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20503

Distr.
LIMITED

IPCT.192(SPEC.)
25 November 1993

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

ORIGINAL: ENGLISH

International Seminar on New Technologies
and Telecommunication Services

Foz do Iguaçu, Brazil
26-28 October 1993

REPORT*

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* Mention of company names and commercial products does not imply the endorsement of UNIDO. This document has not been edited.

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I. INTRODUCTION

The International Seminar on New Technologies and Telecommunication Services was held from 26 to 28 October 1993 in Foz do Iguaçu, Brazil. The Seminar was organized by the Telecomunicaçoes do Parana S.A. - TELEPAR (the telecommunication company for the state of Parana, a subsidiary of TELEBRAS - the Brazilian telecommunications organization) and the Associaçao Brasileira da Indústria Electrica e Electrónica - ABINEE. At the request of the Brazilian Government, the United Nations Industrial Development Organization (UNIDO), in cooperation with TELEBRAS, arranged for representatives of the telecommunications industry from Africa and Latin America to attend the seminar and the accompanying exhibition. In addition to the seminar programme[1], the delegates participated in the "TCDC Joint Action Programme" organized by UNIDO and TELEBRAS. The aim of the TCDC Joint Action Programme was to provide opportunities to promote transfer of technology through enterprise-to-enterprise cooperation based on bilateral discussions with representatives of various telecommunications firms participating in the seminar and exhibition. The programme also featured discussions on the Build-Operate-Transfer (B.O.T.) mode of financing infrastructure projects drawing on private sector resources.

II. AGREED CONCLUSIONS AND RECOMMENDATIONS

1. The Seminar and the TCDC joint action programme provided a valuable opportunity for enhancing awareness in new technologies and telecommunication services. Participants requested UNIDO to continue organizing such events - preferably in conjunction with major telecommunications exhibitions for the benefit of representatives of developing countries taking into account the rapid technological advances in the sector.

2. The participants took note of the several telecommunications technologies developed in Brazil and other countries to suit conditions in developing countries. The participants requested the Brazilian authorities to support the installation of Brazilian demonstration systems in interested countries in Africa with a view to establish their appropriateness and thereafter promote joint ventures in manufacturing. UNIDO is requested to assist in the planning and execution of the demonstration projects in accordance with the specific requests of interested countries.

3. Participants requested TELEBRAS to support the establishment and/or strengthening of telecommunications R & D institutions in other interested developing countries. UNIDO is requested to assist in the formulation and implementation of such technical cooperation projects.

4. UNIDO in cooperation with the Brazilian authorities is requested to continue supporting TCDC activities aimed at technology transfer and technical cooperation.

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[1]See Seminar Programme in Annex I

The B.O.T. (Build Operate Transfer) method of privatization

5. The participants took note that the B.O.T. approach has been applied as a successful, alternative method of privatizing infrastructure projects and facilities, notably in Europe and in the newly industrialized countries of Asia. This includes, *inter-alia*, privatization of transportation projects, power, oil and gas production, ports facilities, railways, water treatment projects and telecommunications.

6. The participants recognized that a B.O.T. strategy, if properly structured, may provide, among other things, private efficiency and contribute to the much needed infrastructure facilities which would otherwise not have come on stream. A B.O.T. strategy will provide financing off-balance sheet, strong incentives to have the projects performed contractually, modern management, promote transfer of technology, promote staff training programmes, and allow Governments to establish private bench marks to measure the efficiency of similar public sector projects.

7. The participants took note that the B.O.T. concept protects the national interest in the long range control of the country's infrastructure sectors. The concept does not transfer public sector monopoly to private sector monopoly, but provides private competitiveness within a public legal framework and governmental inspection according to the contract terms.

8. The delegates recognized that appropriate B.O.T. schemes could be applied in the privatization stream of the telecommunication sector in Developing Countries.

9. The participants stressed the importance of private companies initiating and/or soliciting B.O.T. projects to the governments.

10. The participants recommended that African countries should consider the B.O.T. scheme in implementing projects in value-added telecommunications services. UNIDO in cooperation with the ITU is requested to assist in the identification, formulation and implementation of such projects.

11. The participants took note of the UNIDO programme on B.O.T. Participants both from the private sector and the public sector strongly supported the UNIDO programme and its elements. Participants, however requested UNIDO to include in the programme the identification of investors and sponsors through its network of investment promotion service. Participants also recommended that UNIDO should approach the B.O.T. programme sector-wise taking into account the specific issues of the telecommunication sector. UNIDO was requested to work out the basic issues of a concession legislation enabling the B.O.T. approach in their countries. All participants favored training programmes on B.O.T. at a national and/or regional level and requested UNIDO to organize such programmes. They also expressed a great need for advise from a UNIDO task force on actual and potential B.O.T. projects.

III. THE UNIDO/TELEBRAS TCDC JOINT ACTION PROGRAMME

The UNIDO/TELEBRAS TCDC Joint Action Programme featured bilateral discussions between the foreign participants and representatives of Brazilian telecommunications companies as well as visits to the exhibition. The aim of the programme was to identify potential areas for technical cooperation with

specific emphasis on enhancing technological capacities for the manufacture of telecommunications equipment. In this connection a representative of TELEBRAS presented the set-up of telecommunications sector in Brazil with particular emphasis on the role of TELEBRAS and the Research and Development Center (CPqD) established by TELEBRAS. Information was provided to participants on various technologies developed by CPqD such as:

Antenna Technology

The CPqD radiating systems laboratory has been developing designs in antennas for satellite ground stations. Recent designs include a 4.5m Cassegrain, a 6m Gregorian and a 9.1m ADE (Axially Displaced Ellipse): all designs were optimized for high efficiencies in both C and Ku bands, with minimum change in reflectors configurations.

The radiating systems laboratory has been working on four main areas, namely:

* Development of reflector design techniques for satellite and terrestrial point to point to multipoint applications. The activities include the development of the software for reflector synthesis and analysis.

* Development of the design techniques of reflector feed systems. Here also, activities include development of software for waveguide components such as filters, polarizers, diplexers and horns synthesis and mode matching analysis and optimization.

* Implementation and development of measurement techniques. These include automated measurements for feed horns and waveguide components performance characterization such as radiation performance, passive intermodulation, return loss, etc. The antenna laboratory features an anechoic chamber which now works up to 20 GHz.

* Development of design techniques for microstrip antennas and frequency selective surface. These include mathematical modelling and the development of moment method software analysis.

The radiating systems laboratory can transfer the technology of earth station and terrestrial radio relay antennas and the feed systems above mentioned to other developing countries. This includes documentation, drawings, descriptions and the electrical characterization. Also consultancy support on electrical performance validation tests for prototype development can be provided.

Dual Channel Digital Radio

This is the CPqD project devoted to the development of a UHF dual-channel digital radio for point-to-point duplex operation intended for the expansion of rural communications together with the digitalization of the rural network. It operates at the same bands (450 MHz and others) of the current analog FM single-channel solutions, using the same 25 KHz bandwidth.

By means of terminal cost reduction due to the usage of digital solutions and by means of increasing of voice channel capacity (a minimum of twice the current capacity), its main features are **low cost advanced telecommunications** and **increased transmission capacity**.

This radio uses all the recently introduced technologies for radio design, that is the extensive use of digital signal processing via DSP integrated circuits and the use of VLSI ICs available for cellular radios, allowing good performance and robustness at low cost.

It also incorporates new features for rural products such as: data and fax transmission capabilities, remote monitoring and supervision, new services availability via MF signaling, privacy, interference control via automatic power control and code verification of stations and full coin-telephones support via either pulse inversion or 12 KHz tone detection.

Expected applications are: substitution of the analog installed systems; community services in low population or isolated areas such as villages, small towns and farms; private service with 2 total accessibility trunks such as 2 subscribers or a 2-trunk PABX.

Technology transfer opportunities include:

* Transfer of Equipment Specifications:
  Transfer of the Modem Technical Documentation:
  Transfer of Power Supply and RF Front-end (LNA, PA, Duplexers) Functional and Electrical Specifications;

* Training on Modem at CPqD;

Synchronous Digital Hierarchy

Synchronous Digital Hierarchy (SDH) is a new digital transmission technology whose international standards are in development. These standards will provide a transversal compatibility among multivendor ambients and between American and European Plesiochronous Digital Hierarchies (PDH). In addition to this, SDH will provide the following features:

* drop/insert a low bite rate tributary from a high bit rate one without demultiplex

* simplified cross-connect

* Telecommunication Management Network (TMN) Compatibility

CPqD may offer consultancy services in:

* Network evolution from PDH and analog to SDH;

* New services on SDH network;

* TMN protocols specifications.

Optical Subscriber Network

CPqD has been studying Optical Subscriber Network since 1989, with special focus on architectures/topologies more suitable to a developing country environment like Brazil. At the present time, CPqD is involved in the following activities:

* definition of an evolution strategy from metallic network to a totally optical access network;

* implantation and management of a Field Trial inside CPqD to evaluate theoretical models, new services, technologies, devices and equipment;

* establishment of methodologies, generic specifications and minimum requirements to define a multi-vendor environment;

* development of special strategic optical routes for large business customers.

During the TCDC Joint Action Programme, representatives of UNIDO secretariat also presented the B.O.T. (Build-Operate-Transfer) scheme as an alternative mechanism for project financing in the field of telecommunications in developing countries.

It was explained that since the early 1960s, many developing countries promoted large investment programmes to establish or strengthen their basic and industrial infrastructures. Those investments in areas such as transportation facilities, telecommunications, hydroelectric power generation, oil and gas extraction and water distribution systems were undertaken with a view to reduce external costs for enterprises and customers alike and thus facilitate rapid economic development. The State or pubic utility organizations were the major actors in the projects which were largely financed through sovereign loans. For social equity and other considerations, many of the services resulting from the investments were heavily subsidized by the State and thus the accrued revenues were often insufficient to repay the loans. Coupled with the ensuing global recession and deteriorating terms of international trade, the debt burden of many developing countries increased tremendously leading to the adjustment and austerity programmes that have become prevalent since the 1980s. These programmes which were designed, inter alia, to limit Government borrowing, severely reduced public investment capacities in infrastructural projects.

At present, in order to meet the need for poverty alleviation, increase standards of living and facilitate their integration in the global economy, there is a pressing need for sustainable economic growth in developing countries. Thus, a new comprehensive effort to rehabilitate, modernize or strengthen their basic and productive infrastructure is essential. In addition, under the prevailing competitive environment, successful participation in the globalization process is largely conditioned by the quality and efficiency of infrastructure facilities in each country. The required investment in this area is considerable in order to cover a broad spectrum of facilities and services, e.g. airports, ports, roads, railways, telecommunications, heavy industry, environmental alleviation/restoring facilities, housing and health etc. In particular, efficient

telecommunication systems and services are increasingly fundamental requirements for economic development.

This is the background leading up to the creation of the concept of B.O.T. (Build-Operate-Transfer), the idea of private sector involvement in public infrastructure involving Governments, international lending institutions and construction companies. In other words, the B.O.T.-strategy represents an association of interests of both the private investor for business opportunities and the Government for strategic development promotion.

B.O.T. is an innovative means of limited recourse project financing. A typical contractual B.O.T. arrangement implies that the private investor receives from the Government or public enterprise, for a specified period, the commission to build and operate a plant or service, at the end of which concession period, the ownership of the project and the right to operate it revert to the Government. During the operation period the private investor receives a delivery payment sufficient to repay the investment in the project and to provide dividends to the shareholders of the project venture.

B.O.T. provides Governments with the opportunity to finance their development projects outside their budget allocations. The main characteristic of B.O.T. is that financing of the project is broken down into separate elements and the risk associated with the project is distributed to the participants, roughly in proportion to their financial participation. Unlike traditional public sector projects whose capital costs are largely financed by loans raised by the Government, B.O.T. projects are normally financed by a combination of debt and equity capital. The ratio between the two types of capital varies from project to project. The providers of these two forms of capital are compensated solely from project revenues so that capital costs are normally financed with recourse normally limited to the project revenue stream. Hence, the private sector bears a greater share of the risk. The revenues can either be market-tied or contract-tied. In the case of market-tied revenues the delivered service is paid directly by the customer. The contract-tied revenues come from an intermediary usually a public sector agency operating a network of service. The latter will have to underwrite a minimum delivery. This form of contract is generally known as a "take-or pay contract". Compared to contract-tied revenues, market-tied revenues impose higher risks for the concession company.

As an example of a recent application of the B.O.T. mechanism in telecommunications, the case of Pakistan was cited. In 1991 the monopolistic Telegraph and Telephone Department was converted into an autonomous corporation - the Pakistan Telecommunications Corporation (PTC). PTC immediately embarked on a crash programme to expand the telecommunications network.

In April 1991, PTC invited bids for the supply and installation of 200,000 telephone exchange lines, including local cable network and local junctions (hereinafter collectively referred to as "exchanges") in the cities of Lahore, Faisalabad, Rawalpindi and Islamabad on the basis of B.O.T. The basic terms and conditions of the bids were:

1) the exchanges were to be built and operated by a concession company (contractor) in accordance with the PTC's standard and specification;

2) the contractor was allowed to interconnect his exchanges with PTC's system and to operate them in accordance with Pakistan Law, for the period agreed upon in the contract with PTC. The quality of service provided by the contractor to his subscribers had to be international standards;

3) the contractor was allowed to charge the same tariff from his subscribers as was being charged by PTC;

4) the contractor was to transfer the possession and ownership of the exchanges in good working order and condition to PTC, free of any charge or encumbrance at the end of the specified period.

At the end of the negotiation process agreements have been made for supplying and installing the envisaged telephone exchange lines on a Build-Lease and Transfer (BLT) basis.

The complex negotiations leading to a B.O.T. project were however emphasized. A typical project cycle would involve firstly the establishment of a joint venture (concession company) as a consortium of construction and supply companies, the operator of the facility and the Government or public corporation. This is followed by the implementation agreement, setting out the concession and sales agreement and determining the terms under which revenue will be generated. The third stage involves raising funds from banks and export credit agencies where the concession company is the borrower. Fourthly, the plant/facility is constructed and operation commences. The fifth stage is a period during which the project operates under the management of the concession company and the firm hopes to receive sufficient money to pay operating costs, debt service commitments and dividends to shareholders. After the concession period, the concession company is dissolved and ownership of the facility/plant is transferred to the Government or public corporation.

B.O.T. financing satisfies multiple purposes of all the parties involved. On the one hand, it enables the host country to have a certain strategic plant/facility without engaging its own funds, by giving a concession to those who are willing to invest in such an undertaking. On the other hand, it enables the private sector partners to sell equipment, machinery and technology, while giving them, in their role as sponsors and to their lenders, an opportunity to recoup their investment through sale of products/services of the facility.

The UNIDO has recognized the need of countries and operators for standard arrangements and contracts and is in the process of producing guidelines on the development, negotiation and implementation of B.O.T. projects. The guidelines are aimed at policy makers, to assist them in formulating an appropriate approach to the promotion and development of B.O.T.s as an alternative scheme when implementing large infrastructure industrial projects. They are also intended to provide some suggested approaches to the various financial and legal issues that may confront project managers and Government authorities in developing countries. Naturally, they will also be of interest to other participants in the B.O.T. process, such as promoters, lenders and contractors.

The preparation of the "Guidelines on the Development, Contracting and Negotiation of B.O.T. Projects" is a part of an evolving UNIDO Programme on B.O.T. leading to: (a) the establishment of standard contracts and procedures

for the negotiation and implementation of B.O.T. arrangements: (b) the availability of an advisory task force that can provide assistance in connection with specific B.O.T. projects on a fee basis or under trust fund arrangements; and (c) technical assistance at the national or regional levels for capacity building and policy advice related to the implementation of the B.O.T. scheme.

The UNIDO approach to B.O.T. scheme is to promote a clearly defined and negotiated contractual and financial arrangement between investors, contractors and host countries. Through standard procedures and documents and a pool of international expertise UNIDO could assist the parties involved to speed up the negotiation and implementation process in an equitable manner. In this connection emphasis is placed on domestic capacity building in developing countries, through continuous transfer of human skills, technology and training.

TCDC & B.O.T. Needs

Discussions on the B.O.T. concept and contacts with Brazilian telecommunications companies led to the identification of the following needs for TCDC and the B.O.T. mechanism

Country	TCDC & B.O.T. Needs	Recommended Follow-up
1. Argentina	Advisory services in formulating B.O.T. projects.	Argentina to contact UNIDO with specific request.
2. Chile	a. Transfer of VSAT technology from Brazil.	TELEBRAS to assist in identifying appropriate Brazilian firms.
	b. Expert services and information exchange on privatization of the telecommunications.	Chile to submit request to UNIDO/ITU.
3. Honduras	a. Transfer of technology for data communications systems.	Honduras to submit request to UNIDO and TELEBRAS under TCDC programme.
	b. Licensing arrangements for public telephones in Honduras.	Honduras to submit request to UNIDO and TELEBRAS.
4. Kenya	Joint research, technology transfer, training, and information exchange between Gilgil Telecommunication Industries and TELEBRAS.	Gilgil Telecommunication Industries to initiate request through UNIDO Headquarters.

5. Mexico	R&D in ISDN terminal equipment development in collaboration with CPqD.	Cinvestav Communications Section, Mexico, to initiate proposal to CPqD through UNIDO Headquarters.
6. Mozambique	Establishment of a National Network Control Centre in Maputo in collaboration with CPqD.	Telecomunicacoes de Mozambique to initiate request to CPqD through UNIDO Headquarters.
7. Uganda	Procurement, installation and operation of inductive card public telephones system from Icatel - I.C.A. Telecomunicaçoes Ltd., Sao Paulo.	CDK Engineers, Uganda to submit enquiry to Icatel.

CPqD = Centro de Pesquisa e Desenvolvimento of TELEBRAS.

ANNEX I

International Seminar on New Technologies and Telecommunication Services, Foz do Iguaçu, 26 to 28 October 1993

Seminar Programme

PLACE: CATARATAS I AUDITORIUM

DATE: OCTOBER 26 - TUESDAY

- 8:00 Management Based on "TQC"
  Hisaei Kikuchi - Ex-President of NEC TOHOKU
  (Deming Award).

- 9:00 TMN - A Well Known Philosophy....
  But what's about reality and cost.
  Volkmar Rompke - DEUTSCHE TELEKOM.
  Klaus Biedenbach - DEUTSCHE TELEKOM.

- 10:30 Telecommunications in the XXI Century.
  Ian M. Ross - President Emeritus of AT&T BELL LAB.

- 11:30 The Future of TELEBRAS SYSTEM in a Competitive Environment.
  Adyr da Silva - President of TELEBRAS.

- 14:00 The Contribution of the Telecommunication to the Services Area.
  Luis Almeida Marins - Consultant.

- 16:30 Panel
  Industrial Policies: What is best for Brazil?
  Coordinator: Wilson Moherdaui - TELECOM - Jornal de Telecomunicaçoes.

PLACE: IPE AUDITORIUM

DATE: OCTOBER 26 - TUESDAY

- 8:00 Voice Processing - A New Universe of Facilities for the Latin American Telecommunications.
  Terry Bridges - OCTEL CORPORATION.

- 9:00 AXE - New Income Opportunities.
  Harry Alfredo Cohn - ERICSSON.

- 10:30 Simultaneous Transmission of Cataratas I Presentation.

- 11:30 Synchronous Networks - The ALCATEL Solutions.
  Jefferson L. Nobile - ALCATEL
  Edmundo Neder - ALCATEL

- 14:00 Deploying the First "SDH" Transmission Systems in the Network.
  Brent Groce - NORTHERN TELECOM.

- 15:00 Deploying Advanced Services in an Overlay Environment.
  Greg Butler - NORTHERN TELECOM.
  Personal Communication Services - The Future.
  Iván Tuñón - NORTHERN TELECOM.

- 16:30 Crossing the Boundary of Multimedia Networking.
  Martin Shum - President of ADVANCED COMPRESSION TECHNOLOGY.

PLACE: ARAUCARIA AUDITORIUM

DATE: OCTOBER 26 - TUESDAY

- 8:00 An Innovative Experience on Telecommunication Systems.
  Frank Klisch - Vice-President of HUGHES NETWORK SYSTEMS.

- 9:00 Switching Distribution Technology: The ZETAX Solution.
  Jorge Eduardo Wood Faulhaber - Director of ZETAX.
  Marcos Eduardo Bandeira Maia - President of ZETAX.

- 10:30 Simultaneous Transmission of Cataratas I Presentation.

- 11:30 Optical Switching.
  Marko Erman - ALCATEL - FRANCE.

- 14:00 Satellite Technology for Rural Voice Communications.
  Doug Medina - HUGHES NETWORK SYSTEMS.

- 15:00 Global Mobile Communications.
  Fátima Raimondi - ERICSSON.

- 16:30 SIEMENS SDH/ATM: The Evolution Towards High Speed Communications.
  Claus Collatz - EQUITEL.
  Hermano do Amaral Pinto Jr. - EQUITEL.

PLACE: CATARATAS I AUDITORIUM

DATE: OCTOBER 27 - WEDNESDAY

- 8:00 Personnel Communication Systems.
  Richard Mo - Director of BELL NORTHERN RESEARCH.

- 9:00 Global Virtual Data Strategies.
  Steve Vonrump - Director of MCI - USA.

- 10:30 The Prospect on the Unification of Telecommunications and Cable Television in Optical Subscriber Loop.
  Takao Namiki - Director of FURUKAWA - JAPAN.

- 11:30 Synchronous Digital Hierarchy - Future Network Technology for Challenging Carriers.
  Juergen Beer - ANT BOSCH TELECOM.
  Wilfried Hanselmann - ANT BOSCH TELECOM.

- 14:00 Cellular Telephony.
  Robert S. Kerby - Director of AT&T NETWORK SYSTEMS.

- 15:00 Capabilities of Signalling Number 7 and their Application in Telecommunication Networks.
  Hans Appenzeller - BELL NORTHERN RESEARCH.

- 16:30 The ERICSSON Solution for Transportation Networks.
  Neil Livingstone - ERICSSON.

PLACE: IPE AUDITORIUM

DATE: OCTOBER 27 - WEDNESDAY

- 8:00 Technology: Threat or Competitive Advantage.
  Carlos Antonio Taube - CPqD - TELEBRAS.
  Strategic Planning for the Management of the Integrated Network.
  Bruno Souza Vianna/José Ricardo Formagio Bueno/Lauro Edson de Carvalho Gomes - CPqD - TELEBRAS.

- 9:00 The Brazilian Technological Telecommunication Vocation.
  Hans Gerhard Schorer - UCIEE Counsellor.
  MERCOSUL - its consequences for the relationship of the countries involved.
  Luiz Carlos Bahiana - President of ASSOCIAÇAO TELEBRASIL.

- 10:30 ISDN: The Boom of a Technology.
  Altinger Kerscher - SIEMENS.
  Intelligent Network Marketing Aspects.
  Chris Wahl - SIEMENS.

- 11:30 New Technologies and Services. A Challenge for TELEPAR.
  Roberto Heinrich - TELEPAR.
  Telecommunication - A MERCOSUL Integration Factor.
  José Luis Valle - EMBRATEL.

- 14:00 Intelligent Pay-Phones - Global Services Improvements.
  Múcio C.B. Vianna - Director of DARUMA.

- 15:00 Advanced Intelligent Network.
  Sushil Gill - NEC.

- 16:30 Emerging Trends for High Speed Interconnection Networks.
  Cristiano Henrique Ferraz - WANDEL & GOLTERMANN.

PLACE: ARAUCARIA AUDITORIUM

DATE: OCTOBER 27 - WEDNESDAY

- 8:00 Telecommunications Management Network.
  C.N. Kimberlev - CPT - UK.
  Roberto Fischer - EQUITEL.

- 9:00 Full Digitalization of the Chile Network.
  Germán Ramajo - President of CTC - CHILE.
  Alberto Gonzáles Soto - Vice-President of CTC - CHILE.

- 10:30 Advantages of Spread Spectrum Techniques in Mobile Cellular Communications.
  Shahid H. Batalvi - US WEST.

- 11:30 Digital Cellular Network Deplovment Considerations.
  Maria Martinez - Director of MOTOROLA - USA.

- 14:00 Panel.
  The Integration of the Telecommunication Networks/Voice. Data. Image/Multimedia.
  Coordinator: Hélio Azevedo - H&T.

- 16:30 Development of Chile Telecommunication and the VTR Experience in a Competitive Environment.
  Carlos Canete Zuloaga - Director of VTR TELECOM - CHILE.

PLACE: CATARATAS I AUDITORIUM

DATE: OCTOBER 28 - THURSDAY

- 8:00 Experiences and Expectations with Digital Cellular Systems.
  Jaime Martinell - Vice-President of MOTOROLA - USA.

- 9:00 Data Communication.
  Joseph T. Seko - Director of AT&T NETWORK SYSTEMS.

- 10:30 US WEST and the American Experience on the Digital Voice Processing.
  Gloria Davy - US WEST.

- 11:30 NTT New Technology Trends.
  Kazuo Shirai - NTT - JAPAN.

- 14:00 Telecommunications Management Network: Towards a Tailored-made Design.
  Laurent Chauvin - FRANCE TELECOM.

- 15:00 System Integration for Telecommunication
  John Hardy - Vice-President of BULL WORLDWIDE TELCO - ABC BULL - FRANCE.

- 16:30 Panel
  A New Model for the Brazilian Telecommunications.
  Coordinator: Ethevaldo Siqueira - RNT.

PLACE: IPE AUDITORIUM

DATE: OCTOBER 28 - THURSDAY

- 8:00 Network Based on Voice Mail. A Key to Marketing Success
  César O. Andrade - BOSTON TECHNOLOGY.

- 9:00 Smoothing the Transition from Copper to Fibre.
  Alberto Eder - Director of ECI TELECOM - ISRAEL.

- 10:30 Reliability and Specifications of Passive Components for Fiber in the Loop.
  Enrique Cuellar - Director of RAYNET INTERNATIONAL.

- 11:30 Supervision of Digital Networks/Synchronous Digital Hierarchy.
  Carlos Asborno - EDISA HP.

- 14:00 Quality and Productivity Search in the Brazilian Telecommunication Material Industries.
  Foad Shaikhzadeh - FURUKAWA.
  Miguel Matsumoto - Director of FURUKAWA.

- 15:00 New Concepts in Vendor/Customer Research and Development Relationships.
  James J. Poynter - President of TELESCIENCES.

- 16:30 The Role of the Terrestrial Microwave Latin American Telecommunication Development.
  Daniel Lopez - MICROWAVE/SPLICE.

PLACE: ARAUCARIA AUDITORIUM

DATE: OCTOBER 28 - THURSDAY

- 8:00 The IBM Solution for the Voice Mail Public Service
  Ron Haney - Director of IBM - CANADA.

- 9:00 UNISUR Submarine Cable.
  Enrico Banfi - PIRELLI - ITALY.

- 10:30 Panel
  The Telecommunications as an Inductor Factor of Quality and Productivity in the Companies.
  Coordinator - Fábio de Souza Neto - SUCESU.

- 14:00 AMPS to TDMA Migration
  Mauricio Bouroncle - Director of NORTHERN TELECOM WIRELESS.

- 15:00 Enhanced Information Services - A Profile for Creating Consumer Acceptance of Voice Messaging Services.
  Samuel D. Cannavo - Director of NYNEX - USA.

- 16:30 Data Network Technology Today
  Bob Hinton - GENERAL DATA COMMUNICATION.

ANNEX II

TELEBRAS/UNIDO TCDC JOINT
ACTION WORK PROGRAMME

PLACE	DATE	TIME	EVENT
Cedro Auditorium	October 26 1993	15:00 - 16:30	UNIDO presentation on Build-Operate and Transfer
Hotel Don Pedro	October 27 1993	11:00 - 12:30	General discussions on the B.O.T. concept
Cedro Auditorium	October 27 1993	17:30 - 18:30	Presentation of activities by CPqD and bilateral discussions
Hotel don Pedro	October 28 1993	10:00 - 11:00	Adoption of the Conclusions and Recommendations

ANNEX III

International Seminar on New Technologies and Telecommunication Services

Foz do Iguaçu, Brazil
26 to 28 October 1993

LIST OF PARTICIPANTS

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