



**ORGANIZATION OF AMERICAN STATES**  
**Inter-American Telecommunication Commission**

**XI MEETING OF PERMANENT  
CONSULTATIVE COMMITTEE I:  
PUBLIC TELECOMMUNICATION  
SERVICES**  
**October 25 to 29, 1999**  
**Buenos Aires, Argentina**

**OEA/Ser.L/XVII.4.1**  
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**FINAL REPORT**

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## FINAL REPORT

### ELEVENTH MEETING OF PERMANENT CONSULTATIVE COMMITTEE I: PUBLIC TELECOMMUNICATION SERVICES

The Eleventh Meeting of the Permanent Consultative Committee I: Public Telecommunication Services was held in Buenos Aires, Argentina, October 25 to 29, 1999.

#### I. AGENDA<sup>1</sup>

1. Approval of the Agenda and Calendar.
2. Establishment of the Drafting Groups of the meeting.
3. Report from the Working Group on the Progress made since the tenth meeting.
4. Development of the tasks of:
  - (a) Working Group on Standards Coordination (Chairman: Mr. Edmundo Matarazzo);
  - (b) Ad Hoc Group on Certification Processes (Chairman: Mr. Raúl Topete);
  - (c) Working Group on Basic and Universal Telecommunications Services (Chairman: Mr. Héctor Carril);
  - (d) Working Group on the Promotion of the Global Information Infrastructure in the Americas (Chairperson: Ms. Dalila Hernández);
  - (e) Ad Hoc Group on International Telephone Services Accounting Rates (Chairman: Mr. John Prince);
  - (f) Ad Hoc Group for the preparation for the ITU World Telecommunication Standardization Assembly (Chairman: Mr. Leonel López Celaya);
  - (g) Ad Hoc Group on the Strategic Analysis of PCC.I (Chairperson: Ms. Marian Gordon).
5. Status Report of the Strategic Analysis of PCC.I (Chairperson: Ms. Marian Gordon).
6. Status Report on the preparations for the Third Forum of CITEL/PCC.I (Coordinator: Mr. Alberto Zetina).
7. Status Report from the Coordinator on Telecommunications over IP (Chairman: Mr. Sergio Martínez).
8. PCC.I's preparations for COM/CITEL:
  - (a) Contributions for CITEL Annual Report.
  - (b) Program of activities for PCC.I in the year 2000.
9. Status report from the ITU on the joint projects with CITEL.
10. PCC.I inputs for the Strategic Plan of CITEL
11. Preparations for the revision of the Blue Book.
13. Approval of the Final Report.
14. Agenda, site and date of the next Meeting.
15. Other Matters.

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<sup>1</sup> PCC.I/doc.853/99rev.2

## II. MEETING AUTHORITIES <sup>2</sup>

Alternate Chairman:	Mr. Felix Castro Chief of International Affairs Office Ministry of Communications, Colombia
Executive Secretary:	Mr. William Moran Executive Secretary of CITEL, OEA
Drafting of the Final Report:	
Chairman:	Ms. Amalita Martinoli (Argentina)
Members:	Ms. Judy Kilpatrick (United States) Ms. Maria Villavicencio (Venezuela)

## III. RESOLUTIONS

### CCP.I/RES. 71 (XI-99)<sup>3/</sup>

#### COORDINATED STANDARDS DOCUMENT FOR LOW MOBILITY WIRELESS ACCESS SYSTEMS IN THE 1910 – 1930 MHz BAND

The XI Meeting of the Permanent Consultative Committee I: Public Telecommunication Services,

#### CONSIDERING:

- (a) The increasing commercial deployment of low power PCS equipment offering a wide range of applications and benefits in the 1910-1930 MHz band; and
- (b) That the common allocation of the spectrum among CITEL countries will enable them to benefit from the economies of scale and the multiple manufacturers supplying equipment.

#### RECOGNIZING:

- (a) That the Sixth PCC.III Meeting held a seminar on “Applications in the 1910-1930 MHz band” to inform CITEL members of the new technologies, standards and applications available in this band;
- (b) That PCC.I developed a coordinated standards document, CSD, entitled “Personal Communication Services (PCS)/Wireless in 2 GHz” which established the air interface standards for devices in the PCS band focusing on sub-bands A-F standards and that said document was approved at the X PCC.I meeting held in Cartagena de Indias, Colombia;
- (c) That Recommendation PCC.III/Rec.32 (IX-97) recommends CITEL Member States to consider, based on their national needs and regulations, the use of the band for any of the following applications:

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3. PCC.I/doc.865/99rev.1

- a) Fixed Wireless Access,
  - b) Low Mobility Wireless Access,
  - c) Voice and Data Applications Low Power Systems,
  - d) Combination of these applications.
- (d) That PCC.III/REC.32 (IX-97) recommends that CITEL Member States that adopt the 1910-1930 MHz band for low mobility wireless access systems, consider the results of the study referred to in PCC.III/Res.69 (IX-98), for reference and assistance to ensure the necessary compatibility amongst different applications and with PCS operating in adjacent bands, and
- (e) That document PCC.I/doc.761/99 was circulated amongst all participants at the X and XI PCC.I meetings, giving rise to additional comments included therewith.

**RESOLVES:**

To adopt document PCC.I/doc.761/99 rev.3 (annex) as Document on Coordination of Standards for Low Mobility Wireless Access Systems on the 1910-1930 MHz Band.

**INSTRUCTS THE EXECUTIVE SECRETARIAT:**

To distribute this document of coordinated standards to all CITEL Member States and to PCC.I associate members.

**X MEETING OF PERMANENT CONSULTATIVE COMMITTEE I:  
PUBLIC TELECOMMUNICATION SERVICES  
June 28 to July 2, 1999  
Cartagena de Indias, Colombia**

**OEA/Ser.L/XVII.4.1  
CCP.I/doc.761/99 Rev.3  
22 June 1999  
Original: textual**

**DOCUMENT ON COORDINATION OF STANDARDS  
FOR LOW MOVILITY WIRELESS ACCESS SYSTEMS ON THE 1910-1930 MHz BAND**

**(Ref. doc: PCC.I/doc.624/98)**

(Document submitted by Working Group on Standards Coordination)

## **ABSTRACT**

**This document on the coordination of standards examines global activity relating to low-power devices operating on the 1910-1930 MHz band, with a particular focus on their air interface standards and unlicensed applications. The 1910-1930 MHz band is the sub-band that has been reserved by CITELE for personal communications services, pursuant to PCC.III/Rec.32(IX-97), section “b”.**

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## WORKING GROUP ON STANDARDS COORDINATION

### DOCUMENT ON COORDINATION OF STANDARDS

#### FOR LOW MOBILITY WIRELESS ACCESS SYSTEMSON THE 1910-1930 MHz BAND

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## **1. Executive Summary**

This document on standards coordination examines activity relating in general to low-power devices operating on the 1910-1930 MHz band, focusing on “air interface” standards and unlicensed applications. The 1910-1930 MHz band is the sub-band of the frequency plan for personal services identified initially among the CITELE member countries as “unpaired”. Subsequently, Rec. 32 of PCC.III, identified applications for this frequency band, included under Low Power Voice and Data Equipment.

## **2. Introduction**

This document on Standards Coordination examines worldwide activity relating to low-power devices operating on the 1910-1930 MHz band, focusing on “air interface” standards and unlicensed applications.

The 1910-1930 MHz band is the sub-band of the frequency plan reserved by CITELE for personal communications services, the use of which was identified by Rec. 32 of PCC.III held in Mexico City in September 1997.

The typical distribution of the frequency spectrum in this frequency band among CITELE member countries, together with the adoption of these standards, will provide benefits in terms of economies of scale and diversity of manufacturers offering equipment that meets all of the INTERNATIONALLY ACCEPTED STANDARDS operating currently in many countries of Latin America and the rest of the world.

## **3. Background**

COM/CITELE recommends the frequency plan for personal communications services in PCC.III/Rec.11 (III-95) and PCC.III/Rec.12 (III-95), found in annexes C and D. As indicated in Figure 1, the personal communications services band corresponds to a spectrum of 140 MHz between the frequencies of 1850 and 1990 MHz. The band is divided into seven sub-bands. Six of these sub-bands, A to F, are identified for FDD personal communications services and make use of the frequencies 1850-1910 and 1930-1990 MHz. The seventh sub-band, with a band width of 20 MHz, covering frequencies 1910-1930 MHz, is reserved under the denomination “unpaired”. As issued by the IX meeting of PCC.III, Rec. 32 identifies applications for this frequency band, as shown in Figure 1.

Figure 1. PCS Band

A	D	B	E	F	C	PCC.III/Rec. 32 (IX-97)	A	D	B	E	F	C
15	5	15	5	5	15		15	5	15	5	5	15
1850			1910			1930			1990			
MHz			MHz			MHz			MHz			

Note:

Rec. 32/97 of PCC.III identifies use of the 1910-1930 MHz band for the following applications:

- a) Fixed wireless access
- b) Low mobility wireless access
- c) Low-power voice and data equipment
- d) Combination of the foregoing.

PCC.I has prepared a document entitled “Wireless personal communications services on 2GHz”, identifying the air interface standards for devices operating on the PCS band, and focussing on the standards relating to the sub-bands A to F. The purpose of this document is to supplement those standards by identifying standards applicable to the 1910-1930 MHz sub-bands.

#### 4. Standards

##### 4.1 International Standards

###### 4.1.1 ITU Recommendations

**ITU-R recommendation M.1033 titled “Technical and operational characteristics of cordless telephones and cordless telecommunications systems“ specifies systems characteristics of digital cordless systems. This ITU recommendation lists three systems that operate within the range 1910-1930 MHz band. They are:**

System 8: TIA/EIA 663, Personal Communications Interface, 1995 operating in the 1920-1930 MHz band.

System 9: TIA/EIA 662, Personal Wireless Telecommunications 1995 operating in the 1920-1930 MHz band.

System 10: ANSI J STD 014, Personal Access Communications System Air Interface Standard (this document has been replaced by TIA/EIA 667), Personal Access Communications Systems Unlicensed, Version B Air Interface Standard, all operating in the 1920-1930 MHz band.

###### 4.1.2 Other international standards organizations

~~There are no other international standards for devices within 1910-1930 MHz band.~~

#### 4.2 Regional Standards

#### 4.2.1 Region 1 (Europe, Middle East, Africa)

~~ETSI has defined the DECT standard for low power systems on the 1880-1939 MHz bands (ETSI 300 175 second Edition), and relating specifically to the 1910-1930 MHz band, ETSI TR 101 159 v1.2.1, which also specifies other blocks of frequencies such as 1880-1900, 1900-1920 MHz.~~

In Europe, primarily the DECT standard has been defined in ETSI Norm EN 300 175 (second version) for digital cordless telecommunications operating in the bands 1880-1900 MHz . ETSI Technical Report ETR 101 159 provides information about how to apply the DECT standard, outside Europe, for operation anywhere in the band 1880-1939 MHz.

#### DECT – Digital Enhanced Cordless Communications

DECT is a general standard for radio access. It is designed for high traffic volumes, with a micro and pico cell architecture, of MULTIPLE use for public and/or private applications such as Fixed Wireless Access (FWA), or with low mobility for public telephone networks, wireless telephone for office or residential use. As a standard, it offers a voice quality similar to that of copper telephone wire, and a wide variety of data services.

DECT has a dynamic channel selection mechanism, which is a new system that guarantees the best available radio channel at all times, and offers efficient spectrum management. Thanks to this characteristic, it does not require coordination for public installations.

Functioning in duplex	TDD (time division duplex)
Frequency band (MHz)	1910-1930, 1880-1900,1900-1920
Separation between carriers (kHz)	1782
Number of carriers	10
Carrier channels/Carrier	12/(24 timeslots)
Binary channel speed (kb/s)	1152
Modulation	GMSK
Coding of voice signals	32 kb/s ADPCM
Tx Power (mW)	250 Mw
Length of one frame (milliseconds)	10

#### 4.2.2 Region 3 (Asia and the Pacific)

Standards organizations in the region (ARIB and PHS MoU Group) have developed the PHS standard for use in the area.

The DECT standard for low-power systems within the 1880-2937 MHz bands (ETSI 300 175 Second Edition) and ETSI TR 101 159 v1.2.1, which specifies the frequency blocks as 1880-1900 MHz, 1900-1920 MHz, and 1910-1930 MHz.

The frequency band 1910-1930 MHz has been adopted by the countries of the Americas; 1880-1900 MHz by the countries of Europe, Asia and Africa; and 1900-1920 by China.

### **4.3 CITELE Countries**

#### **4.3.1 Argentina**

The National Communications Commission has assigned the 1910-1930 MHz band for public applications of fixed WIRELESS ACCESS and, as a secondary use, for low-power systems (with limited radiation).

#### **4.3.2 Brazil**

The National Telecommunications Agency in 1998 assigned the 1910-1930 MHz band to be used primarily for public fixed WIRELESS ACCESS, and secondarily for low-power systems (with limited radiation).

#### **4.3.3 Canada**

~~Canada's regulations for the 1910-1930 MHz band is presented in Industry Canada's Spectrum Management and Telecommunications Policy, Radio Standards Specifications RSS 213 for "2 GHz License Exempt Personal Communications Services Devices (PCS)". The RSS 213 adopts the technical standards, with minor exceptions. Hence the standards presented in section 4.3.5.2 meet the requirements established in RSS 213.~~

#### **4.3.4 Chile**

On June 5 1998, published a decree that the 1910-1930 MHz band is to be used primarily for public fixed WIRELESS ACCESS, and secondarily for low-power systems (with restricted radiation).

#### **4.3.5 USA**

##### **4.3.5.1 Background**

Given the importance of examining spectrum use for understanding standard-setting activity for wireless transmission, the following summary of the allocation of 1910-1930 MHz frequencies in the USA is provided.

The Federal Communications Commission has assigned the 1910-1930 MHz band as a band for PCS for Users. There is no granting of licenses to the PCS for Users band, as opposed to bands A to F of the PCS frequency plan. Allocation of the PCS for Users spectrum is intended to "promote the swift introduction of new PCS technologies that will allow manufacturers to sell directly to the general public products that use innovative designs and technologies, without the delays relating to the granting of licenses for radio services".

PCS for Users devices have been conceived for cordless personal and local communications via portable and fixed computers, cordless notepads and devices for cordless message transmission, cordless office and domestic telephone systems. These services are used by individuals and organizations who purchase and operate the equipment for their own benefit, without the need to lease the service from a third-party supplier or carrier. In this way, the final user can enjoy the benefits of PCS technology without incurring the monthly expenses of using the spectrum. PCS for User services are of low power and cover a limited range.

Although PCS for User devices are operated in some countries without a license requirement, these devices, and the band they use, are regulated. Transmission rules for the equipment, prepared by WINForum, are commonly known as “etiquettes”, and were approved first by the United States in the Code of Federal Standards, part 15, subpart D, of the FCC.

#### 4.3.5.2 Standards

Standard-setting organizations in the United States have completed the preparation of four standards for the air interface in the 1910-1930 MHz band, known in the United States as the PCS users’ band. The four standards are the following:

- TIA/EIA 662, Personal Wireless Telecommunications, 1995
- TIA/EIA 663, Personal Communications Interface, 1995
- ANSI J-STD-014 A, Personal Access Communications Systems – Unlicensed A, 1996. This document has been replaced by TIA/EIA 667, Personal Access Communication System- Wireless User Premises equipment (PACS-WUPE), 1997
- ANSI J-STD-014 B, Personal Access Communications Systems – Unlicensed B, 1996

The TIA/EIA standards 662, 663 and 667 were prepared by the Telecommunications Industry Association. That body is a consortium of telecommunications equipment manufacturers and service providers that develops standards for telecommunications equipment. ANSI J-STD-014 A, which has been replaced by TIA/EIA 667, and ANSI J-STD 014 B were prepared jointly by the T1 Committee and the Telecommunications Industry Association, and future development of these standards is in the hands of the T1 Committee.

##### 4.3.5.2.1 TIA/EIA 663, Personal Wireless Telecommunications

The standard on Personal wireless Telecommunications (PWT), TIA/EIA 662, is based on a microcell radio communications system that provides low-power radio access between portable equipment and the fixed network over distances of a few hundred meters. Wireless personal telecommunications deices may be used for wireless PBX services and for sending data in packets or over circuits. This standard is based on the Digital Enhanced Cordless Telecommunications (DECT) standard. Its technical characteristics are as follows:

Functioning in duplex	TDD (time division duplex)
-----------------------	----------------------------

Frequency band (MHz)	1920 - 1930
Separation between carriers (kHz)	1250
Number of carriers	8
Carrier channels/Carrier	12 (24 time slots)
Binary channel speed (kb/s)	1152
Modulation	/4 DQPSK
Coding of voice signals	32 kb/s ADPCM
Peak power of telephone device Tx (mW)	90
Length of one frame (milliseconds)	10

#### 4.3.5.2.2 TIA/EIA 663, Personal Communications Interface

The standard on Personal Communications Interface (PCI) TIA/EIA 663 was approved in 1995 for wireless PABX services. PCI makes it possible to provide several-cell, low-power digital cordless telephone services, which in turn provide both internal and external operations to the private node. Included are services such as advanced call management, portable position finding, incoming and outgoing call services, and complete user mobility. Also possible are wireless data transmission services that can be implemented in such a way as to facilitate incorporation of wireless computer telephony. In the standard known as European Cordless Telephone 2 (CT2), PCI has been enhanced to allow for more advanced services. The basic technical characteristics of the PCI standard are as follows:

Functioning in duplex	TDD
Frequency band (MHz)	1920-1930
Separation between carriers (kHz)	100
Number of carriers	99
Carrier channels/Carrier	1
Binary channel speed (kb/s)	72
Modulation	GMSK
Coding of voice signals	32 kb/s ADPCM
Peak power of telephone device TX (Mw)	32
Length of one frame (milliseconds)	2

#### 4.3.5.2.3 TIA/EIA 667, Personal Access Communications Systems – Wireless User Premises Equipment

The standard on Personal Access Communications Systems – Wireless User Premises Equipment (PACS-WUPE), TIA/EIA 667, is based on the Personal Handyphone System (PHS). PACS-WUPE

is a microcell technology with a wide range of voice service and data carrying functionalities, which allows for user mobility. Its general characteristics are as follows:

Functioning in duplex	TDD (time division duplex)
Frequency band (MHz)	1920-1930
Separation between carriers (kHz)	300kHz
Number of carriers	32
Carrier channels/Carrier	4
Binary channel speed (kb/s)	384
Modulation	/4 DQPSK
Coding of voice signals	32 kb/s ADPCM
Peak power of telephone device Tx (mW)	53
Length of one frame (milliseconds)	5

#### 4.3.5.2.4 ANSI J-STD-014 A and B, unlicensed PACS A and B

The PACS air interface standard, ANSI J-STD-014, contains two supplements relating to bands that do not require licenses, known as PACS-UA and PACS-UB. Standard TIA/EIA 667 replaces ANSI J-STD-014 A, and the table in section 4.3.5.2.3 lists its characteristics. The physical configuration characteristics of PACS-UB are very similar to the PACS-UA Standard. The major difference between PACS-UA and PACS-UB is that PACS-UB uses a frame length of 2.5 milliseconds, instead of 5 milliseconds. The physical configuration characteristics of the PACS-UB standard are as follows:

Functioning in duplex	TDD (time division duplex)
Frequency band (MHz)	1920-1930
Separation between carriers (kHz)	300 kHz
Number of carriers	32
Carrier channels/Carrier	4
Binary channel speed (kb/s)	384
Modulation	/4 DQPSK
Coding of voice signals	32 kb/s ADPCM
Peak power of telephone device Tx (mW)	53
Length of one frame (milliseconds)	2.5



The structure of the PACS-UB tables is consistent with the structure defined in the air interface standard for licensed PACS.

#### **4.3.6 Mexico**

Mexico has approved the spectrum etiquette rules and standards described above for the region within 72 kilometers (45 miles) of the United States border. Outside this region, the 1910-1930 MHz band is reserved pending completion of studies now underway.

### **5. Conclusions**

A number of CITELE member countries have reserved part of the frequency spectrum for personal communications services in the 1850-1990 MHz frequency band. Several of them are studying the possibility of reserving the 1910-1930 MHz band for low-power devices and unlicensed applications that will allow users to select the most appropriate radio technology for their respective applications.

The joint distribution of the spectrum in this frequency band among the member countries of CITELE, together with the selection of these standards, will offer the benefits of economies of scale and a diversity of manufacturers who can supply equipment that meets the standards. Users will be able to select technologies within a group of standards, choosing the optimum technology for their specific environment and application.

### **6. Proposal**

The PCC.I standards offer strong support to the PCC.III standards, in terms of recommending the 1910-1930 MHz frequency band for low-power, unpaired devices that do not require licenses. Further steps are needed to ensure that users can select the most appropriate radio technology for any given application, consistent with the standards set out by the CSD for the 1910-1930 MHz frequency band. The joint distribution of the frequency spectrum in CITELE member countries, together with the adoption of these standards, will offer the benefits of economies of scale and a diversity of manufacturers who can supply equipment that meets the standards.

### **7. Future work**

This document will be updated once new standards are available that are compatible with this frequency band, in accordance with the services described in Rec. 32 of PCC.III, applications "c" and "d".

### **8. References**

1. TIA/EIA 662. Personal Wireless Telecommunications, 1995
2. TIA/EIA 663, Personal Communications Interface, 1995
3. ANSI J-STD-014 A, Personal Access Communications Systems-Unlicensed A, 1996. This document is superseded by TIA/EIA 667, Personal Access Communications

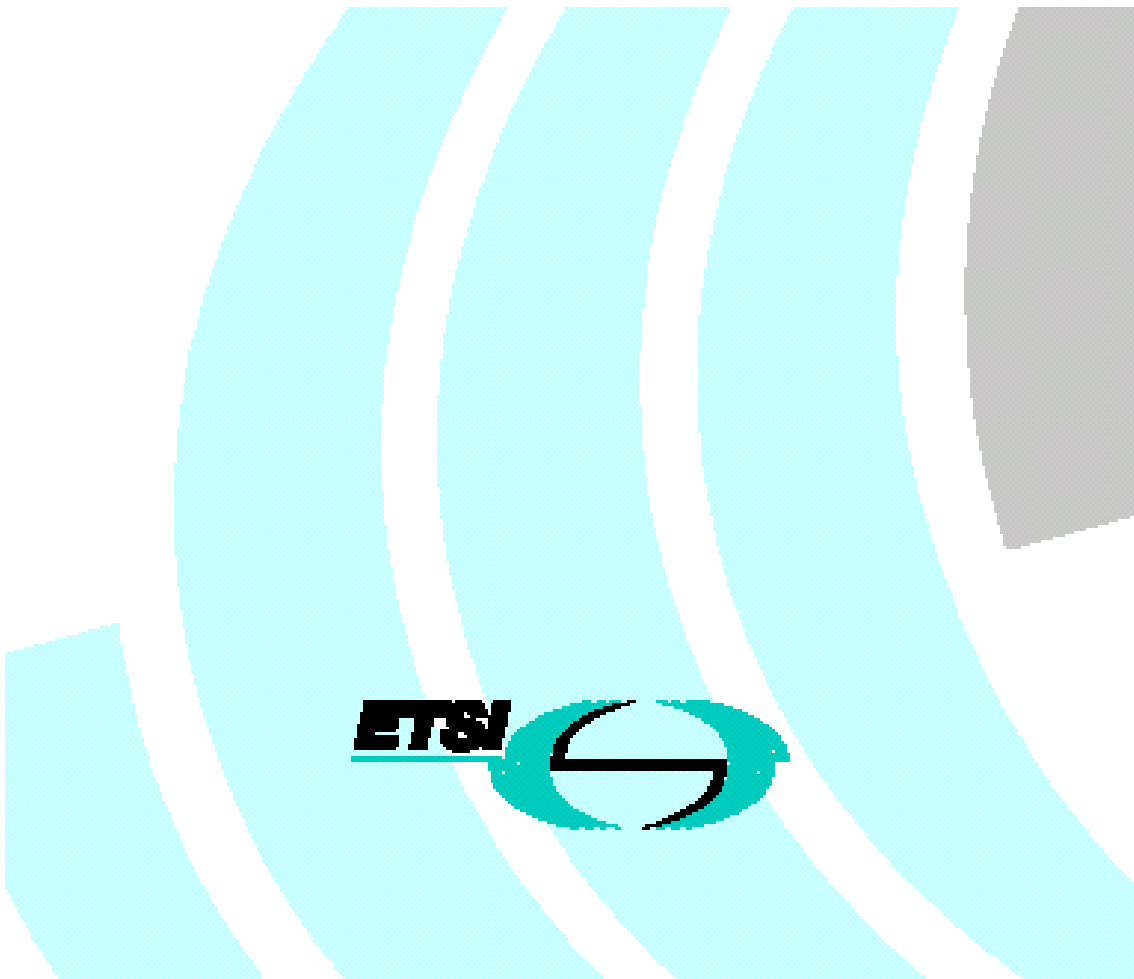
System – Wireless User Premises Equipment (PACS-WUPE), 1997, ANSI J-STD-014 A, is superseded by TIA/EIA 667

4. ANSI J-STD-014 B, Personal Access Communications Systems – Unlicensed B, 1996
5. ETSI 300 175 Second Edition, 1996 Digital Enhanced Cordless Telecommunications (DECT);
6. ETSI ETR 310, Digital Enhanced Cordless Telecommunications (DECT);: Traffic Capacity and spectrum requirements for multi-system and multi-service DECT applications co-existing in a common frequency band
7. ETSI TR 101 159 v1.2.1, Digital Enhanced Cordless Telecommunications (DECT); Implementing DECT in an arbitrary spectrum allocation.

ANNEX A

*ETSI TR 101 159 Version 1.2.1*

**Digital Enhanced Cordless Telecommunications (DECT);  
Implementing DECT in an arbitrary spectrum allocation**



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**TR 101 159 V1.2.1 (1998-06)**

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## Foreword

This Technical Report (TR) has been produced by the Digital Enhanced Cordless Telecommunications (DECT) Project of the European Telecommunications Standards Institute (ETSI).

The present document provides a guide on how to implement and test DECT systems operating at frequencies outside the frequency-bands described in TBR 6 [11].

## 1 Scope

The present document is a guide how to implement and test Digital Enhanced Cordless Telecommunications (DECT) systems operating at frequencies outside the frequency-bands described in TBR 6 [11]. The need to have this arises if DECT equipment is to be adapted to national requirements of countries which do not allow to use the basic 1 880 to 1 900 MHz DECT frequency band.

The present document is thereby also a guide for approval of such DECT systems in the above mentioned countries.

## 2 References

References may be made to:

- a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or
- b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or
- c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or
- d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] EN 300 175-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".

[2] EN 300 175-2: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical layer (PHL)".

- [3] EN 300 175-3: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI);  
Part 3: Medium Access Control (MAC) layer".
- [4] EN 300 175-4: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI);  
Part 4: Data Link Control (DLC) layer".
- [5] EN 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI);  
Part 5: Network (NWK) layer".
- [6] EN 300 175-6: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI);  
Part 6: Identities and addressing".
- [7] EN 300 175-7: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI);  
Part 7: Security features".
- [8] EN 300 175-8: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI);  
Part 8: Speech coding and transmission".
- [9] EN 300 176-1: "Digital Enhanced Cordless Telecommunications (DECT); Approval test specification; Part 1: Radio".
- [10] EN 300 176-2: "Digital Enhanced Cordless Telecommunications (DECT); Approval test specification; Part 2: Speech".
- [11] TBR 6: "Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements".
- [12] EN 300 444: "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)".
- [13] ETR 056: "Digital European Cordless Telecommunications (DECT); System description document".
- [14] ETS 300 700: "Digital European Cordless Telecommunications (DECT); Wireless Relay Station (WRS)".
- [15] ETS 300 765-1: "Digital Enhanced Cordless Telecommunications (DECT); Radio in the Local Loop (RLL) Access Profile (RAP); Part 1: Basic telephony services".

[16] ETS 300 765-2: "Digital Enhanced Cordless Telecommunications (DECT); Radio in the Local Loop (RLL) Access Profile (RAP); Part 2: Advanced telephony services".

[17] ETR 246: "Digital European Cordless Telecommunications (DECT); Application of DECT Wireless Relay Station (WRS)".

[18] ETR 308: "Digital Enhanced Cordless Telecommunications (DECT); Services, facilities and configurations for DECT in the local loop".

[19] ETR 310: "Digital Enhanced Cordless Telecommunications (DECT); Traffic capacity and spectrum requirements for multi-system and multi-service DECT applications co-existing in a common frequency band".

[20] ETS 300 822: "Digital Enhanced Cordless Telecommunications (DECT); Integrated Services Digital Network (ISDN); DECT/ISDN interworking for intermediate system configuration; Interworking and profile specification".

[21] ETR 185: "Digital European Cordless Telecommunications (DECT); Data Services Profile (DSP); Profile overview".

[22] ETR 178: "Digital European Cordless Telecommunications (DECT); A high level guide to the DECT standardization".

[23] TBR 22: "Attachment requirements for terminal equipment for Digital Enhanced Cordless Telecommunications (DECT) Generic Access Profile (GAP) applications".

[24] 91/263/EEC: "Council Directive of 29 April 1991 on the approximation of the laws of the Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity" (Terminal Directive).

[25] 91/287/EEC: "Council Directive of 3 June 1991 on the frequency band to be designated for the coordinated introduction of digital European cordless telecommunications (DECT) into the Community".

[26] 91/288/EEC: "Council Directive of 3 June 1991 on the co-ordinated introduction of digital European cordless telecommunications (DECT) into the Community".

[27] 90/388/EEC: "Council Directive of 28 June 1990 on competition in the markets for telecommunications services".

### **3 Definitions and abbreviations**

#### **3.1 Definitions**

For the purposes of the present document, the following definitions apply:



*Fixed Part (DECT Fixed Part) (FP):* A physical grouping that contains all of the elements in the DECT network between the local network and the DECT air interface.

*Portable Part (DECT Portable Part) (PP):* A physical grouping that contains all elements between the user and the DECT air interface. PP is a generic term that may describe one or several physical pieces.

### **3.2 Abbreviations**

For the purposes of the present document, the following abbreviations apply:

CTA	Cordless Terminal Adapter
CTR	Common Technical Regulation
DAS	DECT Access Site
DCS	Dynamic Channel Selection
DECT	Digital Enhanced Cordless Telecommunications
ERO	European Radio communications Office
EUT	Equipment Under Test
FDD	Frequency Division Duplex
FP	Fixed Part
FS	Fixed Service
FSS	Fixed Satellite Service
FWA	Fixed Wireless Access
GAP	Generic Access Profile
GPS	Global Positioning System
ISDN	Integrated Services Digital Network
LOS	Line Of Sight
NLOS	Near Line Of Sight
P-MP	Point-to-Multipoint
POTS	Plain Old Telephone Service
PP	Portable Part
PSTN	Public Switched Telephone Network
RAP	RLL Access Profile
RF	Radio Frequency
RFP	Radio Fixed Part
RLL	Radio in the Local Loop
TBR	Technical Basis for Regulation
TDD	Time Division Duplex
TE	Terminal Equipment
UMTS	Universal Mobile Telecommunications System
WLL	Wireless Local Loop
WRS	Wireless Relay Station

## 4 Introduction to DECT services and applications

DECT is a general radio access technology for short range wireless telecommunications. It is a high capacity, pico-cellular digital technology, for cell radii ranging from about 10 m to 5 km depending on application and environment. It provides telephony quality voice services, and a broad range of data services, including Integrated Services Digital Network (ISDN). It can be effectively implemented in a range from simple residential cordless telephones up to large systems providing a wide range of telecommunications services.

The DECT instant or continuous dynamic channel selection, provides effective coexistence of uncoordinated installations of private and public systems on the common designated DECT frequency band, and avoids any need for traditional frequency planning. See ETR 310 [19] for further explanation. Figure 1 gives a high level graphic overview of applications and features of DECT.

A list of all ETSI standards and ETSI technical reports for DECT are given in ETR 178 [22]. Annex A of ETR 178 [22] contains a list of the essential standards and reports.

The DECT standardization has developed a modern and complete standard within the area of cordless telecommunications. The European wide allocation of the frequency band 1 880 - 1 900 MHz, has been reinforced by the Council Directive 91/287/EEC [25]. Spectrum allocation for DECT has also been adopted by many other countries worldwide.

DECT carriers have been defined for the whole spectrum range 1 880 - 1 939 MHz in the basic DECT standards EN 300 175, parts 1 to 8 [1] - [8] and TBR 6 [11]. This allows DECT services to be introduced in countries where the basic DECT frequencies 1 880 - 1 900 MHz are not available.

For rapid introduction DECT, Common Technical Regulations (CTRs) have been established for DECT relating to harmonized DECT standards, Technical Bases for Regulation (TBRs) and ENs. TBRs contain the technical requirements of a CTR. Approval to a CTR gives access to a single European market through a simplified legal procedure.

The Council Recommendation 91/288/EEC [26] recommends that the DECT standard should meet user requirements for residential, business, public pedestrian and radio in the local loop applications. The standard should also provide compatibility and multiple access rights to allow a single handset to access several types of systems and services, e.g. a residential system, a business system and one or more public systems. The public applications should be able to support full intersystem roaming of DECT handsets. The DECT standard provides these features. Of special importance is the Generic Access Profile (GAP) and the related TBR 22 [23], which define common mobility and interoperability requirements for private and public DECT speech services. For a more comprehensive overview of the DECT standardization see ETR 178 [22].

The European Commission has elaborated an amendment of Directive 90/388/EEC [27] on competition in the market for telecommunications services. This Directive defines DECT as an important alternative to the wired Public Switched Telephone Network (PSTN)/ISDN network

access. Furthermore any restriction on the combination of DECT with other mobile technologies are to be withdrawn.

The emerging deregulation of fixed services will also speed up fixed-mobile convergence in service offerings from operators. The different DECT interoperability profile standards are designed to facilitate provision of mixtures of fixed and mobile services through a single infrastructure.

The aim of the present document is to provide technical requirements that can be applied for DECT approval in countries having a spectrum allocation for DECT, different from the European allocation. The present document consists of references to the relevant ETSI DECT standards (TBR 6 [11]) and amendments required for application in a general spectrum allocation band.

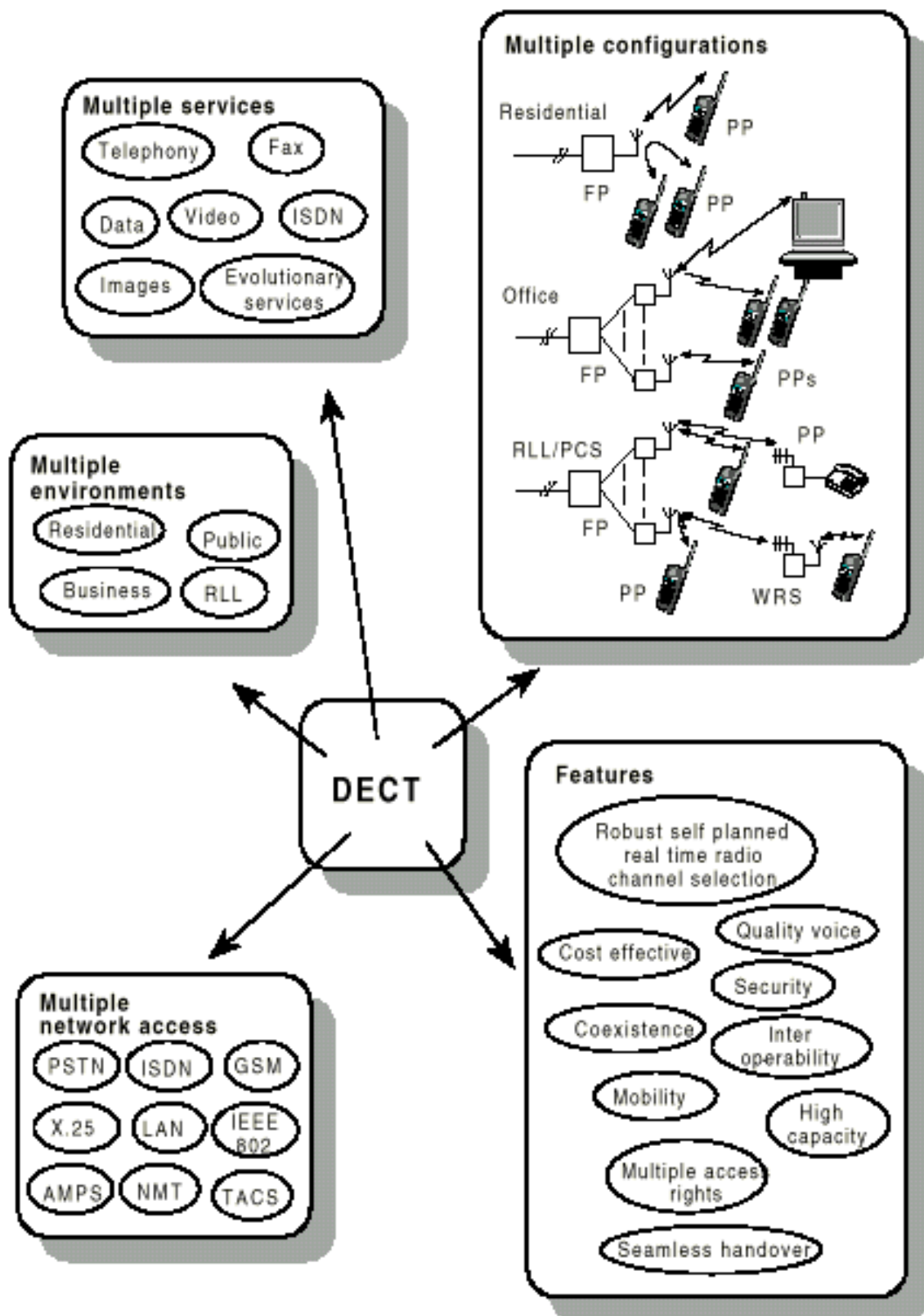


Figure 1: Overview of DECT applications and features

## 5 Requirements

This clause defines the minimum required functions and parameters for DECT equipment operating in the frequency band  $F_L$  to  $F_U$ .  $F_L$  defines the lower edge of the assigned frequency band and  $F_U$  defines the upper edge of the frequency band.

The technical requirements are contained in TBR 6 [11] together with the amendments which are defined in this clause.

### 5.1 Carrier positions

Examples of carrier allocations and carrier positions are given in Annex A.

The frequencies to be used can be software controlled by the DECT base stations. They are indicated in a broadcast message to the portables.

DECT equipment should be capable of working on all assigned channels. This normally provides the most efficient use of the spectrum, but it is possible to limit specific applications, or a specific system, to part of the spectrum if this is suitable due to local circumstances.

### 5.2 General requirements

A summary of the main technical requirements of TBR 6 [11] is given in table 1.

**Table 1**

Parameter	Characteristic/ Value	Reference
accuracy and stability of Radio Frequency (RF) carriers	RFP: $\pm 50$ kHz PP: $\pm 100$ kHz	7.2, 7.3, 7.4, 7.5
packet timing jitter	$\pm 1$ $\mu$ s	8.3
reference timing accuracy of a Radio Fixed Part (RFP)	max 10 ppm	8.4
packet transmission accuracy of a PP	5 ms $\pm$ 2 $\mu$ s	8.5
transmission burst	power-time template	9
transmitted power	max 250 mW	10
RF carrier modulation	digital modulation	11
unwanted emissions due to modulation	emission mask	12.2
unwanted emissions due to transmitter transient	emission mask	12.3
unwanted emissions due to intermodulation	1 $\mu$ W	12.4
spurious emissions when allocated a transmit channel	250 nW below 1 GHz 1 $\mu$ W above 1 GHz	12.5
radio receiver sensitivity	-83 dBm at BER = $10^{-3}$	13.1
radio receiver reference BER	$10^{-5}$ at -73 dBm	13.2
radio receiver interference performance	BER < $10^{-3}$	13.3
radio receiver blocking	See table 2	13.4
radio receiver intermodulation performance	BER < $10^{-3}$	13.6
spurious emissions when the PP has no allocated transmit channel	2 nW	13.7
efficient use of the radio spectrum	channel handling	17.1, 17.2, 17.3
antennas with directivity	12 dBi	H.2

The tests cases in table 1 shall be performed, where relevant, on the two supported carriers nearest to the band edges and on one carrier inside the band. The applicant shall declare the band edge limits F L and F U and the carriers supported.

For the blocking requirements, table 2 shall be applied instead of the requirements given in table 12 of TBR 6 [11].

**Table 2**

Frequency (f)	Continuous wave interferer level	
	For radiated measurements dB $\mu$ V/m	For conducted measurements dBm
$25 \text{ MHz} \leq f < F_L - 100 \text{ MHz}$	120	-23
$F_L - 100 \text{ MHz} \leq f < F_L - 5 \text{ MHz}$	110	-33
$ f - F_C  > 6 \text{ MHz}$	100	-43
$F_U + 5 \text{ MHz} < f \leq F_U + 100 \text{ MHz}$	110	-33
$F_U + 100 \text{ MHz} < f \leq 12,75 \text{ GHz}$	120	-23

The Equipment Under Test (EUT) shall operate on the declared frequency allocation with the low band edge  $F_L$  MHz and the high band edge  $F_U$  MHz.

## **Annex A:**

Examples for frequency band allocations

### **A.1 DECT carrier numbers and carrier positions around 1,9 GHz**

DECT is specified for the whole frequency range 1880 –1939 MHz.

For the frequency band 1880 - 1900 MHz 10 RF-carriers with centre frequencies  $F_c$  are given by:

$$F_c = F_0 - c * 1,728 \text{ MHz, where: } F_0 = 1897,344 \text{ MHz}$$
$$c = 0, 1, 2, \dots, 9$$

For carriers from 1899,072 to 1939,088 MHz the carrier frequencies are defined by:

$$F_c = F_9 + c * 1,728 \text{ MHz, where: } F_9 = 1881,792 \text{ MHz}$$
$$c = 10, 11, 12, \dots, 32$$

RF-band number = 00001 (see EN 300 175-2 [2], subclause 4.1.1 and EN 300 175-3 [3], subclause 7.2.3.3.1)

The above carrier frequencies are explicitly given in table A.1.

**Table A.1: Carrier numbers and carrier positions**

Carrier number c	Rf-band number	Carrier freq. MHz	Carrier number c	Rf-band number	Carrier freq. MHz
9	-	1881,792	17	00001	1911,168
8	-	1883,520	18	00001	1912,896
7	-	1885,248	19	00001	1914,624
6	-	1886,976	20	00001	1916,352
5	-	1888,704	21	00001	1918,080
4	-	1890,432	22	00001	1919,808
3	-	1892,160	23	00001	1921,536
2	-	1893,888	24	00001	1923,264
1	-	1895,616	25	00001	1924,992
0	-	1897,344	26	00001	1926,720
10	00001	1899,072	27	00001	1928,448
11	00001	1900,800	28	00001	1930,176
12	00001	1902,528	29	00001	1931,904
13	00001	1904,256	30	00001	1933,632
14	00001	1905,984	31	00001	1935,360
15	00001	1907,712	32	00001	1937,088
16	00001	1909,440			

Examples of current spectrum allocations for DECT in different parts of the world are: 1880 – 1900 MHz, 1900 – 1920 MHz and 1910 – 1930 MHz.

The DECT fixed part (base station) broadcast messages indicate the locally relevant carrier to ensure that portables and WLL subscriber units set up calls only within the locally allocated band.

New or modified bands can locally be defined when needed.

#### History

Document history		
V1.1.1	February 1998	Publication
V1.2.1	June 1998	Publication



**PCC.I/RES. 72 (XI-99)**<sup>4/</sup>

**COORDINATED STANDARDS DOCUMENT FOR FIXED WIRELESS ACCESS SYSTEMS  
(FWA) IN THE 1910 – 1930 MHz BAND**

The XI Meeting of the Permanent Consultative Committee I: Public Telecommunication Services,

**CONSIDERING:**

- (a) The increasing commercial deployment of Fixed Wireless Access Systems (FWA) in the 1910-1930 MHz band in most CITELE member countries; and
- (b) That the common allocation of the spectrum among CITELE countries will enable them to benefit from the economies of scale and the various manufacturers offering equipment that complies with accepted international standards.

**RECOGNIZING:**

- (a) That the Sixth PCC.III Meeting included a seminar on “Application in the 1910-1930 MHz band” to inform the members of CITELE of the new technologies, standards and applications available in this band;
- (b) That PCC.I developed a CSD entitled “Personal Communication Services (PCS)/Wireless in 2 GHz” establishing the air interface standards for devices in the PCS band focusing on sub-bands A-F standards and that said document was approved at the last PCC.I meeting (X-99);
- (c) That PCC.III/Rec.32 (IX-97) recommends CITELE member States to consider, based on their national needs and regulations, the use of the band for any of the following applications:
  - a) Fixed Wireless Access,
  - b) Low Mobility Wireless Access,
  - c) Voice and Data applications Low Power Systems,
  - d) Combination of these applications.
- (d) That PCC.III/Rec.32 (IX-97) recommends CITELE Member States that adopt the 1910-1930 MHz band for Fixed Wireless Access (FWA) should take into consideration the results of interference study that are noted in this CD (section 3) for reference and assistance to ensure the necessary compatibility amongst the different applications and with PCS in adjacent bands; and
- (e) That document PCC.I/doc.762/99 was circulated amongst all participants at the X and XI PCC.I meetings, giving rise to additional comments included therewith.

---

4. PCC.I/doc. 884/99rev.1

**RESOLVES:**

To adopt document PCC.I/doc.762/99rev.3 (annex) as Coordination of Standards for Public Wireless Access (FWA) Systems in the 1910-1930 MHz Band.

**INSTRUCTS THE EXECUTIVE SECRETARIAT:**

To hand out this document of coordinated standards to all CITELE Member States and to PCC.I Associate members.

**XI REUNIÓN DEL COMITÉ  
CONSULTIVO PERMANENTE I:  
SERVICIOS PÚBLICOS DE  
TELECOMUNICACIONES  
Del 25 al 29 de octubre de 1999  
Buenos Aires, Argentina**

**OEA/Ser.L/XVII.4.1  
CCP.I/doc.762/99 rev.3  
30 junio 1999  
Original: textual**

**COORDINATION OF STANDARDS FOR PUBLIC FIXED WIRELESS ACCESS (FWA)  
SYSTEMS IN THE 1910–1930 MHz BAND**

Reference document / Documento de referencia: CCP.I-625/98

(Document Submitted by Alcatel, Ericsson, NEC, and Siemens)

## ABSTRACT

**THIS STANDARDS COORDINATION DOCUMENT EXAMINES THE RELEVANT GLOBAL ACTIVITY INVOLVING PUBLIC SYSTEMS FOR FIXED WIRELESS ACCESS (FWA) THAT OPERATE IN THE 1910–1930 MHZ BAND, WITH PARTICULAR EMPHASIS ON THEIR AIR INTERFACE STANDARDS. THIS DOCUMENT IDENTIFIES THOSE STANDARDS WHICH COMPLY WITH THE TECHNICAL STRUCTURES AND PROCEDURES OF FIXED WIRELESS ACCESS SYSTEMS OPERATING IN THE 1910–1930 MHZ BAND PURSUANT TO RECOMMENDATION PCC.III/REC.32(IX-97), SECTIONS (A) AND (B).**

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**WORKING GROUP ON STANDARDS COORDINATION  
COORDINATION DOCUMENT FOR PUBLIC FIXED WIRELESS ACCESS SYSTEMS  
IN THE 1910–1930 MHz BAND**

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## 1. EXECUTIVE SUMMARY

This standards coordination document examines the relevant global activity involving public systems for FIXED WIRELESS ACCESS (FWA) that operate in the 1910–1930 MHz band, with particular emphasis on their air interface standards. This document identifies those standards which comply with the technical structures and procedures of fixed wireless access systems operating in the 1910–1930 MHz band pursuant to PCC.III recommendation Rec.32(IX-97), sections (a) and (b).

## 2. INTRODUCTION

This standards coordination document examines global activity involving public FIXED WIRELESS ACCESS (FWA) services that operate in the 1910–1930 MHz band, with particular emphasis on “air interface” standards.

The 1910–1930 MHz band is the sub-band of the frequency plan for personal communications services (PCS) reserved by CITEL; its use has been identified in Rec. 32 of PCC.III, adopted in Mexico City in September 1997.

The typical distribution of frequencies in this frequency band around the CITEL countries, together with the selection of these standards, will bring two sets of benefits: economies of scale, and a wide range of manufacturers providing equipment that meet a set of INTERNATIONALLY ACCEPTED STANDARDS that are currently in place in many countries in the region and around the world.

## 3. BACKGROUND

COM/CITEL recommends the frequency plan for personal communications services in PCC.III/Rec.11 (III-95) and PCC.III/Rec.12 (III-95). As shown in Fig. 1, the personal communications services band covers a range of 140 MHz between 1850 and 1990 MHz. The band is divided into seven sub-bands. Six sub-bands (A through F) have been identified for Frequency Division Duplex (FDD) personal communications services using frequencies of 1850–1910 and 1930–1990 MHz.

The seventh sub-band, covering 20 MHz of bandwidth between 1910 and 1930 MHz, is reserved as “unpaired” for Time Division Duplex (TDD) access systems. Subsequently, at the IX Meeting of PCC.III, Rec. 32 identified the applications for this frequency band, as shown in Fig. 1.

*Figure 1. PCS Band*

A	D	B	E	F	C		Rec. 32	A	D	B	E	F	C
15	5	15	5	5	15			15	5	15	5	5	15
1850					1910			1930					1990
MHz					MHz			MHz					MHz

Note:

PCC.III Rec. 32/97 identifies use of the 1910–1930 MHz band for the following applications:

- a) Fixed wireless access
- b) Low mobility wireless access
- c) Low power voice and data units
- d) Combinations of the above

PCC.I has drawn up a document titled “Wireless Personal Communications Services at 2 GHz,” which identifies air interface standards for units operating in the PCS band, with particular emphasis on the standards applicable to sub-bands A through F. The purpose of this paper is to supplement the PCC.I document and to identify the standards applicable to the 1910–1930 MHz sub-bands.

Regarding the study group crested to study the possible incompatibility issues between FWA and PCS systems operating in the 1850 - 1990 MHz band, PCC III has presented the following documents showing its results and conclusions. These documents will be published in a CITELE guide in accordance with PCC.III RES 69 (IX-98):

Doc PCC III – 935/97

Doc PCC III – 1077/98

Doc PCC III – 922/97

The presentation made in the seminar (Xth. Meeting PCC III) “ Results of studies of working group to Quantify the Incompatibilities between FWA and PCS within the 1850 – 1890 MHz frequency band.

#### **4. STANDARDS**

##### **4.1 International Standards**

##### **4.1.1 ITU Recommendations**

There are no ITU recommendations for FWA standards. However many suppliers have made FWA applications available that adhere with ITU standards for cordless systems in 1910-1930 MHz band, which are included in ITU-R Rec. M.1033-1.

##### **Recommendation ITU-R Rec. M1033-1**

Recommendation ITU-R M.1033-1, “Technical and Operational Characteristics of Cordless Telephones and Cordless Telecommunications Systems”, identifies five standards that operate in the 1.9 GHz band with fixed wireless access applications (Table 3: Systems Characteristics of Digital Systems):

- System 5: ETSI, Digital Enhanced Cordless Telecommunications, 1992 – operating in the 1880–1900 MHz band.
- System PHS: ARIB (RCR STD 28), Personal Handy phone Systems, 1992 – operating in the ~1900 MHz band.
- System 8: TIA/EIA 663, Personal Communications Interface, 1995 – operating in the 1920–1930 MHz band.



- System 9: TIA/EIA 662, Personal Wireless Telecommunications, 1995 – operating in the 1920–1930 MHz band.
- System 10: ANSI J-STD-014 – Personal Access Communication System Air Interface Standard (this document has been replaced by TIA/EIA 667, Personal Access Communication System Unlicensed, Version B Air Interface Standard), all operating in the 1920–1930 MHz band.

#### 4.1.2 Other International Standards Organizations

There are no other international standards used for FWA applications other than those described in section 4.1.1.

## 4.2 Regional Standards

### 4.2.1 REGION 1 (EUROPE, MIDDLE EAST, AFRICA)

In Europe, primarily the DECT standard has been defined in ETSI norm EN 300 175 (second version) for digital cordless Telecommunications operating in the bands 1880–1900 MHz.

ETSI Technical Report ETR 101 159 provides informations about how to apply the DECT standard, outside Europe, for operation anywhere in the band 1880 – 1939 MHz.

### DECT – Digital Enhanced Cordless Telecommunications

DECT is a general standard for radio access. It is designed for high traffic levels, using an architecture of multipurpose micro – and pico - cells, and is intended for public and/or private applications such as fixed wireless access (FWA) or wireless telephones for office or residential use when there is low mobility in public telephone networks. As a standard, it offers voice quality similar to copper telephone cable and a wide range of data services. DECT supports dynamic channel selection, a novel system that guarantees the best available radio channel at all times as well as efficient management of the spectrum. Thanks to this feature, public installations do not require coordination.

Duplex Operation	TDD (Time Division Duplex)
Frequency Band (MHz)	1910-1930, 1880-1900, 1900-1920
Carrier Separation (kHz)	1782
Number of Carriers	10
Channels per Carrier	12 (24 timeslots)
Channel Binary Speed (kb/s)	1152
Modulation	GMSK
Voice Signal Encoding	32 kb/s ADPCM
Tx Power (mW)	250 mW

Frame Length (milliseconds)	10
-----------------------------	----

FWA-DECT FIXED WIRELESS ACCESS offers the final users of public networks the following benefits:

- Dynamic Channel Selection, the main aim of which is to offer a high-quality, robust link to satisfy the service expectations of public networks and to allow the coexistence of different operators and applications in the same area for efficient spectrum use, subject to national regulations.
- Security: guaranteed confidentiality with encrypting and terminal authentication procedures.
- High voice quality, similar to copper cable (32 kbit/s ADPCM encoding).
- Service variety, benefiting users and operators (voice, fax, data, Internet, multimedia, public telephony).
- No frequency planning required.
- Range increased to 16 km.

#### **4.2.2 REGION 3 (ASIA, PACIFIC)**

The region's standardization bodies (TTC and ARIB/PHS MoU Group) have developed the PHS standard for use in Japan pursuant to RCR-STD-28. In certain other Asian and Pacific countries, the PHS standard was adopted for public FIXED WIRELESS ACCESS systems in the original band under RCR-STD-28 (ARIB) and, in others, under A-GN3.00-01-TS (PHS MoU Group) in the 1900–1920 MHz band. To introduce PHS in other countries where the original frequencies are not available, the radio parameters have been defined by the PHS MoU Group organization in technical specification A-GN3.00-01-TS for the 1880–1930 MHz frequency range. The following is a summary of the PHS standard as a wireless access system:

#### **PHS – Personal Handy phone System**

PHS is a general standard for wireless access systems based on digital technology in the 1.9 GHz band, established by the Association of Radio Industries and Businesses (ARIB) as RCR STD-28 for use in Japan and certain Asian countries. To facilitate the introduction of PHS in other countries where the basic frequencies are not available, the PHS MoU Group has defined the radio parameters for the 1880–1930 MHz frequency range in technical specification A-GN3.00-01-TS.

The PHS standard offers a variety of applications, from public and private communications service such as mobile cellular systems, fixed wireless access (FWA), wireless PBXs, and wireless devices. PHS provides high traffic capacity, good voice quality, and a range of data transmission services, including integrated services digital networks (ISDNs). PHS also supports dynamic channel selection, allowing easy coexistence between public and private PHS systems and between public PHS systems in a single area and on a single frequency band, without requiring coordination and frequency plans.

The basic technical characteristics of PHS are shown below. For further details, consult PHS MoU Document A-GN3.00-01-TS and RCR STD-28.

Duplex Operation	TDD (Time Division Duplex)
Frequency Band (MHz)	1910–1930, 1900–1920, 1895-1918, 1880–1900
Carrier Separation (kHz)	300
Number of Carriers	For 20 MHz: 66 carriers For 23 MHz: 76 carriers
Channels per Carrier	4
Channel Binary Speed (kb/s)	384
Modulation	/4 QPSK
Voice Signal Encoding	32 kb/s ADPCM
Tx Power (mW)	Private: 80 mW Public: up to 4 W
Frame Length (milliseconds)	5

FWA-PHS FIXED WIRELESS ACCESS offers the final users of public networks the following benefits:

- Dynamic Channel Selection, allowing the coexistence of different operators and applications in the same area and the same frequency band, without requiring frequency planning.
- Security: guaranteed confidentiality with encrypting and terminal authentication procedures.
- High voice quality, similar to copper cable (32 kbit/s ADPCM encoding).
- Service variety, such as voice, fax, data, Internet, multimedia, public telephony.
- Range increased to 12 km.

In some Asian countries, the DECT standard has also been adopted for public FIXED WIRELESS ACCESS systems in the 1880–1939 MHz band (ETSI 300 175, second edition), and specifically for 1910–1930 MHz, ETSI TR 101 159 v1.2.1, which also specifies other frequency blocks, such as 1880–1900 MHz and 1900–1920 MHz.

### 4.3 CITELE Nations

Within the CITELE nations, no standards have been defined for fixed wireless access in the 1910–1930 MHz band.

The allocations in the member countries with Fixed Wireless Access applications are indicated below. Some of these countries are using the DECT or PHS standards.

#### 4.3.1 Argentina

The National Communications Commission has assigned the 1910–1930 MHz band for public applications of fixed Wireless Access and, as a secondary use, for low power systems (with limited radiation)

#### **4.3.2 Bolivia**

The 1996 National Frequency Plan allocated the 1910–1930 MHz band for public FIXED WIRELESS ACCESS applications.

#### **4.3.3 Brazil**

In 1998, the National Telecommunications Agency allocated the 1910–1930 MHz band for primary use by Fixed Wireless Access and for secondary use by low power (restricted radiation) systems.

#### **4.3.4 Colombia**

On December 22, 1996, the Colombian Ministry of Communications published in the Official Journal that the 1910-1930 MHz band had been allocated for exclusive use by public FIXED WIRELESS ACCESS.

#### **4.3.5 Chile**

As published on June 5, 1998, the 1910–1930 MHz band has been assigned for primary use by public FIXED WIRELESS ACCESS and for secondary use by low power systems.

#### **4.3.6 Ecuador**

In 1997, the Communications Secretariat assigned the 1910–1930 MHz band for FIXED WIRELESS ACCESS.

#### **4.3.7 Honduras**

In its resolution 905/98, the CNT ruled that the 1910–1930 MHz band had been allocated for Fixed Wireless Telephone Access.

#### **4.3.8 Mexico**

On May 25, 1998, Mexico's Official Journal published the allocation of the 1910–1930 MHz band for specific use by Fixed and/or Mobile Wireless Access Systems. But it has reserved a 72-km (45 miles) strip along the border with the USA, for use of unlicensed PCS in accordance with the Technical and Procedural Framework presented in PCC.III/Rec.33 (IX-97). Beyond that area, the 1910–1930 MHz band is reserved until the studies currently underway are concluded.

#### **4.3.9 Panama**

The 1910–1930 MHz band has been assigned for FIXED WIRELESS ACCESS.

#### **4.3.10 Paraguay**

The 1910–1930 MHz band has been assigned for FIXED WIRELESS ACCESS.

#### **4.3.11 Dominican Republic**

The 1910–1930 MHz band has been assigned for FIXED WIRELESS ACCESS.

#### **4.3.12 Uruguay**

The 1910–1930 MHz band has been assigned for FIXED WIRELESS ACCESS.

### **5. CONCLUSIONS**

A number of CITEL member nations have reserved part of the frequency spectrum for personal communications services in the 1850–1990 MHz band.

Several countries are studying the possibility of reserving the 1910–1930 MHz band for one of the applications described in PCC.III Rec. 32, sections (a) and (b).

Standard development organization such as ETSI and the ARIB/PHS MoU Group have defined standards that can be used in common spectrum based on leading-edge technologies already in operation across the world.

The selection of these standards in the CITEL countries that choose sections (a) and (b) of PCC.III Rec. 32 will bring the benefits of economies of scale and of a wide range of manufacturers who provide equipment that is compatible with those standards. Users will be able to select technologies from within a group of standards, enabling them to choose the best technology for a given environment and application in accordance with their national laws and regulations.

### **6. PROPOSAL**

That CITEL member countries that choose the (a) and (b) applications of PCC.III Rec. 32; consider the use of standards presented in this CSD for the provision of Fixed Wireless access services.

### **7. FUTURE WORK**

This document will be updated as new compatible standards for FIXED WIRELESS ACCESS in this frequency band become available or are identified.

### **8. REFERENCES**

1. ETSI 300 175 Second Edition, 1996 Digital Enhanced Cordless Telecommunications (DECT).
2. ETSI ETR 310, Digital Enhanced Cordless Telecommunications (DECT); Traffic capacity and spectrum requirements for multi-system and multi-service DECT applications co-existing in a common frequency band.
3. ETSI TR 101 159 v1.2.1, Digital Enhanced Cordless Telecommunications (DECT); Implementing DECT in an arbitrary spectrum allocation.
4. ITU. WIRELESS ACCESS LOCAL LOOP. Volume 1. HANDBOOK ON LAND MOBILE (including Wireless Access), RADIOCOMMUNICATION BUREAU, 1996.
5. Recommendation ITU-R M.1033-1: Technical and Operational Characteristics of Cordless Telephones and Cordless Telecommunication Systems.
6. ARIB RCR STD 28, Third Edition, 1998 – Personal Handy phone Systems (PHS).
7. PHS MoU Group, C-GN0.00-02-TS, Jul/97: PHS – WLL Systems, General Description.
8. PHS MoU Group, Series of PHS – WLL Technical Specifications C-IFx.0x-01-TS, Dec/96.
9. PHS MoU Group, Series of Network PHS – WLL Technical Specifications C-NWx.00-03-TS, Dec/97.
10. PHS MoU Group, Series of Service PHS – WLL Technical Specifications C-SVx.00-01-TS, Dec/96.
11. PHS MoU Group, A-GN3.00-01-TS, Apr/99: Extension of Frequency Band Allocations for Personal Handy phone Systems.

APPENDIX A

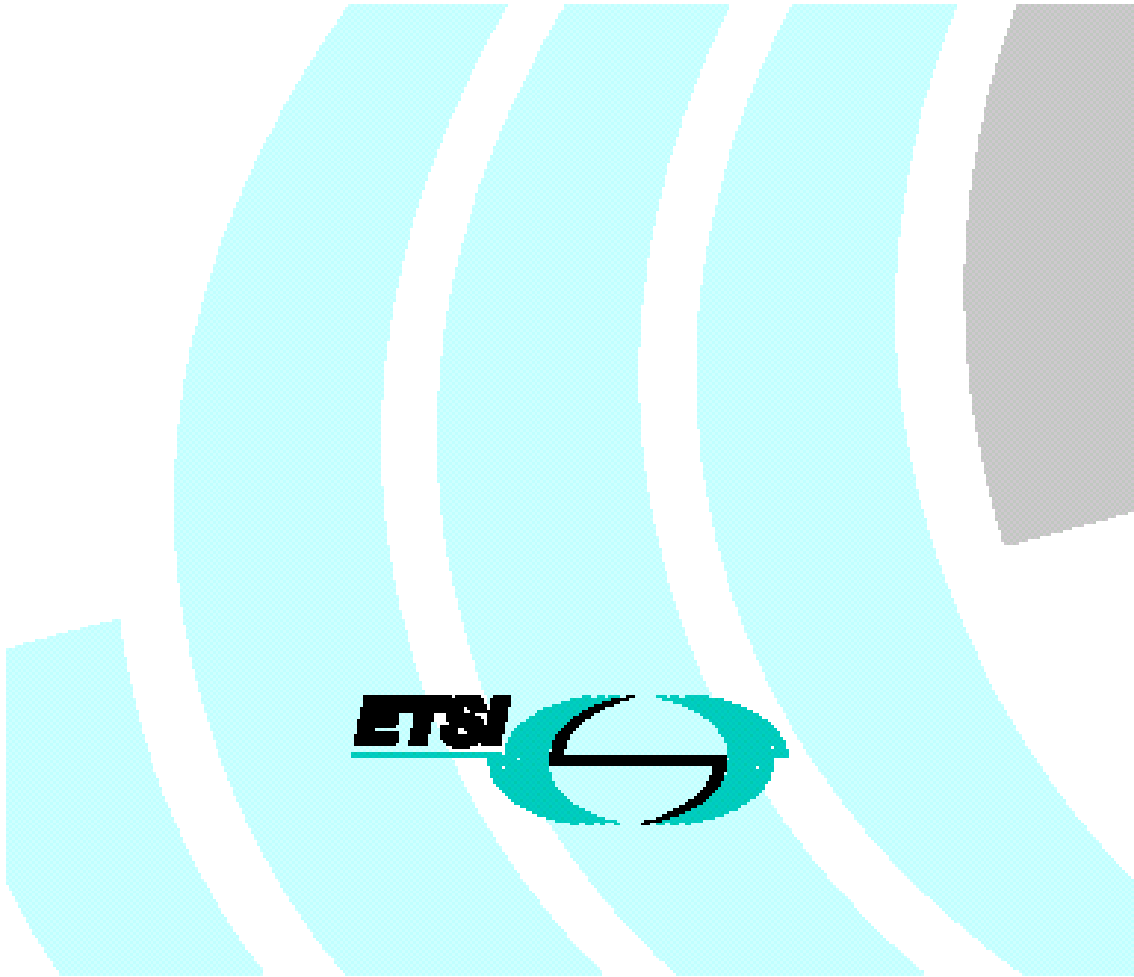
*ETSI TR 101 159 Version 1.2.1*

TR 101 159 V1.2.1 (1998-06)

Technical Report

**Digital Enhanced Cordless Telecommunications (DECT)**  
**Implementing DECT in an arbitrary spectrum allocation**





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**TR 101 159 V1.2.1 (1998-06)**

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## **FOREWORD**

This Technical Report (TR) has been produced by the Digital Enhanced Cordless Telecommunications (DECT) Project of the European Telecommunications Standards Institute (ETSI).

The present document provides a guide on how to implement and test DECT systems operating at frequencies outside the frequency-bands described in TBR 6 [11].

### **1 Scope**

The present document is a guide how to implement and test Digital Enhanced Cordless Telecommunications (DECT) systems operating at frequencies outside the frequency-bands described in TBR 6 [11]. The need to have this arises if DECT equipment is to be adapted to national requirements of countries which do not allow to use the basic 1 880 to 1 900 MHz DECT frequency band.

The present document is thereby also a guide for approval of such DECT systems in the above mentioned countries.

### **2 References**

References may be made to:

- a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or
- b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or
- c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or
- d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] EN 300 175-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".

[2] EN 300 175-2: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical layer (PHL)".

- [3] EN 300 175-3: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI);  
Part 3: Medium Access Control (MAC) layer".
- [4] EN 300 175-4: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI);  
Part 4: Data Link Control (DLC) layer".
- [5] EN 300 175-5: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI);  
Part 5: Network (NWK) layer".
- [6] EN 300 175-6: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI);  
Part 6: Identities and addressing".
- [7] EN 300 175-7: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI);  
Part 7: Security features".
- [8] EN 300 175-8: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI);  
Part 8: Speech coding and transmission".
- [9] EN 300 176-1: "Digital Enhanced Cordless Telecommunications (DECT); Approval test specification; Part 1: Radio".
- [10] EN 300 176-2: "Digital Enhanced Cordless Telecommunications (DECT); Approval test specification; Part 2: Speech".
- [11] TBR 6: "Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements".
- [12] EN 300 444: "Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)".
- [13] ETR 056: "Digital European Cordless Telecommunications (DECT); System description document".
- [14] ETS 300 700: "Digital European Cordless Telecommunications (DECT); Wireless Relay Station (WRS)".
- [15] ETS 300 765-1: "Digital Enhanced Cordless Telecommunications (DECT); Radio in the Local Loop (RLL) Access Profile (RAP); Part 1: Basic telephony services".

[16] ETS 300 765-2: "Digital Enhanced Cordless Telecommunications (DECT); Radio in the Local Loop (RLL) Access Profile (RAP); Part 2: Advanced telephony services".

[17] ETR 246: "Digital European Cordless Telecommunications (DECT); Application of DECT Wireless Relay Station (WRS)".

[18] ETR 308: "Digital Enhanced Cordless Telecommunications (DECT); Services, facilities and configurations for DECT in the local loop".

[19] ETR 310: "Digital Enhanced Cordless Telecommunications (DECT); Traffic capacity and spectrum requirements for multi-system and multi-service DECT applications co-existing in a common frequency band".

[20] ETS 300 822: "Digital Enhanced Cordless Telecommunications (DECT); Integrated Services Digital Network (ISDN); DECT/ISDN interworking for intermediate system configuration; Interworking and profile specification".

[21] ETR 185: "Digital European Cordless Telecommunications (DECT); Data Services Profile (DSP); Profile overview".

[22] ETR 178: "Digital European Cordless Telecommunications (DECT); A high level guide to the DECT standardization".

[23] TBR 22: "Attachment requirements for terminal equipment for Digital Enhanced Cordless Telecommunications (DECT) Generic Access Profile (GAP) applications".

[24] 91/263/EEC: "Council Directive of 29 April 1991 on the approximation of the laws of the Member States concerning telecommunications terminal equipment, including the mutual recognition of their conformity" (Terminal Directive).

[25] 91/287/EEC: "Council Directive of 3 June 1991 on the frequency band to be designated for the coordinated introduction of digital European cordless telecommunications (DECT) into the Community".

[26] 91/288/EEC: "Council Directive of 3 June 1991 on the co-ordinated introduction of digital European cordless telecommunications (DECT) into the Community".

[27] 90/388/EEC: "Council Directive of 28 June 1990 on competition in the markets for telecommunications services".

### **3 Definitions and abbreviations**

### 3.1 Definitions

For the purposes of the present document, the following definitions apply:

*Fixed Part (DECT Fixed Part) (FP):* A physical grouping that contains all of the elements in the DECT network between the local network and the DECT air interface.

*Portable Part (DECT Portable Part) (PP):* A physical grouping that contains all elements between the user and the DECT air interface. PP is a generic term that may describe one or several physical pieces.

### 3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CTA	Cordless Terminal Adapter
CTR	Common Technical Regulation
DAS	DECT Access Site
DCS	Dynamic Channel Selection
DECT	Digital Enhanced Cordless Telecommunications
ERO	European Radio communications Office
EUT	Equipment Under Test
FDD	Frequency Division Duplex
FP	Fixed Part
FS	Fixed Service
FSS	Fixed Satellite Service
FWA	Fixed Wireless Access
GAP	Generic Access Profile
GPS	Global Positioning System
ISDN	Integrated Services Digital Network
LOS	Line Of Sight
NLOS	Near Line Of Sight
P-MP	Point-to-Multipoint
POTS	Plain Old Telephone Service
PP	Portable Part
PSTN	Public Switched Telephone Network
RAP	RLL Access Profile
RF	Radio Frequency
RFP	Radio Fixed Part
RLL	Radio in the Local Loop
TBR	Technical Basis for Regulation
TDD	Time Division Duplex
TE	Terminal Equipment
UMTS	Universal Mobile Telecommunications System
WLL	Wireless Local Loop

#### **4 Introduction to DECT services and applications**

DECT is a general radio access technology for short range wireless telecommunications. It is a high capacity, pico-cellular digital technology, for cell radii ranging from about 10 m to 5 km depending on application and environment. It provides telephony quality voice services, and a broad range of data services, including Integrated Services Digital Network (ISDN). It can be effectively implemented in a range from simple residential cordless telephones up to large systems providing a wide range of telecommunications services.

The DECT instant or continuous dynamic channel selection, provides effective coexistence of uncoordinated installations of private and public systems on the common designated DECT frequency band, and avoids any need for traditional frequency planning. See ETR 310 [19] for further explanation. Figure 1 gives a high level graphic overview of applications and features of DECT.

A list of all ETSI standards and ETSI technical reports for DECT are given in ETR 178 [22]. Annex A of ETR 178 [22] contains a list of the essential standards and reports.

The DECT standardization has developed a modern and complete standard within the area of cordless telecommunications. The European wide allocation of the frequency band 1 880 - 1 900 MHz, has been reinforced by the Council Directive 91/287/EEC [25]. Spectrum allocation for DECT has also been adopted by many other countries worldwide.

DECT carriers have been defined for the whole spectrum range 1 880 - 1 939 MHz in the basic DECT standards EN 300 175, parts 1 to 8 [1] - [8] and TBR 6 [11]. This allows DECT services to be introduced in countries where the basic DECT frequencies 1 880 - 1 900 MHz are not available.

For rapid introduction DECT, Common Technical Regulations (CTRs) have been established for DECT relating to harmonized DECT standards, Technical Bases for Regulation (TBRs) and ENs. TBRs contain the technical requirements of a CTR. Approval to a CTR gives access to a single European market through a simplified legal procedure.

The Council Recommendation 91/288/EEC [26] recommends that the DECT standard should meet user requirements for residential, business, public pedestrian and radio in the local loop applications. The standard should also provide compatibility and multiple access rights to allow a single handset to access several types of systems and services, e.g. a residential system, a business system and one or more public systems. The public applications should be able to support full intersystem roaming of DECT handsets. The DECT standard provides these features. Of special importance is the Generic Access Profile (GAP) and the related TBR 22 [23], which define common mobility and interoperability requirements for private and public DECT speech services. For a more comprehensive overview of the DECT standardization see ETR 178 [22].

The European Commission has elaborated an amendment of Directive 90/388/EEC [27] on competition in the market for telecommunications services. This Directive defines DECT as an important alternative to the wired Public Switched Telephone Network (PSTN)/ISDN network access. Furthermore any restriction on the combination of DECT with other mobile technologies are to be withdrawn.

The emerging deregulation of fixed services will also speed up fixed-mobile convergence in service offerings from operators. The different DECT interoperability profile standards are designed to facilitate provision of mixtures of fixed and mobile services through a single infrastructure.

The aim of the present document is to provide technical requirements that can be applied for DECT approval in countries having a spectrum allocation for DECT, different from the European allocation. The present document consists of references to the relevant ETSI DECT standards (TBR 6 [11]) and amendments required for application in a general spectrum allocation band.



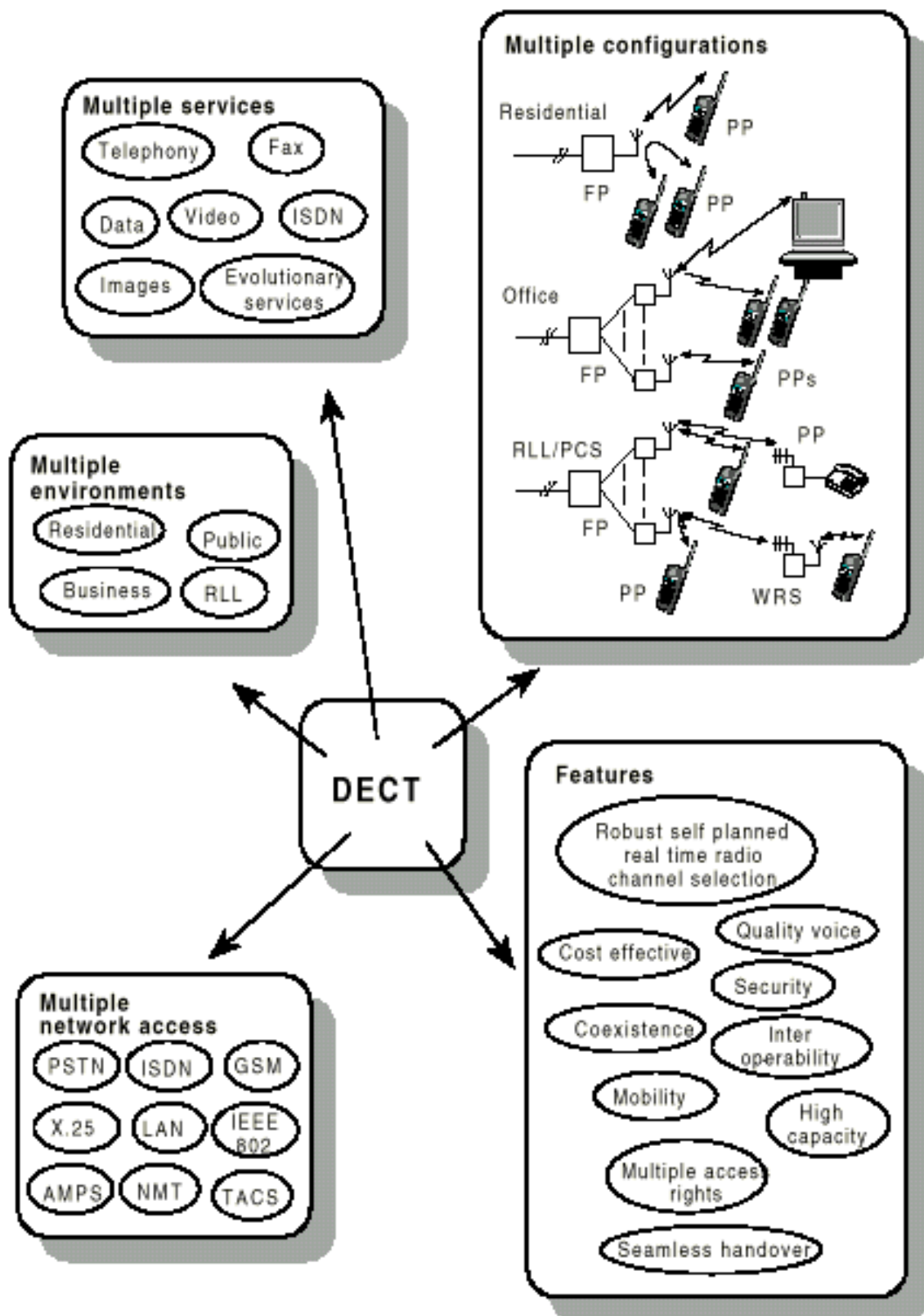


Figure 1: Overview of DECT applications and features

## 5 Requirements

This clause defines the minimum required functions and parameters for DECT equipment operating in the frequency band  $F_L$  to  $F_U$ .  $F_L$  defines the lower edge of the assigned frequency band and  $F_U$  defines the upper edge of the frequency band.

The technical requirements are contained in TBR 6 [11] together with the amendments, which are defined in this clause.

### 5.1 Carrier positions

Examples of carrier allocations and carrier positions are given in Annex A.

The frequencies to be used can be software controlled by the DECT base stations. They are indicated in a broadcast message to the portables.

DECT equipment should be capable of working on all assigned channels. This normally provides the most efficient use of the spectrum, but it is possible to limit specific applications, or a specific system, to part of the spectrum if this is suitable due to local circumstances.

### 5.2 General requirements

A summary of the main technical requirements of TBR 6 [11] is given in table 1.

Table 1

Parameter	Characteristic/ Value	Reference
accuracy and stability of Radio Frequency (RF) carriers	RFP: $\pm 50$ kHz PP: $\pm 100$ kHz	7.2, 7.3, 7.4, 7.5
packet timing jitter	$\pm 1$ $\mu$ s	8.3
reference timing accuracy of a Radio Fixed Part (RFP)	max 10 ppm	8.4
packet transmission accuracy of a PP	5 ms $\pm$ 2 $\mu$ s	8.5
transmission burst	power-time template	9
transmitted power	max 250 mW	10
RF carrier modulation	digital modulation	11
unwanted emissions due to modulation	emission mask	12.2
unwanted emissions due to transmitter transient	emission mask	12.3
unwanted emissions due to intermodulation	1 $\mu$ W	12.4
spurious emissions when allocated a transmit channel	250 nW below 1 GHz 1 $\mu$ W above 1 GHz	12.5
radio receiver sensitivity	-83 dBm at BER = $10^{-3}$	13.1
radio receiver reference BER	$10^{-5}$ at -73 dBm	13.2
radio receiver interference performance	BER < $10^{-3}$	13.3
radio receiver blocking	See table 2	13.4
radio receiver intermodulation performance	BER < $10^{-3}$	13.6
spurious emissions when the PP has no allocated transmit channel	2 nW	13.7
efficient use of the radio spectrum	channel handling	17.1, 17.2, 17.3
antennas with directivity	12 dBi	H.2

The tests cases in table 1 shall be performed, where relevant, on the two supported carriers nearest to the band edges and on one carrier inside the band. The applicant shall declare the band edge limits  $F_L$  and  $F_U$  and the carriers supported.

For the blocking requirements, table 2 shall be applied instead of the requirements given in table 12 of TBR 6 [11].

**Table 2**

Frequency (f)	Continuous wave interferer level	
	For radiated measurements dB $\mu$ V/m	For conducted measurements dBm
$25 \text{ MHz} \leq f < F_L - 100 \text{ MHz}$	120	-23
$F_L - 100 \text{ MHz} \leq f < F_L - 5 \text{ MHz}$	110	-33
$ f - F_C  > 6 \text{ MHz}$	100	-43
$F_U + 5 \text{ MHz} < f \leq F_U + 100 \text{ MHz}$	110	-33
$F_U + 100 \text{ MHz} < f \leq 12,75 \text{ GHz}$	120	-23

The Equipment Under Test (EUT) shall operate on the declared frequency allocation with the low band edge  $F_L$  MHz and the high band edge  $F_U$  MHz.

Annex A:

Examples for frequency band allocations

A.1 DECT carrier numbers and carrier positions around 1,9 GHz

DECT is specified for the whole frequency range 1880 –1939 MHz.

For the frequency band 1880 - 1900 MHz 10 RF-carriers with centre frequencies  $F_c$  are given by:

$$F_c = F_0 - c * 1,728 \text{ MHz}, \text{ where: } F_0 = 1897,344 \text{ MHz}$$

$$c = 0, 1, 2, \dots, 9$$

For carriers from 1899,072 to 1939,088 MHz the carrier frequencies are defined by:

$$F_c = F_9 + c * 1,728 \text{ MHz}, \text{ where: } F_9 = 1881,792 \text{ MHz}$$

$$c = 10, 11, 12, \dots, 32$$

RF-band number = 00001 (see EN 300 175-2 [2], subclause 4.1.1 and EN 300 175-3 [3], subclause 7.2.3.3.1)

The above carrier frequencies are explicitly given in table A.1.

**Table A.1: Carrier numbers and carrier positions**

Carrier number c	Rf-band number	Carrier freq. MHz	Carrier number c	Rf-band number	Carrier freq. MHz
9	-	1881,792	17	00001	1911,168
8	-	1883,520	18	00001	1912,896
7	-	1885,248	19	00001	1914,624
6	-	1886,876	20	00001	1916,352
5	-	1888,704	21	00001	1918,080
4	-	1890,432	22	00001	1919,808
3	-	1892,160	23	00001	1921,536
2	-	1893,888	24	00001	1923,264
1	-	1895,616	25	00001	1924,992
0	-	1897,344	26	00001	1926,720
10	00001	1899,072	27	00001	1928,448
11	00001	1900,800	28	00001	1930,176
12	00001	1902,528	29	00001	1931,904
13	00001	1904,256	30	00001	1933,632
14	00001	1905,984	31	00001	1935,360
15	00001	1907,712	32	00001	1937,088
16	00001	1909,440			

Examples of current spectrum allocations for DECT in different parts of the world are: 1880 – 1900 MHz, 1900 – 1920 MHz and 1910 – 1930 MHz.

The DECT fixed part (base station) broadcast messages indicate the locally relevant carrier to ensure that portables and WLL subscriber units set up calls only within the locally allocated band.

New or modified bands can locally be defined when needed.

## History

Document history		
V1.1.1	February 1998	Publication
V1.2.1	June 1998	Publication

ANNEX B

PHS MoU Technical Specification Document  
A-GN3.00-01-TS

A-GN3.00-01-TS

Title: Extension of Frequency Band Allocations for Personal Handy-phone Systems (PHS)

Version: 01

Date: April 20, 1999

PHS MoU Classification: Unrestricted

List of contents:

Foreword

1. Scope
2. Brief Guide to PHS Services and Applications
3. Technical Requirements

Annex A : Extension of PHS Frequency Band

Number of pages: 8

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A-GN3.00-01-TS

History of Revised Versions

Version	Date	Outline
01	Apr. 20, 1999	Established

**Extension of Frequency Band Allocations  
for Personal Handy-phone Systems (PHS)**

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### ***FOREWORD***

This Technical Specification (TS) is elaborated to define the new PHS frequency band allocation extending from 1880 MHz to 1930 MHz in place of the original PHS band (1885–1918,1 MHz), in order to cover most TDD bands allocated especially in European and Latin American countries where they need for TDD access based on PHS systems.



## **1. Scope**

This document is a standard regulating the minimum required functions and parameters necessary for implementation and test of PHS systems operated in the band of 1880 –1930 MHz.

The purpose of this document is to define the new PHS frequency band and to provide technical requirements, which will be the basis for making specifications and related tests for PHS operators as a part of the PHS MoU Specifications.

## **2. Brief Guide to PHS Services and Applications**

PHS is a wireless access system based on digital micro-cell technology operating in the 1.9 GHz frequency band. It provides high capacity with good voice quality and a broad range of data transmission including ISDN services. PHS systems are easily implemented in the short term and at low cost, covering high-density to low-density areas. It is also equipped with dynamic channel assignment that allows coexistence of public and private PHS systems in the same area and same frequency band without any frequency re-arrangement.

The standards for the PHS Common Air Interface were established by the Association of Radio Industries and Businesses (ARIB) as RCR STD-28. Other standards for the PHS Public Cell Station to Network and Network to Network Interfaces were formulated by the Telecommunication Technology Committee (TTC) based on ITU-T Recommendations, while the end-to-end multimedia protocol was standardized as the PHS Internet Access Forum Standard (PIAFS). These standards are to be applied in Japan.

To deploy PHS services commonly throughout the world, the PHS MoU Group has been elaborating PHS MoU Technical Specifications (PHS MoU TSSs) which are based on the above mentioned standards and global standards such as ITU-T Recommendations.

Due to its well designed system structure, the PHS system can be deployed in several fields of public (mobile and fixed) and private communication services as follows:

### **(1) Mobile Public Digital Telephony**

PHS provides mobile public and personal communication services with low mobility by using a micro-cell architecture ranging from 200 m to 400 m in radius depending on the transmitted power and environment. It efficiently covers urban, suburban and indoor areas such as public halls, department stores, theaters, subway stations etc.

PHS uses 32 kbps ADPCM for voice coding, TDMA/TDD for multiple access and a transmission rate of 384 kbps. It is able to support high speed data transmission and is robust against delay spread due to multi-path interference in urban areas and in mobile environments.

## (2) Wireless Local Loop (WLL)

WLL is a generic term for a radio access network connecting a local exchange and its subscribers instead of using conventional copper cable. This type of access is also known as FWA (Fixed Wireless Access). WLL has several advantages such as a flexible network plan, quick deployment of telephone networks, low system cost, easy maintenance, and cordless telephones in a limited range of cells.

With these features and considering open standards technologies, there are mainly two kinds of WLL applications, namely those based on micro-cell technology (PHS, DECT) and those based on cellular technology (GSM, TDMA IS-136, and CDMA IS-95). As WLL is used for fixed access networks, it should satisfy several requirements, such as data/ISDN services allowing access to the Internet and G3 fax with good quality. PHS WLL systems can meet these essential requirements.

PHS based WLL systems can cover different density areas with many base stations from urban to rural areas and, if necessary, employ entrance transmission lines between local exchange/control stations and base stations.

## (3) Wireless PBX

PHS-based wireless PBX systems provide convenient mobile wireless extension at any place such as inside an office building. It also allows relocation of offices without moving the telephones in the business environment. The systems offer sufficient circuit quality and capacity for computer communication and G3 fax.

## (4) Home Digital Cordless Telephone

A PHS terminal can be used outside as a public telephone or inside as a home digital cordless telephone. If necessary, it can also be used in the office as a PBX terminal. For these features, a subscriber can keep only one telephone handset by using address memories in common.

The PHS digital cordless telephone is made highly secure from illegal use and wire-tapping by means of the latest digital technology.

As mentioned before, the PHS technology is well designed and has several advantages in various fields of applications. Recently, many countries have taken advantage of PHS systems to expand subscribes lines.

The Technical Working Group under the PHS MoU Group has amended the Technical Specifications to extend the PHS frequency band down to 1880 MHz and up to 1930 MHz for the sake of countries where the original PHS frequency band is not available, such as European and Latin American countries. They will be able to enjoy the PHS services and

applications based on the PHS MoU Technical Specifications and this Technical Specification.

### 3. Technical Requirements

This part clarifies the minimum requirements of functions and parameters necessary as reference for operators' specifications and equipment tests on PHS systems operated in the new frequency band 1880-1930MHz.

#### 3.1 Carrier Numbers and Carrier Positions

Carrier numbers and carrier positions in the new PHS frequency band are given in Annex A.

#### 3.2 General requirements

A summary of the minimum technical requirements of Functions & Parameters is given in Table 1.

*Table 1. Required Functions and Parameters*

Parameter	Characteristic/Value
Modulation method	/4 shift QPSK Transmission side filter
Transmission rate	384 Kbps
Frame length	5 ms
Packet length	625 $\mu$ s
Bit length	2.6 $\mu$ s
Transmission rate accuracy	< $\pm$ 5 ppm
Transmission timing	$\pm$ 5.6 $\mu$ s ( $\pm$ 1 symbol)
Transmission jitter	$\pm$ 0.7 $\mu$ s ( $\pm$ 1/8 symbol)
Frequency stability	< $\pm$ 3 ppm ( $\pm$ 5.75 kHz)
Transmission power (peak)	Private: 80 mW, Public: 4000 mW
Modulation accuracy	<12.5 %
Adjacent channel power (modulation)	Standardized at transient
Adjacent channel power (transient)	2 $\times$ $\Delta$ f (600kHz offset): <0.8 $\mu$ W 3 $\times$ $\Delta$ f (900kHz offset): <0.25 $\mu$ W
Allowed value for occupied bandwidth	288 Khz
Inter-modulation	Not standardized
Transmission spurious	Within band: <250 nW Outside of band: <2.5 $\mu$ W
Carrier off time leakage power	<80 nW
Cabinet radiation	<2.5 $\mu$ W
Antenna gain	Private : <2.14 dBi (Cabinet built in) Public : <10 dBi

The above technical requirements are based on the PHS MoU specifications.

## **Annex A: Extension of PHS Frequency Band**

### **1. General**

Public benefits would be significant if PHS services would be distributed equally to most countries in the world. However, frequency allocations are generally different between countries. The present PHS MoU Technical Specifications have been elaborated based on the ARIB Standard, RCR STD-28, that prescribes the PHS air interface in the frequency band of 1895 to 1918.1 MHz. In view of this, this document describes a proposed extension of the PHS frequency band as PHS MoU Technical Specification to cover most of the allocated TDD bands in the world, especially European and Latin American countries.

### **2. Proposed Extension of PHS Frequency Band**

Considering the allocated TDD bands as shown in section 3, the PHS MoU Group has decided to extend the frequency band down to 1880 MHz and up to 1930 MHz from the original PHS band of 1895 to 1918.1 MHz. The extended PHS band can accommodate 166 carriers within 50 MHz bandwidth. The carrier numbers and their center frequencies ( $F_c$ ) in the extended PHS band are given by:

(1) For 1895 – 1930 MHz

$$F_c = F_o - 0.15 + 0.3N$$

Where,  $N = 1, 2, 3, \dots$  to 116 ( $N$  : Carrier numbers),  $F_o = 1895$  MHz

(2) For 1880 – 1895 MHz

$$F_c = F_o - 76.65 + 0.3N$$

Where,  $N = 206$  to 255 ( $N$  : Carrier numbers),  $F_o = 1895$  MHz

The carrier numbers and the center frequencies are shown in Table 1.

### **3. Example of Frequency Bands allocated for TDMA-TDD**

The TDMA/TDD bands are regulated differently by countries as follows:

1880 - 1900 MHz: Most of European countries and Australia

1895 - 1918 MHz: Japan (the original PHS band) and many Asian countries

1900 - 1920 MHz: China

1910 - 1930 MHz: Most North and South American countries

Also, some other countries are studying the frequency allocation for this kind of applications.

**Table 1. PHS Carrier Numbers and Center Frequencies**

Carrier Numbers	Carrier Frequency [MHz]	Carrier Numbers	Carrier Frequency [MHz]	Carrier Numbers	Carrier Frequency [MHz]
<b>206</b>	1880.15	7	1896.95	63	1913.75
<b>207</b>	1880.45	8	1897.25	64	1914.05
<b>208</b>	1880.75	9	1897.55	65	1914.35
<b>209</b>	1881.05	10	1897.85	66	1914.65
<b>210</b>	1881.35	11	1898.15	67	1914.95
<b>211</b>	1881.65	12	1898.45	68	1915.25
<b>212</b>	1881.95	13	1898.75	69	1915.55
<b>213</b>	1882.25	14	1899.05	70	1915.85
<b>214</b>	1882.55	15	1899.35	71	1916.15
<b>215</b>	1882.85	16	1899.65	72	1916.45
<b>216</b>	1883.15	17	1899.95	73	1916.75
<b>217</b>	1883.45	18	1900.25	74	1917.05
<b>218</b>	1883.75	19	1900.55	75	1917.35
<b>219</b>	1884.05	20	1900.85	76	1917.65
<b>220</b>	1884.35	21	1901.15	77	1917.95
<b>221</b>	1884.65	22	1901.45	<b>78</b>	1918.25
<b>222</b>	1884.95	23	1901.75	<b>79</b>	1918.55
<b>223</b>	1885.25	24	1902.05	<b>80</b>	1918.85
<b>224</b>	1885.55	25	1902.35	<b>81</b>	1919.15
<b>225</b>	1885.85	26	1902.65	<b>82</b>	1919.45
<b>226</b>	1886.15	27	1902.95	<b>83</b>	1919.75
<b>227</b>	1886.45	28	1903.25	<b>84</b>	1920.05
<b>228</b>	1886.75	29	1903.55	<b>85</b>	1920.35
<b>229</b>	1887.05	30	1903.85	<b>86</b>	1920.65
<b>230</b>	1887.35	31	1904.15	<b>87</b>	1920.95
<b>231</b>	1887.65	32	1904.45	<b>88</b>	1921.25
<b>232</b>	1887.95	33	1904.75	<b>89</b>	1921.55
<b>233</b>	1888.25	34	1905.05	<b>90</b>	1921.85
<b>234</b>	1888.55	35	1905.35	<b>91</b>	1922.15
<b>235</b>	1888.85	36	1905.65	<b>92</b>	1922.45
<b>236</b>	1889.15	37	1905.95	<b>93</b>	1922.75
<b>237</b>	1889.45	38	1906.25	<b>94</b>	1923.05
<b>238</b>	1889.75	39	1906.55	<b>95</b>	1923.35
<b>239</b>	1890.05	40	1906.85	<b>96</b>	1923.65
<b>240</b>	1890.35	41	1907.15	<b>97</b>	1923.95
<b>241</b>	1890.65	42	1907.45	<b>98</b>	1924.25
<b>242</b>	1890.95	43	1907.75	<b>99</b>	1924.55
<b>243</b>	1891.25	44	1908.05	<b>100</b>	1924.85
<b>244</b>	1891.55	45	1908.35	<b>101</b>	1925.15
<b>245</b>	1891.85	46	1908.65	<b>102</b>	1925.45
<b>246</b>	1892.15	47	1908.95	<b>103</b>	1925.75
<b>247</b>	1892.45	48	1909.25	<b>104</b>	1926.05
<b>248</b>	1892.75	49	1909.55	<b>105</b>	1926.35
<b>249</b>	1893.05	50	1909.85	<b>106</b>	1926.65
<b>250</b>	1893.35	51	1910.15	<b>107</b>	1926.95
<b>251</b>	1893.65	52	1910.45	<b>108</b>	1927.25
<b>252</b>	1893.95	53	1910.75	<b>109</b>	1927.55
<b>253</b>	1894.25	54	1911.05	<b>110</b>	1927.85
<b>254</b>	1894.55	55	1911.35	<b>111</b>	1928.15
<b>255</b>	1894.85	56	1911.65	<b>112</b>	1928.45
<b>1</b>	1895.15	57	1911.95	<b>113</b>	1928.75
<b>2</b>	1895.45	58	1912.25	<b>114</b>	1929.05

3	1895.75	59	1912.55	<b>115</b>	1929.35
4	1896.05	60	1912.85	<b>116</b>	1929.65
5	1896.35	61	1913.15		
6	1896.65	62	1913.45		

Note: Additional carriers in the expanded PHS band are shown in bold.

**PCC.I/RES. 73 (XI-99)**

**CITEL GUIDELINES ON CERTIFICATION**

The XI Meeting of the Permanent Consultative Committee I: Public Telecommunication Services,

**NOTING:**

That CITEL Resolution PCC.I/RES.30 (V-96) has approved the CITEL Guidelines on Certification in order to promote greater consistency of certification processes for telecommunications equipment,

**CONSIDERING:**

- a) That the definitions of CITEL Resolution PCC.I/RES.30 (V-96) regarding certification and approval/homologation processes are not compatible with the terms of the ISO/IEC Document No. 2 (98);
- b) That in the “definitions” section of the Inter-American Mutual Recognition Agreement for Conformity Assessment of Telecommunications Equipment, which is being discussed within the CITEL framework, it was adopted the ISO/IEC regulations terminology;
- c) That to avoid discrepancy between the certification and approval/homologation definitions contained in ISO/IEC Document No. 2 (98) and contained in CITEL Resolution PCC.I/RES.30 (V-96) it is necessary to revise the last document; and
- d) That a standardized understanding of the definitions adopted for “certification”, “approval/homologation”, is necessary among all CITEL member countries;

**RECOGNIZING**

That the objective and the Guidelines on Certification of Resolution PCC.I/RES. 30 (V-96) remain included in the present Resolution.

**RESOLVES:**

1. To adopt the Guidelines on Certification contained in the Annex I of this Resolution, within the CITEL framework, which take in consideration the concepts of “certification” and “approval” presented in ISO/IEC Document No. 2 (98);
2. To repeal Resolution PCC.I/RES. 30 (V-96).

**ANNEX 1**

## CITEL GUIDELINES ON CERTIFICATION

### PREAMBLE

To promote the objectives set forth in the Plan of Action for Telecommunications included in Declaration of Santiago, signed by the Heads of State and Government participating in the Second Summit of the Americas, the Ad Hoc Working Group on Equipment Certification Processes recommends to CITEL Member States the following guidelines regarding telecommunications equipment certification processes in the Americas.

### FOR THE PURPOSES OF THESE GUIDELINES, THE FOLLOWING DEFINITIONS APPLY:

- **Certification** is the procedure by which a third party gives a written guarantee that a product, process, or service conforms to the specified requirements.
- **Approval/Homologation** means authorization for a product, process, or service to be marketed or used for an established purpose or under established conditions;
- **Telecommunications equipment** means network terminal attachment and other equipment subject to telecommunications regulation of each Party, including wire and wireless equipment, and terrestrial and satellite equipment, whether or not connected to a Public Telecommunications Network.
- **Technical regulations** are technical specifications and applicable administrative procedures with which compliance is mandatory according to national laws and regulations.

The objectives of these guidelines are:

- To ensure that certification processes of telecommunications equipment are pro-competitive in the sense of promoting modernization and investment in telecommunications, to facilitate trade in telecommunications goods and services.
- To promote an evolution of the certification processes for telecommunications equipment in order to make equipment certification processes across the Americas more consistent.
- To develop useful common criteria as the basis for technical regulations of CITEL Member States.

It is considered that the application of these guidelines would enable equipment to be introduced to the marketplace sooner and at lower prices to the end-user; would foster greater innovation; and would improve market access for telecommunications equipment suppliers to CITEL Member States.



Given the rapid evolution of technology and the need for proper regulation of telecommunications equipment, it is recommended CITELE Member States, in accordance with their respective national laws, regulations, and development priorities, apply these principles as soon as possible.

## **GUIDELINES FOR TELECOMMUNICATIONS EQUIPMENT CERTIFICATION PROCESSES**

It is recommended that CITELE Member States, in accordance with their respective national laws, regulations, and development priorities, conduct the certification processes of telecommunications equipment, according to the following guidelines.

Nothing in these guidelines is intended to prevent CITELE Member States from protecting consumer rights with regard to the functioning of telecommunications equipment through their relevant regulations or their applicable technical regulations. It is recognized that the trend in technical regulations is that they be limited to those established in paragraph seven of these guidelines. In light of this trend, Member States may review technical regulations pertaining to consumer protection regarding the functioning of telecommunications equipment to determine their effect on technical innovation, choice of equipment, and cost to consumers.

1. Administrative procedures for certification of telecommunications equipment be conducted in a manner which:

- limits information required to that strictly necessary for the purpose of assessing conformity to technical regulations and encourage the development of mechanisms to protect intellectual property;
- maximizes the available choices of telecommunications equipment;
- is non-discriminatory, and transparent, and it is recommended the application of reasonable and objective criteria;
- is undertaken, to the extent possible, by an entity separate and independent from the network operator;
- is streamlined in the issuance of certifications; and
- includes appeal and review processes.

2. Include, also, in these certification processes, requirements necessary to accept from telecommunications equipment suppliers test results issued by any laboratory in accordance with the accepting CITELE Member State's technical regulations and, when applicable, in the context of international agreements, including mutual recognition agreements. If criteria for laboratories is deemed necessary, these should be based, to the extent possible, on international standards and recommendations for laboratories (such as ISO/IEC Guide 25). Administrative procedures should minimize administrative delays and costs to equipment suppliers.

3. Carry out certification on the basis of type, rather than item by item, wherever possible, considering that equipment with no differences in product performance shall be treated as one type for purposes of certification.
4. Efforts be made so that certification and homologation be required only for wireline terminal equipment that connects to the public network and wireless equipment whether or not it connects to public networks and use the radio spectrum.
5. In the elaboration of the national technical specifications, use as reference the international technical standards when they are considered appropriate.
6. Efforts be made for technical regulations to be publicly available, including the interface between the telecommunications equipment and the public network.
7. Technical regulations relating to attachment of terminal equipment to the public network or relating to conformity of wireless equipment be limited to those necessary to:
  - prevent the equipment from causing technical damage to public telecommunications networks or electrical hazards to network operating personnel;
  - prevent harmful electromagnetic interference and ensure compatibility with other users of the spectrum;
  - prevent the equipment from causing billing malfunction or technical interference with, or degradation of, public telecommunications services;
  - ensure user safety, access for hearing impaired and access to emergency services.
8. Facilitate the participation of all interested parties (for example users, manufacturers, and service providers) in the development of technical regulations.

**PCC.I RES.74 (XI-99)**

**APPROVAL OF THE DEVELOPMENT GUIDELINES  
FOR A MUTUAL RECOGNITION AGREEMENT (MRA) ON ASSESSMENT OF THE  
CONFORMITY OF TELECOMMUNICATIONS EQUIPMENT FOR THE AMERICAS**

The XI meeting of the Permanent Consultative Committee I: Telecommunications Public Services,

**CONSIDERING:**

- a) That the Secretary General of the Organization of American States (OAS) recently published a document which establishes the need to review and update the Vision of the OAS, based on the impact of the new telecommunications technologies and the real needs of Member Countries in the region, as well as the importance of fostering trade and the technological development of telecommunications networks in the Region;
- b) That during the Second Summit of the Americas, the Heads of State and Governments of Member States decided to give new assignments and make commitments to develop Telecommunications in the region. This task was entrusted to the OAS for development and coordination, with special emphasis on the creation of mechanisms to facilitate the trade in and access to Information technologies, taking advantage of the Mutual Recognition Agreement for Conformity Assessment;
- c) That to carry out the new assignments it was entrusted by the Second Summit of the Americas, Permanent Consultative Committee I instructed the Ad-Hoc Group on Certification Procedures of Telecommunications Equipment to take charge of the activities required to propose Guidelines and a Frame of Reference for a Mutual Recognition Agreement among Member States of the CITEI; and
- d) That in its Decision PCC.I/DEC.14 (VIII-98), PCC.I approved the appointment of a Rapporteur to assist the Ad-Hoc Group on Certification Procedures in drafting the "Guidelines or a Framework for the Development of a Mutual Recognition Agreement (MRA) on Telecommunications equipment for the Americas" and of a "Text of a Mutual Recognition Agreement for Conformity Assessment for countries in the Region;"

**NOTING:**

- a) That as the result of the activities of the Ad-Hoc Group and the Rapporteur, the Guidelines for a Mutual Recognition Agreement (MRA) for Conformity Assessment of Telecommunications Equipment for the Americas were completed in during this XIth. Meeting;
- b) That some Member States and Associate Members of the CITEI stated that these Guidelines are highly important and will have a positive effect on the development of telecommunications in the Region and that they should be distributed among the Member States and adopted by them as soon as possible; and

- c) That PCC.I is working on a text of a Mutual Recognition Agreement for Conformity Assessment of Telecommunications Equipment based on these Guidelines;

**RESOLVES:**

1. To approve the document on Guidelines for a Mutual Recognition Agreement (MRA) on Conformity Assessment of Telecommunications Equipment for the Americas, which is included in the Appendix to this Resolution.
2. To urge Member States to adopt these guidelines as soon as possible, in the measure that their Regulations and National Policies allow it.

**INSTRUCTS THE EXECUTIVE SECRETARIAT:**

3. To instruct the Executive Secretary to send this Resolution and its appendix to PCC.II and PCC.III for consideration during their next meeting, in view of the fact that it contains provisions on wireless Telecommunications Equipment.

**A FRAMEWORK FOR THE DEVELOPMENT OF A MUTUAL  
RECOGNITION AGREEMENT (MRA) FOR TELECOMMUNICATIONS  
EQUIPMENT FOR THE AMERICAS**

**1.0 SUMMARY**

This contribution proposes a framework for the development of a Mutual Recognition Agreement (MRA) for Telecommunications Equipment for the Americas.

**2.0 The Purpose of MRA**

The purpose of a MRA is to facilitate trade. Each country of the Americas has its own mandatory technical regulations and administrative procedures. In order to market or use the telecommunications equipment in a particular country, the exporting manufacturer or supplier will have to meet the mandatory technical regulations of that importing country. This framework document addresses mutual recognition in the context of current testing and certification arrangements. Mutual recognition can be seen not just as an end in itself, but also as a confidence building measure towards future work. That future work could deliver one-time testing against international standards and the use of suppliers' declaration as the mechanism for increased market access across the Americas.

This Framework document is not intended to be a legally binding document. It should be used as a blue print for countries of the Americas to develop and implement a specific MRA which when signed would be legally binding. If the principles, conditions and steps of the Framework are met in

the development of a specific MRA, it is anticipated that a multilateral MRA would be developed meeting the requirements of the countries of the Americas.

In cases where homologation is required, Parties will grant homologation under transparent terms, conditions, and timeframes no less favorable than those accorded to like products of national origin or originating in any other country. Homologation shall not have the effect of creating unnecessary obstacles to international trade in telecommunications equipment.

The Framework has the following elements:

## **2.1 The Principles**

There are two basic principles. The first principle is for each member state to keep the number of mandatory technical regulations and administrative procedures to a minimum. The second principle is to limit the number of conformity assessment methods. This will allow mutual recognition of conformity assessment of telecommunication equipment to the importing Member State's mandatory technical regulations.

The aim of the first principle is to reduce non-tariff barriers in order to facilitate trade. The goal is to attain the minimum number of regulations among all countries of the Americas. The CITELE Guidelines on Certification (PCC.I.RES/73 (XI-99)) serve as a target for the countries to simplify their regulatory requirements.

The second principle could apply in parallel with the process to implement the first principle. The aim of this second principle is to reduce the costs and the time for conformity assessment such as testing and certification by mutual recognition.

## **2.2 The Conditions**

There are two conditions which the countries should meet in order to develop a MRA for telecommunications equipment for the Americas. The first condition is that countries should subscribe to the CITELE Guidelines on Certification. This will ensure a level playing field for the purpose of promoting trade. Since countries of the Americas have different technical infrastructures, their time schedules to simplify their regulatory requirements according to the guidelines will be different. Each country is requested to indicate its own time schedule.

The second condition is that the countries should use the conformity assessment modules developed within this framework in the development of a MRA. By referencing or adopting the conformity assessment modules, the countries can benefit from the multilateral agreements which minimize the effort and time in MRA development and provide wider and focused coverage.

## **2.3 The Steps**

A number of steps should be followed in the development of the MRA. The first one is to exchange information among countries so that each country would have a good understanding and knowledge of the other countries' mandatory technical regulations and administrative procedures. The information should also include terms and definitions used in conformity assessment procedures. The seminar initiated by PCC.I in April 1998 had begun the process to exchange information among countries.

The second step is the discussion and consultation to develop a set of guidelines for these regulations so that a level playing field is created for the purpose of trade. The CITELE Guidelines on Certification represents an effort by PCC.I to develop such guidelines. Each country should develop an action plan to simplify its regulations based on these guidelines.

The third step is that the testing laboratory (TL) or certification body (CB) of each exporting party (EP) wishing to assess the conformance of a product to the technical regulations (TR) of the importing party (IP) must devote the necessary technical, material and human resources to this end.

The fourth step is that the regulatory authority (RA), designating authority (DA), or accreditation body (AB) of each EP should be capable of accrediting the domestic TLs or CBs, which are interested in assessing conformance of a product to the TRs of a participating IP.

The fifth step is that the RA or DA of each EP may only designate a TL or CB which has been accredited to show it is competent to test or certify the conformance of a product to the TRs of a participating IP.

The sixth step is that a means should be developed through training, workshops, joint activities etc. to build the necessary confidence in the accreditation and designation process to ensure that the TL or CB is competent to perform the appropriate conformity assessment activities to the IP's technical regulations.

The seventh step is that The RA or DA of each participating IP will formally recognize the TL or CB designated for each participating EP whose technical competence and accrediting conditions have proven satisfactory to evaluate conformance of the TRs of the IP.

The eighth step is that the appropriate of the importing Party will accept the test results or certificates produced by the recognized TL or CB designated by the exporting party on terms no less favorable than those accorded to equipment certifications by Conformity Assessment Bodies of the importing Party.

## **2.4 Conformity Assessment Methods**

Depending on their regulatory requirements the countries should have their own conformity assessment procedures which can be grouped into different modules of conformity assessment procedures. In order to reduce the costs and effort required to meet these conformity assessment procedures the countries should attempt to develop a set of conformity assessment methods.

One method is the mutual recognition of the test results:

- mutual recognition of test results from exporting country based on the importing country's established procedures while working toward a common basis for accrediting and designation of testing laboratories.

Another method is the mutual recognition of certification:

- mutual recognition of certification by authorized bodies in the other countries, so that the designated conformity assessment bodies from each country can certify products to the other country's requirements.

It is anticipated that these two methods will cover the needs of the countries of the Americas.

## **2.5 Scope of a MRA**

A MRA should cover any equipment that is subject to country's mandatory technical regulations for terminal attachment (wired and wireless) or other telecommunication regulations. For such equipment, the MRA should cover the country's mandatory technical regulations for EMC and electrical safety.

### **PCC.I/RES.75(XI-99)**

#### **APPROVAL OF THE WORDING OF THE INTERAMERICAN MUTUAL RECOGNITION AGREEMENT FOR THE ASSESSMENT OF CONFORMITY (MRA) OF TELECOMMUNICATIONS EQUIPMENT**

The XI Meeting of the Permanent Consultative Committee I: Public Telecommunication Services,

#### **CONSIDERING:**

- a) That the Secretary General of the Organization of American States (OAS), has recently published a document pointing out the need to revise and update the OAS Vision, on the basis of the impact of new Telecommunication technologies and the actual needs of the Member Countries of the Region, which establishes the importance of fostering trade and technological development of the telecommunications networks in the Region;
- b) That during the Second Summit of the Americas, the Heads of State and Government of the Member Countries agreed to undertake new commitments toward the development of Telecommunications in the region, which were commissioned for their development and coordination by the OAS, placing special emphasis on the establishment of mechanisms that facilitate trade and the access to Information technologies, under the Mutual Recognition Agreements for the Assessment of Conformity;

- c) That, in order to carry out the new instructions received from the said Second Summit of the Americas, CITEL Permanent Consultative Committee I instructed the Ad Hoc Group on Certification Processes of Telecommunication Equipment to take custody of the development of the necessary works aimed at establishing Guidelines and a Baseline Scenario for the establishment of a MRA between the CITEL Member Countries; and
- d) That PCC-I approved in its PCCI/DEC.13 Decision, the appointment of a Rapporteur with the purpose of assisting the Ad-Hoc Group on Certification Processes in the Development of “Guidelines or a Baseline Scenario for the Development of a Mutual Recognition Agreement (MRA) of Telecommunication Equipments for the Americas” and the “Wording of a Mutual Recognition Agreement for the Assessment of Conformity between the Countries of the Region,”

**TAKING INTO ACCOUNT:**

- a) That as a result of the activities performed by the Ad-Hoc Group and the Rapporteur, during the XI Meeting, the Wording for the Interamerican Agreement on Assessment of Conformity of Telecommunication equipment was completed.
- b) That some of the Member States and CITEL associated Members have stressed the importance and positive impact that this wording will have on the development of telecommunications in the Region, and its interest in its prompt distribution and adoption by the Member States.
- c) That parallel activities are being carried out for the negotiation of a possible Free Trade Zone of the Americas (ALCA), and that one of the main activities of this negotiating group is to establish Mutual Recognition Agreements for the Assessment of Conformity.

**RESOLVES:**

To approve the Text of an Inter-American Mutual Recognition Agreement for the Assessment of Conformity of Telecommunication Equipment, which is included in the annex of this resolution.

**INSTRUCTS THE EXECUTIVE SECRETARIAT:**

1. To instruct the Executive Secretary to send this resolution to the PCC.II and PCC.III so that they get acquainted with its contents during their next meeting, since it includes provisions on wireless Telecommunication equipment.
2. To instruct the Executive Secretary to send this resolution and the wording of the MRA annexed to COM/CITEL, so that it sends it to the next OAS General Assembly if it deems necessary, in order to invite the Member States to participate in this Agreement as soon as possible, within their Regulatory Frameworks and National Policies.





**Organization of American States (OAS)  
Inter-American Telecommunication Commission**

**Inter-American Mutual Recognition Agreement  
for Conformity Assessment of  
Telecommunications Equipment**

**October 29, 1999 (Final Version)**

**INTRODUCTION**

The Declaration of Santiago, signed by the Heads of State and Government participating in the Second Summit of the Americas, includes a Plan of Action for Telecommunications. The Plan of Action indicates that Governments will continue to examine ways to develop consistent regulatory approaches among member countries, leading to the promotion of greater commonality in the certification processes for telecommunications equipment; and, that Governments will work towards the establishment of a framework and to move toward the negotiation and implementation of a Mutual Recognition Agreement for telecommunications equipment encompassing all the countries of the Region.

CITEL Member States are striving to follow the CITEL Guidelines for Telecommunications Equipment Certification Processes, adopted in 1996 by Senior Telecommunications Officials, with a view to facilitating trade in telecommunications goods and services.

The implementation of a Mutual Recognition Agreement for telecommunications equipment, along with the utilization of the CITEL Guidelines, will promote rapid and economical access for new telecommunications equipment to the Americas, while assuring continued compliance with national Technical Regulations. This would benefit CITEL Member States' efforts to upgrade national and regional telecommunications infrastructure and services.

The World Trade Organization (WTO) Agreement on Technical Barriers to Trade provides that WTO Members "shall ensure, whenever possible, that results of conformity assessment procedures in other WTO Members are accepted, even when those procedures differ from their own, provided they are satisfied that those procedures offer an assurance of conformity with applicable technical regulations or standards equivalent to their own procedures."

The WTO Agreement on Technical Barriers to Trade also provides that "where a positive assurance of conformity with a technical regulation or standard is required, Members shall, wherever practicable, formulate and adopt international systems for conformity assessment and become members thereof or participate therein," and that "Members are encouraged to permit participation of conformity assessment bodies located in the territories of other Members in their conformity assessment procedures under conditions no less favorable than those accorded to bodies located within their territory or the territory of any other country."

One essential precondition for mutual recognition is an importing Party's confidence in the competence of Conformity Assessment Bodies of another Party to test or assess conformity to the importing Party's requirements, including confidence that physical standards of measurement are maintained to a high degree of accuracy and are traceable to international standards, that instruments in laboratories and test facilities are properly calibrated, and that inspectors and assessors are technically competent to carry out tests and to interpret results and are familiar with and able to put in place all necessary tests and procedures.

Confidence building can be facilitated in various ways, including through technical cooperation and assistance which can help to develop institutional structures on measurement, testing and other conformity assessment skills, and also by means of courses, seminars, personnel exchanges, inter-comparisons, joint audits and the like. Such technical cooperation and assistance can help to develop a greater familiarity with other Parties' requirements and a greater commonality of approach.

Confidence building is promoted by the development within each member state of rigorous systems of accreditation for Conformity Assessment Bodies, using guides such as ISO/IEC guides or recommendations issued by international bodies. Parties to this Agreement may rely on mutual recognition agreements between such accreditation systems to secure and simplify their participation in this Agreement.

This Agreement is not intended to displace private sector agreements among Conformity Assessment Bodies, or to displace regulatory regimes allowing for manufacturers' self-assessments and declarations of conformity. This Agreement represents a statement of intention on the part of the member states of CITEL in the sense that they commit themselves to make progress in their territories for the adoption of measures needed to start the implementation of the set of criteria and procedures as long as they are prepared to do so. This document is flexible enough so that the member states may apply the criteria established in the Agreement in one or both Phases according to their needs and possibilities. Likewise, as provided for in the Agreement, the member states are free to withdraw from it, or to limit their participation, without legal consequences.

The Parties to this Agreement mutually decide as follows:

## **1. PURPOSE OF THE AGREEMENT**

This Agreement is intended to streamline the conformity assessment procedures for a wide range of telecommunications and telecommunications-related equipment and thereby to facilitate trade among the Parties. It provides for the mutual recognition by the importing Parties of Conformity Assessment Bodies and mutual acceptance of the results of testing and equipment certification undertaken by those bodies in assessing conformity of equipment to the importing Parties' own Technical Regulations.

In cases where homologation is required, Parties will grant homologation under transparent terms, conditions, and timeframes no less favorable than those accorded to like products of national origin or originating in any other country. Homologation shall not have the effect of creating unnecessary obstacles for international trade in telecommunications equipment.

## 2. GENERAL PROVISIONS

- 2.1 The requirements that the Parties will apply to designate and monitor testing laboratories and certification bodies as Conformity Assessment Bodies are found in Appendix A to this Agreement, “Designation and Monitoring Requirements of Conformity Assessment Bodies.”
- 2.2 The procedures that the Parties will use to mutually recognize Conformity Assessment Bodies and to mutually accept the results of Conformity Assessment Procedures produced by those Bodies are set forth in two additional appendices:  
Appendix B – “Phase I Procedures for Mutual Recognition of Testing Laboratories As Conformity Assessment Bodies and Mutual Acceptance of Test Reports” (Phase I Procedures).

Appendix C – “Phase II Procedures for Mutual Recognition of Certification Bodies as Conformity Assessment Bodies and Mutual Acceptance of Equipment Certifications” (Phase II Procedures).

## 3. DEFINITIONS AND INTERPRETATIONS

- 3.1 General terms concerning test reports and Conformity Assessment Procedures used in this Agreement have the meaning given to those terms in ISO/IEC Guide 2 (1996 edition) *Standardization and related activities - General Vocabulary* of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC Guide 2). In addition, the following definitions apply to this Agreement:

***Administrative Arrangements*** means any publicly available procedures or permission or legal or contractual agreements within a Party’s jurisdiction which impact on the Conformity Assessment Procedures for the telecommunications equipment within the scope of this Agreement, as described in paragraph 4 of this Agreement.

***Conformity Assessment Body*** means a body, which may include a third party or a supplier’s testing laboratory, or a certification body, that performs conformity assessment to an importing Party’s Technical Regulations.

***Designation*** means the act by a Designating Authority of designating a Conformity Assessment Body to perform Conformity Assessment Procedures under this Agreement.

***Certification*** means a procedure by which a third party gives written assurance that a product, process, or service conforms to specify requirements.

***Approval /Homologation*** means permission for a product, process or service to be marketed or used for stated purposes or under stated conditions.

***Party*** means an OAS member state that chooses to join this Agreement.

**Public Telecommunications Network** means public telecommunications infrastructure that permits telecommunications between defined network termination points.

**Technical Regulations** means those technical requirements, legislative and regulatory provisions, and Administrative Arrangements that a Party has specified under Annex I of the Phase I or Phase II Procedures pertaining to the registration, testing or certification of equipment with respect to which compliance is mandatory.

- 3.2 In the event of any inconsistency between a definition in ISO/IEC Guide 2 (1996 edition) and a definition in this Agreement, the definition in this Agreement will prevail.

#### **4. SCOPE**

- 4.1 Scope of Technical Regulations - This Agreement applies to Technical Regulations listed separately by each Party under Annex I concerning conformity assessment of equipment. The Technical Regulations will concern equipment subject to network terminal attachment or other telecommunications regulation. Where network terminal attachment or other telecommunications regulation pertains, the Agreement applies to the Technical Regulations listed in Annex I concerning conformity assessment, including electromagnetic compatibility (EMC) and electrical safety.

- 4.2 Equipment Scope - The equipment scope covers network terminal attachment and other equipment subject to telecommunications regulation of each Party, including wire and wireless equipment, and terrestrial and satellite equipment, whether or not connected to a Public Telecommunications Network.

Equipment which can only be connected behind devices providing adequate network protection for a Public Telecommunications Network may be excluded by some Parties from the scope of testing and equipment certification as it applies to network terminal attachment.

- 4.3 Nothing contained in this Agreement precludes the Parties from entering into agreements under the International Telecommunication Union Memorandum of Understanding on Global Mobile Personal Communications by Satellite (GMPCS).
- 4.4 This Agreement does not constitute an acceptance of the standards or technical regulations of a Party by the other Parties, or mutual recognition of the equivalence of such standards or technical regulations.
- 4.5 Agreements concluded by any Party with a Member State that is not a Party to this Agreement (including non-OAS member states) will not impose any obligation upon any other Parties.

#### **5. DESIGNATING AUTHORITIES**

- 5.1 Parties will ensure that their Designating Authorities have the authority and competence to designate, list, verify the compliance of, limit the Designation of, and withdraw the

Designation of Conformity Assessment Bodies within their jurisdictions. Parties also will ensure that their Designating Authorities have the authority and competence to recognize Conformity Assessment Bodies outside their jurisdictions.

- 5.2 Designating Authorities will take such measures as necessary to ensure that their designated Conformity Assessment Bodies maintain the necessary technical competence to undertake the Conformity Assessment Procedures for which they have been designated.
- 5.3 The Designating Authority also may appoint an accreditation body to accredit Conformity Assessment Bodies while maintaining full responsibility as a Designating Authority under this Agreement.
- 5.4 Each Party will list, under Annex II, its Designating Authorities and accreditation bodies.

## **6. DESIGNATION OF CONFORMITY ASSESSMENT BODIES AND APPOINTMENT OF ACCREDITATION BODIES**

- 6.1 Each Designating Authority listed in Annex II may designate Conformity Assessment Bodies to perform conformity assessment of equipment subject to another Party's Technical Regulations.
- 6.2 In making such Designations, a Designating Authority will observe the procedures set out in Appendix A to this Agreement.
- 6.3 A Conformity Assessment Body will publish and maintain a list of equipment certifications, and upon a request by a Party, will identify all equipment certified by that Conformity Assessment Body to the Party's Technical Regulations. The Designating Authority that designated the Conformity Assessment Body will enforce the request, as necessary.

## **7. RECOGNITION OF CONFORMITY ASSESSMENT BODIES AND MUTUAL ACCEPTANCE OF THE RESULTS OF CONFORMITY ASSESSMENT PROCEDURES**

Under the conditions and procedures specified in the Phase I or Phase II Procedures, a Party will recognize the Conformity Assessment Bodies designated by another Party's Designating Authority and accept the results of Conformity Assessment Procedures performed by those bodies.

## **8. VERIFICATION OF CONFORMITY ASSESSMENT BODIES**

- 8.1 Parties concerned have the right to contest the technical competence of Conformity Assessment Bodies, as well as the Conformity Assessment Bodies' conformity with Appendix A. This right will be exercised under exceptional circumstances only.

- 8.2 The contesting Party will provide written notice of its contest to the exporting Party. The contest will include an objective and reasoned written description of the basis for the contest, including a description of the available evidence and opinions supporting the contest. The relevant Designating Authority, accreditation body, and the Conformity Assessment Body will be given prompt notice of the contest and not less than sixty days from receipt of the notice to present information refuting the contest or correcting the deficiencies which form the basis of the contest.
- 8.3 Where verification of the Conformity Assessment Body's technical competence or conformity with Appendix A is required to resolve the issue, it will be carried out in a timely manner jointly by the Parties concerned with the participation of the relevant Designating Authority and accreditation body.
- 8.4 Parties will ensure that their Conformity Assessment Bodies are available for verification of their technical competence and their conformity with Appendix A.
- 8.5 The results of this verification will be discussed by the Parties, the relevant Designating Authority, accreditation body, and the Conformity Assessment Body concerned with a view to resolving the issue as soon as possible. Where, as a result of the verification, the Conformity Assessment Body is found to be not in conformity with Appendix A, the contesting Party will give the Conformity Assessment Body prompts notice. The Conformity Assessment Body will present, not less than sixty days from receipt of the notice information refuting the findings of the verification or correcting the deficiencies, which form the basis of the contest.
- 8.6 Where, as a result of the verification and subsequent response by the Conformity Assessment Body, the contesting Party intends to withdraw or limit to certain Technical Regulations its recognition of the Conformity Assessment Body, the contesting Party will provide sixty days advance notice of its intent, including a written explanation of its reasons, to the Conformity Assessment Body concerned, to the relevant Designating Authority, accreditation body, and the exporting Party.
- 8.7 Upon mutual consent of one or more contesting Parties and the relevant Designating Authority and accreditation body, matters relating to the conformity of the Conformity Assessment Body with Appendix A may be referred to a review process recognized by those Parties, or to a subcommittee of the Joint Committee, comprised of the Parties involved, for evaluation and assistance in resolution of technical issues.
- 8.8 When a Party withdraws or limits to certain Technical Regulations recognition of a Conformity Assessment Body, that Party will continue to accept the results of Conformity Assessment Procedures performed by the Conformity Assessment Body prior to the withdrawal or limitation, unless that Party has good cause for not accepting such results.

8.9 If the Party determines not to accept such results, it will provide sixty days advance notice including a written explanation of the reason to the Conformity Assessment Body concerned, to the relevant Designating Authority, accreditation body, and the exporting Party.

8.10 The withdrawal or limitation will remain in effect until agreement has been reached by the Parties upon the future status of the Conformity Assessment Body.

## **9. COMMENCING THE AGREEMENT AND INITIATING PARTICIPATION IN PHASE I OR PHASE II PROCEDURES**

9.1 This Agreement does not, in and of itself, create legally binding obligations. Two or more Parties may enter into legally binding obligations between or among themselves through exchange of letters incorporating this Agreement, or through such other means, as they deem necessary such as bilateral or regional agreements.

9.2 Member states that are preparing to initiate participation in Phase I or Phase II Procedures will notify the CITELE Secretariat at any time when they are prepared to do so. Such notification will generally be given six months prior to the date that the member state intends to initiate participation in Phase I or Phase II Procedures, or both, so that other Parties have the opportunity to begin learning about the member state's Technical Regulations, and vice versa. No later than one month after receiving a notification from a member state under this paragraph, the CITELE Secretariat will identify the Member State to the other member states.

9.3 Once the CITELE Secretariat has identified a Party under paragraph 9.2, the Party will supply to the other Parties the following information in writing:

- a) The list of Technical Regulations for which it will recognize the test reports and equipment certifications from other Parties' Conformity Assessment Bodies in accordance with the respective Phase I and Phase II Procedures. The list will be provided in the format specified in Annex I to the procedures.
- b) The list of Designating Authorities in the notifying Party's jurisdiction that will be responsible for designating Conformity Assessment Bodies in accordance with Appendix A. The list will be provided in the format specified in Annex II to the Phase I and Phase II Procedures. The list will include any accreditation bodies that the Designating Authority intends to appoint for accrediting Conformity Assessment Bodies as provided under paragraphs 5.3 of this Agreement.
- c) The contact persons to be responsible for the activities under this Agreement.

The other Parties will supply the new Party with the same information.

9.4 The information relating to designation and recognition of Conformity Assessment Bodies will be provided in the format specified in Annex III and IV to the Phase I and Phase II Procedures and in accordance with Appendix B and C.



- 9.5 Parties will enjoy full and equal benefits and responsibilities under this Agreement immediately upon initiating participation in accordance with this Agreement.

## **10. INFORMATION EXCHANGE**

- 10.1 Each Party will maintain a publicly available list of Technical Regulations under Annex I of the Phase I and Phase II Procedures and will make those Technical Regulations publicly available. Except where more urgent action is required, each Party will make publicly available any amendments to the Technical Regulations included in the Parties' list of Technical Regulations or any changes to its list of Technical Regulations within sixty days of publication of the amended or new regulation. In the event of any need for interpretation of such provision, the official language in which the provision was prepared will be used.
- 10.2 The Parties will consult as necessary to ensure the maintenance of confidence in Conformity Assessment Procedures and to ensure that all Technical Regulations are identified and are satisfactorily addressed.
- 10.3 Each Party will provide public notice of any new or amended technical regulations within the scope of the respective Phase I and Phase II Procedures. The Party will provide any interested person, including manufacturers of other Parties, an opportunity to comment, unless expressly prohibited under a Party's law, on the relevant part of the new or amended technical regulations in advance of their adoption. When the new or amended technical regulations come into effect, the Party will amend its list accordingly.
- 10.4 Each Party will promptly notify the other Parties of any changes to its list of Designating Authorities and accreditation bodies (Annex II), list of designated Conformity Assessment Bodies (Annex III), or list of recognized Conformity Assessment Bodies (Annex IV).

## **11. JOINT COMMITTEE**

- 11.1 The Parties hereby establish a Joint Committee, consisting of representatives of each Party. The Joint Committee will meet at the request of the CITEC Secretariat, or more frequently as agreed by the Joint Committee, to assist in the effective implementation of the Agreement. The Joint Committee will determine its own rules of procedure. All decisions of the Joint Committee will be made by consensus, unless the Parties mutually decide otherwise.
- 11.2 To assist in the effective implementation of this Agreement, the Joint Committee may appoint one or more subcommittees in which the representatives of a Party may include persons from the business/private sector including suppliers, manufacturers and Conformity Assessment Bodies.

## **12. ADDITIONAL PROVISIONS**

- 12.1 Each Party will endeavor to use international standards, or the relevant parts of international standards, as the basis for its Technical Regulations, where applicable international standards exist or when their completion is imminent, except when such international standards or relevant parts would be ineffective or inappropriate. Examples include, but are not limited to, fundamental climatic or geographic considerations or fundamental technical problems.
- 12.2 An importing Party may specify the language in which test reports, equipment certifications, notices of designation and recognition, and other pertinent documents shall be submitted. An importing Party will issue Technical Regulations in the language of its choice.

### **13. CONFIDENTIALITY**

- 13.1 An importing Party will not require a Designating Authority, accreditation body or Conformity Assessment Body to disclose a supplier's proprietary information except where necessary to demonstrate conformity with an importing Party's Technical Regulations.
- 13.2 A Party, in accordance with its applicable laws, will protect the confidentiality of any proprietary information disclosed to it in connection with Conformity Assessment Procedures.

### **14. PRESERVATION OF REGULATORY AUTHORITY**

- 14.1 Each Party retains all authority under its laws to interpret and implement its Technical Regulations governing equipment included within the scope of this Agreement.
- 14.2 Nothing in this Agreement will be construed to limit the authority of a Party to determine the level of protection it considers appropriate with regard to safety, the protection of consumers, and otherwise with regards to risks of concern to the Party.
- 14.3 Nothing in this Agreement will be construed to limit the authority of a Party to take all appropriate measures whenever it ascertains that equipment may not meet the Party's Technical Regulations. Such measures may include carrying out surveillance activities, prohibiting connection of the equipment to the Public Telecommunications Network, withdrawing the equipment from the market, prohibiting their placement on the market, restricting their free movement, initiating an equipment recall, or otherwise preventing the recurrence of such problems, including through a prohibition on imports. If a Party takes such action, it will notify the affected Parties within fifteen days of taking such action, providing its reasons.

### **15. FEES**

The Parties will ensure that any fees imposed by the Parties for determining compliance of Conformity Assessment Bodies with the Designation requirements under paragraph 6 of this Agreement will be non-discriminatory, transparent, and reasonable.

## **16. AMENDMENT AND TERMINATION OF AGREEMENT**

- 16.1 This Agreement may be amended by the mutual, written consent of the Parties provided, however, that a Party may modify its respective lists of Technical Regulations (Annex I), Designating Authorities and accreditation bodies (Annex II), designated Conformity Assessment Bodies (Annex III), and recognized Conformity Assessment Bodies (Annex IV).
- 16.2 Any Party may terminate its participation in this Agreement or only in the Phase I or Phase II Procedures, as applicable, by giving to all other Parties six months notice in writing.
- 16.3 Following termination by a Party of its participation in this Agreement or only in the Phase I or Phase II Procedures, as applicable, a Party will continue to accept the results of Conformity Assessment Procedures performed by Conformity Assessment Bodies under this Agreement prior to termination, unless the Party decides otherwise, and so advises other Parties in its termination notice.

## **17. FINAL PROVISIONS**

- 17.1 This Agreement includes:
- Appendix A, “Designation and Monitoring Requirements for Conformity Assessment Bodies”;
  - Appendix B, “Phase I Procedures for Mutual Recognition of Testing Laboratories as Conformity Assessment Bodies and Mutual Acceptance of Test Reports” ;
  - Appendix C, “Phase II Procedures for Mutual Recognition of Certification Bodies as Conformity Assessment Bodies and Mutual Acceptance of Equipment Certifications” ;
  - Annex I, “List of Technical Regulations For [Name of Party]” ;
  - Annex II, “List of Designating Authorities and Accreditation Bodies For [Name of Party]” ;
  - Annex III, “List of Conformity Assessment Bodies (CAB) Designated by [Name of Party]” ;and
  - Annex IV, “List of Conformity Assessment Bodies (CABs) Recognized by [Name of Party]”.

17.2 In the event of any inconsistency between a provision in this Agreement and a provision in one of the Appendices, the Appendices will prevail, to the extent of the inconsistency.

**APPENDIX A**  
**DESIGNATION AND MONITORING REQUIREMENTS**  
**FOR CONFORMITY ASSESSMENT BODIES**

This Appendix specifies the Designation and monitoring requirements for two categories of Conformity Assessment Bodies -- testing laboratories and certification bodies.

A Conformity Assessment Body for electrical safety may require different Designation procedures depending on the Technical Regulations of the importing Party.

**A. COMMON REQUIREMENTS**

1. The Designating Authority may designate a testing laboratory or a certification body as a Conformity Assessment Body. The Designating Authority may appoint an accreditation body to accredit Conformity Assessment Bodies, while maintaining full responsibility as a Designating Authority under this Agreement.
2. Designating Authorities will designate and accredit, and accreditation bodies will accredit, only legally identifiable entities as Conformity Assessment Bodies.
3. Designating Authorities will only designate Conformity Assessment Bodies able to demonstrate by means of accreditation that the Conformity Assessment Bodies understand, have experience relevant to, and are competent to apply the Conformity Assessment Procedures pertaining to the Technical Regulations, as well as interpretations and policies of the other Party.
4. The technical competence of Conformity Assessment Bodies will be demonstrated by means of accreditation and including the following areas:
  - a) Technological knowledge of the relevant equipment, processes and services;
  - b) Understanding of the Technical Regulations and the general protection requirements for which Designation is sought;
  - c) The knowledge relevant to the applicable Technical Regulations;
  - d) The practical capability to perform the relevant Conformity Assessment Procedures;
  - e) An adequate management of the Conformity Assessment Procedures concerned; and
  - f) Any other evidence necessary to give assurance that the Conformity Assessment Procedures will be adequately performed on a consistent basis.
5. Parties are encouraged to harmonize Designation and Conformity Assessment Procedures through cooperation between Designating Authorities and Conformity Assessment Bodies by

means of coordination meetings, participation in mutual recognition agreements, and working group meetings.

6. To ensure consistency of the Designation and Accreditation processes, the international guides for conformity assessment will be used in conjunction with the Technical Regulations of the importing Party to determine the technical competency of an accreditation body, testing laboratory, or certification body.

The following list of relevant ISO/IEC guides will be applied:

- a) ISO/IEC Guide 58:1993 - Calibration and Testing Laboratory Accreditation Systems - general requirements for operation and recognition;
- b) ISO/IEC Guide 25:1990 - General requirements for the competence of calibration and testing laboratories;
- c) ISO/IEC Guide 61:1996 - General requirements for assessment and accreditation of certification/registration bodies; and
- d) ISO/IEC Guide 65:1996 - General requirements for bodies operating equipment certification systems.

## **B. DESIGNATION OF TESTING LABORATORIES**

The following requirements, conditions, and procedures will apply for the Designation of testing laboratories:

1. Requirements for a Designating Authority or Accreditation Body.

The exporting Party may use one or more Designating Authorities or one or more accreditation bodies, or both Designating Authorities and accreditation bodies, to accredit and designate testing laboratories that are capable of performing conformity assessment to an importing Party's Technical Regulations.

- a) A Designating Authority selected by an exporting Party will be capable of using the requirements and conditions of ISO/IEC Guide 58 to the maximum extent necessary to accredit testing laboratories.
- b) Any accreditation body appointed will meet the requirements and conditions of ISO/IEC Guide 58.

2. Requirements for Designating Testing Laboratories

- 2.1 A testing laboratory may be accredited and designated by a Designating Authority. The Designating Authority may appoint an accreditation body to accredit a testing laboratory. In either case,
  - a) The testing laboratory will be accredited against ISO/IEC Guide 25 in conjunction with the Technical Regulations specified for Phase I Procedures, and
  - b) The testing laboratory will have the technical expertise and capability for testing against the standards covered in the scope of the accreditation. A specialized test, if necessary, may be performed in accordance with the provisions for subcontracting in ISO/IEC Guide 25. The laboratory also will be familiar with the applicable Technical Regulations for the equipment under test.

3. Additional Designation Requirements

The exporting Party will assign to each testing laboratory designated under paragraph 2, a unique six-character identifier, consisting of two letters identifying the party, which designated the testing laboratory, followed by four additional alpha-numeric characters.

### **C. DESIGNATION OF CERTIFICATION BODIES**

The following requirements, conditions, and procedures will apply for the Designation of certification bodies:

1. Requirements for a Designating Authority or Accreditation Body

The exporting Party may use one or more Designating Authorities or one or more accreditation bodies, or both Designating Authorities and accreditation bodies, to accredit and designate Certification Bodies that are capable of performing conformity assessment to an importing Party's Technical Regulations.

- a) The Designating Authority selected by an exporting Party will be capable of using the requirements and conditions of ISO/IEC Guide 61 to the maximum extent necessary to accredit certification bodies.
- b) The accreditation body appointed will meet the requirements and conditions of ISO/IEC Guide 61.
- c) The accreditation body will appoint a team of qualified experts to perform the assessment covering all of the elements within the scope of accreditation. For assessment of telecommunications equipment, the areas of expertise to be used during the assessment will include, but not be limited to: Electro-magnetic compatibility, telecommunications equipment (wire and wireless), and electrical safety.

## 2. Requirements for Designating Certification Bodies in the Area of Equipment Certification

The certification body may be accredited and designated by a Designating Authority. The Designating Authority may appoint an accreditation body to accredit a certification body. In either case:

- a) The certification body will be accredited against ISO/IEC Guide 65 in conjunction with the Technical Regulations specified for Phase II Procedures and based on type testing as identified in sub-clause 1.2(a).
- b) The type testing normally will be based on testing no more than one unmodified representative sample of each equipment type for which certification is sought. Additional samples may be requested if clearly warranted for technical regulatory purposes, such as in cases where certain tests are likely to render a sample inoperative. According to generally accepted conformity assessment practices, all samples, components and parts will be returned to the supplier unless the supplier has requested otherwise in writing.
- c) The certification body will, by means of accreditation, demonstrate for each equipment type, expert knowledge of the Technical Regulations identified in Annex I of Phase II of the Agreement, as well as interpretations and policies for each equipment type with respect to which the certification body seeks Designation.
- d) To ensure that the certification body has current technical competence, knowledge and expertise to evaluate the test data, and test reports, and to reach the appropriate conclusion in conformity assessment work with respect to applicable Technical Regulations, the certification body must have the technical expertise and capability to test the equipment it will certify. Alternatively, the certification body may enter into contractual agreements with designated testing laboratories such that the personnel of the certification body has access to personnel and facilities capable of performing the required testing and can oversee and supervise the testing so as to maintain current expertise and understanding of the applicable Technical Regulations.
- e) The certification body will demonstrate, through assessment, general competence, efficiency, experience, and familiarity with Technical Regulations and equipment included in those Technical Regulations as well as conformity with applicable parts of the ISO/IEC Guides 25 and 65. The certification body also will demonstrate an ability to recognize situations where interpretations of the Technical Regulations or Conformity Assessment Procedures may be necessary. The appropriate key certification personnel will demonstrate knowledge of the responsible officials of the importing Party to contact to obtain current and correct Technical Regulation interpretations. The competence of the certification body will be demonstrated by assessment.



- f) A certification body also will participate in any reasonable consultative activities, identified by the regulatory authority of the importing Party, to establish a common understanding and interpretation of applicable regulations. After Designation, designated certification bodies will continue to participate in such consultative activities.

### 3. Sub-contracting

- a) In accordance with the provisions of sub-clause 4.4 of ISO/IEC Guide 65, a sub-contractor of a designated certification body, including a supplier's testing laboratory may perform the testing of equipment or a portion thereof. In accordance with the Technical Regulations of the importing Party, the testing laboratory will be accredited to ISO/IEC Guide 25 or the testing laboratory will be evaluated by the certification body to be competent in accordance with ISO/IEC Guide 25.
- b) When a subcontractor is used, the certification body remains responsible for the tests and will maintain appropriate oversight of the subcontractor to ensure reliability of the test reports. A Party may require that such oversight will include periodic audits of equipment that have been tested.

### 4. Additional Designation Requirements

- a) The exporting Party will assign to each certification body designated under paragraph 2, a unique six-character identifier, consisting of two letters identifying the party that designated the certification body, followed by four additional alphanumeric characters.
- b) In the case of a concern and before making a determination to recognize a certification body under paragraph 2 of Phase II Procedures, a Party may request and receive within thirty days of said request a complete copy of the evaluation report prepared in the course of designating the certification body. The confidentiality provisions of paragraph 13 of the Agreement apply to evaluation reports.

### 5. Post-certification Requirements

- a) The surveillance activities required under ISO/IEC Guide 65 will be based on type testing a few samples of the total number of equipment types, which the certification body has certified. Other types of surveillance activities of equipment that has been certified are permitted, provided they are no more onerous than type testing. The importing Party may request and receive copies of equipment certification reports.
- b) If during post market surveillance of certified equipment, a certification body determines that equipment fails to comply with the applicable Technical Regulations, the certification body will immediately notify the supplier and the appropriate importing Party. A follow-up report also will be provided within thirty days of the action taken by the supplier to correct the situation.

- c) Where concerns arise, the certification body will make every effort to provide a copy of the equipment certification report within thirty days upon request by a Party to the certification body and the manufacturer. If the certification report is not provided within thirty days, a statement will be provided to the Party as to why such a report cannot be provided. This could be ground for revocation of the equipment certification or other steps, as specified in this Agreement. The confidentiality provisions of paragraph 13 of the Agreement apply to equipment certification reports.

**APPENDIX B**  
**PHASE I PROCEDURES FOR**  
**MUTUAL RECOGNITION OF TESTING LABORATORIES**  
**AS CONFORMITY ASSESSMENT BODIES AND**  
**MUTUAL ACCEPTANCE OF TEST REPORTS**

**1. Scope**

The procedures in this Appendix address the mutual recognition of testing laboratories as Conformity Assessment Bodies and mutual acceptance of test reports relating to the conformity of equipment with the Parties' respective Technical Regulations identified in Annex I. The term "Conformity Assessment Bodies" as used in the Phase I Procedures refers to testing laboratories.

**2. Designation and Recognition of Conformity Assessment Bodies**

2.1 Each Party may designate and recognize Conformity Assessment Bodies using the procedures in paragraph 2.2 or paragraph 2.3, or both.

2.2 Designating Authority Procedures

2.2.1 The Designating Authority of an exporting Party will accredit and designate Conformity Assessment Bodies as being competent to perform testing of equipment subject to the Technical Regulations specified in Annex I by an importing Party. Alternatively, in accordance with paragraph 5.3 of this Agreement, the Designating Authority may appoint an accreditation body to accredit Conformity Assessment Bodies. In either case, the Designating Authority will designate the Conformity Assessment Bodies to the importing Party. The requirements for designation and accreditation of Conformity Assessment Bodies are contained in Appendix A to this Agreement.

2.2.2 The notification of the Designation of a Conformity Assessment Body to an importing Party will include: the testing laboratory's name, the unique six-character identifier, physical address, mailing address, contact person, contact person's telephone and telefax numbers and e-mail address, and the scope of the accreditation. Thereafter, the Designating Authority will update each Designation as necessary, for example, to revise the scope of a Conformity Assessment Body's accreditation.

2.2.3 The importing Party, upon receipt of a Designation from the exporting Party, will evaluate and make a determination on recognizing the Conformity Assessment Body under terms and conditions no less favorable than those accorded to the bodies of the importing Party that apply for recognition as a Conformity Assessment Body. Designations performed in accordance with Appendix A normally will be recognized.

2.2.4 The importing Party must notify the other Parties its acceptance of a designated Conformity Assessment Body within sixty days from receipt of the Designation. If the importing Party does not recognize a designated Conformity Assessment Body, in whole or in part, the importing Party will provide, within sixty days receipt of the Designation, a written

explanation to the Designating Authority and the designated Conformity Assessment Body, including the basis for that decision.

- 2.2.5 The Designating Authority and the designated Conformity Assessment Body will be provided a period of not less than sixty days from receipt of the importing Party's explanation to present additional factual information in order to resolve the concerns or to correct the deficiencies which form the basis of the importing Party's decision.
- 2.2.6 The importing Party will have up to thirty days to evaluate and act upon the additional information under terms and conditions no less favorable than those accorded to the bodies of the importing Party that apply for recognition as a Conformity Assessment Body.
- 2.2.7 Upon mutual consent of the two or more Parties directly involved, matters relating to the designation of the Conformity Assessment Body in accordance with Appendix A may be referred to a review process recognized by the Parties concerned, or to a subcommittee of the Joint Committee, comprised of the Parties involved, for evaluation and assistance in resolution of technical issues.

### 2.3 Information Relating to Designation and Recognition of Conformity Assessment Bodies

- 2.3.1 Under paragraph 2.2, the exporting Party will specify in its Annex III to these procedures all Conformity Assessment Bodies that it has designated.
- 2.3.2 The importing Party will specify in its Annex IV to these procedures all Conformity Assessment Bodies that it has recognized.

## **3. Participation in Phase I Procedures**

A Party may participate in these Phase I Procedures exclusively for the purpose of enabling other exporting Parties to designate Conformity Assessment Bodies as being competent to perform testing of equipment subject to the Technical Regulations specified in Annex I to these procedures by the importing Party. Such a Party will provide the information specified in Annex I, List of Technical Regulations, and Annex IV, List of Conformity Assessment Bodies Recognized, as provided in paragraphs 9 and 10 of this Agreement.

## **4. Transition Periods**

- 4.1 After a Party has notified other Parties of its intention to initiate participation in these Phase I Procedures as specified in paragraph 9 of the Agreement, the notifying Party may indicate its desire to enter into a transition period with one or more of the other Parties or any of the other Parties may indicate their desire to enter into a transition period with the notifying Party, within ninety days of the exchange of information pursuant to paragraph 9 of the Agreement. Otherwise, these procedures will apply at the end of the ninety-day period, or other time as mutually decided by the Parties.
- 4.2 The Parties may agree to conduct familiarization activities, e.g., permitting the importing Party the opportunity to participate in evaluations of Conformity Assessment Bodies and to

review the Conformity Assessment Body evaluation reports, during the transition period for the benefit of the Designating Authorities and Conformity Assessment Bodies. The transition period normally will last no more than twelve months from the date of mutual agreement regarding the commencement of such activities.

- 4.3 Upon the satisfactory completion of any agreed transition period, the Parties involved will recognize the Conformity Assessment Bodies designated by each exporting Party whose technical competence has been determined through accreditation to the technical requirements of the importing Party. The importing Party will accept the test reports prepared by Conformity Assessment Bodies recognized in accordance with procedures specified in paragraph 5.

## **5. Mutual Acceptance of Test Reports**

- 5.1 After the importing Party has recognized another Party's designated Conformity Assessment Body, the appropriate entities of the importing Party will accept test reports produced by the recognized Conformity Assessment Body of the other Party on terms no less favorable than those accorded to test reports produced by Conformity Assessment Bodies of the importing Party.

- 5.2 The importing Party will take steps to ensure that:

- a) Upon receipt of a test report, the report is promptly examined for completeness of data and documentation;
- b) The applicant is informed in writing in a timely, precise and complete manner of any deficiency;
- c) Any request for additional information is limited to omissions, inconsistencies, and/or variances from the Parties' Technical Regulations ; and
- d) Re-testing or duplicate testing is avoided, e.g., upon a change in commercial distribution agreements, logo, packaging, or minor equipment changes that do not affect compliance with Technical Regulations.

- 5.3 Parties will grant equipment certification, based on test reports produced by recognized Conformity Assessment Bodies, under transparent terms and conditions no less favorable than those accorded to the bodies of the importing Party's recognized Conformity Assessment Bodies.

## **6. Processing of Applications**

Applications for equipment certification accompanied by test reports completed by recognized Conformity Assessment Bodies of the other Parties normally will be processed, and a decision communicated to applicants, within the same time-frames as those applicable to local applicants.

**7. Suspension of Mutual Recognition and Acceptance Obligations**

- 7.1 A Party may suspend its mutual recognition and acceptance obligations under this Phase I Procedures with respect to a second Party, upon sixty days written notice, providing the reasons for suspension. Examples of such reasons include the following conditions:
- a) The suspending Party loses confidence in the Designating Authorities or Conformity Assessment Bodies of the second Party;
  - b) The suspending Party no longer perceives mutual benefits in terms of the facilitation of trade in the equipment within the scope of this Agreement or
  - c) The suspending Party is dissatisfied with the protection by the other Party of confidential information.
- 7.2 If the two Parties so decide, they may resume their mutual recognition and acceptance obligations at any time.

## APPENDIX C

### PHASE II PROCEDURES FOR MUTUAL RECOGNITION OF CERTIFICATION BODIES AS CONFORMITY ASSESSMENT BODIES AND MUTUAL ACCEPTANCE OF EQUIPMENT CERTIFICATIONS

#### 1. Scope

The procedures in this Appendix address the mutual recognition of certification bodies as Conformity Assessment Bodies and mutual acceptance of equipment certifications relating to the conformity of equipment with the Parties' respective Technical Regulations identified in Annex I. The term "Conformity Assessment Bodies" as used in the Phase II Procedures refers to certification bodies.

#### 2. Designation and Recognition of Conformity Assessment Bodies

2.1 The Parties may designate and recognize Conformity Assessment Bodies using the procedures in paragraph 2.2 or paragraph 2.3, or both.

##### 2.2 Designating Authority Procedures

2.2.1 The Designating Authority of an exporting Party will accredit and designate Conformity Assessment Bodies as being competent to perform certification of equipment subject to the Technical Regulations specified in Annex I by an importing Party. Alternatively, in accordance with paragraph 5.3 of this Agreement, the Designating Authority may appoint an accreditation body to accredit Conformity Assessment Bodies. In either case, the Designating Authority will designate the Conformity Assessment Bodies to the importing Party. The requirements for designation and accreditation of Conformity Assessment Bodies are contained in Appendix A to this Agreement.

2.2.2 The notification of the Designation of a Conformity Assessment Body to an importing Party will include: the certification body's name, the unique six-character identifier, physical address, mailing address, contact person, contact person's telephone and telefax numbers and e-mail address, and the scope of the accreditation. Thereafter, the Designating Authority will update each Designation as necessary, for example, to revise the scope of a Conformity Assessment Body's accreditation.

2.2.3 The importing Party, upon receipt of a Designation from the exporting Party, will evaluate and make a determination on recognizing the Conformity Assessment Body under terms and conditions no less favorable than those accorded to the bodies of the importing Party that apply for recognition as a Conformity Assessment Body. Designations performed in accordance with Appendix A normally will be recognized.

2.2.4 The importing Party must notify the other Parties its acceptance of a designated Conformity Assessment Body within sixty days from receipt of the Designation. If the importing Party does not recognize a designated Conformity Assessment Body, in whole or in part, the

importing Party will provide, within sixty days of receipt of the Designation, a written explanation to the Designating Authority and the designated Conformity Assessment Body, including the basis for that decision.

- 2.2.5 The Designating Authority and the designated Conformity Assessment Body will be provided a period of not less than sixty days from receipt of the importing Party's explanation to present additional factual information in order to resolve the concerns or to correct the deficiencies which form the basis of the importing Party's decision.
- 2.2.6 The importing Party will have up to thirty days from receipt to evaluate and act upon the additional information under terms and conditions no less favorable than those accorded to the bodies of the importing Party that apply for recognition as a Conformity Assessment Body.
- 2.2.7 Upon mutual agreement of the two or more Parties directly involved, matters relating to the designation of the Conformity Assessment Body in accordance with Appendix A may be referred to a review process recognized by the Parties concerned, or to a subcommittee of the Joint Committee, comprised of the Parties involved, for evaluation and assistance in resolution of technical issues.

### 2.3 Information Relating to Designation and Recognition of Conformity Assessment Bodies

- 2.3.1 Under paragraph 2.2, the exporting Party will specify in its Annex III to these procedures all Conformity Assessment Bodies that it has designated.
- 2.3.2 The importing Party will specify in its Annex IV to these procedures all Conformity Assessment Bodies that it has recognized.

## **3. Participation in Phase II Procedures**

A Party may participate in these Phase II Procedures exclusively for the purpose of enabling other exporting Parties to designate Conformity Assessment Bodies as being competent to perform certification of equipment subject to the Technical Regulations specified in Annex I to these procedures by the importing Party. Such a Party will provide the information specified in Annex I, List of Technical Regulations, and Annex IV, List of Conformity Assessment Bodies Recognized, as provided in paragraphs 9 and 10 of this Agreement.

## **4. Transition Periods**

- 4.1 The satisfactory completion of the steps set forth in the Phase I Procedures is not necessarily a prerequisite to initiating the steps set forth in Phase II Procedures.
- 4.2 After a Party has notified other Parties of its intention to initiate participation in these Phase II Procedures as specified in paragraph 9 of the Agreement, the notifying Party may indicate its desire to enter into a transition period with one or more of the other Parties or any of the other Parties may indicate their desire to enter into a transition period with the notifying



Party, within ninety days of the exchange of information pursuant to paragraph 9 of the Agreement. Otherwise, these procedures will apply at the end of the ninety-day period, or other time as mutually decided by the Parties.

- 4.3 The Parties may agree to conduct familiarization activities, e.g., permitting the importing Party the opportunity to participate in evaluations of Conformity Assessment Bodies and to review the Conformity Assessment Body evaluation reports, during the transition period for the benefit of the Designating Authorities and Conformity Assessment Bodies. The transition period normally will last no more than twelve months from the date of mutual agreement regarding the commencement of such activities.
- 4.4 Upon the satisfactory completion of any agreed transition period, the Parties involved will recognize the Conformity Assessment Bodies designated by each exporting Party whose technical competence has been determined through accreditation to the technical requirements of the importing Party. The importing Party will accept certificates prepared by Conformity Assessment Bodies recognized in accordance with procedures specified in paragraph 5.

## **5. Mutual Acceptance of Equipment Certifications**

- 5.1 After the importing Party has recognized another Party's designated Conformity Assessment Body, the appropriate entities of the importing Party will accept equipment certifications produced by the recognized Conformity Assessment Body of the other Party on terms no less favorable than those accorded to equipment certifications produced by Conformity Assessment Bodies of the importing Party.
- 5.2 Parties will grant equipment certification by a recognized Conformity Assessment Body under transparent terms and conditions no less favorable than those accorded to the importing Party's recognized Conformity Assessment Bodies.

## **6. Suspension of Mutual Recognition and Acceptance Obligations**

- 6.1 A Party may suspend its mutual recognition and acceptance obligations under these Phase II Procedures with respect to a second Party, upon sixty days written notice, providing the reasons for suspension. Examples of such reasons may include the following conditions:
  - a) The suspending Party loses confidence in the Designating Authorities or Conformity Assessment Bodies of the second Party;
  - b) The suspending Party no longer perceives mutual benefits in terms of the facilitation of trade in the equipment within the scope of this Agreement or
  - c) The suspending Party is dissatisfied with the protection by the other Party of confidential information.
- 6.2 If the two Parties so decide, they may resume their mutual recognition and acceptance obligations at any time.

**ANNEX I  
TO PHASE I AND II PROCEDURES**

**LIST OF TECHNICAL REGULATIONS  
FOR [NAME OF PARTY]**

**PHASE I**

The Technical Regulations for which [Name of Party] will accept test reports from recognized Conformity Assessment Bodies designated by other Parties are:

- 1.
- 2.
- 3.

**PHASE II**

The Technical Regulations for which [Name of Party] will accept equipment certifications from recognized Conformity Assessment Bodies designated by other Parties are:

- 1.
- 2.
- 3.

**ANNEX II  
TO PHASE I AND PHASE II PROCEDURES**

**LIST OF  
DESIGNATING AUTHORITIES AND ACCREDITATION BODIES  
FOR [NAME OF PARTY]**

**PHASE I**

Designating Authorities

1. Name of Designating Authority:  
Physical address:  
Mailing address  
Home page address:  
Name/title of contact person:  
Phone:  
Fax:  
E-mail address:

2.

Accreditation Bodies

1. Name of Accreditation Body:  
Physical address:  
Mailing address:  
Home page address:  
Name/title of contact person:  
Phone:  
Fax:  
E-mail address:

2.

## **PHASE II**

### Designating Authorities

1. Name of Designating Authority:

Physical address:

Mailing address:

Home page address:

Name/title of contact person:

Phone:

Fax:

E-mail address:

2.

### Accreditation Bodies

1. Name of Accreditation Body:

Physical address:

Mailing address:

Home page address:

Name/title of contact person:

Phone:

Fax:

E-mail address:

2.

**ANNEX III  
TO PHASE I AND II PROCEDURES**

**LIST OF CONFORMITY ASSESSMENT BODIES (CAB)  
DESIGNATED BY [NAME OF PARTY]**

**PHASE I**

1. Name of CAB:  
Six-character identifier:  
Physical address:  
Mailing address:  
Name/title of contact person:  
Phone:  
Fax:  
E-mail address:  
Parties/technical regulations for which this CAB has been designated:

2.

**PHASE II**

1. Name of CAB:  
Six-character identifier:  
Physical address:  
Mailing address:  
Name/title of contact person:  
Phone:  
Fax:  
E-mail address:  
Technical regulations for which this CAB has been designated:

2.

**ANNEX IV  
TO PHASE I AND II PROCEDURES**

**LIST OF CONFORMITY ASSESSMENT BODIES (CAB)  
RECOGNIZED BY [NAME OF PARTY]**

**PHASE I**

Conformity Assessment Bodies

1. Name of CAB:  
Six-character identifier:  
Physical address:  
Mailing address:  
Name/title of contact person:  
Phone:  
Fax:  
E-mail address:  
Technical regulations for which this CAB has been designated:
- 2.

**PHASE II**

Conformity Assessment Bodies

1. Name of CAB:  
Six-character identifier:  
Physical address:  
Mailing address:  
Name/title of contact person:  
Phone:  
Fax:  
E-mail address:  
Parties/technical regulations for which this CAB has been designated:
- 2.

**CCP:I/RES.76 (XI-99)<sup>5/</sup>**

**APPROVAL OF THE BOOK ON UNIVERSAL SERVICE IN THE AMERICAS**

The XI Meeting of the Permanent Consultative Committee I: Public Telecommunication Services,

**NOTING:**

- a) That a Book on Universal Services in the Americas to be drafted jointly by the CITELE and the BDT/ITU was approved by Resolution **PCC.I/RES.45 (VIII-98)** adopted by the Eighth Meeting of Permanent Consultative Committee I: Public Telecommunication Services of CITELE;
- b) That subsequently AHCIET's participation in the project was also approved by Resolution **PCC.I/RES.56 (IX-98)** adopted by the Ninth Meeting;
- c) That both resolutions entrusted the coordination of the preliminary tasks to the Chairman of the Working Group on Basic and Universal Services, this assignment to be shared with the Chairman of PCC.I and the Executive Secretary of the CITELE;
- d) That the first item of the terms of reference of PCC.I/RES.45 (VIII-98) refers to the collection of information requested in the questionnaire contained in Resolution **PCC.I/RES.36 (VI-97)**; and
- e) That Resolution **PCC.I/RES.60 (X-99)** adopted by the Tenth Meeting of PCC.I urges the Governments which have not yet done so to reply to the questionnaire and those who have replied, to update their information, if necessary;

**CONSIDERING:**

- a) That the ITU has participated actively in this project through an expert who collected and processed the information, analyzed the replies to the questionnaire referred to in Resolution PCC.I/RES.36 (VI-97) and drafted the **"Book on Universal Services in the Americas"**;
- b) That as a result of the collaboration of the Chairman of PCC.I and the Executive Secretariat of the CITELE in the tasks being carried out by the Working Group on Basic and Universal Telecommunications Services and by the ITU, two experts chosen by the ASETA and the Caribbean Telecommunications Union (CTU) were contracted. These experts helped to search for information and to draft the Book, one of them on questions related to countries in the Andean Group and the other on matters related to countries in the Caribbean;
- c) That the General Secretariat of the AHCIET provided documented information on countries in Latin America and on ongoing activities and publications in these countries in compliance with the request made by the Chairman of the Working Group;

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5. PCC.I/doc.918/99

- d) That with respect to the information requested in the questionnaire contained in Resolution PCC.I/RES.36 (VI-97), replies have been received from 13 Governments and were presented to the Seventh, Eighth, Ninth, and Eleventh Meetings of PCC.I;
- e) That the Chairman of Working Group on Basic and Universal Telecommunications Services submitted documents **PCC.I/doc.871/99 and PCC.I/doc.872/99** in compliance with the Plan of Action established by Resolution PCC.I/RES.60 (X-99);
- f) That these documents contain the final work, the first of them the main part and the second the appendices, both comprising the book on “Universal Services in the Americas”; and
- g) That these documents were considered and approved by the Working Group on Basic and Global Services;

**RESOLVES:**

1. To approve documents **PCC.I/doc. 871/99** and **PCC.I/doc.872/99** which comprise the book on “Universal Services in the Americas”.
2. To publish the Book and distribute it to the Administrations, Associated Members and Telecommunications Organizations.

**RECOMMENDS:**

1. That the Executive Secretary of the CITEC adopt the necessary measures to publish the Book.
2. That the Chairmen of PCC.I and of the Working Group on Basic and Global Services draft a Prologue to the Book.
3. That the Executive Secretary of the CITEC invite the competent authorities of the ITU and AHCIET to draft a prologue to the Book on “**Universal Service in the Americas**”.



**PCC.I/RES 77 (XI-99)<sup>6/</sup>**

**CITEL GUIDELINES AND PRACTICES FOR INTERCONNECTION REGULATION**

The XI Meeting of the Permanent Consultative Committee I: Public Telecommunication Services,

**CONSIDERING:**

That the Working Group on the Promotion of the Global Information Infrastructure has approved the attached document PCC.I/doc. 864/99 titled "CITEL Guidelines and Practices for Interconnection Regulation."

**RESOLVES:**

1. To approve the attached document;
2. To request that the Chairman of PCC.I inform COM/CITEL that these guidelines have been adopted in PCC.I in response to the mandate set forth in the 1998 Summit of the Americas that includes a mandate for CITEL to develop best practices guidelines on interconnection by the end of 1999;
3. Finalize the Rapporteur Group on Interconnection of the Working Group on the Promotion of the Global Information Infrastructure; and
4. Express the appreciation of PCC.I for the excellent contribution made by Ms. Jeanne Gellman in the preparation of the **CITEL Guidelines and Practices for Interconnection Regulation**.

**INSTRUCTS THE EXECUTIVE SECRETARIAT:**

To send this document to COM/CITEL.

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6. PCC.I/doc.920/99

**CITEL GUIDELINES AND PRACTICES  
FOR INTERCONNECTION REGULATION  
DRAFT, JUNE 1999\***

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\* From document PCC.I/doc.782/99rev.1 (X-99).

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## 1. INTRODUCTION

Most CITELE member countries have introduced competition into at least one telecommunications sector, and many have expressed commitments to further liberalization. The methods used to reach competition vary, reflecting the need to balance and accommodate a range of social, economic, and political objectives. This document seeks to discuss the terms, principles, and tools that CITELE

member countries can use to implement an interconnection regime that promotes competition in tandem with these other important policy objectives.

More specifically, this document contains a set of principles that CITELE members have agreed constitute critical elements for any interconnection regime. It provides concrete examples of existing regulations that CITELE member countries have used to implement these principles. The purpose of this document is not to direct, but rather to assist countries facing the rigorous task of developing and implementing interconnection regulations. This document includes information collected through the CITELE interconnection survey and reflects discussions within the CITELE PCC.I Ad Hoc Working Group on the Study of the Global Information Infrastructure (WGII) and the Interconnection Regulation Seminar held during the Second CITELE PCC.I Forum.

## **1.1 Purpose of Interconnection Regulation**

In the most basic terms, interconnection is the linking of different networks so customers of different networks may call one another. The purpose of an interconnection regime is to benefit users by encouraging competition that will lower the price and improve the scope and quality of services. For competition to be successful at maximizing consumer benefits and innovation in the telecommunications market, carriers must have the opportunity to access all customers, even those customers connected to networks of their competitors.

In the context of the transition from monopoly to competition, however, interconnection becomes more than just the linking of networks. An incumbent telecommunications provider has a vastly superior market position and a strategic interest to keep out or minimize competitors in its market area which means that it has an incentive to limit interconnection. If the incumbent, with the vast majority of customers, does not interconnect with new entrants, the new entrants will have little chance of attracting customers of their own. If promoting competition is an important goal, then interconnection regimes need to be carefully designed to ease the way for firms to enter the telecommunications service industry. Thus, interconnection regimes should be designed in the interest of promoting liberalization of the telecommunications sector and competition among providers.

## **1.2 Methods of Competitive entry**

Before interconnection can occur, to foster a competitive environment, the regulator must allow multiple forms of entry, each with its own form of pricing. Restricting methods and modes of entry can cause investment distortions and result in higher prices to consumers. By allowing the market to select preferred approaches do the regulator encourages efficient entry. There are generally three methods of entry:

- (a) Facilities based competition
- (b) Unbundling of network elements
- (c) Resale

**1.2.1 Facilities-Based Competition:** When a new entrant constructs a network using its own facilities to reach its customers (*i.e.*, without using the incumbent carrier's network), that type of entry is commonly referred to as "full facilities-based competition." By developing a new network, a facilities-based competitor is not constrained by existing, possibly obsolete embedded plant and instead can install the newest, most efficient technology. As a result, the competitor will be able to supply new or additional services such as faster

transmission and switching speeds or higher bandwidth capacity, and may be able to do so at lower costs than the incumbent. Facilities-based competitors not only directly benefit their customers but also create competitive pressure for the incumbent to upgrade its network. In addition, facilities-based entry allows the marketplace to drive competition with less regulatory presence.

Full facilities-based entrants still require interconnection for the mutual exchange of traffic with other providers. New entrants' customers need to be able to communicate with subscribers on other networks, especially the incumbent's network where the majority of users obtain their service. Without the ability to interconnect on fair terms, a new facilities-based competitor cannot survive.

**1.2.2 Unbundling of Network Elements:** In countries that allow either full or partial facilities-based competition, unbundling of essential facilities (see example 1.2.1A for Canada's view of essential facilities) is an approach to aide competitive entry in various telecommunications service markets and, thereby, bring the benefits of competition, such as better and cheaper service, to the majority of telecommunications users. Such unbundling can increase utilization of the incumbent's network in areas with relatively low teledensity. This increased utilization can spread fixed costs, thereby reducing the unit cost for the incumbent in its provision of service to its users.

Types of conditions a regulator may consider desirable to facilitate unbundling include:

(1) A list of the minimum number and types of technically feasible points of interconnection in the major supplier's network that are considered critical to facilitating entry of competing service providers.

(2) A requirement that major suppliers offer interconnection at any point beyond those identified in a list (as was described in (1)), subject to charges that reflect the cost of construction of necessary additional facilities. These costs might include physical collocation or virtual collocation, or interconnection at a point between the major supplier's and new entrant's network.

(3) A requirement that major suppliers provide unbundled elements for resale in a way that a competing carrier can have access only to elements it requires for its business and not have to pay for elements it does not require. This may also provide a check to gauge whether a major supplier is cross-subsidizing a service.

(4) Requirements that competitors can gain non-discriminatory and reasonable access to key rights of way, often from the major supplier. Often, a major supplier tries to impede a new entrant's access to its network by not offering use of poles, ducts, conduits, and rights-of-way, that are necessary for competitive entry and are owned or controlled by the major supplier. Regulations are often required to create an environment to permit new entrants access to rights of way in order to take advantage of the offer of unbundled elements.

(5) A requirement that major suppliers protect competitors' commercial information obtained in the provision of bottleneck or essential services or interconnection, including in the provision of billing and collections, customer care, operator services, database administration in the carrier selection process, and related services.

**Example 1.2.2.A:** In Canada, only “essential facilities”, defined as monopoly-controlled facilities that a new entrant requires to provide service but which it cannot duplicate economically or technically, are subject to mandatory unbundling and mandatory pricing (long run incremental cost plus a 25% mark up). These essential facilities are limited to central office codes, subscriber listings and local loops in certain rate bands (e.g., rural and remote areas). However, for an initial 5-year period beginning May 1, 1997, the Commission has mandated that unbundled facilities necessary during the early stages of competition (e.g., local loops in all areas and local traffic transiting services). New entrants’ facilities are not subject to mandatory unbundling.

**Example 1.2.2.B:** In Peru, the Interconnection Rules require the unbundling of essential elements of the network which include: (1) signalling and transfer facilities for the termination of calls, (2) transport in cases where the circuit and equipment necessary for interconnection are in the same place, (3) auxiliary services such as operator services and information needed for billing.

**1.2.3 Resale:** In the telecommunications context, resale occurs when competitors obtain a service at a discounted or wholesale rate from the underlying, established carrier and then sell the service to their own customers.

Resale can serve a multi-faceted role in promoting and sustaining competition in telecommunications services. Resale may be an effective entry vehicle for new entrants that may initially lack the necessary capital to build their own networks. Resale may also allow small competitors, which will not become facilities-based providers, to offer service.

In addition, resellers may stimulate usage of the incumbent's network, and thus may benefit the incumbent facilities-based provider and further growth of the entire sector. Moreover, this competition may help to keep prices lower for consumers, increase consumer choice, and ultimately stimulate economic growth.

**Example 1.2.3.A:** In the United States, MCI began as a reseller competing against AT&T in a very narrow market niche. Over time, MCI has made the most of these opportunities, expanded to become facilities owner, and currently is the second largest facilities-based long distance carrier in the United States.

**Example 1.2.3.B:** In Canada, resale is not considered a substitute for facilities-based competition. Nevertheless, resale has been authorized for most telecommunications services including long distance and local service.

## 2. Competitive Safeguards

In most CITELE member countries, the incumbent carrier has considerable market power or dominance, which is often reflected in the following: market share, access to resources, relationships with suppliers, and the ability to exert control over the price of services in the market.

An interconnection regime should have safeguards that firmly address the risk that an incumbent carrier with market power may delay or otherwise inappropriately influence negotiations. As competition increases, the continuing relevance of the safeguards will need to be examined. At a minimum, the regime should be able to address the following issues:

- o Anti-competitive cross-subsidization should be prohibited.

**Example 2.A:** In Mexico, the Federal Telecommunications Law prohibits carriers from cross-subsidization of services through their subsidiaries or affiliates.

- o Controls on the ability of an operator with substantial market power to misuse that market power for anti-competitive purposes. Some economies rely on general competition laws to provide this safeguard, others address it specifically in telecommunications regulation.
- o Controls against misuse of competitors' proprietary information obtained by the major supplier as a result of its control of essential facilities or functions (e.g., billing and collections, carrier selection processing, customer care) that every supplier in the industry must rely on.
- o Sanctions for delay and anti-competitive behavior, including pecuniary penalties, license cancellation and suspension.

While many of these issues relate to the incumbent, at least during the period of transition to a competitive environment, the issues can apply to any telecommunications service supplier who has some market power. Unfortunately, none of the safeguards offers certainty in guarding against anticompetitive behavior.

**2.1 Separation:** In many countries the major supplier offers more than one service, such as local and long distance service. When a company offers multiple services, it effectively charges itself for the different services within its own operation. This charge is called a "transfer price." In such cases, clear lines of separation between the different services offered by the major supplier may help ensure that the transfer price for each service adequately reflects market conditions, and does not allow a carrier to improperly subsidize services provided in a competitive market with revenues from monopoly markets. Anti-competitive subsidization of services in a competitive market unfairly burdens captive rate payers with the costs of undercutting the major supplier's competitors.

There are a number of methods that may be used to help develop either fair transfer prices or arms-length transactions. The methods listed differ in the degree of severity in separating the different services of a monopoly or dominant provider and may vary in effectiveness. In most cases, independent auditing may be necessary to guarantee fair pricing.

Accounting separation is the weakest method of separation. With enforced accounting separation, separate accounts are kept for lines of business within the incumbent carrier. All of the costs are allocated to the different lines of business. While this method causes the least disruption to the incumbent, one problem with this method is that an incumbent may not know how much a division "pays" for a particular service.

Structural separation would require that separate companies be established to provide the different telecommunications services of the dominant provider while retaining common ownership. The

incumbent provider would wholly own these companies. The purpose of structural separation is to force each of the subsidiary companies to operate as a separate line of business and thus to bill each of the other subsidiary companies for services rendered. While this method creates separate businesses and separate accounts that make determining the transfer price between companies more transparent to regulators, common ownership means the incentive to manipulate prices charged to the different subsidiaries still exists.

Divestiture would require separate firms for each service and therefore provides the greatest guarantee that a carrier that controls a bottleneck facility would not use this position to discriminate against competing carriers that require the use of the bottleneck facility. Divestiture relies on market forces to solve the transfer pricing problems by replacing internal transfers with market-determined transactions. While divestiture offers the greatest level of guarantee that interconnect prices will be fair, it also causes the greatest disruption and may reduce or eliminate economies of scope held by the incumbent.

**Example 2.1.A.:** In the United States, incumbent local exchange carriers are required to separate their books of account into regulated and non-regulated accounts. All monopoly services are governed by regulated accounts whereas competitive services are governed by non-regulated accounts. This separation aims to ensure that revenues from monopoly services are not used to unfairly cross-subsidize competitive services. For example, local exchange carriers that offer enhanced services such as voicemail, caller ID (caller identification), are required to account for revenues and expenses of these services in the non-regulated account, while revenues and expenses for local exchange services are allocated to the regulated account.

**Example 2.1.B:** In the United States, local exchange carriers that also provide long distance and/or commercial mobile radio service are required to provide such services through a separate corporate subsidiary. This separation aims to guard against cross-subsidy, discrimination and the potential for a predatory price squeeze. In the United States, local exchange carriers are also subject to detailed accounting safeguards to ensure that such conduct does not take place.

**Example 2.1.C:** In the Dominican Republic, according to article 30 (h), if a carrier provides various telecommunications services to the public, the carrier must maintain separate accounts.

## 2.2 Price Caps

The problem of cross subsidy arises when a carrier is subject to rate of return regulation. If a carrier's over-all rate of return is fixed, then it has an incentive to raise the price of non-competitive products and set a low price for competitive products to forestall entry. Under price cap regulation, the prices of the monopoly services are capped (indexed to inflation and expected productivity increases). Price cap regulation has a number of advantages, including incentives for the carrier to be more efficient. A carrier that is under price caps has no incentive to offset high returns in one market with low returns in another market because it has no overall constraint on its earnings. Only its prices are capped. Thus in each market the firm has an incentive to set the profit maximizing price.



### 2.3 Obligations to Interconnect and the Role of the Regulatory Regime

The regulatory regime should take into account that incumbent carriers have strong incentives to limit competitors' interconnection to their networks in order to maintain their dominant position in the market. Therefore, it is important that rules or prohibitions exist that prevent a major supplier from taking unreasonable advantage of its market power or its control over essential facilities. Such rules or prohibitions should, however, also provide adequate incentives for ongoing investment in telecommunications services infrastructure. As stated in the reference paper attached to the World Trade Organization's Basic Telecommunications Agreement, major suppliers should provide interconnection in a timely fashion, at any technically feasible point, under non-discriminatory terms and conditions, and at cost-oriented and reasonable rates.

Commercial negotiation is the preferred means for competitors to reach agreements on interconnection. Often, however, commercial negotiations fail in the absence of pro-competitive regulations that articulate the specific terms and conditions of a major supplier's obligation to its competitors to allow them to enter the market. Regulations or general competition law can enhance the likelihood of successful commercial negotiations if they provide the parties with incentives to enter into negotiations in good faith and to reach a constructive interconnection agreement in a timely manner.

**Example 2.3.A:** In Brazil, Art. 12 of the 1998 rules on interconnection issued in Resolution 33 states that all common carriers are obliged to make their networks available for interconnection when requested by any other common carrier.

**Example 2.3.B:** In Peru, the obligation to interconnect is considered an essential part of any concession, and the right to interconnect has been declared part of the public and social interest. All common carriers and transport service providers are obligated to interconnect with any other common carrier upon request.

**Example 2.3.C:** In Guatemala all commercial operators of telecommunications, that is, all operators that are listed in the "Registro de Telecomunicaciones", have the right to interconnection.

**Example 2.3.D:** In Chile, the article 25 of the Telecommunications Law established the right to interconnection between licensees of public switched telecommunications services. The Law also states that licensees must provide interconnection according to the technical standards, procedures and time frames established by the Subsecretaria de Telecomunicaciones, SUBTEL, with the objective that a user of a given service can communicate with other users of the same service inside and outside the national territory.

**Example 2.3.E:** In the Dominican Republic, the General Telecommunications Law states that interconnection of different operators of service on the public switch network is in the public and social interest, and it requires providers of service on the public switch network to provide unrestricted access to their networks and to their services in a non-discriminatory manner.

**Example 2.3.F:** In El Salvador, according to article 30 of the rules on telecommunications issued by the Superintendencia General de Electricidad y Telecomunicaciones (SIGET), interconnection is an essential resource of the networks and has to be provided to every operator of another network that requests it, without any discrimination, provided that it is technically feasible and that interconnection equipment does not damage or contribute to the malfunctioning of the preexisting network.

In addition, according to Art. 32 of the SIGET's telecommunications regulations, every access service operator will have to establish in each defined local area, at least one point of interconnection for the operators that request the interconnection service. Without invalidating the above, the same interconnection point can permit the access to various local areas, if it is so agreed by both parties.

**Example 2.3.G:** In Venezuela, article 3 of the Interconnection Regulation states that all operators of a telecommunications network must interconnect with other telecommunications networks when technically and economically feasible.

**Example 2.3.H:** In Mexico, the Federal Telecommunications Law establishes that licensees of public switched telecommunications services should adopt an open network architecture design to permit interconnection and interoperability of its networks.

**2.4 Nondiscrimination:** There are many aspects to non-discrimination. Highlighted here are three of the most important: any-to-any connectivity, fair and equal treatment of calls, and quality of service.

Any-to-any connectivity of a public switched telecommunications network refers to the ability of any user to communicate with any other. No carrier with market power over essential facilities and services should have the power to preclude a telecommunications user from terminating calls on its network

A state of fair and equal treatment of calls exists when a customer experiences no difference between calls originated or terminated on an incumbent's network or its competitor's network, assuming the only variable is the interconnection arrangement. Among the more serious kinds of discriminatory activity related to fair and equal treatment of calls is quality-of-service discrimination. It is especially damaging to new entrants because customers will perceive that calls originating on the new entrant's network are lower quality in comparison to calls originating on the major supplier's network -- even though both types of calls are terminating on the same major supplier's network. As a result, it may be necessary to have arrangements to preclude discrimination in such areas as routing plans, grade of service, post dial delay, transmission media and provisioning intervals, among others..

**Example 2.4.A:** In Canada, Section 27 of the *Telecommunications Act* further establishes that in providing a telecommunications service, no Canadian carrier can unjustly discriminate or give an undue preference toward any person, including itself, or subject any person to an undue or unreasonable disadvantage.

**Example 2.4.B:** In Brazil, the 1998 rules on interconnection as found in Resolution 33 specify that interconnection shall ensure compliance with the service's quality standards as stated in the interconnection contract. The providers, however, are not obliged to supply a service quality level superior to that employed in their own operations or established in other interconnection contracts.

**Example 2.4.C:** In the United States, it is unlawful for any "common carrier" or provider of public telecommunication service to "make any unjust or unreasonable discrimination in charges, practices, classifications, regulations, facilities, or services, for or in connection with like communications service, by any means or device, or to make or give any undue or unreasonable preference or advantage to any particular person or class of persons or locality, or to subject any particular person or class of persons or locality to any undue or unreasonable prejudice or disadvantage." 47 U.S.C. § 202.

Other provisions of the Communications Act also require nondiscriminatory treatment. For example, the Federal Communications Commission has interpreted the nondiscrimination principle of section 251(c)(2) as follows: "The equal in quality standard of section 251(c)(2)(C) requires an incumbent local exchange carrier to provide interconnection between its network and that of a requesting carrier at a level of quality that is at least indistinguishable from that which the incumbent provides itself, a subsidiary, an affiliate or any other party." Section 201(b) requires that: "All charges, practices, classifications, and regulations for or in connection with such communication service, shall be just and reasonable . . . ."

**Example 2.4.D:** In Peru, the law states that all interconnection agreements must reflect the principles of neutrality, non-discrimination and equal access. In addition, cross subsidization is expressly prohibited by law, and Peruvian law prohibits business practices that restrict fair competition, and gives OSITEL authority to adopt corrective measures if necessary to guarantee the rules on fair and open competition.

**Example 2.4.E:** In Venezuela, article 4 of the interconnection regulation states that interconnection agreements must be subject to the principles of neutrality, non-discrimination, and equal access.

### 3. Transparency

Transparency has an important role in the transition from monopoly environment to a competitive environment. Not only should the interconnection agreements be published or available, but also the entire process by which regulatory decisions are reached should be open, transparent and well defined.

Regulatory oversight or publishing key elements of interconnection agreements concluded with the major supplier, can advance the objectives of a pro-competitive interconnection regime. If a major

supplier has a dominant position or control of an element essential to a firm seeking interconnection, the major supplier may have an incentive to leverage its market power in negotiating with other competitors. No clear regulatory oversight or public availability of terms and conditions of interconnection agreements may lead to undesirable results such as a lack of benchmarks for other entrants when dealing with major suppliers, and additional delay in negotiating agreements.

Interconnection agreements made in a transparent environment also help avoid disputes regarding discriminatory practices. The kind of information that would assist competitors in negotiating agreements are the key terms and conditions of previous agreements. Also important to make available are the technical information necessary for a carrier to efficiently interconnect, such as network architecture and signalling protocols.

**Example 3.A:** In the United States, "dominant," carriers or major suppliers are required to file publicly available tariffs for all interconnection arrangements used to provide interstate service. Thus, all incumbent local exchange carriers are required to file tariffs detailing their access arrangements for terminating interstate calls. The Federal Communications Commission is authorized to reject tariffs that contain unjust or unreasonable "charges, practices, classifications, and regulations for or in connection with" a communications service. The Federal Communications Commission has broadly interpreted these provisions to reject interconnection tariffs that imposed excessive costs and/or unjustified conditions. In addition, carriers are required to make all agreements for local service interconnection available to the public by filing them with the appropriate State Commission. Such agreements must also be approved by the State Commission.

**Example 3.B:** In Canada, both incumbent and competitive local exchange carriers are required to file interconnection agreements and tariffs with the federal regulator. In addition, because changes made in a network can affect terminals and interconnected networks, all local exchange carriers are required to provide advance notice of any network modifications that may affect the operations of the networks of other carriers to which they are interconnected. It is also a regulatory requirement that the tariffs of all regulated companies be made publicly available.

**Example 3.C:** In Bolivia, in accordance with article 127 of the Telecommunications Law, the Superintendent of Telecommunications maintains a registry of interconnection agreements between licensees that provide service on the public switched network. The registry contains information on what parts of the network are interconnected, the type of network used, the date the agreement went into effect and the date of expiration. In addition, the rates included in the agreement are available to the public.

**Example 3.D:** In Chile, all carriers are required to file their interconnection agreements and tariffs with the regulator, SUBTEL. Although these agreements are not available to the public, the following aspects of the agreements will be made available to the public: technical conditions, time tables, procedures and maximum tariffs that may be applied.

**Example 3.E:** In the Dominican Republic, article 57 of the General Telecommunications Law states that interconnection agreements for public switched services must be submitted to the regulator for its approval. At the same time, the substantial aspects of the agreement should be published in at least

one nationally circulated newspaper. Upon publication of the agreement, any interested party affected by this agreement may submit comments to the regulator within 30 calendar days. The regulator has 10 days to review the agreement, at the end of which the agreement will be considered approved. If the regulator finds that the agreement violates any of the rules on interconnection, the regulator will notify the carriers of the specific violations and request that they submit for reconsideration a modified agreement addressing those specific violations.

**Example 3.F:** In El Salvador, according to articles 44 and 45 of the SIGET's telecommunications regulations, any interconnection contract, and its modifications, will be registered before the SIGET, in the corresponding section of the Electricity and Telecommunication Registry, and will have to comply with all legal and regulatory requirements that may be applicable. The valid interconnection contracts between two operators will be available to be consulted in at any time in the corresponding section of the Electricity and Telecommunication registry of the SIGET by a third operator, with the purpose that the latter will be able to verify whether or not it similar contracting terms, according to Art. 20 of the Law.

**Example 3.G:** In Mexico, although interconnection agreements are not available to the public, interested parties may solicit information from the agreement by submitting a written request to the regulator expressing the reasons why that party would like this information.

#### 4. Dispute Resolution Mechanisms

Commercial negotiation of interconnection terms and conditions is preferable, and there should be strong incentives for both the major supplier and new entrant to negotiate in good faith and to not always rely on the regulatory authority or the courts to resolve disputes. However, the asymmetric bargaining power between the major supplier and a new entrant due to the major supplier's dominance in the market, means a clear framework for such negotiations must be established. As described in the reference paper attached to the World Trade Organization Basic Telecommunications Agreement, if parties cannot resolve all issues through commercial negotiations in a timely and fair manner, the regulatory regime must include a fair and efficient mechanism for parties to resolve areas of disagreement. Parties should have access to legal mechanisms such as the courts or arbitration when it is clear that a negotiated agreement is not possible for certain issues within a reasonable period of time. Rules on negotiation procedures, arbitration procedures, and obligations of both parties, including strong penalties for failing to negotiate in good faith, assist in creating incentives to reach an agreement without regulatory intervention.

**Example 4.A:** In Brazil, pursuant to Resolution No. 33, Art. 7, the conditions for network interconnection are the subject of free negotiation between interested parties. According to Art. 43-67, any conflicts that may arise in relation to the application and interpretation of the regulations during the course of the interconnection contract negotiations shall be resolved by ANATEL by means of arbitration. Arbitration of interconnection conditions shall be conducted by an Arbitration Council, composed of three members appointed by the President of ANATEL. The procedure for interconnection arbitration begins with a petition addressed to the President of the Council. Once the Council receives the petition, the petitioning party will be notified to submit information and documents relating to the controversy within the period of 10 days and the Council shall arbitrate the interconnection conditions in fifteen days.

**Example 4.B:** In Brazil, pursuant to Resolution No. 33, Art. 69, ANATEL may impose sanctions on providers that do not comply with the obligations agreed upon in their interconnection contracts. According to Art. 70, following ANATEL's approval of the interconnection contract, the implementation provided for shall be operational for full interconnection between the networks within ninety days.

**Example 4.C:** In the United States, incumbent local exchange carriers are under an obligation to negotiate in good faith with competitors. The parties have the right to request mediation of unresolved issues by the State Commission at any time, and may petition the State Commission to arbitrate issues that are unresolved after the 135th day of negotiation. Arbitration may last no longer than 9 months after negotiations were initiated.

In addition, the Federal Communications Commission and many states have established expedited complaint processing procedures to resolve disputes that cannot be (or were not) resolved through negotiations among disputing carriers. The Federal Communications Commission views these rules as vital to ensuring full and fair competition and protecting the interests of consumers.

As a result of the Telecommunications Act of 1996, incumbent local exchange carriers in the United States have entered into one or more interconnection agreements -- either negotiated or arbitrated -- in most of the fifty states. In New York, for example, Bell Atlantic has reached interconnection agreements with over 25 requesting carriers. In its region, Bell Atlantic has well over 100 interconnection agreements.

Note that currently in the United States local-to-local interconnection is treated differently than long distance-to-local interconnection, which is called access and currently is governed by tariffs.

**Example 4.D:** In Canada, the Canadian Radio-television and Telecommunications Commission (CRTC) has established informal procedures for the purposes of dispute resolution for matters that do not require formal regulatory proceedings. These dispute resolution mechanisms include staff assisted resolution, staff mediation and the appointment of an inquiry officer. Parties are encouraged to make use of these processes, which do not preclude resolution under more formal procedures such as formal proceedings and applications to review and vary CRTC determinations or appeals to the federal Cabinet to vary, rescind or refer back CRTC decisions.

**Example 4.E:** In Peru, according to the Reglamento de Interconexion, any disagreement that arises over an interconnection contract or the interpretation of the contract can be submitted to OSIPTEL by either party for arbitration.

**Example 4.F:** In Bolivia, article 126 of the Telecommunications law states that in the event that the parties involved in negotiating interconnection can not come to an agreement, either party can request the help of the Superintendent of Telecommunications to determine the conditions of the agreement. In such cases, the parties will be required to comply with and execute the agreement within 15 days

following the Superintendent's issuance of a resolution.

**Example 4.G:** In Guatemala, the General Telecommunications Law has established arbitration procedures in the event that the parties seeking interconnection can not come to an agreement within a period 40 working days of the request for interconnection, unless both parties mutually agree to extend the period. In the event that the parties want to seek arbitration, they can submit together or separately documentation of the points of disagreement to the Superintendent of Telecommunications (SIT). The SIT will then contract the services of an expert (Perito) to assist in the resolution of the disagreement. The expert will come from a list that the SIT maintains of accredited experts. Within 5 days following the selection of the expert the SIT and the parties requesting arbitration will pay in equal part the cost of contracting the expert. The expert will have 30 days to submit to the SIT an opinion on the appropriate way to resolve each one of the points of disagreement. The SIT will then have 10 days to make a decision on how the disagreement should be handled based on the analysis of the expert.

**Example 4.H:** In the Dominican Republic article 56 of the General Telecommunications Law establishes that interconnection agreements will be freely negotiated by the parties following the rules on interconnection. In the event of a disagreement, either party or the regulator may initiate arbitration by the regulator. The regulator is required to determine the preliminary conditions of interconnection within 30 days and fix the terms and conditions of the interconnection charges in accordance with the rules on interconnection pricing.

**Example 4.I:** In Venezuela, title III of the interconnection regulations states that interconnection agreements are to be negotiated by the parties within a period of 2 months from the date an operator receives the request to provide interconnection. If the parties cannot come to an agreement the Law on Commercial Arbitration (Ley de Arbitraje Comercial) states that either party can request the intervention of the Comision Nacional de Telecomunicaciones (CONATEL).

## 5. Enforcement

In the event that a carrier refuses to comply with any aspect of the interconnection regime, the regulator must be able to take enforcement action. If there is a need for regulatory intervention, a regulatory regime that is independent of all operators and free from inappropriate political influence is often in the best position to create and enforce an interconnection regime for the benefit of everyone.

**Example 5.A:** In Peru, failure of any carrier to meet its interconnection obligations is considered extremely serious and that carrier may be subject to fines, and in the event that a carrier accumulates interconnection infractions, OSIPTEL has the authority to revoke that carrier's license.

**Example 5.B:** In Bolivia, failure to provide interconnection upon requested can result in fines between Bs \$2,450,000 and Bs.\$36,750,000, the confiscation of equipment and materials, or with a temporary prohibition of the operator to provide service for one year. If a party interconnects without permission

to another operator's network, that party will be subject to fines between Bs \$490,000 and Bs. \$2,450,000, the confiscation of equipment and materials, or with temporary prohibition of that party to provide service for one year.

**Example 5.C:** In Guatemala, the Superintendent of Telecommunications has the authority to impose fines of up to U.S. \$100,000 on an operator that refuses to interconnect.

**Example 5.D:** In Chile, according to article 36 of the Telecommunications Law, obstructing or refusing to accept or establish interconnection is considered an infraction and can be sanctioned with a fine of no less than U.S. \$52,000 and not more than \$260,000 per day. At no time should interconnection be interrupted, unless ordered by an administrative or legal entity.

**Example 5.E:** In the United States, the Communications Act gives the Federal Communications Commission broad authority to fine carriers US\$110,000 for a single violation of the Federal Communications Commission's rules and orders, up to a statutory maximum of US\$1,000,000 for a continuing single violation. The Federal Communications Commission also has authority to order carriers to pay monetary damages to any entity that can show actual damages suffered as a consequence of any such violation. The Federal Communications Commission has ordered a carrier to pay complaining parties as much as US\$80,000,000 in damages, plus interest, for violations of section 201(b) and certain related Federal Communications Commission's rules and orders.

**Example 5.F:** In El Salvador, the SIGET has the authority to apply economic sanctions to operators for failing to comply with the SIGET's rules on telecommunications. The sanctions vary depending on whether the infraction is considered "less serious," "serious," or "very serious;" and the fine can range from 5,000 colones to 500,000 colones plus a fine per day, if the infraction continues, that can range from 500 colones to 5,000 colones.

**Example 5.G:** In Mexico, the Federal Telecommunications Law and concession titles establish that the penalties for failure to comply with interconnection obligations may be fines and/or the revoking of the concession.

## 6. ECONOMIC CONSIDERATIONS AND PRICING

When there is enough competition so that no supplier is dominant, commercially negotiated interconnection prices are preferred. However, in markets where a major supplier has market power or control over bottleneck facilities, regulations are likely necessary to prevent the major supplier from exploiting its market power over other carriers. In a scenario of market power or control of bottleneck facilities, it is therefore necessary to develop interconnection prices through regulatory intervention. These prices may be used as a price ceiling on interconnection, a default in case of failed negotiations, or as a tariff available to all interested parties.



If, in order to encourage competition, interconnection is mandated to encourage competition, then interconnection pricing should be consistent with what would prevail in a competitive market. In a competitive market, a producer charges a customer a price that is close to cost, otherwise another producer will offer the same product at a lower price. A lower cost service provider has the advantage in a competitive market because rates are driven towards cost and the low cost provider can price its services lower. In addition, when making an investment decision, firms predict what the market will be like in the future. Thus, forward-looking cost-based pricing reflects not only a competitive market condition, but also the conditions of an efficient company. For these reasons, interconnection rates that are cost-based give signals to producers and consumers that are more likely to ensure efficient entry and utilization of the telecommunications infrastructure. Such an approach is most likely to simulate the prices that would result if there already were a competitive market.

In markets with a dominant telecommunications service provider, new entrants will need access to the dominant supplier's unbundled essential facilities. For unbundled elements, the level of prices directly affects the viability of competitive networks and the incentives for network investment and development. The challenge for all CITELE member countries is to have unbundled element charges that promote efficient facilities deployment. In an open market, if element charges are set too low, facility based competition will not be realized and there will be an aggregate under-investment in new and augmented infrastructure, both by new entrants and by major suppliers. Under pricing relative to cost therefore will distort investment decisions about infrastructure. On the other hand, if element prices are set too high, there will be either little or no market entry, or there may be increased investment in infrastructure with consequential uneconomic by-pass of major suppliers' facilities. In either case, competition will be distorted, whether because it is delayed or made unsustainable.

**Forward-looking principle.** New carriers make market entry decisions based on forward-looking costs. If the price of interconnection or unbundled elements is based on embedded or historic costs, new entry into the market may be distorted. This is because the forward-looking cost of some assets will exceed historic costs, and the forward-looking cost of other assets will be less than historic costs.

As an interim strategy, economies with no established approach for interconnection charges can look to other economies that have developed forward-looking models and use those prices as proxies. In general, regulatory regimes should decide on policy goals, choose an approach which can deliver an efficient interconnection price in a timely manner, and proceed on that basis.

## **6.1 Different costing methodologies**

Negotiations between the parties are preferred in the first instance, within an appropriate policy framework. This allows the parties to take into account all factors that might influence prices, and terms and conditions, with more information available to them than is likely to be available to a regulatory regime.

**6.1.1 Forward-looking models.: Long-Run Incremental Cost (LRIC)** A forward-looking long-run incremental costs (LRIC) based pricing methodology has merit for determining rates designed to facilitate competition because it provides an analytical framework that can be used to obtain an

estimate of the cost that would be found in a competitive market. A well-designed LRIC approach seeks to both compensate carriers and promote competition

New entrants make their decisions whether to lease unbundled elements or to build their own facilities based on the relative costs of these options. Since entry is based on forward-looking economic costs, new entrants' investment decisions tend to be distorted if the price of unbundled elements is based on embedded or historic costs.

Prices developed from a LRIC-based methodology give signals that attempt to mimic the market to producers and consumers, and are more likely to promote efficient entry and utilization of the telecommunications infrastructure. Such an approach best simulates the prices for network elements that would result if there already were a competitive market for such elements.

For example, "normal" profits are embodied in forward-looking costs because in calculating forward-looking costs one of the elements is the forward-looking cost of capital, i.e., the price of obtaining debt and equity financing. Thus, a forward-looking incremental cost methodology can create the right investment incentives for competitive facilities-based entry, and can create incentives for the market to move toward competition. In addition, unbundled element prices based on forward-looking economic costs would help prevent incumbents from exploiting their market power at the expense of competitors who are dependent on the incumbents' facilities.

When calculating Long-Run Incremental Costs, it is best to segregate the network into distinct facilities that have little or no common costs with other facilities. For example, building a switch has little common cost with constructing loops. Thus it is appropriate to calculate the LRIC of switching as the LRIC of building a switch and the LRIC of loops as the cost of building loops.

TELRIC, LRAIC, and TSLRIC are all methods that capture this basic idea, that it is best to calculate the cost of individual, distinct facilities, rather than attempt to calculate the "cost" of different retail services such as long distance service and local service where these two "services" have large common costs between them.

**Example 6.1.1.A:** In the United States, the forward-looking economic costing model preferred by the Federal Communications Commission is a Total Element Long-Run Incremental Cost based model (TELRIC). TELRIC is a forward-looking economic costing methodology that reflects the additional cost a firm will incur in the future to produce an additional quantity of a good. Prices in this system are based on physical elements, and it uses the most efficient technology currently in use. A TELRIC based model includes forward-looking, risk-adjusted cost of capital.

**Example 6.1.1.B:** In Canada, the Canadian Radio-television and Telecommunications Commission (CRTC) has adopted a forward-looking long run incremental costing methodology as the basis of setting rates for essential services and facilities, including network interconnection. This incremental costing methodology - referred to as "Phase II" - includes all forward-looking incremental causal direct, indirect and variable common costs, based on the most efficient technology in current use. Under this approach, fixed costs are not included and, therefore, must be recovered through a "mark up" which has been set at a level of 25% by the CRTC. Consequently, the rating formula relied on to set rates for interconnection services is Phase II incremental costs plus a 25% mark up.

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**Example 6.1.1.C:** In Chile, the rules on interconnection establish that costs used for the pricing of interconnection should be based on long run incremental costs.

**6.1.2 Efficient Component Pricing Rule (ECPR).** Under ECPR, an incumbent carrier that sells an essential input service, such as interconnection, to a competing network would set the price of that input service equal to "the input's direct per-unit incremental costs plus the opportunity cost to the input supplier of the sale of a unit of input."<sup>7</sup> Under the ECPR, competitive entry will not place at greater risk the incumbent's recovery of its overhead costs or any profits that it otherwise would forego due to the entry of the competitor. In other words, the incumbent's profitability would not be diminished by providing interconnection or unbundled elements or both. The ECPR presupposes that the incumbent is the sole provider of a bottleneck service, and seeks to define efficient incentives for incremental entry based on that assumption.

Under the ECPR, competitive entry does not drive prices toward competitive levels, because it permits the incumbent carrier to recover its full opportunity costs, including any monopoly profits. In general, the ECPR framework tends to preclude the opportunity to obtain the advantages of a dynamically competitive marketplace; the monopolist continues to receive monopoly profits; and distortions remain in the price structure.

**6.1.3 Fully allocated cost.** Fully allocated or distributed costs are, in general, the costs derived from the process of assigning the total embedded or historic costs of the firm to individual products or services. Fully allocated costs typically measure historical costs rather than forward-looking costs.

In many respects, historical costs differ from the current costs that might be faced by a new entrant. First, inflation can create a gap between the original costs and the current cost of acquisition. Second, technological change can cause historical costs to overstate the current value of the capital good. Third, depreciation practices can create an inconsistency between the book cost and the market value of the asset. Finally, past regulations may have created incentives for inefficient investment. These inefficiencies are then passed into any calculations based on historical costs.

New entrants generally make their entry decisions based on current costs and upon what they believe will happen in the future, thus new entrants' investment decisions may tend to be distorted if the price of unbundled elements is based on embedded or historic costs. Therefore, if the purpose of an interconnection regime is to promote competition by encouraging new entry in the market, using a fully-allocated cost may not achieve this objective in a timely manner.

**6.1.4 Revenue Sharing.** In many developing economies the information necessary for a regulatory regime to determine interconnect charges is only partially or completely unavailable. For this reason, the regulatory authority, which is often constrained by tight budget and tight supply of qualified staff, may prefer to use an interim costing methodology for interconnect service. One such approach is "revenue sharing arrangement". However, this type of arrangement is not a surrogate for estimating costs, but instead a means of allocating profits. Such a revenue sharing

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<sup>7</sup> William Baumol & Gregory Sidak, *The Pricing of Inputs Sold to Competitors*, 11 Yale J. on Reg. at 178.

arrangement may not encourage new entrants to enter the market since interconnection prices under such a regime would likely be far above cost.

## 6.2 Implementation

There are a variety of procedures employed by those regulatory regimes which have a role in determining interconnection price levels. In keeping with the ideas expressed in the reference paper attached to the World Trade Organization Basic Telecommunications Agreement, the development of interconnection rates should be transparent, cost-oriented, and have regard to economic feasibility. Procedures that encourage broad consultation among interested parties and open public discussion are more likely to be able to achieve these objectives.

**Example 6.2.A:** In Canada, following established regulatory procedures, the Canadian Radio-television and Telecommunications Commission (CRTC) has initiated a number of public proceedings to examine proposed rate levels for interconnection services and essential facilities. These proceedings typically involve a comprehensive review of all data and assumptions used to determine the long run incremental cost of the service or facility under consideration. Rates are typically set on an interim basis until the Commission modifies the rates, if necessary, and gives final approval.

## 7. OTHER RELATED ISSUES

**7.1 Universal Service and Access.** Work on universal service and access in the Americas is already being handled in the Working Group on Basic and Universal Services. However, it is important to note that among CITELE countries that believe there is a need to provide universal access to telecommunications services, universal access and interconnection charges have sometimes been linked. For some CITELE countries, interconnection charges contain implicit subsidies that generate revenue in excess of cost from some services that can be used to financially support services that may not be commercially viable. However, views on policies to promote universal access have evolved to an emerging international consensus that using market forces to expand the reach of the communications network may be more effective than relying on traditional monopoly providers. For example, in the reference paper attached to the WTO states that “any Member has a the right to define the kind of universal service obligation it wishes to maintain...provided they are administered in a transparent, non-discriminatory and competitively neutral manner...”

**Example 7.1.A:** In Peru, the 1993 Telecommunications Law established the Fund for Investment in Telecommunications (FITELE). FITELE, which is administered by the telecom regulator, OSIPTEL, derives its fund from a transparent 1 percent tax on the gross revenues of all telecommunications companies. OSIPTEL allocates FITELE funds through a competitive bidding process.

**Example 7.1.B:** In Chile, since cross-subsidies are not permitted, 1994 Telecommunications Law established the Rural Telecommunications Development (RTD) Fund that provides “direct” and “transparent” subsidies to companies that submit proposals to provide public payphone telephones to

rural areas and low income urban areas RTD funds come from the annual government budget and are allocated to SUBTEL. These earmarked funds come from the general government revenues that are raised through income taxes and other sources. The RTD is administered by SUBTEL through an annual competitive bidding process. SUBTEL assigns an “RTD subsidy” for each project. RTD funds can be used by the selected companies to subsidize between 1/3 and 1/4 of the initial investment costs of rural projects. The remaining costs are borne by the companies and can be recovered through revenues raised from providing service.

## 7.2 Rate rebalancing

Historically, many countries allegedly have relied on an internal cross-subsidy mechanism to finance the development of a public network and the provision of basic telecommunications services to users at affordable prices. Under this mechanism, the dominant, vertically integrated operator uses revenues from the more profitable services, such as international, long-distance and business services, to subsidize the provision of other services, such as residential local service and service to rural areas, at rates that may be below the cost of providing the service.

This cross-subsidy mechanism is not sustainable under a competitive regime because new entrants target the more lucrative segments of the market that have been used to subsidize the provision of other services. Competitive pressures would drive down the prices of international, long-distance and business services, thus reducing the margins available from such services. Furthermore, a social policy that artificially constrains carriers to offer some services at below-cost prices thwarts competition in the market for such services by reducing incentives to enter that market and to invest in more innovative technologies for service provision.

Therefore, if the objective of a regulatory regime is to bring the benefits of competition to the telecommunications market, it is essential to allow rebalancing of the rates faced by users to levels that more closely reflect the cost of providing services. A policy of prohibiting or restricting rate rebalancing, which may include a rise in local service rates, may hinder the realization of the benefits of competition in the telecommunications market. Such a policy also may be unfair to the incumbent provider, if the incumbent is required to provide some services at below-cost prices.

Although competitive market pressures will force such rebalancing to occur automatically once the provision of services is opened to new entrants, it is far better to accomplish this rebalancing in advance of opening the market to competition. Otherwise, the incumbent provider has an incentive to try to exploit the rebalancing process to its own advantage after competition is introduced. In particular, the incumbent may rely on claims that it continues to under-recover its costs in the residential local market as a justification for maintaining artificially high interconnection rates. If the regulator supports the incumbent’s position, the effect would be to deter entry and harm competitors under the guise of supporting the provision of socially important services.

If the regulator is concerned that rebalancing of rates will lead to unaffordably high prices for socially important services, a universal service program that subsidizes these rates may assist in bringing rates for socially important services to more affordable levels. As described in the section on universal access, the calculation, collection and distribution of the subsidies should be transparent and competitively neutral to be most effective.

**CCP.I/RES.78 (XI-99)<sup>8/</sup>**

**CREATION OF THE RAPPORTEUR GROUP  
“APPLICATIONS DEVELOPED ON  
GLOBAL INFORMATION INFRASTRUCTURE”**

The XI Meeting of the Permanent Consultative Committee I: Public Telecommunication Services,

**CONSIDERING:**

- a) That the main objective of the Working Group for the promotion of the Global Information Infrastructure is to submit recommendations to foster common policies for the countries of the Americas to contribute to the development of Global Information Infrastructure and to enjoy its benefits;
- b) That it is important to analyze the existing regulatory instruments, as well as the infrastructure characteristics of the countries in the Region for promoting applications on such infrastructures; and
- c) That it is necessary to formulate proposals with relation to applications developed on Global Information Infrastructure;

**RESOLVES:**

1. To create the Rapporteur Group on “Applications Developed for Global Information Infrastructure.”
2. To entrust Ms. Judy Kilpatrick, delegate of the U.S.A, the responsibility of being the Rapporteur for “Applications Developed on Global Information Infrastructure.”

**CCP.I/RES.79 (XI-99)<sup>9/</sup>**

**ESTABLISHMENT OF THE AD HOC GROUP TO STUDY AND DEFINE AN  
APPROACH TO TELECOMMUNICATIONS SERVICES THAT USE IP TECHNOLOGY**

The XI Meeting of Permanent Consultative Committee I: Telecommunications Public Services.

**CONSIDERING:**

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8. PCC.I/doc. 934/99  
9. PCC.I/doc.917/99

- a) The importance and dynamic development of the operations of telecommunications services that use the newest technologies in countries in the region;
- b) The possibility that telecommunications over IP will shortly become a means of communication vitally important to the development of countries; and
- c) The three fundamental principles contained in PCC.I/doc.888/99: Report of the Ad Hoc Group on the Strategic Planning of PCC.I.:
  - 1. That the CITELE should be the “one stop shop” for information on networks using the IP protocol.
  - 2. That the CITELE should help private sector initiatives to increase access to Internet.
  - 3. That PCC.I should attempt to increase the influence of the Americas in other international organizations that work on Telecommunications over IP, such as the ITU.

**BEARING IN MIND:**

- a) The need to draw up recommendations for common, broad and flexible measures that will make it possible for existing networks and telecommunications services to develop at the same rate as Telecommunications over IP;
- b) The relevance of telecommunications over IP to the fulfillment of new user’s needs and the different uses of this technology; and
- c) The recommendation submitted by the coordinator entrusted with studying the manner in which PCC.I should approach telecommunications over IP.

**RESOLVES:**

- 1. To establish an Ad Hoc Working Group to study and define an approach to telecommunications services that use the IP technology, which are available to the public in the Americas.
- 2. This new Group will have the following Mandate and Terms of Reference:

**MANDATE:**

- (a) To study the implications of the use of technologies that use the IP protocol in telecommunications in the Americas; to collect information and draw up resolutions for adopting broad and flexible common measures in the Americas, that will foster the development of telecommunications over IP in a harmonious and expeditious manner with the existing telecommunications networks and services make it possible for existing networks and telecommunications services to develop at the same rate as Telecommunications over IP.

**TERMS OF REFERENCE:**

- (a) To identify priority issues related to Telecommunications over IP facing the Administrations, operators and service suppliers in the Americas that require rapid solutions because of their legal, political or economic implications.
  - (b) To collect and to facilitate access to information and experiences worldwide on regulations and policies connected with the priority issues of telecommunications over IP, that might be useful to the Administrations, operators and suppliers of services in the Americas.
  - (c) To implement mechanisms for disseminating information in the region regarding the Group's studies and decisions and the manner in which the Administration might deal with the use of telecommunications over IP at the national and regional level.
  - (d) To propose options and initiatives to be considered by the Administrations, that will facilitate the development and increased access to Telecommunications over IP. The options and initiatives will take into account the important role played by the private sector.
  - (e) To participate in the organization of forums and seminars on the topic of telecommunications over IP.
  - (f) To coordinate together with other Working Groups of PCC.I the treatment of the different topics related to Telecommunications over IP and especially with the Working Group to promote the Global Information Infrastructure and the Working Group on Standards Coordination.
  - (g) To identify the possible need to coordinate standards regarding the technical rules for Telecommunications over IP and to provide this information to the appropriate Working Group.
  - (h) To help clarify the terminology used in the treatment of topics related to telecommunications over IP as well as that used in such existing services or applications as the Internet and in projected applications.
3. To appoint Sergio Martinez Chairman and the United States as Vicepresident of the Working Group.
  4. To submit a program of activities to the Twelfth Meeting of PCC.I.

**INSTRUCTS THE EXECUTIVE SECRETARIAT:**

To inform members of the CITEL regarding the establishment of this Group, so that they can make comments and suggestions.

**PCC.I/RES. 80 (XI-99)<sup>10/</sup>**

**AGENDA OF THE XII MEETING OF THE PERMANENT CONSULTATIVE  
COMMITTEE I: PUBLIC TELECOMMUNICATION SERVICES**

The XI meeting of the Permanent Consultative Committee I: Public Telecommunication Services,

**RESOLVES:**

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10. PCC.I/doc.929/99



1. To hold the XII Meeting of the Permanent Consultative Committee I: Public Telecommunication Services in date and place to be determined.
2. To adopt the Draft Agenda for the XII Meeting of PCC.I annexed to this Resolution.

**DRAFT AGENDA:**

1. Approval of the Agenda and Calendar.
2. Establishment of the Drafting Groups of the meeting.
3. Report from the Working Groups on the Progress made since the eleventh meeting.
4. Development of the tasks of:
  - (a) Working Group on Standards Coordination
  - (b) Ad Hoc Group on Certification Processes
  - (c) Working Group on Basic and Universal Telecommunications Services
  - (d) Working Group on the Promotion of the Global Information Infrastructure in the Americas
  - (e) Ad Hoc Group on International Telephone Services Accounting Rates
  - (f) Ad Hoc Group for the preparation for the ITU World Telecommunication Standardization Assembly
  - (g) Ad hoc Group to study and define an approach to telecommunications services that use IP technology.
5. Report of the Third Forum of CITEL/PCC.I
6. Status report from the ITU on the joint projects with CITEL.
7. Approval of the Final Report.
8. Agenda, site and date of the next Meeting.

**CCP.I/RES.81.(XI-99)<sup>11/</sup>**

**ORGANIZATION OF THE THIRD FORUM OF  
THE CITEL/PCC.I OF THE CITEL**

**“CONVERGENCE OF SERVICES, INFRASTRUCTRE AND REGULATORY  
FRAMEWORK INTENDED TO GUARANTEE ACCESS TO IP NETWORKS  
A NEW VISION OF TELECOMMUNICATIONS IN THE AMERICAS”**

The XI Meeting of Permanent Consultative Committee I: Public Telecommunication Services,

**CONSIDERING:**

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11. PCC.I/doc.931/99

1. That the Secretary General of the Organization of American States (OAS) has recently published a document pointing out the need to revise and update the OAS Vision based on the impact of new Telecommunication technologies and the real needs of Member Countries in the Region;
2. That during the Second Summit of the Americas, the Heads of State and of Government of Member States decided to issue new mandates and make commitments for the development of Telecommunications in the region, entrusting their development and coordination to the OAS;
3. That to comply with the new mandates issued by the Second Summit of the Americas, Permanent Consultative Committee I of the CITEI approved at its Tenth Meeting, the following RESOLUTIONS:

PCC.I/RES.61 “Establishment of an Ad-Hoc Group on the Strategic Analysis of PCC.I”

PCC.I/RES.62 “Establishment of a Coordinator for the issue of Telecommunications over IP”.

PCC.I/RES.64 “Establishment of the Working Group on the promotion of the Global Information Infrastructure in the Americas”

PCC:I/RES.66 “A new Vision of Telecommunications”

4. That the reports submitted by the Coordinators of the Working Groups, Ad Hoc Groups and the Coordinations done at the Tenth Meeting of PCC.I agree on the importance and impact that Telecommunications over IP will acquire in the immediate future in countries in the Region and on the urgent need that PCC:I study this topic and make recommendations, this being the main concern of Member States and Associate States of PCC.I.

**NOTING:**

1. That as a result of the Second Summit of the Americas, the Governments issued new mandates in the sector of telecommunications, which include:
  - Establish strategies to support the development and continuous updating of a regional telecommunications infrastructure plan, taking into account national plans, the need for universal access to basic telecommunications services throughout the Region, and the evolution of the Global Information Society.
  - Work together in close cooperation with the private sector to rapidly build out the telecommunications infrastructure in the region, adopting strategies to make affordable access available to all for basic telephone service and the INTERNET, such as implementing the Inter-American Telecommunication Commission (CITEI) guidelines on value-added services and encouraging the development of community information service centers that provide access to basic telephone and value-added services, computers, the INTERNET and multimedia services bearing in mind the diverse needs of the countries of the Region and divergent levels of development;
  - Encourage CITEI to address, as a matter of urgency, studies of standards coordination aspects of telecommunications infrastructure, including the areas of Telecommunication Management Network (TMN) and Intelligent Networks (IN) so that the network can evolve

to meet the interconnection requirements and to support the implementation of new applications in the regional context.

2. The success of the previous CITEI/PCC.I Telecommunication Forums in advancing and speeding up the tasks entrusted to CITEI and especially to PCC.I and its different Working Groups;
3. That Mr. Alberto A. Zetina of Mexico, the General Coordinator of the Third Telecommunications Forum of the CITEI/PCC.I submitted to the Eleventh Meeting his report on the progress as well as suggestions for the organization of the Third Forum, which take into account the needs and emergencies detected by the coordinators of the different Working Groups of PCC.I and the new mandates of the Second Summit of the Americas, as well as the recommendations PCC.I submitted to the Secretary-General of OAS for consideration and use in drafting the "New Vision of the OAS on Telecommunications in the Americas" which are contained in Appendix to resolution PCCI/RES.66 (X-98).

**RESOLVES:**

1. To hold a THIRD CITEI/PCC.I FORUM ON TELECOMMUNICATIONS, during the period and within the budget assigned for the First Meeting of PCC.I in 2000 (Twelfth Meeting), the main topic of which will be "The Convergence of the Services, Infrastructure and Regulatory Frameworks of Networks over IP. A new Vision of Telecommunications in the Americas", proposing as a provisional date, February 14 through 16, 2000, as well as a full day (February 17, 2000) for the first meeting of the Ad hoc Group to Study and to define an Approach to Telecommunications Services over IP as well as the meeting of any other Working Group which is approved by the Chairman of PCC.I because of the urgency of the results required. However, no more than two Groups shall hold meetings;
2. To indicate specific issues and the coordinators consulting with the chairman and vicechairman of the Ad Hoc Working Group to study and define an Approach to Telecommunications Services that use IP Technology.
3. That the General Coordinator of the Third Forum should propose to the Chairman of PCC.I, for his approval, prior to the next COM/CITEI meeting, the issues, the names of Coordinators for each Seminar, which are listed in item 2 of the resolute part of this document.
4. Bearing in mind OAS procedures and policies, to instruct the Executive Secretary to advertise and publish the Third Forum in all countries in the Region in order to ensure numerous and high level attendance, using, if necessary and with the prior approval of the Chairman of PCC.I., hired advertising agencies.
5. To instruct the General Coordinator to ensure, if possible, that this Forum coincides with other regional meetings, for example the Meeting of PCC.III, the CAATEL Meeting and other regional meeting of similar importance.

**CCP.I/RES.82 (XI-99)** <sup>12/</sup>  
**FOR APPROVAL AND DISTRIBUTION OF COORDINATED  
PROPOSALS TO THE ITU-T WTSA-2000**

The XI Meeting of Permanent Consultative Committee I: Telecommunications Public Services,

**CONSIDERING:**

The importance of the work of the World Telecommunication Standardization Assembly (WTSA) and the need for the Americas to have a voice in its deliberations and

**NOTING:**

That CITELE PCC.1 in recognition of the importance of the WTSA has established a group to prepare coordinated proposals.

**RESOLVES:**

To approve the common proposals in the attached document entitled "CITELE PCC.I CONTRIBUTION TO WTSA-2000"

**INSTRUCTS THE EXECUTIVE SECRETARIAT:**

To distribute the common proposals to the member states for their concurrence and to forward the proposals, respecting the established guidelines for input to the WTSA, to the ITU-T having applied the procedure adopted in PCC.III/RES.65 (X-98) for approval of common proposals.

**CITELE PCC.I CONTRIBUTION TO WTSA-2000**

**(Item on the Agenda: Ad Hoc Group for Preparation for WTSA)**

**1. BACKGROUND**

Taking into account that the World Telecommunication Standardization Assembly (WTSA) will meet in Montreal Canada 27th September to 6<sup>th</sup> October 2000, CITELE PCC.I has both an opportunity and a duty to provide input to the WTSA on issues of concern and relevance to the region. Furthermore, for the International Telecommunication Union – Telecommunication Sector (ITU-T) it is widely acknowledged that maintaining and strengthening the pre-eminence of the Sector in international standardization is of the utmost importance. In this regard it has been concluded that this can only be accomplished by:

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12. PCC.I/doc.925/99

- an increased Sector Member participation in the work of the ITU-T and the use of, in appropriate cases, a more rapid alternative approval process for Recommendations
- development of Recommendations that reflect market and trade-related considerations
- playing a leading role in the promotion of cooperation among international and regional standardization organizations and forums and consortia concerned with telecommunications
- addressing important issues related to changes due to competition, tariff principles and accounting practices
- development of Recommendations for new technologies and applications such as Internet Protocol (IP)-based networks, as well as global multimedia and mobility

## **2. PROPOSAL**

Recognizing that global standardization is one of the core strengths of the ITU, and having concluded that IP - related issues including interoperability and convergence of IP-based networks with existing infrastructures represent a key priority for the region, it is proposed that the Montreal Assembly devote considerable attention to developing a strategy to carry this work forward. It is also recognized in the region that while ITU-T Recommendations are widely deployed, a rapid increase in IP-related standardization activities in the ITU-T can be expected. Furthermore it is the recommendation of CITELEC PCC.I that the Assembly consider the following specific matters:

- the need for an appropriate Study Group structure to address IP-based networks standardization, and to facilitate collaboration with the Internet Engineering Task Force (IETF) and other relevant standardization bodies
- the need for a standardization role to address the evolution of the physical transport network to include extensive deployment of an optical infrastructure in view of the rapid increase in demand for high speed data services
- formulation and promotion of a clear role for the ITU-T in third generation mobile communications in the context of the Internet and mobile data communications, recognizing that IMT 2000 is a high priority activity of the ITU-T, and also recognizing that standardization activities outside of the ITU-T require coordination and collaboration for global standards development
- the possibilities to increase the authority delegated to the Telecommunications Standardization Advisory Group (TSAG), in cooperation with the ITU-T Director, as appropriate, to act on behalf of the WTSA to enable rapid response to change in work priorities and other such matters arising between WSAs
- review and consider the advisability of free Web distribution of certain, or all, Recommendations as a means of promoting widespread awareness of the work of the ITU-T.

## **3. RATIONALE**

The WTSA provides an opportunity for the representatives of national and regional standardization bodies and organizations such as CITELEC PCC.I to contribute to the debates and put forward perspectives and proposals that can lead towards global solutions to issues before the ITU-T.

Consequently CITEI PCC.I through its ad hoc group for Preparations for the WTSA-2000 has prepared this contribution which addresses key concerns of the region and provides specific guidance on those aspects of these work areas which are of importance to the Americas.

#### IV. RECOMMENDATIONS

##### PCC.I/REC.5(XI-99)<sup>13/</sup>

#### IMPROVEMENTS TO THE ACCESS TO INFORMATION IN THE AMERICAS

The XI Meeting of Permanent Consultative Committee I: Public Telecommunication Services,

#### CONSIDERING:

- a) That in the XXI century access to information through telecommunications and information and technologies will be decisive;
- b) That the **Working Group on Basic and Universal Services** dealt with the need to facilitate access to Internet by our peoples without discrimination;
- c) That facilities include affordable rates to allow access to Internet by all social sectors in our countries;
- d) That it is also important to facilitate the acquisition of equipment to permit increasing access to Internet from the home; and
- e) That a significant barrier to the access of information in Internet in the Americas is the small amount of contents in Spanish and Portuguese.

#### CONSIDERING ALSO:

- a) That we must succeed in entering the new world presented to us by the next millennium with all of the inhabitants of the Americas, without exclusion;
- b) That the Summit of the Americas held in Santiago de Chile established that governments should work jointly with the private sector to render the basic telephone service and Internet as well as the purchase of computers affordable, bearing in mind the variety of needs of the countries of the region and their divergent levels of development;
- c) That some countries have given Internet special consideration by declaring it of national interest and a special offer has been made to contact Internet providers on

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13. PCC.I/doc.928/99

the phone at a discount rate, with additional rebates of up to 50% for schools, universities and public libraries;

- d) That the establishment of this type of program has led to a significant growth in the amount of users having access to Internet; and
- e) That other countries, through the private sector, have likewise developed special offers to facilitate the purchase of computers for use in the home,

**RECOMMENDS:**

1. Administrations to declare Internet of National Interest and implement national plans of access to Internet.
2. To establish jointly with the private sector tariff plans and plans of other type to enable access by the population at large to Internet.
3. To grant larger discounts to schools and universities through those plans so that every student in the Americas may have equal opportunities to access to information and knowledge.
4. To promote the training of programming languages of Internet.
5. Governments and the telecommunications sector to jointly analyze the means to facilitate the purchase of computers by the population.
6. Governments to advance the development of contents in Spanish and Portuguese.

**INSTRUCTS THE EXECUTIVE SECRETARIAT:**

1. To send this recommendation to all Member States.
2. To inform the office of the OAS for the Follow Up of the Summit of the Americas on this resolution.
3. To submit this recommendation to COM/CITEL and request it be notified to the OAS General Assembly together with the book on “**Universal Service in the Americas**”.

**CCP.I/REC.6 (XI-99)** <sup>14/</sup>

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14. PCC.I/doc.910/99

**COMMON CHANNEL SIGNALING N° 7  
FOR INTERCONNECTION BETWEEN NATIONAL TELECOMMUNICATION  
NETWORKS**

The XI Meeting of the Permanent Consultative Committee I: Public Telecommunication Services,

**CONSIDERING:**

- a) That international organizations such as the ITU recommend the use of Common Channel Signaling N° 7 (CCS7) to guarantee the evolution of the Telecommunications networks and the services that are thus available;
- b) That CITELE recommends this Signaling System for the networks of the Region;
- c) That to this purpose CITELE approved the resolution PCC.I/RES.68 (X-99), which includes the minimum set of functionality for the ISDN User Part;
- d) That some countries have already adopted Common Channel Signaling n° 7 and have defined their national ISUP version; and
- e) That other countries in the region and/or their operators have not yet adopted any Common Channel Signaling;

**TAKING INTO ACCOUNT:**

That CITELE, by means of the PCC.I promotes the efficient interconnection between national networks in order to guarantee the regular and ordered evolution of the networks and the services that they offer;

**RECOMMENDS:**

That those countries that have not yet defined a national interconnection specification using Common Channel Signaling do adopt the Resolution PCC.I/RES.68 (X-99) as reference basis for the interconnection between their national networks.

**PCC.I/REC.7 (XI-99)<sup>15/</sup>**

**FIRST PILOT PROJECT ON TELE-EDUCATION FOR THE AMERICAS**

The XI Meeting of the Permanent Consultative Committee I: Public Telecommunication Services,

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<sup>15/</sup> PCC.I/doc.918/99



**CONSIDERING:**

- a) That in the Considerings of Resolution PCC.I/RES.48 (VIII-98) the Governments express their concern as to finding ways of improving their ability to provide their citizens with an improved medical assistance and better educational facilities;
- b) That they also admitted that some CITELE member countries are currently developing tele-education and tele-medicine networks and applications on the basis of the degree of development of their telecommunications infrastructure;
- c) That they also took into consideration that there are several national and international organizations which are willing to participate and provide financial resources for the execution of pilot projects on tele-medicine and tele-education, as a result of which it was resolved to appoint Rapporteurs on Tele-education and Tele-medicine, and to develop pilot projects with the specific purpose of trying out selected applications under a variety of existing telecommunications link generic scenarios;
- d) That in Resolution PCC.I/RES.57 (IX-99), the Republic of Argentina was chosen as host country for the *First Pilot Project on Tele-Education for the Americas*; and
- e) That the Rapporteur on Tele-education submitted the document PCC.I/doc.876/99 included in the Annex of this Recommendation for consideration by the Working Group on Basic and Global Services;

**RECOGNIZING:**

That the model prepared within the framework of the *First Pilot Project on Tele-education for the Americas* submitted by the delegation of Argentina meets the conditions set forth by Resolution PCC.I/RES.48 (VIII-98);

**RECOMMENDS:**

- 1. That, when developing the tele-education projects in their countries, the Member States take into consideration the Model for the Creation of a Distance Education System prepared within the framework of the *First Pilot Project on Tele-education for the Americas*, which is included in the Annex of this Recommendation.
- 2. That the institution responsible for the development of the *First Pilot Project on Tele-education for the Americas*, the Production and Labor University Foundation (Fundación pro Universidad de la Producción y del Trabajo) of the Republic of Argentina, provide technical assistance to the administrations of the countries in the Region that request it, and transfer its own technology and know-how for the development of tele-education systems and new technologies applicable to education.
- 3. That in the next sessions of the PCC.I Working Group on Basic and Universal Services, the Republic of Argentina report on the status of the execution of the *First Pilot Project on Tele-education for the Americas*

**XI MEETING OF PERMANENT  
CONSULTATIVE COMMITTEE I:  
PUBLIC TELECOMMUNICATION  
SERVICES  
October 25 to 29, 1999  
Buenos Aires, Argentina**

**OEA/Ser.L/XVII.4.1  
PCC.I/doc. 876/99  
27 October 1999  
Original: Spanish**

**PILOT PROJECT OF TELE-EDUCATION  
FOR THE AMERICAS  
(Item of the Agenda: 4.c )  
(Document submitted by the Delegation of Argentina)**

**PILOT PROJECT OF TELE-EDUCATION  
FOR THE AMERICAS  
(Item 4.c of the Agenda)  
(Document submitted by the Delegation of Argentina)**

**Background**

The Permanent Consultative Committee I: Public Telecommunication Services of the Inter-American Telecommunications Commission of the Organization of American States (CITEL/OEA) resolved during its VIII Meeting held in Cartagena de Indias, Republic of Colombia from June 29 through July 3, 1998, that the topics of Telemedicine and Tele-education would be discussed by the Basic and Universal Services Working Group (WGBUS) of PCC.I.

It also resolved that the Chairman of the Working Group on Basic and Universal Services would appoint Rapporteurs to report on these topics.

The functions assigned the Rapporteurs included: *Collecting and submitting to the plenary session of the Working Group on Basic and Universal Services requests made by the countries to act as headquarters for the development of a **pilot project** which would be carried out with the assistance of financial and technical counterparts, with the specific aim of testing in different generic settings the selected uses of existing telecommunications links* (PCC.I Resolution 48 (VIII-98)).

During the IX Meeting of the Permanent Consultative Committee held in Cartagena de Indias, Colombia from 16 through 20 November, 1998, professor Saad Chedid, the Rapporteur appointed for Tele-education, submitted in his report the request made by the Republic of Argentina to act as coordinator of the Tele-education pilot project. (OAS/Ser.L/XVII.4.1. PCC.I/doc.709/98).

In the course of that Meeting, the PCC.I decided to name Argentina coordinator of the *First Tele-education Pilot Project* (Resolution PCC.I/RES.57 (IX-98)).

The Government of Argentina designated the *Fundación pro Universidad de la Producción y del Trabajo* as the institution responsible for designing and developing the Tele-education Pilot Project.

The Secretariat of Communications of the Office of the President and the National Communications Commission of the Republic of Argentina negotiated the financing of the design of the Tele-education Pilot Project with the Telefonica de Argentina S.A. and Telecom Argentina Stet France Telecom S.A., which signed various Financial Assistance Agreements with the Foundation.

The Foundation appointed a Team of Experts to design a Tele-education Pilot Project that could be used as a model for countries in the Americas.

During the X Meeting of the PCC.I, held in Cartagena de Indias, Colombia from June 28 through July 2, 1999, the Foundation submitted a report on the *Progress of the Tele-education Pilot Project for the Americas* (OAS/Ser.L/XVII.4.1.PCC.I/doc.824/99 and PCC.I/doc.830/99).

In this document (OAS/Ser.L/XVII.4.1.PCC.I/doc.824/99 and PCC.I/doc.830/99) the Foundation presented the *Working Plan for the Development of the Tele-education Pilot Project*.

The Foundation's Team of Experts has completed the First Stage of the Working Plan - Policy and Strategy Planning - the design of the Tele-education Pilot Project.

This document contains a presentation of the design made in accordance with the commitment made by the Foundation which is referred to in the Report of the Chairman of the Basic and Universal Services Working Group to the Third Plenary Meeting of PCC.I (Doc. OAS/Ser.L/XVII.4.1.PCC.I/doc. 844/99)(11).

The presentation also contains a schedule of activities for the subsequent stages of the Working Plan for the development of the Tele-education Pilot Project, which establishes the estimated deadlines for pilot tests.

## **TELE-EDUCATION PILOT PROJECT FOR THE AMERICAS**

### **Model for creating a Distance Education System (DES)**

#### **Previous actions**

The institution which aims to create a Distance Education System should consider:

- a. forming an interdisciplinary team of experts who will design the System, and
- b. establishing connections with other national, foreign and international institutions and organizations in order to obtain technical and financial assistance for developing the DES.

#### **a. Forming the team of experts who will design the System**

It is proposed that the interdisciplinary team should be made up of experts who have the following professional profiles:

- A General Project Coordinator
- An expert (or technologist) in Educational Design
- A Curricula planning expert
- Experts on the means to be used (printed, audio, video and multimedia)
- Expert consultants who will advise on matters related to the contents. These consultants will join the team after the stage of planning the system's operating structure has been completed.

These professionals must have experience in Distance Education Systems.

#### **Tasks of the Team of Experts**

1. Study and analysis of the different normative models for the operation of a DES.
2. Establishment of a schedule of activities.
3. Creation of a normative model and determination of each component part of the DES.
4. Drawing up and/or reviewing the study curricula that will be offered, in order to adapt them to Distance Learning.
5. Choosing an indicative educational design.
6. Preparation of teaching material.
7. Submission of partial progress reports.
8. Drawing up a Final Report, making sure that the adopted model is compatible with the national rules in effect in the country in which the DES is to operate.

In addition, the Report should contain:

- The basis on which the proposal is founded, with special reference to the profiles of the beneficiaries, whether students or potential graduates, as well as project feasibility studies .
- Planning the organization, administration and permanent evaluation procedure of the DES, with special regard to the inclusion of professional studies and courses in the structure of the institution: the required and available infrastructure and equipment: the required profiles, backgrounds and functions of the personnel in charge of administration, of system evaluation, of the supporting structure and the connections established by the institution with local and foreign organizations.
- Designing the area of production and evaluation of materials, detailing the materials, distribution methods and frequency, or, if necessary, methods of access to the materials by the

beneficiaries, a list of the staff entrusted with preparing the materials, their functions and background and the work organization plan.

- Local and regional education centers that provide support, if any, their geographical location and equipment; agreements or letters of intention signed with local institutions that might provide goods and services; tutorship, including the profile of the persons who provide it, as well as guidelines for their training and follow up.
- System of beneficiaries, details of their duties and the academic activities planned as well as the rules for evaluating individual learning.
- Budget and financing method.

**b. National and International connections**

The institution shall establish connections with other institutions and organizations able to provide financial and/or technical assistance for the development of the DES.

As recommended by PCC.I of CITELO/OAS in resolution 48 (OAS/Ser.L/XVII.4.1 PCC.I-645/98), the institution shall maintain close contact with these organizations and learn from their experience as well as from that of PCC.II of the International Telecommunication Union (ITU) and from the local and subregional telecommunications institutions, among other, that it should identify as suitable for inclusion in the project.

## Development of a Distance Education System (DES)

### Normative model

#### Stages

A methodology for establishing and operating a Distance Education System is a structured and sequenced set of activities that are necessary to make the system possible and feasible.

This methodology is expressed in a *normative model* which is the ideal design of a possible reality and which can be changed at the time it is put in operation.

On many occasions the dynamic of the action changes the arbitrariness of the theoretical sequence and the stages interrelate to become what they really are: the component parts of a system.

Therefore, the *normative model* takes into account the different stages to be followed by the institution that seeks to create and operate a Distance Education System.

There are obviously many normative models implemented by the institutions that use Distance Learning.

**The PDES methodology (Planning a Distance Education System)** adopted by **The Open University** in Great Britain consists of thirteen steps, actions or momentos for planning and organizing distance learning systems.

#### I. *System of the course*

1. To give the reasons for adopting an open or distance learning system and to explain what educational needs it aims to fill.
2. To specify the population or public that benefits by such a system.
3. To specify the courses that shall be offered and the learning activities.
4. To specify the institutional policy with regard to the means to be used.
5. To prepare the teaching material.
6. To make copies of this teaching material.
7. To distribute the material.

#### II. *Student system*

8. Registration of students and a permanent record of their learning activities.
9. Learning support for students.
10. Evaluation of learning.

#### III. *Regulating and supporting programs*

11. Organization and administration of the system.
12. System management and control.
13. Resources and financing.

According to the PDES methodology, these are the thirteen steps or moments to be followed for establishing or evaluating a DES.

The normative model adopted by the **Universidad Nacional Abierta (UNA)** of Venezuela consists of thirteen steps called activities or tasks and four stages.

*I. Planning stage*

1. Professional investigation.
2. Curriculum planning
3. Preparing the plan for the course.

*II. Planning and production stage*

4. Model method planning.
5. Preparation of evaluation instruments.
6. Preparation of complementary methods.
7. Review and delivery of a teaching prototype

*III. Instrumentation stage*

8. Establishment of learning and evaluation conditions.
9. Selection and training of advisors in local centers.
10. Edition and copy of the prototype.
11. Delivery of the course.

*IV. Implementation stage*

12. Learning activities.
13. Evaluation of learning.

This document contains a *normative model* that includes the development stages of the structure to be created and which will serve as a guideline for the design of any Distance Education System.

As we have stated before, this is an experimental model. It is therefore provisional and should be adapted to the different geographic, technological, social, cultural, educational, economic and political conditions of the institution and the country which should decide to use a Distance Education System.



## MODEL FOR CREATING A DISTANCE LEARNING SYSTEM

### *First Stage: Policy and Strategy Planning*

#### **Policy.**

##### **Activities.**

1. Stating the assignment and aims of the institution that will incorporate the Distance Education System.
2. Diagnosis of status and context.
3. Character of the public which is the target of the project.
4. Definition of the institutional aims for the system.
5. Definition of the media.

#### **Strategy planning**

##### **Activities**

6. Establishment of the organizational and administrative structure of the DES.
7. Identification of the technological and communications system.
8. Determination of the necessary resources.

### *Second Stage: Teaching plan*

#### **Design of the curriculum.**

##### **Activities**

9. Definition of the enrolment and graduation profile of the receiving public.
10. Establishing the general aims of the educational activity.
11. Preparation of project curriculum.

#### **Design of teaching material**

##### **Activities.**

12. Drawing up a plan for the course (project).
13. Planning and organizing the sequence of teaching and learning.
14. Choosing the specific media and material for the course or profession.
15. Development of the contents and proposals for teaching activities.
16. Drawing up evaluation mechanisms.
17. Evaluation of the produced material.
18. Adjustment and production of prototypes of the material.

### *Third Stage: Implementation*

#### **Setting up the infrastructure**

##### **Activities.**

19. Organization of Academic Centers.
20. Putting in operation the Communications System.

#### **Development of courses.**

**Activities.**

21. Dissemination of the proposed education.
22. Registration and accrediting of the interested public.
23. Copying and distribution of materials.

**Organization of tutorships.****Activities.**

24. Choosing the professionals who will act as tutors.
25. Training the tutors.

**Administration of education.**

26. Organization of planned learning situations.
27. Development of teaching and learning procedures.
28. Evaluation of teaching.
29. Graduation and diplomas.

***Fourth stage: Evaluation of the DES*****Activities.**

30. Designing the evaluation mechanisms.
31. Use of the evaluation mechanisms.
32. Analysis of information.
33. Drawing up a report on the results.

## **FIRST STAGE: *POLICY AND STRATEGY PLANNING***

### **Policy.**

#### **Activity 1. *Stating the assignment and aims of the institution.***

This activity consists of stating the nature, assignment and aims of the institution that might incorporate the DES.

The entire Distance Education System is incorporated in a institution or an educational project that has a greater scope, which contains it and makes it significant.

The strategic factors of the institution or the project make it possible to observe the orientation of its educational policy and the existence of priority areas. The DES should be planned, taking into account the general and specific characteristics of the institution. The aims of the system as well as its actions shall be determined by the institution's objectives, approaches and criteria.

#### **Activity 2. *Evaluation of status and context.***

The first activity in designing the structure of the system is to seek justification for creating a Distance Education System.

Basically, it refers to two aspects:

- a. the existence of faults or defects that cannot be solved by the existing system of education, and
- b. elucidating the needs, aims and potential of a society or institution that justify the implementation of a Distance Education System.

Conditions may exist that make a Distance Education System possible and even necessary. These conditions arise from what could be referred to as active deficiencies (seeing that their absence generates action) and positive conditions.

Among the active deficiencies, reference can be made to the following:

- Countries with very scattered populations.
- The existence of groups or sectors unable to use the normal education system.
- The existence of a large number of adults who have not completed their education.
- The disparity or heterogeneity of the education system in a specific locality.
- A great demand for education that the existing system is unable to fill.
- A shortage of teachers and of educational institutions.
- Lack of financing for the physical infrastructure for the conventional system of education.
- Other.

The positive conditions include:

- Existence of some type of media.
- Existence of a transportation system.
- Existence of communication channels.
- Willingness of the public, which is the target of the system, to learn independently.
- An attitude of acceptance of a new form of learning.

- The possibility of financing the implementing the Distance Education System.
- Availability of teachers and technicians with training in Distance Learning techniques.
- Other.

The diagnosis of situation and context depends on the results of a survey of the conditions.

**Activity 3. *Character of the targeted public.***

While the evaluation of the status and context (Activity 2) will show the potential targets of the DES, it is necessary to know the characteristics of the public for which this educational project is intended.

To this end, it will be necessary to survey, systematize and interpret information regarding their needs, interests and expectations.

Various techniques can be used for this characterization: visits to predetermined regions, interviews of key informers, opinion polls, etc.

It should be borne in mind that each particular education project will require a specific study to establish the profile of the public which is the target of the project (activity 9).

**Activity 4. *Definition of the institutional aims for the system.***

The evaluation of the situation and context makes it possible to establish the aims which are to be fulfilled when the system has been established and is operational.

A Distance Education System may have remedial or complementary objectives (it proposes to carry out activities and provide learning opportunities that the existing system fails to provide to specific public sectors) or a substantive basis (it expects to provide effective access to knowledge and culture to a great number of persons in the form of continued education).

**Activity 5. *Definition of the media to be used by the institution***

Having explained the institutional aims for the system, it is necessary to establish the media policy of the institution, once the results of the first activity of evaluating the situation and context have been obtained.

The policy of the media to be employed in a project for creating a System of Tele-education or Distance Learning is a pedagogical and organization election that has a social and systemic effect: in addition to the degree of sophistication and technical potential that might be sought, the media should be the best for the learning model, the best for the teaching performance of the system in which they are incorporated or of which they form part.

Thus, the design of the tele-education system should start with an evaluation of the status and context which shows the real possibility of implementing this system. On the other hand, the most suitable media would be those that answer the questions: what do we wish to teach, why, who and in what conditions.

Knowledge of the teaching functions of each media, the demands of the tasks to be carried out and the type of objectives that can be attained will help us to make the best choice of media.

Technological advances in the areas of communication and computer science have enriched the instruments of educational technology which is constantly renewed.

Increasingly more sophisticated technological resources are gaining ground as a complement to printed media and to the direct intervention of teachers. Nowadays teachers and students also communicate through electronic media: television, recordings, cable, satellites, fiber, interactive telecommunications through the PC, audio and video, teleconferences, etc.

The new communications and information technologies have brought about great changes in distance learning systems and tele-education, which is known as mediatized communication, and for which the comprehensive use of all the media is considered of basic importance.

The media or teaching resources play therefore an important role in this method of education that requires a different treatment of the contents, that is to say, providing them a structure or organization that makes it possible to “learn” them at a distance. This need for a special treatment required by the “distance” is what raises the value of the design of the process of teaching and learning as a method of treating and structuring the contents to make it possible to learn them as if the teacher himself were present in the texts or material. It is essential to determine the special nature of the design of the course in order to ensure the effectiveness of learning in these conditions.

The media policy can choose between two alternatives:

- Determination of a main media which implies the subordination of the different media to this main media which is the central line of learning.
- Determination of a comprehensive system of media. We refer to a comprehensive system of media when they coordinate themselves, forming a unit in which each one of them, without becoming subordinated to another unit, contributes its specific feature to make learning more effective. This shows the differentiated equality of the media.

The institution’s media policy makes decisions:

- a. Regarding the teaching material, or how the contents should be moved (through as main media or through a comprehensive system of media).

The decision between the two alternatives may be based on:

- Costs.
- Availability of an infrastructure.
- Institutional policy.
- National interest.

But it must be borne in mind that, from the point of view of teaching, in some measure we are choosing or favoring between two learning methods, depending on the choice of media and the combination of media it is decided to adopt.

Therefore, the theory of learning on which the decision is based should be made explicit.

- b. The communications structure, or the form of sending and receiving the teaching material.

## Strategy planning

### Activity 6. *Establishment of the organizational and administrative structure of the DES*

There are two different ways to create organizational structures, depending on the principles on where they are based.

The models that are most generally used include:

- *The approach to the systems* (which interprets and organizes according to a basic *input-processing-output* plan).
- *The structural approach* (which differentiates and organizes on the basis of *areas and functions*).
- *The approach by projects* (which creates a highly independent ad hoc structure to attain a specific results and dissolves when the goal has been reached. In this model, the schedule substitutes the organization chart.

The structure of the system is determined on the basis of one of these models or on a combination of several models. The analysis of the organization chart of a Distance Education System provides information concerning the chosen organization chart model.

In principle, we can define at least four areas or sectors of a Distance Education System:

- **Regulating Area or Sector:** its functions are related to the management, administration, control and decision making.
- **Administrative Area or Sector:** its functions are related to costs, personnel, salaries and budget.
- **Supporting Area or Sector:** its functions are related to the activities of the secretariat, copying of materials, wrapping, storage and dispatch, the conservation and maintenance of equipment, materials and infrastructure.
- **Academic Area or Sector:** this is the fundamental part of the system and covers two important activities: production of teaching material for the courses and professions and the administration of learning activities.

The first three areas or sectors must combine to ensure the proper functioning of the *raison d'être* of the Distance Education System, thus forming part of an adequate organizational structure which is reflected in the organization chart of the institution.

In the abstract, it is difficult to determine which is the best organizational structure of a DES.

However, it should be borne in mind that this structure usually derives from the chosen normative model (see: Normative Model: Stages) with which it must be consistent.

In principle, an organization on three levels may be proposed:

- A general management and such councils as might be considered necessary, including a consultative, advisory or decision making council, should be placed on the first level.
- The second level, which will depend from the first, should contain a minimum of two sections or units: one in charge of the academic management and the other of administration and of the systems secretariat.

- On a lower level, the third, and dependent from the academic management unit, two units will be placed which are vital to the system: the academic production of teaching material and academic administration of the courses and professions.

This might serve as a tentative organizational structure for the Distance Education System. It should be borne in mind that this structure must be flexible.

### **Activity 7. Identification of the technological and communications system.**

The technological and communications system of a DES shall be identified following an evaluation of the situation and context (Activity 2) and of the media policy to be implemented by the institution (Activity 5).

The choice of the most adequate system is not easy and furthermore, it does not necessarily imply (even now) that the model proposed by the new Information and Communication technologies should be adopted. The fact that the most sophisticated technology is available does not necessarily mean that it is the most effective.

The communications system that the new technologies have made possible might provide the best conditions for developing a DES, but it does not always respond to the realities of our environment, the availability of the technology, economic conditions, etc.

As stated in Document OAS/Ser.L/XVII.4.1 PCC.I/doc. 695/98, broadly speaking, the generic systems presently used for tele-education and the latest telecommunications technologies allow us to separate them into Interactive and Non-interactive systems.

The interactive systems are those in which the teacher and the student (each one of them) play the roles of Issuer/Receiver.

Conferences facilitate the interaction of students from different regions, who are able to express more freely their concerns, having listened to the concerns expressed by other students.

In the non-interactive systems, the student plays a passive role, as during the greater part of the education process, he is unable to interrelate with the teachers and tutors.

Although each system is separately described herein, there is always the possibility of combining the two methodologies to allow a more flexible use of the many available resources.

Document OAS/Ser.L/XVII.4.1 PCC.I/doc. 759/99 states that the design of the network platform should give users maximum options and, in particular, it should use existing network equipment and services (the underlining is ours).

Therefore, the network may count with (always following the guidelines set in the above document): (i). television or videotape broadcasting (*“the network should use existing equipment, such as for example, television sets in schools and videotape players”*, as stated in another paragraph of the document); (ii). Multimedia in independent computers; (iii) high speed television or Internet digital signals delivered by satellite, wire or wireless systems; (iv) medium and low speed Internet signals delivered by wire or wireless media. (...)

Document OAS/Ser.L/XVII.4.1. PCC.I/DOC.695/98 specifies the technical details of the networks. Depending on the form of transmission, the supports are classified as:

- Wire
- Wireless
- Satellite

The following types of wire networks are listed:

- XDSL (copper wire)
- Coaxial cable
- Optic fiber

Wireless technologies have common properties: they provide a fixed service; they have a point to multipoint configuration with cellular reuse of frequencies; the information is digitalized; they may be distributive or interactive, and the exchange may be by message or in real time. The access points may belong to individual users, communities and education centers and the distribution points by short range cable to groups of users. Some frequency bands belong to technologies which are still in the development stage.

The main characteristic of digital technologies is that they expand the range of radio links. At present, geostationary satellites on Band C and Ku are operating and it is expected that constellations of non-geostationary low or intermediate orbit satellites will be shortly made operative. The projected networks can be classified as: Mobile Service by Satellite and Fixed Service by Satellite.

There are reasons to believe that this is the time of great changes in education systems. The choice of telematic for a DES responds conceptually to a new technology, far more advanced than the previous technologies. Telematic is more than distance communications or the automatic process of information. The combination of the two techniques results in a technology which consists of a computer or a combination of computers for storing data banks and telecommunications systems terminals such as broadcasting and cable or hertz networks and their terminals.

In distance learning, satellites can develop a number of functions that depend basically on the user's ability to access the signal and on whether the material is broadcast simultaneously. Thus, we can speak of freely accessible material as compared to codified material or prepared material as compared to videoconferences.

The different combinations that can be obtained result in different systems, each with its own specialty in the field of education, a specialty that, from the educational point of view, is subject to analysis. Among its characteristics, it is perhaps the unidirectionality or the presence of interactivity in the system that is of greatest concern to the Technology of Education (all things considered, a satellite can transmit/distribute different kinds of signals, both unidirectional, as done in mass communications, as well as two way transmissions for interactive experiences).

In any event, the added value that new technologies in general and direct transmission satellites in particular provide the users to fill the growing educational needs is threefold: flexibility, by adapting to many different needs, to student models, to strategies and teaching models (multistrategy) and to a combination of media (multimedia); accessibility, by providing remote or local access to teaching materials whenever and wherever students require it; optimal support for users (students, producers and teachers).

This should cover the different processes that are involved: information for teachers and students regarding the available educational resources prepared for each specific need; their form; the



supervision and tutorship of students and facilitating the access to and use of the basic instruments and material needed by the designers and producers.

These three characteristics affect the quality of distance learning programs by satellite and should be sought in all educational projects.

One of the aspects that causes concern to those who favor education systems based on satellites as well as to their critics, is the cost and the logistics of the contract of the transponder and the conditions of the hardware, even without considering the software requirements, an aspect that is vitally important from the point of view of education.

**Activity 8. *Determination of the necessary resources.***

Once the organizational structure of the system is established, it will be necessary to make provisions for the resources needed to install and operate the DES.

What infrastructure is needed to operate the DES?

Basically, the site, equipment and infrastructure of the Headquarters should be decided by the Regional and Local Education Centers (see Activity 19).

It will be also necessary to define the professional profiles of the managing and advisory staff to be contracted for each area identified in the system's organizational structure (see Activity 6).

These requirements will be taken into account in preparing the budget for setting up and operating the system.

It should be noted that the Headquarters will never take direct action with respect to the academic administration of the courses, but shall always act through the Centers.

The Academic Centers are not only supporting bodies, but they form an effective communications circuit.

They are relatively independent operating units in which the resources needed for learning (media and materials) are concentrated.

One possible way to locate and equip the Academic Centers is to focus on the organization and equipment of the Regional Centers.

This method will ensure that they are located in important areas with good communication facilities and have ample material, while the subordinate Local Centers shall only have minimum equipment and their main function shall be to attend students.

In this model, the organization and management will be concentrated in the Regional Centers and student assistance will be decentralized. These Centers will be the link between the Headquarters and the Local Academic Centers.

In other cases, particularly when there is a great geographical distance between the different points in a country, several centers shall be established (local, academic, associated or whatever name they may be given). All these centers shall have the same degree of independence and the same

functions and will not be subordinated to one another, but will depend directly from the Headquarters.

Thus, only key cities will be chosen, according to the number of inhabitants and potential students, because they possess an educational, academic and technological infrastructure, because it will be easy to obtain premises where students can be assisted and because it will be possible to find professional tutors.

Whatever method is chosen, if the Academic Centers are to operate, they must have suitable premises with sufficient space, easy access and the infrastructure needed to install technological equipment.

The Headquarters as well as the Academic Centers must have the minimum infrastructure they require. Independent physical space for the administration area, a photocopier, telephone, fax, a computer connected to a Data network with administrative and financial software. The academic area must have sufficient physical space for a classroom or meeting room, a library, a special room for the technological equipment, computers connected to a server with access to the Data Network.

While the Headquarters shall have a library (this concept is used in its fullest sense: a newspaper library, a video library, a media library, etc.) suitable for the academic activities carried out by this institution, it might not be advisable for the Academic Centers to have large libraries. To avoid duplicating efforts and costs they should use the libraries that exist in the community or the region (the possibility might be considered that the center's library would be the first to be established in the region).

At this time, it will be also necessary to define the profiles of the professionals who would fill the managerial and advisory positions in the areas that were specified when the organizational and administrative structure of the DES was established (see Activity 6).

Basically, the necessary professional profiles include:

*A Director (or Coordinator) specialized in distance learning.*

Functions:

- To design the DES and its organization, jointly with those responsible for this program.
- To follow up and guide all the activities involved in the establishment and operation of the DES as well as the activities of those responsible for this program.

*A Director (or Coordinator) of each area specified in the structure of the DES.*

Functions: they will be determined by the functions performed by each of the areas

### **Evaluator/s specialists in distance learning**

Functions:

- Cooperate with management in the evaluation of DES  
If the evaluation integrates the variables of context, access, process and product, this function is to be performed from the beginning of the program.

- Prepare the evaluation instruments required for each of the courses and academic activity, in particular:

*Specialist in design of information systems and network management.*

Functions:

- Design the link system between the Headquarters and the Academic Centers.
- Supervise the functioning of integrated networks.

*Teachers specialists in contents.*

Functions:

- Write the contents of the courses and graduate courses in particular.
- Organize teaching activities, evaluate and analyze the results of evaluations for the participants.

*Teaching Processors.*

Functions:

- Handle the treatment of contents, activities and evaluations from a teaching standpoint.

*Graphic Designers.*

Functions:

- Design the teaching materials.

*Media Specialist.*

Functions:

- Produce the teaching materials.

*Educational Technologists.*

Specialists in new technologies.

- Produce teaching materials in multimedia format.

For the functioning of Academic Centers, the following staff is recommended: a coordinator or director of the Center, administrative personnel, tutors team and technical support personnel.

## **Second Stage: Academic Preparation.**

### ***Syllabus Design.***

**Activity 9.** *Prepare and validate the profile of incoming and outgoing participants.*

The first activity involved in the syllabus design of a course or graduate course in particular, consists in establishing the target public it is aimed at, that is to say, define *the profile of the participants* of the educational activity.

This establishment of the participants must provide information on the following variables:

- Estimated number of students or participants in the activity.
- School level and previous studies.
- Age, sex, marital status.
- Employment conditions of the participants.
- Family situation.
- Time availability to study.
- Time availability to attend classes given at study centers.

- Personal motivation.
- Knowledge level and learning attitude.
- Educational supply within the geographical area and the region.
- Geographical distribution of the potential participants.
- Economic availability to allocate resources for their education.
- Previous experience in independent studies.
- Previous experience in self-evaluation.
- Knowledge of other languages.
- Personal and professional interests.
- Services that the participant counts on: electricity, water, mail, telephone, mobile telephony, means of transport, radio, press, television, cable TV, libraries, museums, universities, schools, personal computers, computer software, etc.
- The study of specific graduate courses they are interested in.
- Preferable schedule to attend study centers and to apply for tutorship.

In general, this information is gathered by a survey conducted on the potential participants.

This activity provides *the profile of the target user of the system*, however, in order to define the profile of the graduate, it will be necessary to take into consideration the necessary skills that the potential worker needs in order to meet the current and future requirements of the productive system which constitutes the reference for the design of the educational activities.

**Activity 10. Prepare the general objectives of the academic activity.**

Once the institutional objectives for DES have been determined (*see Activity 4*), the media policy has been defined (*see Activity 5*) and the profile of the participants has been identified (*see Activity 9*), the general objectives of the academic activity must be set.

*The general objectives* of a course or academic activity represent a general skill or ability to achieve throughout the course. Usually they are formulated globally or in a *unified* way.

The general objectives of the academic activity, then, shall be defined by the result of the determination of the profile of the participants. How are the appropriate set of skills that the institution will offer the participants going to be achieved, so that they meet the needs of the graduate?

In the case of universities that offer professional courses, it is easy to determine the objectives of the academic activity, since it is defined by the graduate profile (professional or occupational). By taking into account the skills that the graduate should have, it is relatively logical to determine the knowledge and experience needed and include them in course, units or modules.

In cases where a professional approach is lacking, the objectives shall be determined on the basis of the proposal of isolated courses that have a training value *per se*, which may or may not form part of units, with a higher instrumental value.

**Activity 11. Prepare the syllabus design of the project.**

The syllabus design consists in establishing the general course plan or the specific academic activity, bearing in mind the characteristics of the participant, the needs and demands that have been detected (*see Activity 9*), the scientific knowledge in the corresponding area, the desired

professional profile, the teaching methodologies and the available learning resources according to the media policy that has been chosen (*see Activity 5*).

The steps to follow in the preparation of the syllabus design in a DES are:

- Choose the syllabus model.
- Prepare the syllabus structure (study plan).
- Establish evaluation, accreditation and promotion criteria.
- Define the profiles of the interdisciplinary teams required.

*The syllabus model* refers to a determined teaching and learning theory.

The different theories (conductist, neoconductist, cognitivist, constructivist, genetic evolutionism, among others) pay more or less attention to the importance of such aspects as students' motivation, the reinforcement of behaviors, integration, transference and generalization of learning, creativity, discovery, questioning and reflection of the learner, the construction of knowledge. Each theory calls for a different teaching approach.

In distance learning, it is necessary that the management of theories be aimed at the organization of educational activities through selected media.

*The syllabus structure* relates to the way in which the different parts of a study plan are to be sequenced. The structure determines what kind of courses will be offered and in which locations.

Bearing in mind that distance learning is a way in which the teaching-learning process is carried out by using different technologies (teaching design, organization of tutorship, production of media, assessment of materials, and so on) it is necessary to work with a team which is capable of providing the teaching quality of the DES material on self-teaching techniques.

In this sense, interdisciplinary teamwork provides remarkable teaching features to the educational material.

A possible integration of the team would be as follows:

- Experts in education.
- Specialists in contents.
- Specialists in media.
- Teaching processors.
- Educational technicians.
- Evaluators.

### ***Teaching design of materials***

#### **Activity 12. Preparation of the course plan or academic activity.**

Once the interdisciplinary team has been established, *the course plan* will be prepared and it will establish the basic structure and guidelines of the course in order to determine the organization of the teaching situations, and provide for the preparation of educational materials.

As defined in *Activity 10*, the general objectives of a course or academic activity represent a general skill or ability to be achieved throughout the course.

*The terminal objectives* constitute a complex structure of behaviors that the student will be capable of performing at the end of each *teaching module* in which the course is divided.

The terminal objectives must be broken down into specific components. This is called *task analysis*.

*The specific objectives* represent a clear and precise behavior, usually expressed in a *single behavior per objective*.

Several *specific objectives* linked to one another form and reach an objective or terminal behavior.

*The specific objectives* are operational. They are partial behaviors that form part of a final behavior, which is expected that the student will achieve at the end of each *teaching unit*.

The course plan, based on the *syllabus specifications* provided by the syllabus design:

- Establishes the objectives in behavioral terms.
- Explicitly establishes the contents in subjects, by breaking them down into modules and teaching units with an indication as to sequence.
- Selects the adequate methodological approaches and learning resources that suit the objectives.
- Determines the teaching materials depending on the contents
- Establishes the evaluations criteria of the course.

### **Activity 13. Design and organize the teaching-learning sequence.**

The course plan that has been prepared, constitutes the teaching development plan of the educational material, which is oriented by the defined media policy (*see Activity 5*).

Once the *course plan* is prepared, the interdisciplinary team will be appointed to develop the teaching design and the production of materials.

Each team is responsible for the preparation of an easy-to-learn teaching material by way of a special design.

The teaching design is a conversion or transformation process. It

- Transforms the stated objectives into specific learning goals.
- Sorts out the contents in a logical and sequenced form.
- Determines the evaluation instruments.
- Routes the contents into the selected teaching techniques and monitors the acquisition of knowledge and experience.

In general terms, it is presumed that DES adopts a module-structured teaching design of materials.

The modules consist of *teaching units* (parts of a module that refer to a subject or related subjects which correspond to learning activities which have been clearly differentiated).

Each module may consist of:

- Introduction to the contents.
- Units.
- Indications for their use and application of other learning media.
- Suggestions on how to distribute time in the learning tasks.
- Teaching units.
- Module evaluation.

Each teaching unit may have the following parts:

- Presentation of the unit.
- Objectives of the unit (specific).
- Subjects to be developed.
- “Teaching development” of the unit
- Evaluation activities.

**Activity 14. *Select the specific media and materials for the course.***

The selection of the adequate media or support for improving the visualization of the teaching-learning process which will determine the materials to be used in the DES (as a result of the work performed by the teaching design team), will be contained and limited in a logical way within the technological-communicational system (*see Activity 7*) which the institution has selected under its media policy (*see Activity 5*).

The media policy defined may have favored specific media or support systems over others that will be used as complementary media.

The media or supports are mediation and representation systems present in the communications processes. They have a vital importance, since they are *languages*. If we continue giving importance to the media as support and not as a language, we will have the same trouble we have always had: that the huge television infrastructure has not been good enough to design a high quality education on television.

Next, we are going to point out the advantages and disadvantages of the media or supports most commonly used in Distance Education Systems.

- *The printouts (paper).*

Many of the distance courses offered continue having printed material as basic support for information transmission.

We must bear in mind that the people who receive those materials are often self-motivated adults, as a result of which the material should have orientation, incentives and all the necessary information for self-teaching which does not need the continuous participation of the teacher.

The printed material is still useful, because it is easier to produce and reproduce than other media; it is more economical: it requires fewer specialized staff for its preparation; it is easy to handle in terms of distribution and storage; it is kept as an accessible and permanent document of a course; it

does not require special installations (it can be read anywhere); it does not rely on power supply failures that hinder its use; it can be used when needed; it permits the incorporation of photographs, tables, graphs, illustrations, and so on. That is why printed material is a familiar and comfortable media for the user.

Printed materials may adopt several forms:

1. Texts or lessons.
2. Supplementary material: instructive, notes on tasks, illustrations, drawings, photographs, maps, newspapers, etc.
3. Reading guides, bibliographies.
4. Evaluation tests.

• *Audiovisual media. Radio/Telephone/Television.*

The audiovisual media enable us to improve communication. Most households count on these daily used media: radio, telephone, television, recorders, videotape recorders, and the like, which is one of their greatest advantages.

The radio or “cassette player” are the media that enable users to:

- Go to the theater, attend conferences, go to concerts, etc.;
- improve the teaching of the spoken language and teach or learn a foreign language;
- inform rapidly (radio), etc

Informative, cultural or recreational, the long educational tradition of the radio has played an active role in community programs (sanitation, agricultural, etc.) and in formal teaching for all educational levels. The functions and scope of the radio that were considered appropriate by the British *Open University* have been the following:

- feedback remedial teaching;
- facilitate updated material (for example, the updating of printed material);
- offer original material (speeches, conferences, interviews);
- keep and spread the voice of celebrities;
- present the materials in an attractive form, especially by acting it out;
- offer music and theater sessions;
- analyze the course materials critically, by presenting different alternatives and new points of view;
- enable the student to experience the debates and confrontations where different views are put forward.

Due to its characteristics, the radio:

- may transmit the latest news and information (advertising; announcements, campaigns and the like);
- is a mass media;
- may result in a cozy and personal media as opposed to the impersonality of the printed material.



As far as the students' tasks are concerned, the radio may be used for:

- preparing the evaluation tests, indicating their criteria and orienting users,
- announcing the results of the evaluations;
- gathering opinions, needs and suggestions by means of letters or telephone calls made to the program;
- suggesting works and activities aimed at making up for lost or delayed learning time;
- interpreting, answering and orienting everything which feeds the system back.

However, the radio is a one-way asynchronous system in which there can be no interaction. These are its major limitations since in general they only demand the passive reception of the student. An example of how the student can prepare him/herself for a more active participation is by being alert when doing the homework, writing or calling to the program.

The use of cassette tapes, which enable the user to tape and play sound, is an unmatched and easy-to-use mass media, very affordable. In addition to these advantages, others can be added:

- they overcome the time-space barriers (they can be used where and when they are wanted);
- they are easy to carry;
- we can listen to their contents over and over again, as we please, which is an advantage over radios;
- they can cover a wide range of teaching and learning objectives and contents, and they can turn out to be an excellent supporting or complementary material;
- many of their contents are easy to prepare (record a conference, a lecture, an interview, etc.).

Both the radio and the cassette tape are sometimes identified by their educational use with the different advantages and disadvantages that can be concluded from the above.

- *The Telephone*

From telephone calls for consultation and tutorship, to teleconferences and Internet communication, the telephone assists the functioning of the whole DES as a system or support in a different way

There are no distance teaching experiences that have done without the use of the telephone for communication between the student and teachers, and the progress made in New Communications and Information Technologies have done nothing but conceal its role though enhancing its importance. There is a great difference between a personal and a telephone interview, but the former has often been successfully replaced by the telephone. It was and continues to be a remarkable media for tutorship. It is basically used for:

- transmitting information and solving problems;
- generating and exchanging ideas.

Its great advantage as compared with the radio and television is that it is an interactive or synchronous media.

In *teleconference*, the parties are connected to conference mode. This is possible thanks to a device called audio bridge. Students and teachers call a number where connection is possible.

Once the telephone connection takes place, it may be made from simple question-and-answer sessions to discussion sub-groups. The advantage lies in the fact that students and teachers may do it from their own homes and telephones.

*Teleconference* with image projection counts on an additional device that provides for the transmission and reception of images. Two telephone lines are needed for its use.

*Teleconference* consists in a telephone communication between two distant groups, by means of switched connections.

*Television and video* enable us to learn through images, with the significant advantage that we can fix them more easily. The audiovisual media are generally used for their advertising effect, to complete and stimulate the interest in learning, help in the organization of work schedules (transmission at fixed times) and assist the student to review and self evaluate his/her learning progress. They enable users to:

- replay situations (classes, for instance);
- see documentaries, movies, educational programs;
- record events, experiences, wildlife, places, people;
- present opinions or knowledge of well known people;
- change students' attitudes or abilities by presenting the material in a dynamic and attractive way, and illustrating the abstract principles with audiovisual models;
- explain or show the work that students must do;
- summarize information consistently which otherwise would take up so much time and space, for example, in printed material;
- enhance or reinforce with icons what has been expressed in some other way.

Some disadvantages (that tapes and video often eliminate) have been found in the use of television for education in general and distance education in particular:

- viewers are passive;
- students are subject to fixed schedules;
- transmissions of each course or program are scarce;
- it is a sequential or successive temporal language media, which makes it impossible to recover what has been transmitted;
- its continuous discourse forces viewers to think at a predetermined pace;
- production and transmission costs are high.

Both television and video, as in the case of radio and cassette tapes, can also be identified in education with the differences pointed out above in connection with the advantages and disadvantages of audio resources.

- *The Computer*

Some of the features that can be taken into account when evaluating the educational potential of a multimedia environment are the following:

a) With regards to information:

- It provides for the gathering and interconnection of different kinds of information.
- It facilitates a rapid access to this information, thus encouraging the development of new learning techniques and the interconnection of knowledge.

b) With regards to learning:

- The associative and intuitive nature of learning differentiates them from traditional materials.
- It enables students to structure knowledge.
- It contributes to three kinds of mental representation: active learning, icon and symbol representations (defined by Bruner).
- The interconnection of knowledge is specially adequate for educational applications.
- It fosters the development of new learning techniques.
- Learning is not lineal.
- It offers rich intellectual environments.

c) With regards to the user/learner:

- It conforms a constructive environment for selective educational processes, that is to say, the learner decides with his/her individual capacity and goals, how he/she is going to use the material, he/she makes continuous decisions.
- The user is an active learner who increases his/her intellectual curiosity.
- Since it is a dynamic environment, students control their own learning processes and they adjust the material to their interests.
- The subject pays attention to the relationships between ideas rather than isolated factors.
- It fosters cooperation between students and the communication of knowledge.
- Students who work in multimedia environments have shown improvements in the following areas:  
Factual knowledge, cooperative learning, critical thinking, creative thinking, problem solving, social behavior, familiarity with computers and information technologies and, lastly, research skills.

The advantages of computer-assisted teaching are its interactivity, modeling and simulation, adaptability, control and variety. The learning time can be adjusted the student controls the rate of studies as well as his own progress; the information is easier to understand when images, illustrations and texts are combined and permanent tutorship are important factors in a DES program.

The greatest disadvantages are the long periods needed for the design and production; the high costs; the lack of knowledge of computer science by potential users; the complicated nature of the evaluation and the need to design programs that can be adapted to conditions.

- *Internet*

When the Internet is used as an instrument for learning, three theories: constructivity, the theory of conversation and the theory of located knowledge appear to be specially apt to justify this instrument.

Internet has the characteristics of *constructive learning environment*. It is an open system guided by the intellectual interest of the learner. The interaction will be attractive as long as the design of the environment supports the interest.

The second theory which is frequently quoted to justify the teaching values of the Internet environment is the theory of conversation.

Internet adheres to the Vygotskian notion of interaction between people who bring different experience levels to a technological culture. Internet presupposes a specific social nature and a process through which learners create a *virtual zone of "proximal development"* (Vygotsky, 1978).

In addition to the constructive and conversational theories another theory used as reference to stand for the reliability of Internet as a learning means is the located knowledge.

The Internet environment responds to the premises of knowledge located in two of its characteristics: *realism and complexity*. On the one hand, Internet provides for authentic exchanges between users who come from different cultural contexts, but who have similar interests (Brown, Collins and Duguid, 1989). On the other, the unstable nature of the Internet environment is a hindrance to those who have not started using it who, thanks to their continuous peripheral participation, obtain a gradual "culturization".

With the arrival of the Internet, the barriers between school and the outer world began to fall, as teachers and students establish direct connections in a forum that presents them as virtual equals regardless of their ages.

As far as teachers are concerned, the use of the Internet may help them to reduce their sense of isolation, connect to their colleagues and foster autonomy.

However, the anarchic nature of the Internet and the anguish created by the "free access to information" may constitute a challenge for supporters of syllabus control, and generate different ways to approach the media: 1) no kind of access; 2) restricted access limited to selected electronic materials; 3) access to data bases to develop the research capacity; 4) peripheral participation by means of electronic "newsgroups" to enable students to become familiar with authentic professional communities; 5) active participation through multiple network communities with the purpose of making students good "netizens"; and 6) participation in independent or cooperative projects that contribute to the corpus of accessible knowledge in the WWW.

As far as students are concerned, Internet may provide them with a greater protagonism and help them play a more active role in the process of knowledge acquisition.

Internet is an open invitation to active teaching where students are both recipients and generators of knowledge.

The networks provide a wide variety of communicative possibilities as well as new teaching systems as they not only influence the technological aspects but also the people who are part of the learning process and the organization.

Furthermore, the institution, through Internet, can offer the teacher and the students information regarding its library, curricula, places where conference are held as well as courses.

The creation of this educational cyberspace for high education which passes the physical space bars, allows the creation of new educational “places” and new teaching relation.

It can be referred to as virtual campus, room, virtual room, electronic class, electronic campus. These concepts can be part of the McLuhan’s “global village” considered by the utopian as a non-wall room. Many of these features, except for the distance seem to apply to the educational systems which are organized around the interactive telecommunication networks.

The main feature of an electronic campus is the use of a variety of communication technologies to get effective learning environment and the interaction between students and teachers.

Internet is a network that communicates million of people and computers all around the world. The main communication systems used in the net are electronic mail (e-mail), file transfer protocol (FTP), News and the World Wide Web (WWW, Web).

These systems use Internet as a mean of transport so that the users may use the ordinary programs in their PCs to communicate.

The idea is: a global access and local cost.

- *Web pages.*

The Internet phenomenon took place as a result of the creation of a very simple communication system called World Wide Web or Web.

The Web is a way of creating geographically distributed data to allow people to make some information available for others to consult.

Internet is presented by the Web to the user as a number of hypermedia pages (texts, images, video) which are connected through “hyperlinks” (logical connections or page breaking). These pages are stored in computers located all around the world.

The Web only shows a part of the available information in Internet. There is an important number of public files that can be accessed through FTP, USENET or e-mail.

The e-mail is the communication system most used in Internet.

The electronic mail is an easy way of sending messages or files from one PC to another through Internet. The electronic mail must include the destination address, as in the ordinary mail.

The e-mail allows the student to send any kind of questions to the teacher and receive straight answers.

The following are some of the e-mail advantages with respect to some other human interaction means:

- The electronic mail is asynchronous because previous arrangement with the receiver is not necessary, as it may happen with the telephone.
- The time that passes between the moment the message is sent and received is almost null or instantaneous.

- The participants or speakers who are in the cyberspace can talk about personal subjects almost without any limitations.
- As the electronic mail does not require any space or specific time to communicate, the communications can be made together with other activities.
- The communication can be among individuals or group of people.

Even though the e-mail and the ordinary mail are very similar, the former has some advantages: generally it is received only after some minutes after it was sent, though it is in the antipode (literally). If the person is connected in the moment the message is received he/she can be notified of the new message. It is not necessary to read the message as the person can only connect and decide whether to read the message in that moment or do it later or send it to the recycle bin, as it is done with the ads by giving a look at the *subject* (it is not allowed in the NET)

The sender can always be known and the message automatically replied (*reply*)

A message confirming the receipt of the message can always be sent in order to make sure it was received. A message can also be forwarded to other users (or to one's own address) or sent to a group of users (no matter how many they are).

As we can see, it allows the creation of new ways of communication which are not feasible in other means of communication.

#### - *Talk*

The conversation can be established between two computers through the UNIX command (the operating system which is frequently used by this type of machine).

This mean of communication allows the conversation in real time through the computer screen. Under this generic title a number of the network services deriving from the e-mail are included. The most common services are the lists or interest groups (LIST), news groups (NEW GROUPS), discussion groups, etc..

It mainly consists in a group of people who subscribes to a list of mail, receives the information sent by any of them.

The subscribers have a common interest for which it is created.

There are lists with or without moderator: in the first case the information is received by a person or a group of people and filtered before distributing it.

Usually the lists management is done from a HOST with a specific software called Listserv.

#### - **Usenet news**

It is similar to the lists. The difference lies in the fact that we do not receive all the information generated by the group, but we can see the subjects of the articles generated by the group and then read the news we consider interesting, save it and delete it.

#### - *Telnet*

It is the main protocol that allows the connection with a remote computer.

It allows the user to work with a computer, using another PC hundred or thousand kilometers away.

Once we have accessed the remote PC, we can use it.

A typical example of remote access is the server or servers at the universities library.

- *Chat*

The chat application allows the interactive communication by using a keyboard and in real time with many people at the same time.

- *Videoconference*

This is a teleconference between individuals who can see and listen to one to the other.

In this case the audio and video signals are transmitted simultaneously and in the same channel.

The signals are compressed and sent through a special telephone line and uncompressed on the other side. It depends on the capacity the mean of transmission has to send images at a low or high speed (frames per second). Through the videoconference, the distance education system approaches to the usual attending classes. The student can follow the course from a workplace. It also facilitates the integration of additional teaching material to the teacher's image, such as a virtual board or previously made graphics.

The videoconference offers important educational possibilities as it allows a permanent interaction, in real time, with images and sound between different points. It also allows different teachers, different students and different educational centers to participate in the communication process from the place where they are.

The videoconferencing is a communication system that can be used in collective meetings held between people who are at remote places. This type of communication is done in real time, via phone and both the image and the sound are transmitted in both sides. The speakers can see and talk as if they were in the same meeting room while they interchange data, fax, graphic and documents, videos, slides, etc.

The videoconference can be point to point, ie, it can be done from two remote places, or multipoint, when people who are at three or more different places can speak at the same time. In the first case each point has a board that controls the different functions, such as the camera movement, the focus, sound, etc. Each place can see the other through the corresponding monitors. In the second case, the "continuous presence" is not possible, ie, the users cannot simultaneously see one to the other. Only one person can be seen at the time.

The use of this technology requires a mentoring process by the students and specially the teachers as they need to consider it as a teaching tool.

The videoconference is not longer an expensive technology used only in big installations. It has become a multimedia tool that can be used for teaching purposes.

The introduction of new technologies in the education implies the introduction of new teaching systems.

Multimedia, communications networks, interactive television reflect the growth of the multimedia technology which tends to change our working and leisure habits.

Although it does not imply important technological growth, the combination of computer, telephone and television, offers increasing intercommunication possibilities.

- *WebTV*

WebTV allows the access to Internet and its services from a television. It is an alternative different from the PC that can be easy to use and cheaper.

It consists of an equipment integrated by several tape recorders and/or video digital discs which can be connected to different places. They can be remotely controlled from each place. The same educational video can be seen from different rooms.

• *Internet 2*

After describing the contribution of the Information and Communication New Technologies to the Distance Education System we should also mention the existence of the “mega” network called Internet2.

Its high speed capacity and the capacity to transmit information will improve the design of the situation teaching- distance learning. This includes the teachers and guards permanent assistance, the interchange among teachers and students among themselves, the “on line” emission with the asynchronous vision; the improvement of the material to be used (including multimedia components); the fast access to the library databases, virtual, video or images files requested, the development of simulations for the different disciplines and contents; the general use of videoconference individual or in groups, etc.

All the advances in the technical-communicative system will improve the quality of the Distance Education.

Finally, the means are the adequate support to start the teaching-learning process. The work of the teaching design should contribute as the languages that allow us to approach to our students by using the proper material.

What do we understand by materials?. Materials are texts, ie, they are substance (continent) and text (texture, scheme or the organization of contents in a certain substance or support which also determines the contents organization).

In the DES, a group of experts designs, organizes or arranges a teaching and learning sequence (teaching material) which is different from the usual text of study.

DES considers the teaching material as a “packet” or kit of materials in different ways which are related (printed materials, audio tapes, videos, CD ROMs, etc.) which privileges a main mean and includes the additional ones, for example: it privileges the education through television courses or videos (simultaneous or differet, together with printed material.



The Information and Communication New technologies spreading and the student incorporation to the IT which have become very efficient learning networks is changing not only the DES infrastructure but also the components, ie, the material used for the Distance Education: we should consider the virtual teaching-learning environment with hypertextual, video streams, etc.

According to the languages used (means, analog or digital supports) and taking into account their possible combinations, we include a classification of materials divided as follows:

*1. Linguistic texts. Printed or oral material*

1.1. Printed. Books, brochures, guides, working books, press.

1.2. Oral material: audio tape recordings, radio programs, telephone communication, teleconference.

1.3. Combined: oral and written language (book and audio tape; teleconference and projector of images).

*2. Visual texts, with fixed image*

2.1. Photographs, advertisement, poster or mural painting, fixed projected images (slides, filmed)

2.2. Combined. For example. Comic, poster or mural painting, advertisement (fixed language and image)

*3. Audio visual texts (sound- moving image).*

3.1. Films. Television programs. Videos. Video conference (on TV)

3.2. Combined. For example: video book (book and video).

*4. Hypertext (IT texts)*

4.1. Internet (including all its options, configuration of a virtual campus)

4.2. Peripheral: CDs, CDROMs, CD-Is, DVDs, etc.

4.3. Combined: books and web; book and CD; educational and CDROM; TV program + Web (WebTV), video conference, etc.

These materials can be Interactive or Non-interactive (synchronous or asynchronous) according to the mean or support used. For example: a conversation, which is considered as a linguistic text, in a paper support is asynchronous (ordinary mail). The virtual classroom with NNTT is interactive.

***Activity 15. Developing the contents and education activities proposals***

The purpose of the team (see Activity 11) is to prepare the educational material based on the course plan, so that the contents can be learned by the student in a Distance Education through an educational design.

In order to prepare the educational material, the following steps are followed:

1. Take into account the specification, related to objects and contents, that each support or learning resource to be used allows.
2. Basis on the course plan.
3. Remember that the module sequences and didactic units within it are determined by the sequence between the objective established by the syllabus design.
4. Prepare a general plan of the first version of each didactic unit.

5. Prepare the first version of each unit. Then continue with the second one and the final version.
6. Include the instructions to use the educational material.
7. Include the evaluations.
8. The preparation of the items to be included in the evaluation (which is part of the evaluations) should be prepared when the unit is written (see Activity 16).
9. The number of modules may be related to the number of credits assigned to each course by the syllabus design. In general, each course has from three to five modules and each module includes from three to five units. Each unit has around 20 pages.
10. The course should be assigned an acronym or identification code.
11. In some cases, the educational design cannot be identical for all the DES locations. The means used cannot be the same in the whole country, or their use may vary according to the region where they are used.

### ***Activity 16. Evaluation preparation***

Due to the fact that the evaluations are part of the preparation of the educational material, they should be done together with the pedagogic development of the chosen material.

The course plan should include the suggested evaluation strategies as well as the evaluation plan. The item (evaluation reactive) consists of a situation to be solved, a question with alternatives (distractors) presented as possible answers.

All the answers chosen by the student will enable to know the advances he or she has made. The contents of the evaluation items will be based on the evaluation plan.

The contents of the evaluation items constitutes the substance to prove a specific purpose. Each item can be part of the questionnaires o subject of the thesis works.

As the specific objectives are evaluated and the unit is the development of the specific objectives, the evaluation items should be written together with the units.

It is convenient to have a significant number of items with their possible answers, including the right one when the different versions of the unit are written.

The item contents which are accumulated while the unit is written, do not constitute an *evaluation instrument*. They are only the material to prepare that instrument.

An *evaluation instrument* is a test which is subject to some rules.

The evaluator has to assist the content expert to prepare the items as well as revise the writing and prepare, according to a specification table, the evaluation itself including all its versions.

The specification table may contain the selected (as all the objectives cannot be evaluated only the ones that affect the final objectives are included) specific objectives (and the pertaining contents), the items and the importance they will be given.

It can be previously agreed that the evaluation instruments, such as questionnaires or objective evaluation, which are usually evaluated indistinctively (through a mechanic process), will not include more than 50 or 60 items per evaluation. In the case of self-evaluations, they should not include more than 25 items per module.

Furthermore, the evaluator will prepare the keys for the correction of the evaluations. He will take into account the answers or instructions established by the content expert in the items.

### ***Activity 17. Evaluate the materials created***

At this stage, the formative evaluation of the created materials should be done.

The didactic and technical quality of the educational materials must be considered, taking into account the proposed objectives.

For this purpose, a pilot group is chosen in order that they learn in the same conditions as in the real situation.

This group is given an evaluation instrument including the opinions and comments regarding the following aspects:

- Contents
- Language used
- Technical elements
- Activities and working guidelines

Summing up, the purpose is to enhance the material according to the participants and experts proposals, before producing the prototypes.

### ***Activity 18. Adjust and produce the material prototypes***

The prototype is the final version of the educational material including all the changes made based in the observations done by DES on the technical committees, experts, revisers and the groups comments.

The final version, which will be copied, contains all the images (diagrams, charts, etc.). Its style and presentation is revised, it includes the technical instructions given for its copies and establishes the articulation of the different supports.

The team prepares the final version which includes all the evaluation material (self and hetero) as well as the additional material (guides, anthologies, etc.).

The team will determine the life of the course- from three to five years-, how it will be reorganized, how it will be updated to adjust it to the scientific, technical and professional innovations.

### **Third Stage: Execution**

#### ***Conditioning of Infrastructure***

##### ***Activity 19. Organize Academic Centers.***

The description of the nature and ways of organizing Academic Centers as well as location and equipment criteria have been developed in *Activity 8*.

The Academic Centers may function as enrolment centers for students, where they may obtain the material, receive evaluations and use technological equipment in special rooms. Tutors and educational consultants meet there.

The distribution of material may be made directly from the publisher to the Academic Centers (Regional or Local) or to the beneficiaries. An efficient coordination is needed.

The Headquarters may also be in charge of distributing the material, which means having physical space for storing and the necessary means to distribute it. This enables the coordination to have a better control of the material.

As a second alternative, the Regional or Local Centers receive the material from the Headquarters and are responsible for the distribution within their zone, as well as the enrolment of students, the guaranteed functioning of tutorship and the administration of evaluations.

The Centers supervise and coordinate the performance of tutors (It is convenient that tutors, supervisors and coordinators be initially trained by the Headquarters).

However, the institution shall define:

- What degree of autonomy should a Center have? Is it only an executor of what is established by the Headquarters?
- Can the Center introduce changes in the syllabus? Can it accept changes in the syllabus of a student? Can it accredit previous experiences of students? Can it offer other academic activities than the ones established centrally? Can it evaluate for itself or should its decisions depend on the Headquarters?

The answers will largely depend on the degree of decentralization that DES allows in a specific institution or country.

##### ***Activity 20, Starting up of the Communications System.***

At this moment the institution must try the functioning of DES.

It will check that the locations and equipment are working as expected; that it counts on the necessary academic and administrative human resources to operated DES; that the agreements that might have been made with other institutions for the organization of programmed activities (interships, workshops, residences) in the study plans are underway; that it counts on the necessary teaching material that meets the needs of the beneficiaries of the academic activity; that tutorship is being performed according to the schedule.

#### ***Development of courses***

***Activities 21 and 22. Widespread the educational proposal. Enrolment and accreditation of participants.***

The enrolment in the courses and academic activities offered by DES, as well as the continuous reporting of the performance of participants call for the execution of some institutional activities:

1. Spread and promote the academic proposal among the public of potential students through the mass media, with advertising on the Web, newspapers, chats, TV and radio interviews, brochures, conferences, fairs, and the like, so that the institution activities are known.
2. An orientation action. To that purpose, meetings and personal interviews must be held in order to answer questions arising from the brochures, the use of recorded telephone messages, interviews with small groups, organized visits and everything that helps to meet the needs and demands of potential students and users of DES.
3. Preparation of an admission or application form for DES (or for a graduate course) to be filled out by the student. This request is formalized upon submission of a form bearing certain information. Enrolment may take place at the Coordination (centrally) or by applying for admission at the Centers.
4. Once the forms have been received, the institution or DES perform a double action. First they gather and analyze what is requested (admission to DES, to a course or enrolment in one or several courses), in order to determine whether the institution will be able to accept the admission of which participants and under what conditions, how many courses it will have to offer, what courses are to be replaced, and what teaching materials are to be substituted for in case of an emergency  
Secondly, it must analyze whether the participants are qualified for what they are requesting, that is to say, if they meet the requirements established for admission to DES or the graduate course, which is determined by evaluations of the applicants background (this is more an academic rather than administrative function). After this, the institution decides whether the applicant is admitted or rejected.
5. Once the applicant is admitted, he is enrolled in the DES and he is assigned the course he has requested, or to another one more in accordance with his preparation or available in the region where he belongs (replacing any that he would have requested and would not be offered). In order to avoid that this assignation of students to courses would be arbitrary, it is convenient to establish previously objective guidelines and criteria. Anyhow it may happen that the student doesn't agree with the courses he has been assigned to.
6. For this purpose he is informed individually or collectively, by mail (conventional or electronic), by press releases or with lists in the centers billboards, etc. about the realized assignments. The student will study the offer made to him and whether he does agree with it.
7. The student proceeds then to his enrolment, registration or formal accreditation at the DES, to a graduate course, to the course(s), accrediting certain identity documents, certificates or diplomas, pay bills, etc. Compelled presentation of those documents is registered.
8. It is followed by an administrative process that analyzes and orders the specific information on the student, afterwards to convert it in a permanent instrument and to spread the data to the dependencies or units involved in the tasks such as forwarding the studying material, designation of tutors and opening of the file, wherein the enrolment in each course will be consigned together with its qualifications, and personal data will be updated. The student will probably be forwarded an identification card to move inside the DES.
9. The periods to make the registration can be permanent or continuous (called parallel cycle) or only at certain time in the year (serial or successive cycle). According to its own operating system, a DES will use one or the other one, or maybe both proceedings.

When a DES is still in its initial constitution steps, it may be convenient to proceed to a pre-enrolment even before elaborating the instructional material. The pre-enrolment is a way to convert the potential public in a real public.

A continuous registration of his learning, his academic skills within the system, that is to say the courses, workshops, residencies that he had performed and the certifications that he has obtained will be required afterwards.

***Activity 23. Reproduction and widespreading of materials.***

The academic preparation of the instructional material ends up with the production of the *prototype*, that is to say, the definitive version of the selected supports. The *prototype* is, at this moment of its reproduction, the first point of the system of the student or of the step of academic administration of the courses.

When the prototype material is, for example a printed document, a video tape or a CD ROM, there must be defined the number of copies, taking into account the foreseen number of students, tutors, libraries and records whereto they will be sent, the one used for spread or promotion, or sent to any other academic institutions.

In order to fix the number of copies, the useful life of the course would be pondered, that is to say, to analyze for how many years this version will be used before it will be reformulated. New technologies easy, among others, the ongoing updating of the instructional material within the electronic networks for teaching - learning.

At this moment of the reproduction, a decision must be taken about the codification system or the identification of the several products and components of the teaching material.

**Organization of tutorships.**

***Activities 24 and 25. Choosing and training of tutors***

The summons and choosing of tutors are usually done at a decentralized level. Although the training is done in the Headquarters for uniformity reasons in the preparation, there will be also a training in the Academic Center where the tutor will be teaching.

Training methodology includes reading, analysis and handling of the teaching materials of the courses, including a detailed discussion of the courses within working groups or workshops and knowledge of the tutorial manual.

Tutor's support is extremely useful to help the student/tutored in solving the problems that might come from this proceeding.

The physical meetings, the use of electronic and telephone tutorship contributes to achieve one of the main functions of the tutor: to foster the student's motivation.

This is the reason why tutors should be general guides more than specialists in some contents.

These educational agents must promote and forward the communication processes necessary to create the conditions for a better quality in the learning of the tutored.

The tutor would have a strong training in pedagogic and didactic matters.

The tutor must orientate the learning process from a different point of view where compared with the teaching role in a teaching process with physical presence, wherein the teacher is the primary source of knowledge.

Tutors will participate as well in evaluating the teaching materials, detecting failures or mistakes, difficulty in understanding some topics because of the uncertainty in the expression of some concepts, because of a wrong definition of targets, or working out the self assessment exercises.

There are several tutorship modes; the one that is preferred presently is:

- Physical presence.
- Through telephone and fax
- Telematics

Hereafter is a look at each of them.

#### *Tutorship with physical presence.*

Traditionally, this is the most appreciated service, because

- It allows a more efficient participation.
- It has much to do with scholar education.
- It allows working with groups.

#### *Telephone tutorship.*

It refers to contact that is only delayed in space terms and that permit not only to clarify subject doubts, but also the student's orientation.

It allows the establishment of quick and bi-directional communications. Moreover, as there is a voice sound with its different tones and accentuation, it makes possible an affective relationship more similar to the physical one.

It is essential that the service be granted in the best conditions, with a good coverage, several telephone lines, to avoid delays for calls congestion.

#### *Fax tutorship.*

The fax tutorship would unify the characteristics of mail and telephony.

The student can explain by telephone the reason for his request and in the cases where a graphic explanation is needed, the fax will be used.

This system would allow overcoming the telephone inconveniences for the numbers and the graphics.

#### *Telematic tutorship.*

The tutorship through electronic mail grant the possibility to get immediately in touch with the student, reaching then a fluid bi-directional communications.

The easiest way to use telematics in the educational environment are the electronic mail systems, although it is especially convenient to combine it with systems facilitating group communication by supplying exchange of collective messages among all the participants into a course.

This proceeding provides a collaboration-based learning, so important in the continuous formation in which the students bring their valuable personal experience.

The main virtue of the telematic tutorship systems is to solve the traditional isolation that students are suffering when using the distance systems, as the asynchronous interactions allows communication between participants in the most convenient moment for each one.

It adds up the advantage to deal with information files, graphics too, etc.

A *chat* site (forum for discussion) can be created in order to:

- Interact with the teacher and/or tutor at a fixed time.
- Interact in group (networks).
- To collect and systematize the results of these talks in Web pages, that can be used by other students.
- To follow-up of the tutoree in terms of understanding certain topics.

The tutor must program the moments of his counseling to the users who might need it, in order to give them a suitable and accurate answer to their doubts.

Tutorship can be carried out upon a voluntary or a compulsory basis, and be granted in different sectors:

- From the Headquarters, in very special cases, and where would be involved the specialists in contents as well.
- From Academic Centers, to meet periodically the needs of the users, with physical presence or by any other suitable means.

Generally speaking the tutorship sessions for consulting are on a voluntary basis.

### ***Academic Administration.***

#### ***Activity 26. Organization of the planned learning situations.***

The learning situation is the conjunction of all the educational possibilities structured in an environment to enable a certain learning.

The instructional material is only a very significant component of the learning situation. Learning situations are expected and organized as from the vision of possible real circumstances in which this interaction will take place.

The following constitute learning situations:

- Studying at home.
- Studying in teams or in study circles.
- Studying through technological means, which will need to be adequately installed in the Center to enable the use of such resources, the relevant equipment will also be needed.
- Tutoring is in itself a clear learning situation, to this end it has to be programmed and planned.



- Learning in workshops, residence, “stage” or internships, practical activities, visits, etc. Constitute learning situations which are specially programmed.
- Experiments made in “kits” at home, in laboratories or in other institutions, demand provisions for their easy execution and clear understanding.
- The use of libraries or similar entities demands provisions for ensuring the material in such institution, and that the student has a real chance to interact with it, be it in an institution hall or checked out for use at home and for reasonable periods of time.

It is advisable to plan an introductory course to specifically train the student in the use of the instructional material in order to increase his/her autonomy and to help the student manage time and efforts more effectively.

The introductory course would include training in independent study techniques, development of effective reading, rapid reading comprehension of the written material, training in understanding texts written in other languages, and training in the use of technological media.

***Activity 27. Development of teaching and learning process***

A part of the teaching and learning process is the organization and coordination of the educational communication. It can be compared to a production line with different people responsible for several stages of the process.

Therefore, management control is necessary so that the work schedule is fulfilled synchronically until it is fully developed.

This aspect of educational communication is mainly linked to the relationship with the student.

The role of the teacher is not played by a single person as in the conventional teaching method, but by several people. Each person fulfills a specific task in the relationship between the student and the teacher.

The tasks carried out by the vocational counselors, content experts, tutors, teaching assistants, advisers, and by the educational institution, as a whole must be coordinated.

In this process, the student is ready to learn a course. He has the instructional material of the course, he is informed of the contribution by the Center and is aware of his tutoring possibilities.

With the new self-discipline habits, independent study techniques, fast reading comprehension that the student has learnt in the DES introductory course, the student can use the prepared material, i.e. the contents addressed by following a certain design.

The learning process is determined by the instructional design which, translated to the student’s activities (as long as its steps are taken), enables the student to learn.

The instructional design entails a learning theory (see *Activity 11*).

***Activity 28. Evaluation of teaching***

Evaluation is a part of the learning process.

In order to verify how objectives were met, evaluation instruments will have to be devised which will now be applied (see *Activity 11*).

However, it is important to consider its media character, avoiding emphasis solely on the scientific character of the test to be used, and on the strict fulfillment of its technical characteristics.

Evaluation of distance education learning is conceived as a methodology different from the conventional methodology or the traditional evaluation method.

That is why the design and objectives to be tested should be carefully made, a clear relationship between contents and objectives has to be planned and the objectives should be clearly relevant to the profile of the graduate, the curricula and the profession.

In practice, the evaluation of teaching in distance systems may be prepared with:

Self-assessment or self-verification: This enables the student to recognize the results attained, and to identify the problems, and make progress in the sequence of learning, and to review the difficult concepts and principles.

Self-assessment of learning is a factor which encourages self-learning.

Evaluation with feedback return:

This evaluation is made at the end of each module or at the end of the course. It is an instrument completed by the student and sent to the institution for correction. The student must receive the evaluation results as soon as possible for immediate results in the learning process.

#### ***Activity 29. Graduation and Diplomas.***

According to the provisions of the specific academic activity instructional design (see *Activity 11*), the institution issues the corresponding certificates.

## **Fourth Stage: Evaluation of the DES**

### **Activity 30. Designing the evaluation mechanisms.**

Evaluation is a continuous process that collects relevant information on the system's level of efficacy with regard to job profiles, organizational structure and the required procedures, processes and resources to improve the quality of the system.

Consequently, we believe it is important to present at this time the critical aspects that should be taken into account for an adequate management control of distance learning programs.

The purpose of the evaluation is to ensure objectives are met and that they are met with the resources that have been provided. It is made up of three phases:

- Recording of data in accordance with the implementation of the programs.
- Comparing forecasts and outcome, deviation analysis and interpretation of the causes for deviation.
- Evaluation report containing recommended corrective actions.

In order to achieve an efficient regulatory control, it must be based on an organized information system. Control must be agile and integrated to the decision-making process.

Among the normally used DES evaluation mechanisms are the *application questionnaires*.

Areas generally covered by the questionnaires, regardless of the different names institutions might give them, include:

#### *1. Organization of the DES*

1.1. *Quality policies*: Does the system have quality policies? Are they formulated in writing? Is the staff aware of the policies? Are the policies consistent with the actual situation of the DES?

1.2. *Institutional objectives*: Does the system have institutional objectives? Are they formulated in writing? Is the staff aware of the objectives? Are there area objectives and, if so, are they related to institutional objectives? Is there a plan of activities to meet the objectives?

1.3. *Organization of the DES*: Has the organizational structure been defined to respond to the objectives? Is the organizational chart updated? Have empowerment and assignment of duties been clearly defined? Is there a quality coordinator? Does management effectively support quality of the system?

1.4. *Quality audits*: Are internal academic quality audits performed? Are there regular evaluations and written reports on their outcome? Are the detected needs made known to each department? Is there tracking of corrective activities?

#### *2. Human Resources*

2.1. *Education and training of teachers*: Are there any studies on training needs? Are there any training and formation programs to respond to the detected needs? Is there evidence of compliance with the training and formation programs?

2.2. *Selection, qualification and promotion*: Has the selection, qualification and promotion system been defined? Are there any evaluations on staff performance?

2.3. *Motivation*: Are there any programs directed at motivating quality teaching? Is there a personal commitment to provide an efficient and timely service? Are there any programs for recognition of individual or group achievements?

- 2.4. *Communications*: How do internal communications work? Is there any procedure to evaluate communication?
3. *Insertion of the DES in the community.*
- 3.1. *Opinion survey and analysis*: Is there any mechanism to identify the needs and expectations of the beneficiaries of the system? Do studies analyze the activities of similar institutions and the regulatory framework of education?
- 3.2. *Dissemination of educational and extension projects*: Which are the means for dissemination employed? Is there an appropriate control of dissemination activities?
- 3.3. *Adequacy of projects to community needs and interests*: Is a report drawn up on the needs of the community? Does the report include qualitative and quantitative aspects of the graduate's profile? Are there any procedures to address the requirements of the community?
4. *Academic design.*
- 4.1. *Designing curricula*: Has the responsibility for designing curricula been assigned? Is there a plan to help define curricular specifications and design? Do they respond to the data provided by the diagnosis of the beneficiaries?
- 4.2. *Design of materials*: Have responsibilities been assigned for the design and development of materials? Is there a plan to help define specifications and design of materials? Do they respond to the data provided by the diagnosis of the beneficiaries, to the policy of resources established by the system and to the contents of the course?
- 4.3. *Review of the curricula*: Is there a review on curricular procedures? Does the review include procedures in all areas? Are these actions performed in writing?
- 4.4. *Modifications to curricular design*: Are the needs for change in design being identified? Is there a control system that enables to plan design modifications? Are changes evaluated as to their impact?
- 4.5. *Updating of teaching resources and materials*: Are teaching resources and materials reviewed? Are the needs for change and updating identified? Are changes evaluated as to their impact?
5. *Student information*
- 5.1. *Selection, and registration of students*: Are there any procedures in place to prepare specifications and documents of admission, registration, academic requirements and graduation procedures? Are they in writing? Do the documents handed to the targets have appropriate and sufficient information? Are they revised to check their contents?
- 5.2. *Administrative procedures*: Has the organization of the administrative system been defined? Are there any internal standards that determine actions?
- 5.3. *Student evaluation*: Is there a specific procedure to keep a record of students? Is there an evaluation process that takes into account psychometric tests and conformity of acquired features with specifications of the professional profile?
6. *Teaching.*
- 6.1. *Control of the teaching process*: Is there an appropriate system to control teaching procedures? Are methodology and control techniques adequate? Are there internal standards that determine control procedures?
- 6.2. *Control of the process and certainty of adequacy*: What steps are taken when teaching deviations arise? Is the control of the system preventive or corrective? Is the staff aware of control techniques? Are they applied correctly? Is there a system to file and record the results of each control procedure?

7. *Quality of teaching.*
  - 7.1. *Internal verification:* Are reports prepared on the quality of service? Is there anybody responsible for problem solving? Are problems solved quickly?
  - 7.2. *Evaluation of the quality of the service as seen by the students:* Is there any research done on expectations of the beneficiaries? Do the findings of the research serve to modify or innovate the design?
  
8. *Administrative service.*
  - 8.1. *Planning of control of the administrative service:* Is there an appropriate system to control the administrative service? Are methodology and control techniques adequate? Are there internal standards that determine control procedures?
  - 8.2. *Control of the administrative service:* What steps are taken when deviations to the service appear? Is the control system preventive or corrective? Is the staff aware of control techniques? Are they applied correctly? Is there a system to file and record the results of each control procedure?
  
9. *Quality of the administrative service.*
  - 9.1. *Internal verification:* Are reports prepared on the quality of the service? Is there a person responsible for problem solving? Are problems solved quickly?
  - 9.2. *Evaluation of the quality of the service as seen by users:* Is there any research on expectations of users? Do the findings of the research serve to modify or innovate the procedure?
  
10. *External users of information.*
  - 10.1. *Service and assistance to external users of information:* Are there any written procedures and instructions to orient prospective users before providing the service? Have the minimum requirements for information to be supplied been established? Are there any discrepancies between information supplied initially and the service actually rendered?
  - 10.2. *Reception of observations during provision of service:* Is there a procedure to detect user claims during the provision of the service? Is remedial action taken? Is information supplied by the user checked?
  
11. *Facilities and general services.*
  - 11.1. *Facilities and resources:* Does the system have adequate facilities and resources to provide efficient internal general services? Is there a method to evaluate the provision of general services?
  - 11.2. *Capacity and distribution:* Does the system have sufficient physical capacity to avoid overcrowding of students, equipment, or personnel? Are facilities adequately located for providing the service?
  - 11.3. *Maintenance:* Is maintenance of the facilities carried out? Is every sector clean and tidy? Is there anybody responsible for maintenance and cleaning and have such activities been contracted?
  - 11.4. *Environmental conditions:* Are environmental conditions adequate to render the service?
  - 11.5. *Environmental control:* Have studies been undertaken to determine whether the service could cause contamination? Is there equipment and resources to avoid contamination?

11.6. *Safety at work:* What are the internal safety standards of the system? Do devices and equipment have user instructions ? Are there training programs focusing on prevention and assistance in case of accident?

11.7. *Storage:* Do you have enough capacity to hold the required volume of equipment, resources and materials? Are storage conditions adequate? Is there a system to identify materials, instruments and equipment in the warehouses? Does the storage system enable turnover and control of equipment and materials?

## 12. *Material resources.*

12.1. *Equipment and resources:* Does the institution have the necessary equipment, resources and elements to provide the service? Are there instructions for use? Are equipment and resources replaced when they can no longer provide a good service due to obsolescence? Has any study been carried out to identify priorities in acquisition and repair of equipment and other elements?

12.2. *Maintenance:* Does the institution have a maintenance program? Is there a preventive maintenance plan? Are corrective maintenance activities recorded?

## 13. *Statistics*

13.1. *Selection and recording of data:* Does the system have control sites in process activities? Have the variables to be measured at each site been identified? Do the variables verify the quality of the service?

13.2. *Basic analysis:* Are statistic techniques employed to analyze each activity in relation to the entire process? Is the staff aware of such techniques?

13.3. *System feedback:* Are the data and the results of statistical analyses used to make adjustment to the process? Are they used to set objectives for the improvement of quality in teaching?

Each institution will draw up its own standards to evaluate the quality of DES. The standards may result from the institution's general internal evaluation of the system and adjust to the regulations in force in the country.

### ***Activity 31. Use of the evaluation mechanisms***

Evaluation mechanisms may be used by the actual DES, by the authorities of the institution where the system has been implemented, or by evaluators outside the system, depending on the design of the mechanisms.

### ***Activity 32. Analysis of information.***

Analysis of information gathered will cover all critical aspects included in the evaluation mechanisms used.

Causes for failure and deviations detected must be established by this activity.

### ***Activity 33. Drawing up a report on the results***

The report on the results must include information gathered, analysis of that information and corrective measures recommended to DES or to institution authorities.

The proposed model intends to fulfill the objective set forth by the OAS Inter-American Telecommunication Commission: *the development of a pilot project ..... for the distinct purpose of testing combinations of selected applications under varying generic types of existing telecommunications links.* (PCC.I Resolution 48 OAS/SER.L/XVII.4.1 PCC.I-645/98).

A truly operational model derived from the proposed normative model can only be developed after experiencing under a given situation and comparing that experience with the objectives, advantages, and limitations of each country and of each institution in particular.

#### **IV. DECISIONS**

##### **CCP.I/DEC.22(XI-99)**

#### **TERMINATION OF THE TASK OF THE RAPPORTEUR GROUP FOR MUTUAL RECOGNITION AGREEMENTS (MRA)**

The XI Meeting of Permanent Consultative Committee I: Public Telecommunication Services,

#### **HAVING SEEN:**

That the Decision PCCI/DEC.13 (VIII-98) establishes a Rapporteur Group to help the Ad-Hoc Group for Certification Processes in compliance with points 2 and 3 of its Working Plan 1998-2002, elaborating Guidelines for the Establishment of Mutual Recognition Agreements for Certification of Telecommunication Equipment and a text on Mutual Recognition Agreement for the countries of the Americas.

#### **CONSIDERING:**

That the Mandate, Terms of Reference and Working Program have been performed in due time and mode by the Rapporteur Group and that the Results are included in the resolutions *PCCI/RES.74 (XI-99) "Approval of the Development Guidelines for a Mutual Recognition Agreement (MRA) on Assessment of the Conformity on Telecommunications Equipment for the Americas"* and the *PCCI/RES.75 (XI-99) "Approval of the Wording of the Inter-American Mutual Recognition Agreement for the Assessment of Conformity (MRA) of Telecommunications Equipment"*.

#### **DECIDES:**

To finalize the tasks of the Rapporteur Group on MRA of the Ad-Hoc Group on Certification Processes of Telecommunications Equipment and MRA.

#### **INSTRUCTS THE EXECUTIVE SECRETARIAT:**

To instruct CITEL's Executive Secretary to address a letter to the Administration of **CANADA** thanking for the participation and excellent works achieved by **Mr. Andrew Kwan** as a Rapporteur and congratulating him for the great contribution his work and results represents for the development of the telecommunications in the Region.

**PCC.I/DEC.23 (X-99)**  
**TERMINATION OF THE ACTIVITIES OF THE AD HOC GROUP**  
**ON THE STRATEGIC ANALYSIS OF PCC.I**

The XI Meeting of Permanent Consultative Committee I: Public Telecommunication Services,

**NOTING:**

- a) That the Ad-Hoc Group on Strategic Analysis of PCC.I was established by resolutions PCC.I/RES. 61 (X-99) and
- b) That Mrs. Marian Gordon of the United States delegation was appointed to chair the above Group;

**CONSIDERING:**

That the Chairperson of the Ad-Hoc Group submitted a Strategic Analysis, document PCC.I/doc.922/99, for improving the effectiveness of the results obtained by PCC.I and adjusting them to the needs of the era of information, so that the Committee should be able to help all Member States of the OAS and their populations to join this new economic and social order, in which telecommunications are of basic and strategic importance.

**DECIDES:**

- 1. To finalize the activities of the Ad-Hoc Group on the Strategic Analysis of PCC.I for the reason stated in the Consideranda.

**INSTRUCTS THE EXECUTIVE SECRETARIAT:**

To send a message to the United States Government, expressing its gratitude for the work carried out by Mrs. Marian Gordon in this Working Group.

**PCC.I/DEC.24 (XI-99)**  
**STRATEGIC PLAN OF PCC.I**

The XI Meeting of Permanent Consultative Committee I: Public Telecommunication Services decided to send to the Chairman of COM/CITEL documents PCC.I/doc.922/99 and



PCC.I/doc. 923/99 (XI-99), so that they are taken into account when preparing the Annual Report and updating the Strategic Plan of CITEL

**PCC.I/DEC.25 (XI-99)**

**THE MODEL OF AGREEMENT FOR COOPERATION BETWEEN THE OAS INTER-AMERICAN TELECOMMUNICATION COMMISSION AND OTHER INTERGOVERNMENTAL AND SEMI-OFFICIAL BODIES**

The XI Meeting of Permanent Consultative Committee I: Public Telecommunication Services

**DECIDES:**

1. To inform COM/CITEL that the Agreements for Cooperation of CITEL with other Intergovernmental and Semi-Official bodies are considered very useful, and
2. To send to COM/CITEL for consideration the document PCC.I/doc.941/99 "Minutes of the Third Plenary Session", observations by the United States and document PCC.I/doc.924/99 "Analysis from the OAS Department of Legal Services, observations by the United States delegation to the Model of Agreement for Cooperation between the OAS Inter-American Telecommunication Commission and other Intergovernmental and Semi-Official bodies.

**VI. LIST OF THE BASIC DOCUMENTS RESULTING FROM THE TENTH MEETING OF PCC.I: PUBLIC TELECOMMUNICATION SERVICES**

Minutes of the Opening Session and First Plenary Session,	PCC.I-906/99
Minutes of the Second Plenary Session,	PCC.I-940/99cor.1
Minutes of the Third Plenary Session and Closing Session,	PCC.I-941/99
List of Documents,	PCC.I-851/99rev.2
List of Participants,	PCC.I-852/99rev.2
Final Report,	PCC.I-942/99rev.1