



CONSEIL INTERNATIONAL DES GRANDS RÉSEAUX ÉLECTRIQUES A HAUTE TENSION
INTERNATIONAL COUNCIL ON LARGE HIGH VOLTAGE ELECTRIC SYSTEMS

STUDY COMMITTEE 35

POWER SYSTEM COMMUNICATIONS AND TELECONTROL

Study Committee 35 Annual Report

by Mr. Maurizio MONTI - SC35 Secretary

STRATEGIC DIRECTION.

Following the issuance of the Cigré Master Plan, the mission of SC35 has been enlarged to include Internet and Information Systems. SC35 has changed accordingly its organisation. This Annual Report will focus mainly on the changes.

SC35 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 SC35 issued in 2001 were as follows:

- One contribution to the SC35 Zagreb Colloquium issued by WG35.07, “External versus Internal IP Network Provision”.
- One “Invited Paper” in Electra (August 2001) on “The Impact of Internet Technology and Modern Information Systems Use in Power Utilities” by Dr. F. Gonzalo and C. Samitier.
- Five Technical Brochures:
 - TB131, “Wavelength Division Multiplexing (WDM) for electricity utilities” by WG35.04 and re-printed by Mr. Graham Vincent (October 2001).
 - TB 132, “Optical Fibre Cable Selection for Electricity Utilities” by WG35.04 and re-printed by Mr. Graham Vincent (February 2001).
 - TB 173, “Use of GSM phase 2+ as a Mobile Radio System for Power Utilities” by SCTF35.05 (December 2000).
 - TB192, “Protection using Telecommunications” by JWG34/35.11 (August 2001).
 - TB193, “Alarm Handling Techniques” by WG35.13 (August 2001).

The preferential subjects for SC35 Zagreb Colloquium were:

- Telecommunications for new electricity market needs.
- Providing Telecommunications for Advanced Substation Designs.
- Call Centres: Techniques for handling avalanche call rates.

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 SC35 Web Site.

TECHNICAL ACTIVITIES.

T1 TRANSMISSION MEDIA AND TECHNIQUES.

Fibre Optics

As more and more electric utilities are looking after benefits from telecommunications investments, SC35 is finalising studies in the field of Fibre Optics. The status of work is as follows:

- Technical Brochure on “Wavelength Division Multiplexing for Electricity Utilities”, TB131, was published. This paper provides utilities with a status report on recent WDM developments.
- Technical Brochure on “Optical Fibre Cable Selection for Electricity Utilities”, TB132, was published. This guide provides utilities with an insight into the important parameters and limitations for the various optical cabling technologies. It covers the critical parameters, including motivating factors and key constraints, to assist a utility in making the correct choice for the trouble free lifetime of a cable installation.
- A new WG, WG35.15, was created having for scope of work:
 - All-optical backbone technology, i.e., WDM, all-optical tera-bit switching, optical amplifiers (EDFA, SOA, etc.), optical filters, etc.
 - New optical access technologies, i.e., APON, SUPERPON, WDMPON, etc.
 - Interface between all-optical backbone and optical access.
 - The Technical Brochures are expected to be published in late 2003.

Digital Power Line Carrier and Power Line Carrier

A new WG, WG35.14, and a Task Force, SCTF35.08, have been created and are investigating these fields.

Mobile Radio

A Study Committee Task Force was implemented in August 1998, i.e., SCTF35.05. The scope of work was to issue a Technical Brochure on the overall potential for Power Utilities to use GSM phase 2+ provided in the public area as the sole operational mobile communications system and to assess that service provided in this area corresponds to functionalities/user needs.

The Technical Brochure on “Use of GSM phase 2+ as a Mobile Radio System for Power Utilities” was published.

To complement this Technical Brochure, SC35 launched a new Task Force 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 is expected to be ready for the 2002 Paris Session. The Technical Brochure should be published by end of year 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 “IP Network Design”. This Technical Brochure will cover the whole design process from network specifications to design, implementation and performance monitoring.

Teleprotection

Joint Working Group JWG34/35.11 was formed in March 1997 to study “Teleprotection”. The scope of work was to assess the state of development of advanced protection using inter-site communications. A Technical Brochure, TB192, to complement the existing TB13 was published. This Technical Brochure provides utilities with relevant information about recent trends as well as conventional systems, performance and reliability requirements, and typical configurations for different types of protection systems.

T2 OPERATION AND MANAGEMENT.

There is no work currently in progress on this subject.

T3 INTERNET AND INFORMATION SYSTEMS.

This new subject was included in SC35 tasks. An Advisory Group, AG35.02, 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.

T4 TELECONTROL SYSTEMS.

A Technical Brochure on “Advanced Alarm handling in Control Centre”, i.e., all possible techniques to detect the underlying cause for the large amount of data received in a Control Centre during emergency situations and to reduce stress on the operator, was published by SC35 Members.

A new WG was created, WG35.16, “Impact of IEC 60850, Model on Telecontrol Systems”. WG 35.16 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.

WG35.13 is focusing on the “real-time” market applications and the use of different technologies. The most significant change in the activity of WG35.13 is the move towards EMS, Metering, Trading and Customer Relation Management. Two tasks are underway:

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

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 “Telecommunications Statistics” booklet was forecast for year 2000. However, only 8 countries provided data following the issuance of the questionnaire in April, 2000. This set of

data is not sufficient to issue a relevant booklet on “Telecommunications Statistics”. No additional data were provided as entry to the SCTF35.01, thus the task could not be completed.

ADMINISTRATIVE ACTIVITIES.

A1 IMPROVE STUDY COMMITTEE PRACTICES.

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

To adapt SC35 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:

- JWG34/35.11 and SCTF35.05 having achieved their scope of work were dismantled in 2001.
- AG35.01 was created, “Telecommunication Technologies”: The objective is to support SC35 knowledge on new and emerging telecommunication technologies, looking for its possible application in power utilities.
- AG35.02 was created, “Information System and Internet” The objective is to produce a general study on current situation about the use of Internet and Information systems in the power utilities environment.
- AG35.03 was created, “Customer Relationship and Web”: The objective is to define “all” SC35 customers and to design a marketing strategy to meet their expectative. The SC35 Web site is a tool to be used to widen SC35 influence.
- WG35.14 was created, “Power Line Communications”.
- WG35.15 was created, “Optical Fiber Infrastructure and Optronics”.
- WG35.16 was created, “Impact of IEC 60850, Model on Telecontrol Systems”.
- SCTF35.07 was created, “Mobile Data”.
- SCTF35.08 was created, “Field experiences and measurement methods to assure compatibility of Digital Power Line Carrier systems”.

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	Fibre Optic	WG35.15 Mr. K. Fukushima	
	PLC	WG35.14 Mr. J. Comabella	
	Digital PLC	AG35.01 Mr. H. Spiess	SCTF35.08 Mr. J. Piotrowski
	Mobile Radio	AG35.01 Mr. H. Spiess	SCTF35.07 Mr. P. Moray
	SCADA/EMS protocols and applications	WG35.13 Mr. R. Baumann	
	IP Networking Issue	WG35.07 Mr. C.Samitier	
	VPN	WG35.07 Mr. C.Samitier	
	TMN	WG35.07 Mr. C.Samitier	
	Teleprotection	AG35.01 Mr. H. Spiess	
T3 Internet and Information Systems	Current practices and experiences	AG35.02 Mr. E. Sandström WG35.07 Mr. C. Samitier	

Action Plan	Subject	WG and Convener	Task Force
	The use of Internet as a tool	AG35.02 Mr. E. Sandström WG35.07 Mr. C. Samitier	
	Definition of data bases and interfaces	AG35.02 Mr. E. Sandström	
T4 Telecontrol Systems	Advanced Alarm Handling	WG35.13 Mr. R. Baumann	TF35.13.03
	Backup Control Centres	WG35.13 Mr. R. Baumann	
	Protocol testing	WG35.13 Mr. R. Baumann	
	New architectures	WG35.16 Mr. F. Planchon	
T5 Industry Deregulation	Provision of Utility Telecommunications	WG35.15 Mr. K. Fukushima	
	Market specific telecommunications network and services	WG35.14 Mr. J. Comabella	
T6 Overview	Telecommunications Statistics		SCTF35.01
	Issue of most concern		SCTF35.01

A2 WIDEN STUDY COMMITTEE INFLUENCE.

As concerning, “**Relationship with kindred organisations**”, SC35 has been highly active:

- UTC Executive Members are active on the SC35 and related WG.
- SC35 Members are active on:
 - IEC TC57 WG,
 - IETF,
 - ATM Forum,
 - ITU-TC,
 - UTC,
 - IEEE.
- Invitation to IEC TC57 Chairman to attend SC35 meetings and vice versa.