the move towards EMS, Metering, Trading and Customer Relation Management. Requirements for the next generation of Control Centres in the environment of Deregulation, Unbundling etc. are not any more the same as in the integrated world. Two tasks are underway:

- Web Technology for a future Telecontrol System environment.
- Control/Communication System Security (paper for Electra).

AGD2.04 was formed to issue in July 2004 a **Tutorial** on “Web-based SCADA”:

T6 OVERVIEW.

The work for collecting, compiling and drafting the statistics report is being carried out over a four-year cycle as part of our action plan. The issue of the **“2000 Telecommunications Statistics”** booklet was not carried out due to the poor results of the questionnaire (only 8 countries answered and this was not sufficient to carry out the work).

A new Task Force Convener has been appointed to carry out the tasks related to draft the “Issue of most concern” in collaboration with AGD2.02 for 2003 as well as the “2004 Telecommunications Statistics”.

An AGD2.03 was formed to **Identify the Customers** for SCD2 activities. Its mission is to draft a marketing and publicity plan.

ADMINISTRATIVE ACTIVITIES.

A1 IMPROVE STUDY COMMITTEE PRACTICES.

To **“Improve Communications”**, and thus to increase SCD2 efficiency e-mail services and SCD2 Web Site are now used to provide primary communications on on-going works. The SCD2 Web Site eases information exchanges between SCD2 Members, but also for WG and SCTF Members. The site, password protected, enables to view and/or download all the published SC35/SCD2 papers (Colloquium, etc.) as well as for WG and SCTF Members to share information currently related to their activities (draft TB, etc.). The SCD2 Web Site moved to the Cigré server; the new URL is www.cigre-sc35.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:

- Mr. A. Fonseca, was appointed as SCTFD2.01 Convener.
- AGD2.04 was created, “Information System and Telecommunications Tutorials”: The general aim is the definition, maintenance and updating of the basic material for tutorial courses (upon the request of a NC) at different levels: managers, senior engineers, young engineers and ever students.
- SCTFD2.07, “Mobile Data”, having performed its task and issued a Technical Brochure is dismantled.
- A new SCTFD2.09 is created “Strategies for Utility Companies seeking to move towards improved mobility”: Some utility companies are breaking new ground in the provision of their telecommunications services by moving to the outsourced/managed service environment for their mobile systems. What is driving such a strategy? The SCTFD2.09 is charged of investigating this strategy.
- Following the tasks carried by AGD2.02TF.01 on IT Security a new JWGD2/B3.01 is created “Security for Information Systems and Intranets in Electric Power Systems”: Its activity is to look for the risks of attack on information systems and intranets existing at different levels of electric power systems: power stations, control centers, substations, etc.

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

Action Plan	Subject	WG and Convener	Task Force
T1 Transmission Media and Techniques	Telecommunication Technologies	AGD2.01 Mr. H. Spiess	
	Fibre Optics	WGD2.15 Mr. K. Fukushima	
	PLC	WGD2.14 Mr. J. Comabella	
	Digital PLC		SCTFD2.08 Mr. J. Piotrowski
	Mobile Radio		SCTFD2.07 & SCTFD2.09 Mr. P. Moray
	IP Networking Issue, VPN and TMN	WGD2.07 Mr. C.Samitier	

Action Plan	Subject	WG and Convener	Task Force
	Tutorial	AGD2.04 Dr. J. Luque	
T3 Internet and Information Systems	Current practices and experiences	AGD2.02 Mr. E. Sandström WGD2.07 Mr. C. Samitier	
	The use of Internet as a tool	AGD2.02 Mr. E. Sandström WGD2.07 Mr. C. Samitier	
	Security for Information Systems and Intranets in Electric Power Systems	JWGD2/B3.01 Mr. A. Torkilseng	
	Tutorial	AGD2.04 Dr. J. Luque	
	Definition of data bases and interfaces	AGD2.02 Mr. E. Sandström	
T4 Telecontrol Systems	Backup Control Centres	WGD2.13 Mr. R. Baumann	
	Protocol testing	WGD2.13 Mr. R. Baumann	
	New architectures	WGD2.16 Mr. F. Planchon	
T5 Industry Deregulation	Web SCADA	WGD2.13 Mr. R. Baumann	
	Market specific telecommunications network and services	WGD2.14 Mr. J. Comabella	
T6 Overview	Telecommunications Statistics		SCTFD2.01 Mr. A. Fonseca
	Issue of most concern		SCTFD2.01 Mr. A. Fonseca
	Identification of Customers	AGD2.03 Mr. P. Cristaudo	

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,
 - UTC,
 - IEEE.
- Invitation to IEC TC57 Chairman to attend SCD2 meetings and vice versa.