



CONFÉRENCE INTERNATIONALE DES GRANDS RÉSEAUX ÉLECTRIQUES A HAUTE TENSION
INTERNATIONAL CONFERENCE 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

SC35 mission is to facilitate and to promote the interchange of technical knowledge, information, and experience in the fields of Power System Communications and Telecontrol. In this scope of work, the Strategic Plan (1993-2002) defines the following eight technical areas of activity:

- T1: Transmission Media.
- T2: Transmission Techniques.
- T3: Switching and Network Techniques.
- T4: Operation and Management of Telecommunications Networks.
- T5: Telecontrol Systems.
- T6: Emerging Telecommunications and Telecontrol Technologies.
- T7: Public Telecommunications Deregulation.
- T8: Telecommunication Statistics.

In addition, the Action Plan includes two administrative directions as follows:

- A1: Improve Study Committee Practices.
- A2: Widen Study Committee Influence.

Following the valuable work carried out in 1996, 1997 saw the finalisation of this work through a number of publications. Publications from SC35 issued in 1997 were:

- Four Technical Brochures and their related summaries in Electra:
 - TB46, « Data Base Management for Telecontrol Systems ».
 - TB106, « New Opportunities for Fibre Optics in electricity utilities - Guidelines ».
 - TB107, « Power System Telecommunications in the high speed environment ».
 - TB108, « Business opportunities for electricity utilities in the telecommunications market ».
- Three papers in Electra on Internet Protocol Technology.
- One paper on ATM at the 1997 Beijing Colloquium.
- Two internal publications on deregulation of Telecommunications in Power Utilities.

The SC35 Colloquium was hosted by CHINA in Beijing. The preferential subjects were:

- Development of Mobile Services,
- Impact of Deregulation of both the Power Industry and the Telecommunications Industry,
- Developing new technologies and maintaining the old.

This Colloquium was particularly well-supported with about 110 delegates participating, of which 42 were from outside China representing about 20 countries. Discussions were held on 41 papers, 23 of them from China. As well as the technical activity, significant work was carried out in the administrative directions including, creation of a Joint Working Group with SC34, development of relations with kindred organisations, and improvement in communications.

TECHNICAL ACTIVITIES

T1 TRANSMISSION MEDIA

Fibre Optics

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

- The Technical Brochure TB106, «New Opportunities for Optical Fibre Technology in Power Utilities», was published during 1997. This guide establishes principles for the construction of a telecommunications network, whether this be for the utility's own use, or for any external business venture. As concerns business ventures, this guide covers considerations that need to be applied for working with a partner, or when taking a considered risk and developing a third party business which may well be in direct competition to an existing public telecommunications operator. A summary of the Technical Brochure is to be found in Electra, October 1997.
- Drafting of a Technical Brochure on « Optical Fibre Cable Solution for Electricity Utilities » continues. This guide is intended to provide utilities with an insight into the important parameters and limitations for the various optical cabling technologies. It will cover 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.
- Drafting of a Technical Brochure on « Preventive and Corrective Maintenance for Aerial Optical Fibre Cables on Power Utility Overhead Lines » continues. This guide will provide utilities with definitive guidance for effective maintenance and emergency repairs for all the known optical cabling technologies covered in the TB45 « Optical Fibre Planning Guide for Power Utilities ».
- Drafting of a paper on « Wavelength Division Multiplexing for Electric Utilities Using Optical Fibres » has commenced. This paper is intended to provide utilities with a status report on recent WDM developments. A revision/update of TB45 may result from this study.

Digital Power Line Carrier

Work on systems assessment of present and future use is underway. A study is being carried out to review and to assess Digital PLC technologies, to identify advantages and limitations of them, to draft outlines for general specifications and testing procedures, as well as drafting application guidelines.

Mobile Radio

This subject was the Preferential Subject N°1 of the 1997 Beijing SC35 Colloquium. Seven papers were accepted and discussed. There was a general consensus that currently installed analogue Private Mobile Radio systems (PMRS) will not cater for data rates higher than 1200/2400 bit/s and that this will be inadequate for needs over the next decade. Utilities will need to consider other alternatives for higher data rates and this, coupled with other functional needs, suggests that analogue systems are no longer an acceptable choice for new system installations. However, widely divergent points of view were expressed on the appropriate solution for the future. Competing digital standards for PMRS - TETRA (Europe), iDEN (US), APCO25 compliant (US), MCA (Japan) - were discussed and compared to publicly provided solutions such as GSM2+ and satellite based systems. There remains considerable dispute about the correct course for the future and SC35 will continue to pursue studies in this area.

T2 TRANSMISSION TECHNIQUES

High Speed Data

The Technical Brochure TB107, « Power System Telecommunication in the High Speed Environment », was published during the year and a summary is to be found in Electra, February 1997. This Technical Brochure provides some guidelines on how utility applications may be related to network technologies such as SDH, ATM and TMN.

Valuable work is being carried out on « **ATM** » and « **Internet Protocol Technology** ». The following papers have been issued:

- « Telecontrol over ATM », Beijing SC35 Colloquium, September 1997.
- « Internet Protocol Technology: an introduction », Electra, June 1997.
- « Transmission of real-time data with a guaranteed QoS using IP technology », Electra, August 1997.
- « Integration of services on IP networks », Electra, October 1997.

Further studies are in progress on these two technical fields, and also on the management of these platforms. A Technical Brochure on ATM and IP technology is underway and it is expected to provide utilities with a panorama of these technologies, including Service Descriptions and Requirements, Business models, Network Technologies (SDH, ATM and Network Management), and Implementation of these Services.

Teleprotection

Joint Working Group JWG34/35.11 was formed in March 1997 to study « Teleprotection ». The scope of work is to assess the state of development of advanced protection using inter-site communications. Drafting of a Technical Brochure to complement the existing TB13 is underway. This Technical Brochure is expected to provide utility's with relevant information about recent trends as well as conventional systems, performance and reliability requirements, and typical configurations for different types of protection systems. Publication of a Technical Brochure is expected by mid 1999.

SCADA Data Transmission and Protocols

The Technical Brochure, « Communication concepts for Control Centres », is underway. This Technical Brochure is intended to provide data about utility data communication requirements and scenarios implemented by different countries.

T3 SWITCHING AND NETWORK TECHNIQUES

There is no work currently in progress on this subject.

T4 OPERATION AND MANAGEMENT OF TELECOMMUNICATIONS NETWORKS

SC35 decided at Cigré 1996 Session, that a study was to be carried out on the second level of « **Telecommunications Network Management** » and this will be carried out in association with work under way on High Speed data transport platforms.

A decision taken during the year was ratified by SC35 to study Telecommunication Management Systems separately as an element of work on Business Opportunities.

T5 TELECONTROL SYSTEMS

As concerns « **Telecontrol in Power System Control Centres** », the Technical Brochure TB46, « Database Management in Telecontrol Systems », was published. A summary is to be found in Electra, April 1997. This Technical Brochure is intended to provide guidelines on Database, Database Networks and Open System Architecture Databases.

Ongoing studies for issuance of Technical Brochures are dealing with:

- « **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 (TF35.13.01, Convener, Mr. J. Hamley).

- « **Knowledge Based Systems in SCADA/EMS** », i.e., guidelines about the stages that need to be completed from conception to operation of an intelligent application and the subsequent life time support necessary to maintain its operation (TF35.13.02, Convener, Mr. D. Cooper).
- « **Backup Control Centres and Emergency Dispatch** », i.e., survey of actions typically being taken by utility in regard to backup Control Centre, database access and duplication and costs/benefits evaluation (TF35.13.04, Convener, Mr. A. Marais). A paper is being drafted for the 1998 Paris Session (Preferential Subject N°1).

T6 EMERGING TECHNOLOGIES

Status of work on this technical field is as follows:

- « **Mobile Radio** » was the Preferential Subject N°1 at 1997 Beijing Colloquium (see T1).
- « **GSM2+** », SC35 decided at the Beijing Session to study « The Potential for the use of GSM2+ by Power Utilities ».

T7 PUBLIC TELECOMMUNICATIONS DEREGULATION

Effects of Public Telecommunications Deregulation on Power Utilities

The Technical Brochure TB108, « Business opportunities for utilities in the telecommunications market », was published during the year. A summary is to be found in Electra, April 1997.

Opportunities

The following tasks have been carried out:

- Drafting of the paper « Development of a model risk acceptable communications provision to electric utilities beyond 1997 », presentation at the SC35 Meeting and on the way to be published in Electra.
- Drafting of a questionnaire about « Outsourcing ».

« Regulation » and « International Technical Connections Issues »:

Two papers have been issued to SC35 Members:

- « Regulatory issues to be considered by power utilities entering the telecommunications market ».
- « Analysis of ability to establish international broadband systems ».

SC35 decided to study « Telecommunications Business Management Systems ».

T8 TELECOMMUNICATION STATISTICS

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 next issue of the « **Telecommunications Statistics** » booklet is for year 2000.

SC35 decided to carry on a yearly cycle statistics on specific issues, i.e., « **Issue of most concern** ». The following « issue of most concern » have been identified for 1998:

- Size, configuration and performance of telecommunications networks in PU's.
- Selling of services.
- Positioning of telecommunications in PU organisations.

ADMINISTRATIVE ACTIVITIES

A1 IMPROVE STUDY COMMITTEE PRACTICES

To « **Improve Communications** », and thus to increase SC35 efficiency, e-mail services are now used to provide primary communications on on-going works.

A homepage on the Web provides SC35 details and the list of published papers including those from SC35 Colloquia (<http://ourwold.compuserve.com/homepages/grahamvincent>). However this is now four years old and urgently needs upgrading. A project will be put in place to provide a replacement homepage with current information, new features and an operational environment for Working Groups.

To adapt SC35 structure to on-going activities and where necessary « **Restructure Working Groups** », the following decisions have been implemented:

- A new Joint Working Group with SC34 (JWG34/35.11) was established in March 1997.
- Additional Members will join the SCTF35.01 in order to carry out the task on « **Issue of most concern** ».

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	Fibre Optics	WG35.04 Mr. J. Martin	
	Mobile Radio	Preferential Subject N°1 at Beijing Colloquium	
	Digital PLC	WG35.09 Mr. J. Piotrowski	
T2 Transmission Techniques	High Speed data	WG35.07 Mr. C.Samitier	
	ATM	WG35.07 Mr. C.Samitier	
	Internet Protocol Technology	WG35.07 Mr. C.Samitier	
	Protection Signalling	JWG34/35.11 Mr. P. Gjerde	
	SCADA Data Transmission and Protocol	WG35.13 Mr. T. Røes	TF35.13.03
T4 Operation and Management of Telecommunications Network	Telecommunications Network Management	WG35.07 Mr. C.Samitier	
	Business Management Systems	WG35.08 Mr. H. Nordgard	
T5 Telecontrol Systems	Telecontrol in Power System Control Centres	WG35.13 Mr. T. Røes	TF35.13.03
	Advanced Alarm handling in Control Centres	WG35.13 Mr. T. Røes	TF35.13.01
	Knowledge Based Systems in SCADA/EMS	WG35.13 Mr. T. Røes	TF35.13.02
	Backup Control Centres and Emergency Dispatch	WG35.13 Mr. T. Røes	TF35.13.04
T7 Public Telecommunications Deregulation	Effects of Public Telecommunications Deregulation on Power Utilities	WG35.08 Mr. H. Nordgard	
	International Technical Connections Issues	WG35.08 Mr. H. Nordgard	
	Opportunities	WG35.08 Mr. H. Nordgard	
	Regulation	WG35.08 Mr. H. Nordgard	
T8 Telecommunications Statistics	Telecommunications Statistics		SCTF35.01 Mr. P. Lynch
	Issue of most concern		SCTF35.01 Mr. P. Lynch

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.
- WG35 Members are active on IEEE Optical Fibre Sub Working Group. A successful joint meeting of IEEE/Cigré was held in Berlin at IEEE summer meeting. IEEE Optical Fibre Sub Working Group is considering proposals to work jointly with Cigré.
- Invitation to IEC TC57 Chairman to attend SC35 meetings and vice versa.