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THIRD ANNUAL PROGRESS REPORT

ON THE

COORDINATED INTRODUCTION OF THE

INTEGRATED SERVICES DIGITAL NETWORK (ISDN)

IN THE EUROPEAN COMMUNITY

(presented by the Commission)

CONTENTS

0) Executive Summary

1) Introduction

1.1) History of the "Coordinated Introduction of ISDN"

1.2) Purpose of the present report

2) *Progress* of the implementation in the Member States

2.1) Summary of implementation status

2.2) Belgium

2.3) Denmark

2.4) France

2.5) Germany

2.6) Greece

2.7) Ireland

2.8) Italy

2.9) Luxembourg

2.10) Netherlands

2.11) Portugal

2.12) Spain

2.13) United Kingdom

2.14) Conclusion on the status of ISDN introduction

3) *Progress* of Standardisation

3.1) New methods for the organisation of the standards work

3.2) Progress with the standardisation work on ISDN

3.3) ISDN test standards and conformity testing

3.4) Overview on ISDN terminal standards

3.5) Private-Public ISDN Interworking

3.6) Resume of the standards work

4) *Progress* towards the implementation of the EURO-ISDN service

4.1) Conclusion on the EURO-ISDN planning

5) *Progress* of further specific measures related to ISDN

5.1) Progress with Open Network Provision and ISDN

5.2) Data Protection and user privacy in ISDN

6) *Progress* of the implementation of the "new initiatives and proposals" from the Second Progress Report on ISDN

6.1) Presentation of European ISDN at Telecom Geneva 1991

6.2) European ISDN User Forum

6.3) European ISDN Atlas

6.4) ISDN terminals

6.5) ETSI Strategic Review Committee

6.6) Conclusion on ISDN terminal equipment

7) *Progress* of ISDN in the less favoured regions: STAR, Telematique and future plans

7.1) Contribution of the STAR programme in the implementation of ISDN

7.2) ERDF operational programmes in telecommunications

7.3) Telematique

7.4) Implementation of the ISDN MoU in the less favoured regions

7.5) Future plans

8) Specific aspects for the implementation of the ISDN

8.1) Migration to the Euro-ISDN

8.2) ISDN terminal type examination

8.3) ISDN-Public Switched Packet Data Network (PSPDN) interworking

9) New proposals and initiatives

9.1) Annual progress meeting on ISDN

9.2) Support for ISDN applications for SME's

9.3) ISDN as "trans-European network"

9.4) EC-Japan ISDN interconnection experiment

9.5) National network signalling

9.6) Tariff considerations

10) Conclusion

List of Annexes:

Annex A: Index of Community documents relevant to ISDN

Annex B: Glossary of technical terms/ abbreviations

Annex 1: Protocols used between international gateways for the interconnection of ISDN

Annex 2: Overview on current ISDN implementations in the Member States

Annex 3: Overview on current ISDN tariffs: in ECU

Annex 4: Overview on current ISDN tariffs: in local currency

Annex 5: Status classes of ISM standards

Annex 6: Definition of supplementary services

Annex 7: Organisational structure of EIUF

Annex 8: Chart on the flow of the work process in EIUF

Annex 9: Packet mode bearer services options as defined in dETSs

Annex 10: Proposal for an EC-Japan ISDN terminal interconnection experiment

Annex 11: Addresses of ETSI secretariat and of EIUF secretariat

List of Tables

Table 1: Status of ISM work as per 29.05.91

Table 2: CTS project relevant to ISDN

Table 3: CTS test laboratories

Table 4: Asterisk-services; provision: no later than 1993

Table 5: ONP: minimum set of ISDN offerings (Phase 1)

Table 6: Overview on ISDN type approval

0 EXECUTIVE SUMMARY

This *third* Progress Report has been prepared for submission to the European Parliament and the Council in accordance with Article 7 of the Council Recommendation on the "Coordinated Introduction of the Integrated Digital Services Network" (ISDN) in the European Community (86/659/EEC).

1990 has been marked by considerable extensions of the geographical availability of ISDN as well as an increase of the number of subscribers (approx. 80.000 at the beginning of 1991).

The number of Member States in which commercial services exist remains at five (B, D, F, NL, UK), but ISDN is now available in most of the major cities.

However, owing to the non-availability of stable standards, the existing commercial ISDN services are not fully harmonised. This implies a number of incompatibilities: for example, it is not possible to operate an ISDN terminal for a network for which it is not designed.

While the level of international interconnection of national ISDN implementations has been increased in comparison to the year 1989, a variety of different protocols are used in the international gateways and there is little information on interconnection of services available for crossborder traffic.

Five other Member States have field trials (ESP, POR) or pilot services (DK, IRL, IT).

In two Member States (GR and LUX) no ISDN services were available in 1990.

At the same time, and in accordance with earlier proposals of the Council, concrete preparatory steps for the implementation of the EURO-ISDN are being made by the standardisers and network operators.

ETSI[1] has made considerable progress with the standards required for the EURO-ISDN (174 standards and 11 technical reports are prepared) and is scheduled to finalize more than 90 % of the required standards by the end of 1991. This target date, which is one year behind the initial time table, is explained by a number of reasons, such as lack of resources, additional tasks, handling of approval of standards initially not included in the scope of work, etc.

At the global level ETSI has a leading position in ISDN standardisation, in particular for the definition of services standards.

The Memorandum of Understanding on ISDN which has now been signed by 26 network operators from 20 countries establishes a suitable framework for the measures to be taken by the signatories to ensure the commercial opening of the EURO-ISDN.

It is expected that the EURO-ISDN on the basis of the ETSI standards will have been opened in all Member States by the end of 1993, at the latest.

The particular importance of "trans-European networks" for the Single Market was addressed by the Commission in a series of communications culminating in a proposal for a Community action programme[2] in December 1990.

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1 European Telecommunications Standards Institute

2 COM(90) 585, 05.12 90

With regard to telecommunications, the report focuses on measures to improve the currently insufficient degree of interconnection and interoperability of the infrastructure in place in the Member States.

In the perspective of improving the cohesion in the Community, further attention is given to the fostering of modern telecommunications in the less favoured regions (LFR)s.

ISDN is seen as one of the key elements for the network and telematic infrastructure required for the well-functioning of an economic space without frontiers.

Early 1992, the Commission will submit to the Council and the Parliament an action plan detailing further steps for the improvement of this infrastructure based on a comprehensive scheme.

The success of the introduction of the EURO-ISDN depends on a number of factors:

* Raising User awareness and further measures for the coordination of the introduction of the EURO-ISDN with a view to foster the acceptability of this service are required.

* ISDN has been very much a technology driven development, and users - in particular with respect to the European dimension of the ISDN service - are still doubtful on its achievement.

* Moreover, European manufactures are still hesitating over the development of ISDN terminal equipment. Prices of current ISDN terminals - notably in the non-voice domain - are high and terminal interfaces are not harmonised. The development of terminals suitable for connection to the EURO-ISDN is a major challenge yet to be met by European manufacturers.

For these and other reasons described in this report, a number of recommendations are made, and summarized as follows:

* The network operators need to:
  - define and publish a migration strategy towards the EURO-ISDN
  - provide information on the geographical availability of the EURO-ISDN services at a national and European level
  - set and publish in advance the tariffs for the EURO-ISDN
  - investigate the feasibility *of* alignment of national network signalling

* The terminal manufacturers and the network operators need to:
  - increase their efforts for truly harmonised terminal standards in ETSI
  - develop a pro-active and concerted effort for the development of a European ISDN terminal market

* The Commission also proposes to:

  - organise an annual progress meeting for the review of the efforts towards the EURO-ISDN.

  - to undertake reflections with the aim of clarifying proposals destined at the support of the usage of ISDN by SME.

The full benefits of ISDN can only be exploited on the basis of a fully fledged European-wide and harmonised offering.

If this condition is fulfilled, ISDN will provide the unique chance to develop into the

GENERAL SWITCHED TELECOMMUNICATIONS NETWORK

suitable of serving a large variety of communications needs of business and residential users in the Single Market in the Community.

1 INTRODUCTION

The availability of a modern, ubiquitous, switched telecommunications infrastructure is of crucial importance to the development of a prosperous Single Market in the European Community. More than 60% of the working population depend directly or indirectly on efficient communications means.

The advent of **a harmonised, truly European-wide ISDN, also referred to hereafter as the "EURO-ISDN"**, is a major prerequisite for the take-off of European-wide services and equipment markets, the main objectives in the field of telecommunications[3] towards the completion of the single market by the end of 1992.

ISDN has the unique potential to develop into the general switched fixed infrastructure, universally available and capable of serving a vast variety of user needs over one network access, if successfully implemented.

Following the approach of the Council Recommendation 86/659/EEC of 22 December 1986, the coordinated introduction of ISDN in the Community became one of the Commission's priority activities in the field of telecommunications.

All Member States agree on the necessity of introducing ISDN on the basis of commonly agreed technical standards.

The concept of Open Network Provision (ONP) will promote the harmonisation of access conditions of ISDN implementations in the Member States, a prerequisite for the development of competitive services using the public infrastructure.

The current situation regarding the status of the introduction of ISDN in the Community is principally of a transitory nature.

While Member States continue to extend their existing national ISDN implementations (which are not fully harmonised) concrete steps (based on a high degree of commitment on the part of the telecoms operators) are being undertaken to migrate to a harmonised ISDN commencing in 1993.

It is a priority objective of the Community's telecommunications policy to foster this development towards the EURO-ISDN.

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[3] Towards a dynamic European economy - Green Paper on the development of the common market for telecommunication services and equipment. COM(87) 290 final - 30.06.87

1.1 HISTORY OF THE "COORDINATED INTRODUCTION OF ISDN"

The Commission's interest in promoting ISDN has been fuelled by recognition (in the 1984 Telecommunications Action Programme[4] and the 1985 White Paper on establishment of the Single Market[5]) of the strategic importance of strong, harmonised telecommunications to the successful achievement of a Community-wide market for goods and services.

ISDN, due to its advanced technology, developing status and promise of a wide range of voice and data services was seen as a prime vehicle to supply these telecommunications needs and, accordingly, after consultation with SOGT[6], CEPT[7] and suppliers, the Council adopted the Recommendation 86/659/EEC on the coordinated introduction of ISDN in the Community. This proposed a timetable for phased introduction of services according to harmonised standards for interfaces and equipment. In the less favoured regions, support from the STAR programme[8] was advocated.

The Recommendation also called for annual progress reports to the Council. The 1st Annual Progress Report on ISDN in 1988 recognised the considerable efforts within the Member States to introduce ISDN in accordance with the Recommendation, but also noted a number of delays and deviations affecting the schedule for Community-wide service availability. As a result of Commission discussions with SOGT and the Member States, it was agreed to strengthen the drive towards a pan-European ISDN (the EURO-ISDN).

At a Commission suggestion, a Memorandum of Understanding[9] was drawn up between Telecommunications Administrations within the CEPT framework, committing signatories to the provision of at least a minimum set of pan-European ISDN services starting in 1992, and by December 1993 at the latest.

In parallel, the Commission was invited to prepare a policy position on the strengthening of ISDN cooperation. This was produced in accordance with the telecommunications market policy and schedule of measures defined in the 1987 Telecommunications Green Paper, the action plan for which was endorsed by a Council Resolution[10] in June 1988. The Commission's proposal was adopted by the Council, who issued a Resolution on the strengthening of the Coordination of ISDN[11] in July 1989. A number of measures were proposed to build on the strong commitment of the CEPT-MoU.

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4 Telecommunications progress report and proposals for an Action Programme (COM(84)277)

5 White Paper on the completion of the Community-wide market for goods and services by 1992 (COM(85)310)

6 Senior Officials Group "Telecommunications"

7 Conférence Européenne des Postes et Télécommunications

8 Council Regulation of 27.10.86, instituting a Community programme for the development of certain less-favoured regions of the Community by improving access to advanced telecommunications services (STAR programme) (86/3300/EEC)

9 Memorandum of Understanding on the Implementation of an European ISDN Service by 1992

10 Council Resolution of 30.06 88 on the development of the common market for telecommunications services and equipment up to 1992 (88/C 257/01)

11 Council Resolution of 18.07.89 on the strengthening of the coordination for the introduction of the ISDN in the European Community up to 1992 (89/C 196/04)

Particular actions called upon provisions made under the Green Paper, namely the application of ONP[12] principles to ISDN and the acceleration of the standards-making process through mandates issued to the recently created ETSI organisation. Commitment of manufacturers to the standardisation process was sought in order to encourage the timely availability of compatible and interchangeable ISDN terminals. In addition, further work on aspects of data privacy related to ISDN was urged.

The 2nd Annual Progress Report on ISDN detailed developments during 1989 and made some new proposals relating to recognised problems, particularly in the areas of user awareness and ISDN terminal development. To raise user awareness, a European ISDN User Forum, sponsored by the Commission, was advocated to address development of ISDN applications. In addition, a 'European ISDN Atlas' was proposed to provide information for business planning using ISDN. In the area of ISDN terminals, further action was proposed to stimulate European development in order to achieve a positive take-up of ISDN by users.

1.2 PURPOSE OF THIS REPORT

The purpose of this report is to give an account of the progress on the Council Recommendation 86/659/EEC of 22 December 1986 concerning **"The coordinated introduction of the Integrated Services Digital network (ISDN) in the Member States of the European Community"**.

It is the *third* Annual ISDN Report, produced in accordance with Article 7 of the Recommendation and concerns the status and the progress of the implementation of ISDN in the year 1990.

It focuses particularly on progress towards the implementation of the EURO-ISDN which will make available ISDN services on a pan-European basis. Some new proposals are made to further enhance the coordinated introduction of ISDN in the Community.

The following sections of this report detail progress in each area of importance to ISDN, many of which have been mentioned briefly in the previous section.

Section 2 discusses progress in ISDN implementation in each Member State.

Section 3 details progress in ISDN standardisation work, which is fundamental to the on-time availability on pan-European ISDN services and compatible ISDN terminals.

Section 4 reviews progress in the drive towards implementation of the EURO-ISDN

Section 5 details work in the application of Open Network Provision (ONP) principles to ISDN and introduces a proposed Directive related to protection of personal data and user privacy.

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[12] Council Directive of 28.06.90 on the establishment of the internal market for telecommunications services through the implementation of Open Network Provision (90/387/EEC)

Section 6 reviews the current status of the new initiatives proposed in the second annual ISDN progress report.

Section 7 discusses the progress of ISDN in the less favoured regions under the STAR programme, and outlines future plans in this area.

Section 8 brings out specific considerations to which attention should be given for barrier-less progress in ISDN introduction.

Section 9 makes proposals which it is believed would complement and assist the ISDN introduction programme.

Section 10 reviews overall progress to draw conclusions representing the current situation of ISDN implementation across the Community. Recommendations for further action are made.

2 PROGRESS OF THE IMPLEMENTATION IN THE MEMBER STATES

While 1989 (the period relevant for the second annual progress report) was the year where commercial ISDN offerings have been started or pilot services have been launched, 1990 has been marked by considerable extensions of the availability of ISDN by some leading network operators as well as a first period of growth regarding the number of ISDN subscribers.

2.1 SUMMARY OF IMPLEMENTATION STATUS

Commercial ISDN offerings exist in the following five Member States:

- Belgium, France, Germany, Netherlands, United Kingdom.

Pre-ISDN services or pilots are conducted in five Member States:

- Denmark, Ireland, Italy, Portugal, Spain

No ISDN capabilities are currently available in 2 Member States:

- Greece, Luxembourg.

In comparison to the status as described in the preceding Progress Report on ISDN, the number of Member States with commercial ISDN offerings remains un-changed.

Major efforts have been made, however, for the expansion of the current ISDN offerings. The geographical availability reaches most of the major cities in the countries concerned and the number of subscribers has increased considerably (approx. 80.000 subscriptions).

The status of interconnection of ISDN between the Member States is behind expectation.

There is a variety of differing protocols used in international gateways for the interconnection of ISDN (see Annex 1 for more details). Only five operators use the TUP+ protocol[13] suggested by the Council Recommendation 86/659/EEC for early interconnections.

Little information is available on the range of services which is provided via international interconnections.

Similarly, the existing implementations of the user-network interface show considerable differences with regard to signalling protocols, addressing mechanisms for terminals and support of supplementary services. Four different types of plugs are used. Only one plug (the ISO plug) is recommended (see Annex 2 for more details).

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[13] Telephone User Part and Telephone User Part (enhanced), an Application Part of the CCITT Signalling System No. 7, describing protocols used between digital exchanges

While current ISDN offerings are not fully harmonised, all Member States have confirmed plans to introduce the EURO-ISDN (see also Chapter 4) on the basis of ETSI standards no later than by the end of 1993.

Tariff information is available from 6 telecoms operators in five countries.

Generally the monthly rates are two to three times higher than for an analogue telephone line (ISDN provides for two bearer channels) and the volume dependent tariffs are set at factors between 1.0 and 1.4 of the ones for telephony.

The sections below contain further country specific information on two levels:

a) status of implementation of current national ISDNs

b) planning for the EURO-ISDN (according to the MoU on ISDN).

The country specific sections follow by and large a common structure and level of information containing the following elements:

- ISDN availability (pilot/commercial)
- opening date
- number of accesses per type
- type of plug
- date of nation-wide coverage
- international interconnections
- tariff information
- planning information on EURO-ISDN

Further details are given in Annex 2 (overview on current ISDN implementations in the Member States), in Annex 3 (overview on current ISDN tariffs) and Annex 4 (ISDN service interconnection at the Community scale).

2.2 BELGIUM

In Belgium, the RTT opened a first phase of commercial ISDN on 28 June 1989 with offerings in 8 cities.

In the beginning of 1991 some 350 Basic Rate Accesses (BRA)[14] and 10 Primary Rate Accesses[15] (PRA) were in use.

The ISO plug is used for BRA-connections.

Nation-wide coverage is planned for the beginning of 1993.

RTT schedules to introduce all asterisk"-services[16] of the MoU and five teleservices conformant to ETSI standards by 1992.

The full list of the MoU services is foreseen for 1994.

International interconnections with France, the United Kingdom, Japan and the United States are already operational.

Interconnections with 8 further European and non-European countries are planned for 1991.

Detailed tariff information is available.

2.3 DENMARK

In Denmark an ISDN pilot service17 which at the beginning of 1991 had some 700 users of BRA was started as a field trial during 1989.

On 1 January 1991 an ISDN pilot service with BRA and PRA was started, and commercial service will commence 2 January 1992.

At the same time ISDN BRA and PRA will be available to 100% of users.

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[14] BRA is one form of User access to the ISDN and provides for 2 B-channels (2 x 64 kbit/s) and a 16 kbit/s signalling channel

[15] PRA is the second form of User access to the ISDN and provides for 30 B-channels (30 x 64 kbit/s) and 1 signalling channel with 64 kbit/s

[16] In the MoU on ISDN identifies a full list services to be based on harmonised standards. Those services which will be made available by all signatories are marked with an "*" (also referred to as the minimum service offering).

[17] a pilot service is a service usually with selected users based on an implementation which close to the one for the commercial service

The plug used for BRA is the ISO 8877 plug socket and for the PRA, it is the BNC plug socket.

All asterisk-services plus a number of other services, all conformant to ETSI standards are planned to be introduced in 1992. In 1993 all bearer services (except 2 x 64 UNR and a number of other supplementary services) are planned for implementation.

Interconnections with 23 European and other countries are planned in the course of 1992/93.

Detailed planning information on tariffs is available.

2.4 FRANCE

In France a commercial ISDN service was opened on 21 December 1987 and a nation-wide coverage was reached in the middle of 1990. Since November 1988 the French ISDN is market under the name NUMERIS.

At the end of 1991 some 5800 BRA and some 800 PRA were connected. A first step of convergence towards harmonised standards underlying the signalling protocol used for those access was implemented in 1989.

In France the ISO plug (ISO 8877) is used for both access types.

Since 1988 a wide range of services have been introduced in the commercial offering. Access to the French.packet switching network is available since the end of 1988.

All services listed in the MoU in conformity with ETSI standards are planned for 1993.

For current interconnections with other countries the TUP or TUP+ is used. ISDN UP18 version 1 will be introduced in 1993.

In 1990 the French ISDN was interconnected with five other networks, 11 further destinations will follow in 1991.

In France, the ISDN implementation strategy is based on a quick, country-wide commercial opening and on interconnection with the networks of other countries.

Detailed tariff information is available.

2.5 GERMANY

In Germany commercial ISDN services were opened in March 1989. The service offering comprises the bearer services 64 kbit/s unrestricted and the one for speech, the teleservices telephony, teletex, facsimile Group 4 and interactive videotex. In addition, the access to the market switched network conforming to the CCITT Recommendation X.31, Case A, is offered. Videotelephony (using 2 64 kbit/s) will be offered as field trial in autumn 1991. On 30.06.91, the number of sold accesses accounted for 39.000 BRA and 3.550 PRA.

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[18] ISDN User Part, an Application Part of the CCITT Signalling System No. 7 describing protocols for ISDN call control

At the end of 1990, ISDN was available in 317 cities and at the end of 1991, 1140 cities will be reached. Country-wide coverage will be reached by the end of 1993 in West-Germany. In the five new "Länder" (ex East-Germany), ISDN will be installed in the course of 1991 in 36 cities. 1992 these locations will be connected with the signalling system No. 7. Complete coverage will be reached by the end of 1995 in the new "Länder".

International services exist with Belgium, Denmark;, France, Great Britain, Japan and the Netherlands. Those countries are reached via the TUP+ lines or via the network of France Telekom.

Towards the end of 1991, connections with the USA, Italy, Hong Kong and Singapore will follow. The introduction of the international ISUP is foreseen for 1992; existing international connections will gradually be converted into ISUP-signalling.

In Germany the ISO 8877 plug will be used for both access types. The existing national plug will gradually be replaced.
For 1993 all asterisk-services plus some further services in conformity with ETSI standards are planned with country-wide coverage. The full list of services of the MoU will be introduced at the end of 1993 (West-Germany) and at the end of 1995 (East-Germany).

The tariffs are based on the telephony tariff. Detailed tariff information is available.

2.6 GREECE

In Greece a test of signalling system No. 7 which will last one year is planned in three cities for 1991. Subsequently some ISDN capabilities will be made available.

For the end of 1993 it is planned to start with twelve ISDN services, including all asterisk-services plus some teleservices.

2.7 IRELAND

In Ireland a pilot with 44 BRA (no PRA) was started in the beginning of 1991. It is intended to increase the number of BRA to 100 towards the end of 1991 and to introduce some PRA. The introduction of ISDN conformant to ETSI standards is scheduled for the end of 1993.

All asterisk-services plus some further services are planned for this date. Introduction of other services has not yet been decided.

The plug which will be used for the BRA is the RJ 45 plug. It has yet to be decided which plug will be used for the PRA.

Planning on interconnections with other countries is not yet finalised.

Also the tariffs for ISDN are still under study.

2.8 ITALY

In Italy an ISDN pilot service will start during the second half of 1991, covering eleven metropolitan areas.

Regular ISDN services will start with an offering comprising all asterisk-services plus a number of further services by 1993. Some other services are planned for 1995 while for other services from the MoU list a decision is still pending.

First interconnections with three countries on the basis of TUP+ are scheduled for the third quarter of 1991, interconnections with other signatories of the MoU will start in 1993.

Decisions on tariffs are expected shortly.

2.9 LUXEMBOURG

In Luxembourg ISDN will be introduced by 1993. All asterisk-services will be offered in accordance with ETSI standards. Implementation of further services is not yet decided.

ISDN will be provided in the main exchanges and country-wide availability will be possible by the installation of remote concentrators and/or repeaters.

No tariffs information is yet available.

2.10 NETHERLANDS

Since October 1989 a pre-ISDN has been available in Rotterdam and currently some 500 BRA are installed. From December 1991 ISDN will be provided in four major cities and 3000 BRAs and 200 PRAs are planned to be available.

From 1993 ISDN in accordance with ETSI standards will be provided (all asterisk-services plus two specific supplementary services), starting with the 30 major cities.

International links with Germany are implemented. Further interconnections are planned for December 1991 using TUP+.

Tariff information is available.

2.11 PORTUGAL

After an ISDN pre-pilot which is in course, both national operators (CTT and TLP) will launch a pilot service by the end of 91/beginning of 92, offering all the MoU asterisk services and most of the remaining ones in conformity with the EURO-ISDN standards. The ISDN commercial phase will start one year later.

International connections will be established in 1993 in accordance with the MoU and based on ISUP signalling.

Tariff information is not yet available.

CTT/Telecom Portugal will launch the ISDN pilot with 300 BRA and 15 PRA by the end of 1991 in the areas of Aveiro, São João da Madeira, Agueda, Coimbra, Leira e Marinha Grande.

The ISDN commercial phase will start in the beginning of 1993 and by that date all cities will be covered.

The ISO 8877 physical connector will be used for BRA and ISO DIS 10173 for PRA. The national coverage will be reached by 1995.

TLP (which operates in the areas of Lisbon and Porto) will launch its pilot in the beginning of 1992 and its commercial phase at the end of the same year.

The type of plug used is ISO DIS 8877 for BRA and is still in study for PRA.

By the end of 1992 it is expected to have 2800 BRA and 100 PRA, covering 6 % of the two cities, and for the end of 1993 the forecast is 5500 BRA and 200 PRA, ensuring a coverage of 42 %.

2.12 SPAIN

A pilot experiment was conducted during 1990. Pre-commercial services were offered during 1991. Full commercial services are planned in 1992.

MoU services will be provided in 1993/94.

The ISO 8877 connector will be used.

For international interconnections the TUP and the ISDN UP version 1 will be used. In 1991, the Spanish ISDN will be interconnected with four other networks and 10 further networks will follow in 1992.

No tariff information is currently available.

2.13 UNITED KINGDOM

British Telecom (BT) has been operating a pre-ISDN Basic Access (IDA) since 1985 with some 600 subscribers now. In October 1988 a Primary Rate Access Services was introduced which accounted at the beginning of 1991 to some 24 000 accesses.

The plugs used for these services are the RJ 45 for the Basic service and the *BNC* for the Primary service.

Services in accordance with the ETSI standards are planned as follows:

In 1991, the BRA and all of the asterisk-services will be introduced. The PRA and some other services will follow during 1993.

By the end of 1991 BT will operate interconnections with some *18* other network providers.

For international connections TUP, TUP+ or ISUP (version 1) are used to suit the correspondent country.

Detailed information on tariffs is available. *In line with other services tariffs* are subject to an annual review.

Mercury Communications has launched a commercial ISDN PRA service in 1988.

The plug used for this service is the BNC connector.

All asterisk-services in line with ETSI standards plus five further services will be offered from 1992. No information on further services is available.

International interconnections have started 1990/91 with five other countries using TUP. Connections with all other European countries and some non-European countries are planned for 1993, then with the ISDN UP version 1.

Tariff information is available.

2.14 CONCLUSION ON THE STATUS OF ISDN INTRODUCTION

In relation to the initial ambitious schedule set out in the Council Recommendation 86/659/EEC the introduction of harmonised ISDN services is delayed.

The take-off ISDN is much slower than expected.

Since harmonised standards have not been available, existing ISDN offerings show a number of incompatibilities.

Harmonisation, in particular of the user/network-interfaces is vital to the success of ISDN. Current ISDN terminals can not be exchanged between the different networks.

ISDN is a complex product and many of its benefits can only be exploited on the basis of a fully fledged and harmonised implementation.

To fulfil the Recommendation of the Council for a coordinated introduction of ISDN in the Member States, the agreement of a clear migration strategy to the EURO-ISDN is a key objective of the ISDN policy at the Community level.

3 PROGRESS OF STANDARDISATION

The availability of harmonised European standards is indispensable for the achievement of a truly European-wide ISDN offering, the EURO-ISDN.

While current ISDN offerings are based on national specifications which show a number of differences, there is a strong commitment in Europe to implement the next generation of ISDN on the basis of fully harmonised standards. This situation occurred because of non-availability of harmonised standards (at the time when it was necessary to fix the specifications).

3.1 NEW METHODS FOR THE ORGANISATION OF THE STANDARDS WORK

ETSI is charged with the task of standardisation of EURO-ISDN and following a recommendation of the "Strategic Review Committee on ISDN" a special group for the management of the ISDN standards (called ISM[19]) was established within ETSI.

The mandate of (ISM) is the coordination of all ISDN standardisation activities related to the Memorandum of Understanding on ISDN. These standards activities have a clear priority over other ISDN related standardisation work.

Principal objective of the ISM standardisation activities is to come up with a **fully consistent set of ISDN standards** in due time with respect to the implementation date[20] of the European-wide ISDN. Given the involvement of numerous ETSI committees and the scope of this work (several thousand pages of standards) the management of such a process is a major challenge for ETSI.

The initial target date for completion of the ISM work was the end of the year 1990.

In accordance with the request of the Council the Commission has supported this ISDN standardisation work. In the context of the framework contract between the Commission and ETSI, the former has issued a standardisation mandate for the year 1990.

A second objective of this standardisation work which is of particular relevance for the European terminal market, is the **assurance of terminal interchangeability**[21].

Also within the scope of ISM work is the production of candidateNETs[22] for the two ISDN access types as well as for some terminal types. Those candidateNETs are fully based on the corresponding standards.

Based on the requirements of the Memorandum of Understanding on ISDN, ISM has initially distinguished two priorities for ISDN services and standards needed for the implementation of the European-wide ISDN in 1993.

However, given that in practice all standards needed for the MoU ISDN have been handled with the same urgency, ISM has decided to abandon this distinction.

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19 ISDN Standards Management

20 *a minimum* lead time of 18 months from availability of fixed specifications to cut in of the service is assumed

21 Terminal interchangeability means to ensure that a terminal is capable of participating in a service independent of the actual network to which it is connected (eg. a public or a private ISDN)

22 Normes Européennes de Télécommunications

These ISM standards embrace services standards as well as standards for network facilities. However, ISDN terminal standards are excluded from the scope of the ISM work, since terminals are outside the terms of reference of the Memorandum of Understanding.

ISM standardisation activities concern numerous "Technical Committees" (TCs) and "Technical Subcommittees" (STCs) within ETSI and a main task of the ISM is the coordination and technical liaison amongst all committees. Beyond this management task ISM **is also empowered to resolve technical conflicts between committees.** It is in particular this latter capacity of ISM which has enabled ETSI to be successful with this huge task of ISDN standardisation.

3.2 PROGRESS WITH THE STANDARDISATION WORK ON ISDN

Table 1 gives an overview on the status of standards (ETS) and technical reports (ETR) which fall within the scope of ISM, i.e, the items which are required for the implementation of the EURO-ISDN:

ETS/ETR status	No. of standards.	Completion in %
ETS/ETR in Status Cl. = 7	75	40.6
ETS/ETR in Status Cl. = 8	110	59.4
ETS/ETR : total	185	100

Table 1: Status of ISM work as per 29.05.1991

For the purpose of identifying the progress of the work, 12 status classes from class "0", for the identification of an item with an unknown status, to class "12", for standards which are published (Annex 5 contains a detailed explanation of the status classes) have been defined.

Standards in status classes 8 and higher are considered technically stable, the general prerequisite for commencement of implementation work.

Thus Table 1 is split into items which are in status class 8 (approval by the Technical Committee) and higher and items which are in lower status classes.

As Table 1 shows, the ISM standardisation work has encountered delays in respect to the initial time target.

Therefore, the mandate of ISM has been extended and the target for this immense task is now the end of the year 1991.

Four major reasons which explain this delay can be stated:

i) initially, test standards have not been included in the scope of ISM

ii) also the approval process for the standards was initially not within the scope of ISM activities.

iii) lack of manpower

iv) dependency on CCITT[23] standardisation work

In particular the approval of standards is a time consuming issue, with certain fixed periods, such as for example a world-wide public enquiry of 60 days (according to GATT requirements).

In addition a number of further constraining factors have occurred, notably requirements stemming from the private ISDN networking domain.

According to the current planning of ISM, with the exclusion of ETS for conformance testing, 92 % (142 of 155) of the standards/*reports* will be finalised by the end of the year 1991.

With the inclusion of conformance testing standards 80 % (148 from 185) standards will be available by the end of the year 1991.

ISM has also produced an "ETSI Basic Guide on the European Integrated Digital Services Network" which gives an detailed overview on the MoU-related ISDN standards and informs about their structure and interrelationship.

This document is published as ETR 10 and will be released in July 1991 in its third edition (available from the ETSI secretariat; address in Annex 11).

3.3 ISDN TEST STANDARDS AND CONFORMITY TESTING

As mentioned in the preceding section, test standards for ISDN account now for an important part of the ISDN standardisation work.

For the implementation of these (and other) test standards the CEC launched in 1985 the Conformance Testing Service (CTS) programme with the aim of supporting the development, and provision of services which will test conformity of manufacturers' equipment to standards. Applicable standards comprise (inter alia): ISO norms, CCITT recommendations, ETSI ETSs and CEN/CENELEC ENVs and ENs.

All these European standards have a voluntary status and the Conformance Testing Services are thus also conducted on a voluntary basis.

Preference and priority are given to relevant European standards where available. Moreover, strong emphasis is given to harmonisation and testing equivalence aspects so that the services offered by different laboratories involved in each CTS project can be recognised as equivalent.

In the context of type approval of telecommunications terminal equipment (see also section 8.2) obligatory testing is used. For this purpose common technical regulations (currently

[23] Comité Consultatif International de Télégraphie et de Téléphonie

known as NET and in future in the form of CTRs[24]) are derived as subsets from the corresponding harmonised standards.

The following CTS projects concern particularly the definition of test specifications and the establishment of testing centres in the ISDN area:

CTS 2	ISDN-BA	(ISDN Basic Access)
CTS 2	ISDN-TA	(ISDN Terminal Adaptors)
CTS 2bis	ISDN-PA	(ISDN Primary Access)
CTS 2bis	ISDN-RA	(ISDN Rate Adaptor)
CTS 3	ISDN-VP	(ISDN Video Phone)
CTS 3	NI-ISUP	(Network Interworking - ISUP+X.75)

Table 2. CTS project relevant to ISDN

The total CEC commitment is 7.27 MECU.

One of the objectives of the CTS projects is the contribution of the relevant test specifications to the standardization bodies, where they will serve as a primary input for future test standards. So far, the Abstract Test Suites (ATSs) developed in the ISDN-BA, ISDN-TA, ISDN-RA projects have been submitted to ETSI.

The objective of the CTS ISDN projects, that have clearly different profiles, is the provision of a "modular" testing service: the kernel is represented by the testing to the obligatory technical regulations NETs and CTRs, but the full conformity testing to the voluntary standards will also be offered.

Table 3 shows the laboratories that will provide the testing service and the scheduled availability:

Project	*Testing service provided by organisation (country)*	*Availability*
ISDN-BA	BT (UK), CET (P), CNET (F), CSELT (I), EOLAS (IRL), FTZ (D), PTT-NL (NL), TID (E), *JT (DK)*	beg - 1992
ISDN-TA	CET (P), EOLAS (IRL)	mid - 1992
ISDN-PA	CSELT (I), TID (E), *JT (DK)*	end - 1992
ISDN-RA	CET (P), EOLAS (IRL)	mid - 1993
ISDN-VP	CSELT (I), EOLAS (IRL)	mid - 1993
NI-ISUP	CSELT (I), NCSR (GR)	mid - 1993

Table 3. CTS test laboratories

[24] Common Technical Regulations

3.4 OVERVIEW ON ISDN TERMINAL STANDARDS

The ETSI work related to the standardisation of ISDN terminal equipment may be categorised as follows:

1) General Specifications concerning ISDN terminal equipment and terminal adaptors

- Network Access and Services (including supplementary services)
- Safety
- Human factors
- Application Programme Interfaces
- EMC Standards

In this category, work is most advanced on the standardisation of network accesses, services and safety with the vast majority of standards written, or out for public enquiry. Standardisation of EMC and human factors aspects are under way, but are lagging behind the first group. Work on application programme interfaces is only just beginning.

2) Specifications for ISDN Terminals

- telephony
- videophony
- telefax
- teletex
- videotex.

Standardisation in this category is well advanced for telefax, teletex and videotex terminals. The basic standard describing type approval requirements for 3.1 KHz telephony over ISDN is also available, however standards detailing additional technical characteristics are not yet ready to be sent for Public Enquiry. Work on videophony services in ETSI is now co-ordinated by AVM and is also well advanced.

3) Specifications for Terminal Adaptors

- for analogue terminals
- for terminals with X and V interfaces.

Terminal adaptors for analogue terminals have not been internationally standardised and there are no standards in preparation. Terminal adaptors for terminals with X or V series interfaces are being prepared.

4) Miscellaneous Specifications

Further areas requiring standardisation are:

- Ancillary equipment
- file transfer
- telemetry

In this category the only standardisation work to have been progressed is on FTAM[25].

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[25] File Transfer and Access Management

3.5 PRIVATE-PUBLIC ISDN INTERWORKING

Standardisation activities for private ISDN networks have moved rapidly ahead due to concertated efforts made by ISPBX manufacturers. Mandates from the CEC set out the scope of this work (defined in detail in the ITSTC[26] Memorandum M-IT-05, derived from the Bon de Commande 74 - 77) which is carried out by ECMA[27] and within ETSI in the Technical Committee BT[28] (coordinating body), NA[29], SPS[30] and TM[31]. In this area of standardisation Europe has a leading position.

The set of ISM standards currently finalised by ETSI already accommodates private-public ISDN interworking in particular for ISDN bearer services and teleservices. Particular attention was paid to terminal interchangeability between private and public ISDN. Terminal interchangeability is crucial for the development of a European-scale terminal market.

Given the tight time schedule for the ISM work programme, it is likely that the studies on private-public ISDN interworking aspects will not be completed within the current ISM framework. Two major aspects for further study work have been identified:

i) Service interworking notably for supplementary services;

ii) Access to virtual leased lines for inter PABX networking.

ETSI should ensure that the ongoing ISDN standardisation work takes account of these requirements and is developed in a way that no incompatibilities with existing European standardisation results occur.

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26 Information Technology Steering Committee

27 European Computer Manufacturers Association

28 Business Telecommunications

29 Network Architecture

30 Signalling, Protocols and Switching

31 Transmission & Multiplexing

3.6 RESUME OF THE STANDARDS WORK

Standards required for the implementation of the European-wide ISDN service are well advanced.

In comparison with other regional standardisation organisations (in Japan and in the United States) ETSI has a leading position in ISDN standardisation matters. The ETR 10 gives a comprehensive overview on the ISM standardisation and is available from ETSI.

Wherever possible, ETSI work is based on international standards. ETSI members, owing to the advanced status of the ETSI ISDN standardisation work, have been in a position to strongly influence the shaping of ISDN standards in CCITT, in particular in the services area.

According to an analysis of the signatories of the Memorandum of Understanding ISDN, no delay for the implementation of ISDN will occur because of the present status of the standardisation work.

Notwithstanding the delays which have occurred, the already achieved standardisation work and the ensurance of the time table for the implementation of ISDN presents a major success for ETSI.

However, terminal related standards are not so advanced and more importantly, terminal standards contain many options (lack of harmonisation) which may result in incompatibilities and which will hamper the free circulation of those products.

To overcome this weakness, ETSI had establish the Strategic Review Committee (SRC on ISDN Terminals) which meanwhile has tabled its recommendations (see 6.5).

The Commission has actively supported the ISM activities and the ETSI Technical Assembly in March 1991 has decided to extend the mandate for ISM until the end of the year 1991.

Given the enormous efforts already undertaken by ETSI members and the importance of ISDN as a general public telecommunications infrastructure, the Commission is committed to continue its support for ISDN standardisation activities.

The Commission will undertake all efforts to ensure the timely availability and the full application of ISDN standards. Further analysis into the standardisation aspects which require improvement will be conducted. Better harmonised terminal standards is one key requirement.

4 PROGRESS TOWARDS THE IMPLEMENTATION OF THE EUROPEAN-WIDE ISDN SERVICE

Upon a proposal of the Commission a "Memorandum of Understanding on the Implementation of an European ISDN Service" was established at the level of CEPT[32] and has now been signed by 26 public network operators (23 in 1989) of 20 countries (18 in 1989).

It has created a unique commitment from all signatories for a harmonised and coordinated introduction of ISDN in Europe.

The main purpose of the MoU is to provide a framework for the coordination of all measures towards the completion of the objectives.

All signatories will provide at the least the following asterisk-services no later than 1993:

Circuit mode 64 kbit/s unrestricted bearer service	
Circuit mode 3.1 kHz audio bearer service	
Supplementary Services	Calling Line Identification Presentation (CLIP)
	Calling Line Identification Restriction (CLIR)
	Direct Dialling In (DDI)
	Multiple Subscriber Number (MSN)
	Terminal Portability (TP)

Table 4: Asterisk-services; provision: no later than 1993

Annex 6 contains short definitions of the *supplementary* services listed here.

Furthermore the ISDN will include bearer capabilities to support in addition a number of teleservices including telephony (3.1kHz), teletex, telefax group 4, telephony (7kHz), videotex and videophony.

Beyond the asterisk services, the MoU contains a "full list" of services for implementation.

All services, if implemented, will be introduced on the basis of harmonised ETSI standards.

Full interconnection of all ISDNs is also foreseen by the MoU.

In order to provide for the required follow up concerning the measures towards the European-wide ISDN service, a special group called IMIMG[33] was formed by the signatories.

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[32] Conférence Européenne des Administrations de Postes et des Télécommunications

[33] ISDN MoU Implementation and Management Group (IMIMG)

This group holds regular meetings and coordinates the activities. IMIMG also considers the progress of the ETSI ISM standardisation work and recently stated, that the status of this standardisation work will not lead to delays with the implementation.

At the present time it is foreseen that the European-wide ISDN service will start in the year 1993. This time target is within the limits set in the MoU.

IMIMG attaches great importance to the achievement of a high degree of harmonised service provision in the various countries. Endeavours are being made to reach agreement on priorities for new services based on ETSI standards.

Sections 2.2 - 2.13 contain information at a Member State level concerning the efforts towards the European-wide ISDN

4.1 CONCLUSION ON THE EURO-ISDN PLANNING

All public network operators in the Community have confirmed plans to introduce the EURO-ISDN no later than by 1993.

However, in order to convince (potential) ISDN users that a fully fledged EURO-ISDN happens, more information on the following aspects is required:

a) level of service interconnection

b) geographical roll-out and coverage of the EURO-ISDN

c) confirmed and stable tariffs for the EURO-ISDN

The telecommunications organisations are requested to ensure that the relevant information will be publicly available in due course.

The Commission will continue to monitor and promote the measures towards the European-wide ISDN.

5 PROGRESS OF FURTHER SPECIFIC MEASURES RELEATED TO ISDN

The progress of two specific measures relating to ISDN are discussed in this chapter:

- the application of the ONP concept to ISDN
- the proposed Directive on protection of personal data and user privacy

5.1 PROGRESS WITH OPEN NETWORK PROVISION (ONP) AND ISDN

ISDN is one of the priority areas for the application of Open Network Provision (ONP) under the ONP framework Directive[34]. The Council has called for a Recommendation on the application of ONP to ISDN, and this will complement the cooperative activity already underway by the signatories of the MoU.

ONP aims to stimulate the development and growth of a wide range of competitive services in Europe, by ensuring that there is open and efficient access and use of public telecommunications networks and services on a non-discrimination basis. This includes harmonisation of conditions for technical access as well as technical specifications, conditions under which services are supplied, and tariff conditions.

In the ONP Directive, a staged process on the application of ONP to ISDN is envisaged, covering:

- Implementation of harmonised technical interfaces and/or service features for ISDN - 1 January 1991
- Adoption by the Council of a Recommendation on the supply of technical interfaces, conditions for usage and tariff principles applying to ISDN - 1 January 1992

A reference list of relevant ISDN standards was published in the *Official Journal* on 29 December 1990[35]. The publication makes reference to 16 ETSs/ETRs in the domain of user-network interfaces, and over 50 ETSs/ETRs related to ISDN services.

The list is 'indicative' because there are a large number of standards undergoing rapid development in ETSI, and at the time of publication not all the referenced standards were adopted.

The reference list provides an open, common basis for future planning of ISDN implementations and applications, and it will be updated as necessary to reflect progress with ISDN standardisation.

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[34] Council Directive 90/387/EEC of 28 June 1990 on the establishment of the internal market for telecommunications services through the implementation of open network provision (OJ L192, 24 July 90)

[35] Official Journal 'List of standards reference' OJ 90/C 327/12, 29 Dec 90

Also in December 1990, an *Analysis Report on the Application of ONP to ISDN*, was discussed in the ONP Committee and subsequently published[36]. It was based on a study carried out for the Commission by ETCO and OVUM. The *Analysis Report* outlined the possible content of a proposal for a Recommendation. The main proposals in the *Analysis Report* were:

1) ISDN Interface standards

ONP conditions should apply at the S/T reference point, where both basic rate access (2B + D) and primary rate access (30B + D) should be made available to users.

2) Services offered

There should be a phased introduction of ISDN services, taking account of the agreements already reached in the ISDN Memorandum of Understanding (MoU) and the ETSI-ISM work programme:

Phase 1 corresponds to a harmonised minimum set of ISDN service offerings, to be offered in all networks. Phase 1 services, shown in the table below, are all covered by the ISDN MoU and are in the current work programme of ETSI-ISM.

Minimum set of ISDN offerings (Phase 1)	
Circuit mode 64 kbit/s unrestricted bearer service Circuit mode 3.1 kHz audio bearer service	
Supplementary Services	Calling Line Identification Presentation (CLIP) Calling Line Identification Restriction (CLIR) Direct Dialling In (DDI) Multiple Subscriber Number (MSN) Terminal Portability (TP)

Table 5 ONP: minimum set of ISDN offerings (phase 1)

Subsequent phases correspond to an extended set of ISDN service offerings, which will require further standards to be developed, and/or agreements to be reached between service operators.

3) Publication of Information

Information should be published and available to users on the general conditions under which ISDN services are supplied, and on target and achieved performance figures for telecommunications organisations.

4) Ordering and billing

There should be a common ordering procedure for ISDN services throughout the Community, with one stop ordering and one stop billing available to users on request.

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[36] OJ No. C 38, 14 02 91, p. 12 Notice No 91/C 38/21

5) Tariffs

Tariffs for ISDN should be cost-oriented, simple and readily understandable, non-discriminatory, independent of the application used, and as far as possible unbundled.

The *Analysis Report* was made available for public comment between February and May 1991 and, based on the Report and the comments received, a proposal for a Recommendation on the application of ONP to ISDN will be prepared for submission to Council by the end of 1991.

5.2 DATA PROTECTION AND USER PRIVACY IN ISDN

The Commission has issued in September 1990 alongside a proposal for a Council Directive on data protection in general, a second proposal for a Directive on protection of personal data and privacy in the context of public digital telecommunications networks[37].

The subject is of great importance for the European Community socio-economic development and the completion of the internal market in 1992.

Data protection issues and related questions have been identified in the ONP framework Directive 90/387/CEE as part of the essential requirements. One of the aims of this proposal for a Directive is consequently to define clearly the substance of this essential requirement in order to avoid undue restrictions to data flow communication and to ensure the provision of services Community-wide, while allowing at the same time a high level of protection for users and subscribers.

A consistent approach at European level will create an increasing feeling of confidence vis à vis the use of new telecommunications services, and help to avoid the formation of new barriers between the Member States and other countries. This is particularly true in the context of fixed and mobile networks, taking also into account the new ISDN developments.

The draft Directive seeks to guarantee telecommunications users in all Member States a basic level of protection thanks to measures to be integrated into the services provided by the new digital networks. With regard to the protection of personal data, those networks give rise to substantial specific issues which must be addressed.

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[37] COM (90) 314 Final

The specific and technical issues more closely related to ISDN and the provision of value added services are:

1) Establishment of profiles

Behind the questions of the protection of personal data and privacy a fair competition must be safeguarded between service operators. For this reason, the conditions for the use of and the disclosure for personal data will need further examination.

2) Directory issues

The Commission is launching a study on legal, regulatory, and economic aspects related to Directories in the Member States of the Community.

The Commission will scrutinize the opportunity for harmonization and liberalization in this sector at a later stage.

3) Calling Line Identification and Restriction

The basic principle behind the Commission proposal concerning calling line identification feature in ISDN, is to implement a similar level of protection for the calling and the called party.

Specific concerns are about:

- the principle of the user consent for identification or restriction on the identity of a call

- the technical aspects related to the implementation of CLI between analogue and digital networks

- the possibility for TO's to charge users for Calling Line Restriction

Developments foreseen:

In close connection with the development of the general Directive on data protection[38], it is expected that the Council will adopt the specific Directive, in particular applicable to ISDN[39] for the beginning or mid-1992.

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[38] COM (90) 314-SYN 287, 14 11 90

[39] COM (90) 314-SYN 288, 14 11.90

6 PROGRESS OF THE IMPLEMENTATION OF THE "NEW INTITIATIVES AND PROPOSALS" FROM THE SECOND PROGRESS REPORT ON ISDN

In the preceding Progress report on ISDN a number of new proposals were made.

These proposals had a particular focus: RAISING THE AWARENESS OF USERS.

The following sections give an overview on the status of the proposed initiatives.

6.1 PRESENTATION OF EUROPEAN ISDN AT TELECOM GENEVA 1991

The Telecom Geneva which took place in October 1991 was a unique opportunity to show the capabilities of ISDN.

In IMIMG, the network operators have discussed the coordination of ISDN presentations at Telecom Geneva '91.

ISDN demonstrations have been a key element in the presentations and the operators clearly informed the users, that they follow the common ETSI standards for the introduction of the EURO-ISDN.

Moreover, IMIMG has developped a common logo, used by IMIMG members at the Telecom Geneva.

With the permission of IMIMG the CEC has made use of this logo which is reproduced at the front page of this report.

6.2 EUROPEAN ISDN USER FORUM

The raising of Users awareness by involving them in the further development of ISDN offerings was the key idea for the creation of the European ISDN User Forum (EIUF).

EIUF has been created with its first Plenary Meeting on 21 September 1990 in the presence of M. Carpentier, Director General of DG XIII.

More than 140 participants, users, operators and suppliers discussed the objectives of this forum.

The charter of EIUF which was endorsed during the second Plenary Meeting on 11 - 12 March 1991, specifies the objectives of EIUF, identification of user requirements for ISDN and definition of applications suitable for ISDN.

Annex 7 presents the organisational structure of the EIUF and Annex 8 contains a chart on the flow of the work process.

The actual work in EIUF has commenced during the second Plenary , where participants met in four working groups with the following main headings:

i) networking/bandwidth

ii) customer premises equipment

iii) data, text, voice, images and graphics

iv) network management and security

A number of application scenarios have been identified (eg. the utilisation of ISDN as fall back network) and a stronger user impact on the development of standardisation was demanded.

Reports from the two Plenary meetings *and an invitation to the 3rd EIUF Plenary meeting* are available upon request from the EIUF Secretariat (address see Annex 11).

The third Plenary meeting is scheduled for 7 and 8 November 1991 in Brussels. In order to focus the activities and to enable the production of results, a number of priority areas have been identified and proposed to the meeting in November. The major topics prepared for this meeting include : audio-visual applications, LAN connectivity via ISDN, multi functional ISDN terminals, fallback/overflow scenario's and ISDN case studies. Triggered by initial presentations it is the objective to identify and prioritise user requirements in those areas.

EIUF wishes to attract more Users to become active within the forum. The support from the European Parliament and the Council for the further promotion of EIUF is invited.

6.3 EUROPEAN ISDN ATLAS

Considering that users in Europe are not yet well aware of the potential of ISDN and that they are doubtful about the timetable for the implementation of ISDN in Europe, the preparation of a European ISDN Atlas was proposed in the second progress report.

The consultancy company OVUM and FISCHER & LORENZ have been entrusted to carry out the Atlas.

The aim of the Atlas is to increase the users' awareness of the advantages of ISDN and give users the confidence to plan for ISDN which they do not have today. It is concentrated on the key elements in ISDN, stating clearly when they will be available within each country and between countries.

The Atlas is available since the beginning of October 1991. It has been presented at the Telecom Geneva '91. Moreover, it is planned to implement an "electronic version" of the European ISDN Atlas.

6.4 ISDN TERMINALS

The availability of suitable low cost ISDN terminals is indispensable for the take off of ISDN.

In the preceding ISDN Progress Report it was stated that "major European suppliers exercise constraint in the development of ISDN terminals".

ISDN terminals are fully in the domain of competition[40] which has changed dramatically the market pattern and the behaviour of economic operators.

While some promising efforts are undertaken in the area of PC-adapter cards for ISDN, European industry appears in a weak position in particular in the area of non-voice ISDN terminals.

In order to provide the necessary framework and guidance, a concept for a European-wide terminal market[41] has been presented and discussed in SOGT.

This concept outlines a scenario for terminals standards which on the one hand ensure terminal interoperability, but allows at the same time any degree of freedom for the innovation of new products and the implementation of new technologies.

A EURO-LABEL, for terminal types for which the manufacturer declares that they conform to given harmonised standards, is proposed.

The application of the EURO-LABEL is strictly voluntary, the manufacturer has the free choice to apply it or not.

This terminal concept is complementary to the new terminal directive, which addresses the regulatory domain. The proposed EURO-LABEL is distinctive to the marking described in the new terminal directive.

6.5 ETSI STRATEGIC REVIEW COMMITTEE

The strategic importance of ISDN terminals has been recognised by ETSI who in April 1990 took the decision to set up a Strategic Review Committee (SRC) to focus on ISDN terminal equipment standardisation. The objective was to gain an understanding of how ETSI could best contribute to the success of ISDN by ensuring appropriate and timely production of standards for terminal equipment.

The first SRC meeting was convened on 1 June 1990 and the report of its findings was made to the March 1991 Technical Assembly of ETSI. The recommendations to ETSI concerned both organisational aspects and aspects involving the production of standards. Recommendations to bodies other than ETSI were also made, the rationale being that for ISDN to take off, a concerted effort is needed among all the different players involved. It was also apparent from this work that the time window for the success of ISDN was very tight.

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[40] c/f Directive 88/301/EEC on the liberalisation of the terminal market

[41] the document describing this terminal concept is available from DG XIII upon request (SOGT 91/30)

Amongst the recommendations made to ETSI, the following are particularly important because of their wider impact:

Recommendation 1:

A strategic planning function related to ISDN terminal equipment should be set up, principally to collect market requirements and to propose priorities in standardisation activities based on which applications may contribute to the rapid take-off of the ISDN market. This recommendation was considered to be particularly important because the overall perception of the ISDN market is still unclear. The recommendation also stressed the need for adequate liaison with other standardisation bodies.

Recommendation 3:

To speed up the overall standardisation process, and also to give priority to work relating to terminal standards which would later become mandatory technical regulations.

Recommendations 4/5:

Standards for product interoperability and software portability and their related conformance test procedures should be accelerated.

Recommendation 6:

Asked ETSI to consider a "branding" programme for ISDN terminal equipment conforming to standards and also to consider the maintenance of a register for interoperable terminal equipment. This recommendation is being considered further within ETSI.

The outcome is likely to be that there is significant value for the customer to see a mark guaranteeing the Conformance to (voluntary) standards. However, the legal implications of using the ETSI name and logo, and the resource implications will mean that ETSI cannot undertake this work (see also section 6.6).

Recommendation 7:

Concerned the development of a set of standards on ISDN Application Programme Interfaces.

6.6 CONCLUSION ON ISDN TERMINAL EQUIPMENT

The findings of the ETSI SRC on ISDN terminals are fully supported by the Commission. There is a large degree of commonality between the SRC-Recommendations and the proposals of the Commission.

It is interesting to note that the recommendation no. 6 of the ETSI SRC on a "branding-programme" is consistent with the EURO-LABEL terminal concept outlined in section 6.4 of this report and which is currently being studied by the Commission services.

This coincidence which supports the idea of the EURO-LABEL concept for the European terminal market, encourages the study on what actions are required to best implement the proposals.

Moreover, the Recommendation no. 1 invites for a concerted pro-active approach based on market needs.

With this perspective in mind, the Commission is preparing a study which will be the first and concrete step of this approach. This study aims at the research of market needs relative to ISDN terminal equipment. On that basis, one or two ISDN terminal profiles can be developed.

Those terminal profiles, based on ETSI standards, should eventually become the basis for an implementation of a PC-based multi-functional terminal from European manufacturers. Moreover, the Community institutions and institutions in the Member States could make reference to those terminal profiles for their procurements.

A successful development of the terminal market in the Community requires the commitment from both operators (to support the corresponding services via the ISDN) and terminal manufacturers.

7 PROGRESS OF ISDN IN THE LESS FAVOURED REGIONS: STAR, TELEMATIQUE AND FUTURE PLANS

7.1 CONTRIBUTION OF THE STAR PROGRAMME IN THE IMPLEMENTATION OF ISDN

STAR is a Community programme (1987-91) designed with a total budget of 1580 million ECU, half of which is provided by the European Regional Development Fund, to give improved access to advanced telecommunications services to assist in the economic development of the less favoured regions of the Community.

The aim of STAR is to develop basic infrastructure for advanced services and to promote the supply and the demand for these services notably to increase the competitiveness of the SMEs in the developing areas of the Community.

Several areas of STAR are relevant to the implementation of ISDN:

- infrastructure
- applications
- ISDN pilot networks

A) Infrastructure

Since its beginning 4 years ago, STAR has made a significant contribution to infrastructural development, by improving regional access to the major European networks. Acceleration of the digitalization of switching and transmission equipment which is a prerequisite for the introduction of ISDN is the central objective of STAR.

In fact, all the "STAR" Member States had (before STAR) planned the digitalization of their networks with a priority for the most developed regions. STAR is boosting the investments for digitalization in the developing regions (increase of 5% to 10% due to STAR) and helped to provide major digital links not only between these regions and the core of Europe but also between the regions themselves.

STAR is thus contributing to a better balance in modern telecommunications infrastructure between the core areas and the peripheral regions of the Community (European space cohesion) with a view to preparing these regions for the "information technology era" and improving competitiveness of their enterprises.

The projects financed under STAR mainly concern digitalization of local and trunk switching, transmission, signalling and synchronization. All these elements constitute the basic prerequisites for the introduction of ISDN.

STAR actions to date

* International/inter-regional optical fibre or satellite: France (Corsica), Greece, Italy, Ireland and Portugal

* Acceleration of digitalization (switching and transmission): all countries

* CCITT N°7 signalling: Ireland and Corsica

* Network synchronization: Ireland and study in Greece

B) Applications

At this stage of STAR implementation, applications are being produced for and by SME through STAR and a significant part of them are based on digital "bearer" services and could easily migrate to ISDN when it will be available in these regions.

Examples in STAR

* Tele-CAD/CAM applications: Spain, Greece, Italy

* Graphic data transfer applications: Portugal

* Distance working applications: Ireland, Spain

* Tele-action applications: Italy, Greece

C) ISDN pilot networks

Several countries have planned in STAR to set up ISDN trials. The objectives of these trials are to analyse market reactions and to draw up commercial recommendations.

Ireland and Spain are the most advanced countries for this type of actions in STAR.

7.2 ERDF OPERATIONAL PROGRAMMES IN TELECOMMUNICATIONS

Most of these regional programmes in telecommunications deal with basic infrastructure. It is to be noted that recommendations from DG XIII (Telecommunication Policy) to the Member States has permitted the content of these programmes to be directed toward digital equipment exclusively (switching and transmission).

7.3 TELEMATIQUE

The TELEMATIQUE initiative announced in February 1991, is intended to amplify the process begun on services with STAR by encouraging the regional development of data communications through notably ISDN applications. Transnational applications could be a distinctive feature in the field.

7.4 IMPLEMENTATION OF THE MOU ON ISDN IN THE LESS FAVOURED REGIONS

The telecommunications operators are committed through the ISDN MoU to implement in their respective countries a minimum set of ISDN services and facilities.

Developing regions should not be excluded from the scope of these commitments. Furthermore, assistance could be given to operators which are willing to invest in and operate ISDN services in these regions.

Such assistance may be supported by current or future structural funds such as ERDF, FEOGA-O, etc.

7.5 FUTURE PLANS

Both STAR and TELEMATIQUE emphasize the role of advanced telecommunication systems in the harmonized development of the EC's regions by supporting regional actions toward notably the implementation of a "pan regional" EURO-ISDN.

In the light of the evaluation of STAR currently underway and of appropriate studies in the field, future actions at the initiative of the Member States or the Commission will have to be set in motion with the aim to continue the improvement of Community cohesion in the field of telecommunications, particularly through an accelerated introduction of the European ISDN (infrastructure and applications).

8 SPECIFIC ASPECTS FOR THE IMPLEMENTATION OF THE ISDN

In this section some specific aspects related to the successful introduction of the EURO-ISDN are addressed.

8.1 MIGRATION TO THE EURO-ISDN

A successful migration[42] to the EURO-ISDN has two principal components:

- the introduction of the EURO-ISDN
- the phasing out of current ISDN offerings based on national standards

While the former aspect is adequately covered under the framework of the MoU on ISDN, a coordination of the timing for the phasing out of current ISDN offerings is proposed.

The following strategy is proposed:

i) introduction of EURO-ISDN in all Member States by 1993 at the latest;

ii) no pre-MOU ISDN service will be newly introduced as of 1 January 1992 (start date of MoU ISDN);

iii) target date for the end of installations of new accesses of current national ISDN offerings: 31 December 1993 (ultimate date for the introduction of MoU ISDN);

iv) only for existing ISDN subscribers further accesses of current national ISDN implementations may be added until the end of 1995.

A clear policy for the phasing out of current national ISDN offerings coordinated at a European level and published well in advance will facilitate the planning of (potential) users to migrate to the EURO-ISDN. Coordination of technical details as to how the migration process is performed (eg. bi-lingual interfaces or backwards compatible solutions) is required.

The ISDN operators in the Community are requested to address this issue and to elaborate by the end of 1991 a coordinated migration plan containing details on the migration itself, on the commercial conditions applicable to users who want to change their terminal equipment, as well as details on the service interworking between existing ISDNs and the EURO-ISDN.

The above strategy is in line with a similar strategy in TRAC[43], which has agreed to set 31 December 1993 as the target date for ceasing the application of national ISDN type approval specifications.

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[42] the migration process is only of relevance for countries which operate a national ISDN prior to the opening of the EURO-ISDN

[43] TRAC, Technical Recommendation Application Committee, a CEPT Committee which is responsible for type approval specifications

8.2 ISDN TERMINAL TYPE EXAMINATION

The new terminal directive (91/263/EEC) which includes the full mutual recognition of conformity certificates, will have impact on terminal equipment for use in areas where the access requirements and (in justified cases) some terminal requirements are harmonised.

ISDN together with GSM terminals are such areas and will constitute the majority of the terminal equipment fully covered under the regime of this directive.

One prerequisite for the application of the new terminal directive is the availability of Common Technical Regulations (CTRs) derived from harmonised standards.

Technical Regulations, at present in the form of NETs have been developed for the relevant aspects of ISDN.

Their suitability for conversion into CTRs will be verified during 1991.

With regard to existing national ISDN offerings, type approval requirements differ amongst the different networks, because those offerings are implemented on the basis of national standards.

For the Member States with commercial ISDN offerings the situation regarding type approval can be summarised as follows:

Type approval specification			testing	remarks
MS/TO	BRA	PRA		
B	CT1/7731	CT1/7732		
D	1TR6	1TR6	ZZF, Saarbrücken	
F	STAS	STAS	CNET, Paris	based on NET 3
NL		1TR6		
BT	SIN 172 SIN 174	SIN 114 BTNR 190		
Merc.		SIN 114 BS 90/93352		

Table 6 Overview on ISDN type approval

Only France has as yet notified their ISDN type approval requirements under Directive 83/189/EEC. The other countries including the Member States which plan to introduce ISDN in the near future are requested to comply with the obligation under the quoted Directive.

With the Directive 88/301/EEC (terminal liberalisation) and the adoption of the new terminal Directive 91/263/EEC, the legal prerequisites for the free circulation of terminal equipment have been put into place.

The Commission will carefully monitor which products benefits from these achievements.

8.3 ISDN-PSPDN[44] INTERWORKING

An aspect of specific importance for data terminal users is the interworking of ISDN with X.25 networks and terminals.

Technically this is a complex matter: a number of scenarios are described in CCITT Recommendations.

Two packet mode bearer services are included in the MOU of ISDN service offering, but there is a multitude of implementation possibilities.

The draft European standard on the packet mode bearer service (PMBS) comprises nine options on how to implement a varying set of PMBS (see Annex 9).

Notwithstanding that those options generally result from different existing network situations, it can be questioned whether there is a sufficient market requirement for all these service options.

The Commission will be consulting with ETSI and IMIMG in order to reach agreement on a limited priority set of these options.

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[44] public switched packet data network

9 NEW PROPOSALS AND INITIATIVES

This chapter contains some new proposals for the further promotion on coordination of ISDN in the Community.

9.1 ANNUAL PROGRESS MEETING ON ISDN

The availability of a European-wide universal switched infrastructure is of crucial importance for the achievement of a Community where the "physical" frontiers will be abolished by the end of 1992.

The coordination of the activities towards the EURO-ISDN and the review of the progress therefore becomes increasingly important.

It is therefore proposed to hold annual meetings with the public network operators, also open for attendance by suppliers.

On the basis of the findings of the annual progress report the meetings could have the following structure:

a) review of the measures towards the EURO-ISDN

b) review of the standardisation

c) discussion of planned interconnections

d) new proposals.

The meeting should be held soon after the release of the annual report and would be organised by the Commission.

9.2 SUPPORT FOR ISDN APPLICATIONS FOR SME's

With the completion of the Single Market economic operators in the Community will encounter new opportunities but also new challenges.

Good crossborder communication is a key requirements for success in the Single Market.

SME's rely largely on the availability of a public telecommunications infrastructure and suitable services and applications supported by the infrastructure.

Unlike bigger enterprises or public administrations SME's, however, encounter difficulties with the definition and implementation of suitable applications, notably if they are intended for international purposes.

In this context the Commission envisages to present proposals destined at the support of the usage of ISDN by SME.

9.3 ISDN AS "TRANS-EUROPEAN NETWORK"

In response to the wishes expressed by the Strasbourg and Dublin European Councils (December 1989 and June 1990 respectively) and to the Council resolution of 22 January 1990[45] the Commission has proposed to the Council a Community action programme for the creation of trans-European infrastructure networks[46].

In this proposal for an action programme particular attention is paid to the establishment of genuine interconnected and interoperable trans-European telecommunication networks for the benefit of citizens, enterprises and administrations operating in an area without internal frontiers as required by Article 8A of the EEC Treaty.

ISDN in general and EURO-ISDN in particular is well suited to support a wide range of telematic services and applications. It is for this reason that the Community should continue to support the availability of ISDN as a harmonized EC-wide infrastructure.

A proposal to implement the trans-European network action programme in the field of ISDN is studied by the Commission.

9.4 EC - JAPAN ISDN INTERCONNECTION EXPERIMENT

Global telecommunications is of increasing importance in global markets. While CCITT has standardised ISDN, regional standardisation includes the further refinement of CCITT Recommendations.

This may lead to some incompatibilities between ISDNs in the various regions.

In order to check the end to end compatibility of ISDN terminal equipment under "live" circumstances, the MPT of Japan has proposed to the Community to conduct an ISDN Interconnection Experiment (IIEX).

Annex 10 provides further detail on the scope of this proposal.

The Commission has considered and discussed this proposal with the Japanese side. A number of mutual benefits are seen in the proposal and European terminal manufacturers and the public ISDN providers are invited to participate in this experiment.

The Commission will conduct discussion with terminal manufacturers and network operators so as to investigate in the feasibility of the proposal.

9.5 NATIONAL NETWORK SIGNALLING

Interconnection of ISDN implementations depends, amongst other factors, on the definition and availability of a suitable signalling protocols for international ISDN circuits

International interconnection has always been one objective of the Community's ISDN policy.

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[45] OJ C27 of 6 February 1990

[46] COM(90)585 of 10 December 1990

In an early phase the so called enhanced Telephone User Part (TUP +) of Signalling System No. 7 was recommended. For the EURO-ISDN, the ISDN User Part, version 1 is the agreed specification.

In order to cater for the crossborder offering of ISDN services, suitable national network signalling systems which support the full range of services are required.

Today those national ISDN signalling systems are not harmonised and consequently costly conversion facilities are required to ensure the "interworking" between the national signalling and the one used over international circuits.

The responsible committee in ETSI (SPS 1) has started studies on the harmonisation of a network signalling system for national application.

Given the enormous potential advantages, the public network operators should be encouraged to investigate into the feasibility of an eventual alignment of the national ISDN network signalling systems and an eventual plan for implementation.

It is recognised that such an alignment would be an immense task which will probably expand over one or two decades.

9.6 TARIFF CONSIDERATIONS

Beside the availability of low-cost terminal equipment, tariffs are the most decisive aspect for an eventual migration to ISDN. Tariffs are one of the three main elements of Open Network Provision.

Tariff principles have already been recommended by the Council in 1986 and are also covered in the ONP Directive (90/387/EEC). Those tariff principles are often applied, but not in all cases.

More important is:

- that in some countries tariffs are either not available at all or tariffs are not considered as stable

- furthermore, that tariff structures are not harmonised amongst Member States.

Without any prejudice to the freedom of network operators to define tariff structures and to set tariff levels it is crucial, that stable tariff information is available even in advance of the service offering.

With regard to the introduction of the EURO-ISDN, the network operators are therefore invited:

- *to set and publish in advance of the commencement of commercial availability the tariffs applicable to the EURO-ISDN.*

The tariff recommendations contained in the Document 659/86/EEC and the deliberations of the forthcoming discussion on ISDN tariffs, when proposals for an ONP ISDN Recommendation and an ONP Telephony directive will be discussed, should be taken into account.

10 CONCLUSION

1991 has seen considerable extension of current national ISDN implementations but commercial offerings are still only available in five Member States.

Existing ISDN are not fully harmonised and international interconnection is behind expectation.

Considerable efforts are devoted to the preparatory work for the introduction of a truly European-wide ISDN service in the framework of the MoU on ISDN, the so-called EURO-ISDN.

Managed by the ISM, the standardisation work in ETSI related to the EURO-ISDN has made good progress.

No further delay with the introduction of the EURO-ISDN owing to delays in ETSI *the standardisation work* will occur.

However, in order to convince (potential) ISDN users of the benefits and the usefulness of migrating to the EURO-ISDN, more reliable information on the availability, interconnection, services interworking and tariffs is required.

To this end the signatories of the MoU are asked to provide detailed information on these aspects.

The support of the coordinated introduction of ISDN continues to be the focal point towards the development of a Community-wide network integrity, the first objective of the Council Resolution of 30 June 1988 (88/C 257/01).

The EURO-ISDN has the unique chance to develop into the:

- **general switched telecommunications network**

for the business and the residential subscriber areas, provided it will be:

- **compatible, ubiquitous and interconnected**

at a European-wide level.

The Commissions activities for the EURO-ISDN will focus on *four* areas:

- finalisation of MoU standards
- promotion of the EURO-ISDN
- availability of suitable ISDN terminals.
- support for applications for ISDN

In the context of the action plan concerning the implementation of the "trans-European networks" which is currently prepared by the Commission, ongoing support to the availability of an EC-wide ISDN-infrastructure and measures for the improvement of the telematic services will be proposed.

This report has been prepared by the Commission of the European Communities and will be submitted to the European Parliament and the Council with the request for opinions.

ANNEX A

Community documents relevant to ISDN

1. Council Recommendation 86/659/CEE of 22 December 1986 on the coordinated introduction of the integrated services digital network (ISDN) in the European Community (O.J. N° L 382, 31.12.86, p. 36).

2. Communication from the Commission concerning the implementation of Council Recommendation 86/659/EEC on the coordinated introduction of the integrated services digital network (ISDN) in the European Community - First annual report from the Commission to the European Parliament (COM(88)589 final of 31 October 1988).

3. Council Resolution 89/C 196/04 of 18 July 1989 on the strengthening of the coordination for the introduction of the Integrated Services Digital Network (ISDN) in the European Community up to 1992 (O.J. N° C 196, 1.8.89, p. 4).

4. Progress report 1989 concerning the co-ordinated introduction of the integrated services digital network (ISDN) in the European Community (COM(90)123 final of 23 March 1990).

5. Proposal for a Council Directive concerning the protection of personal data and privacy in the context of public digital telecommunications networks, in particular the integrated services digital networks (ISDN) and public digital mobile networks (COM(90)314 final of 13 September 1990).

6. Proposal for a Council Recommendation on the provision of harmonised ISDN access arrangements and a minimum set of ISDN functionalities in accordance with open network provision (ONP) principles. (in preparation)

ANNEX B

GLOSSARY OF TECHNICAL TERMS

Addressing	The process by which a calling user indicates the identity of the called user on a particular call. It includes a network addressing (numbering) component to identify the called user-network interface and may include further information (sub-address) to identify a particular terminal beyond the public network.
"B"-channel	For user-to-user information transport.
Basic access	Physical interface structure available at S or T reference point: 2x64 kbit/S "B" channels and 1x16 kbit/s "D" channel. In some configurations S and T reference points are joined.
Bearer Service	A type of telecommunications service that provides the capability for the transmission of signals between user network interfaces.
Bit rate	Number of bits (units of messages) transmitted per second.
Calling Line Identification	Indicates the identification of the calling user line.
CCITT	International Telephone and Telegraph Consultative Committee (ITU)
CCITT Blue Book	Series of CCITT publications due to be adopted by the CCITT Plenary Assembly in 1988, in Melbourne.
CEPT	European Conference of Postal and Telecommunications Administrations
"D"-channel	For user-to-user and user-network signalling information transport
ETS	European Telecommunications Standard
ETSI	European Telecommunications Standards Institute, established in March 1988 and located in Sophia-Antipolis near Nice
GAP	Analysis and Forecasting Group (subgroup of SOGT). Issues a report on ISDN in 1985 as a basis for the Council Recommendation.

Green Paper	Green Paper on the Development of the Common Market for Telecommunications Services and Equipment [COM(87)290], published in June 1987. Outlines the Commission's position on the development of the Community's telecommunications policy and the proposals to reach the 1992 target in this sector, including required regulatory change at EC level.
ISDN	Integrated Services Digital Network
ISPABX	private Automatic Branch Exchange for Integrated Services
ISUP or ISDN-UP	ISDN User Part = part of the N° 7 signalling systems allowing ISDN facilities.
NET	("Normes Européennes des Télécommunications") an approved technical specification recommendation
Numbering	see "Addressing"
ONP	Open Network Provision, concept for the definition of general requirements for the use of the Telecommunications Administrations' network infrastructure and/or services including technical interfaces, tariff principles and conditions of use
Primary access	Physical interface at T reference point
PSPDN	Packet Switched Public Data Network
Quadripartite Collaboration	Close collaboration for the co-ordinated introduction of ISDN between the Telecommunications Administrations of France, FRG, Italy and UK
Reference Point	A conceptual point at the conjunction of functional groups of the telecommunications network
Signalling System N° 7	The new CCITT system allowing two switching centres to exchange information, e.g. information needed for establishing a telephone call
SOGT	Senior Officials Group on Telecommunications (EEC)
S/T reference Point	Possible location of access for Bearer Services supported by an ISDN
TUP	Telephone User Part = part of the N° 7 signalling system allowing telephony
TUP+	Extended TUP, allowing in addition to traditional telephony use of a 64 kbit/s bearer service.

Table 2.5.1 International ISDN connections from EEC countries prior to 1993

To: / From:	Belgium	Denmark	France	Germany	Greece	Ireland	Italy	Luxem-bourg	Nether-lands	Portugal	Spain	UK	Japan	USA
Belgium			1990 TUP(J)	1991 TUP(J)					1991 TUP(J)			1991 TUP(J)	1991 TUP(J)	1991 TUP(J)
Denmark			1990 TUP+	1992 TUP+					1992 TUP +			1992 TUP+		1992 TUP+
France	1990 TUP	1990 TUP+		1990 TUP+			1991 TUP+		1991 TUP		1991 TUP	1991 TUP+	1990 TUP	1990 TUP
Germany	1991 TUP	1992 TUP+	1990 TUP+				1991 TUP+		1990 TUP+			1991 TUP+	1991 TUP+	1991 TUP+
Greece														
Ireland														
Italy			1991 TUP+	1991 TUP+					1992 TUP +			1991 TUP+		
Luxem-bourg														
Nether-lands	1991 TUP	1992 TUP +	1991 TUP	1990 TUP+			1992 TUP +				1992 TUP	1991 TUP	1991 TUP	1991 TUP
Portugal														
Spain			1991 TUP						1992 TUP			1992 TUP	1992 TUP	1992 TUP
UK	1991 TUP	1992 TUP+	1991 TUP+	1991 TUP+			1991 TUP+		1991 TUP		1992 TUP		1991 ISUPv1	1991 ISUPv1

Notes:
1 All inter-connections not shown between EEC countries in the table are planned to be implemented in 1993
2 All inter-connections between EEC countries planned to be upgraded to ISUP version 1 or version 2 by 1993

Table 2.5.1 International ISDN connections from EEC countries prior to 1993 (continued)

From : \ To :	Austria	Cyprus	Finland	Norway	Sweden	Switzerland	Yugoslavia	Turkey
Belgium			1991 TUP (J)	1991 TUP (J)	1991 TUP (J)	1991 TUP (J)		
Denmark								
France			1991 TUP	1991 TUP	1991 TUP	1991 TUP		
Germany								
Greece								
Ireland								
Italy								
Luxembourg								
Netherlands	1992 TUP		1991 TUP	1991 TUP	1991 TUP	1991 TUP		
Portugal								
Spain								
UK			1991 TUP	1991 TUP	1991 TUP			

1 All inter-connections not shown between European countries in the table are planned to be implemented in 1993. The European countries shown are those whose TOs are MoU signatories.

2 All inter-connections between the European countries shown are planned to be upgraded to ISUP version 1 or version 2 by 1993.

Annex 2

	ISDN offering		PLUG		No. of subscribers	country-wide cover	No of int.destinat.	Serv. conformant to ETS
	pilot	commercial	BRA	PRA				
Belgium		28.06.89	ISO 8877		350 BRA (3) 10 PRA	beg 1993	4 (3) + 8 (4)	* : by 92
Denmark	in 1989		ISO 8877	BNC	700 BRA (3)	beg 1992	(5)	*+ : by 92
France		21.12.87	ISO 8877	ISO 8877	10425 BRA (6) 2060 PRA	mid 1990	5 (3) + 11 (4)	all MoU : by 93
Germany		march 89	ISO 8877 (*)	ISO 8877 (*)	39000 BRA (6) 3550 PRA	end 1993 (7)	6 (3) + 4 (4)	all MoU + : by 93/94
Greece	by 92							*+ : by 93
Ireland	beg 91		RJ 45					? : by 93
Italy	beg 91							*+ : by 93 ++ : by 95
Luxembourg						by 1993		* : by 93
Netherlands	10/82	12/91			500 BRA (3)		1 (3)	*+ : by 93
Portugal	end of 91		ISO 8877 (1) ISO 8877 (2)	ISO 10173 (1) (2)		by 1995		? : end of 1992
Spain	1990		ISO 8877	ISO 8877				? : 1h/91 all MoU : 93/94
UK BT		1985 [1]	RJ 45	BNC	600 BRA (3)		+ 18 (4)	* : 1991 [2] all MoU : 93
UK Merc.		1988	////////	BNC			5 (3)	*+ : 1992

(*) in the futur
(1) for CCT network
(2) for TLP network
(3) at 31.12.90
(4) for 1991
(5) 23 interconnections planned for 1992/1993
(6) at 30.06.91
(7) end 1995 for ex Eastern Germany
//// no offering of service

95

ISDN Tariffs

IN COUNTRY CURRENCY	BRA Installation	BRA Monthly	PRA Installation	PRA Monthly	VOLUME (Voice calls) local call (3 min)	VOLUME (Voice calls) nation. long dist. call (/min)
Belgium	12000 FB	1175 FB (a) (c) 4175 FB (b) (c)	395 000 FB (d)	14 100 FB (a) (c) 17 100 FB (b) (c)	6 FB (n)	9 FB (n)
Denmark						
France	675FF	300FF (e)	4200FF	104 FF/channel (mini 960 FF) (f)	0,615 FF (m)	2,17 FF (m)
Germany	130 DM (g)	74 DM (h)	200 DM (g)	518 DM (h)	0,69 DM (m)	0,86 DM (m)
Greece (p)						
Ireland (p)						
Italy (p)						
Luxembourg (p)						
Netherlands	800 fl	85 fl	8000 fl	850 fl	0,1725 fl	0,1911 fl (q)
Portugal (p)						
Spain (p)						
UK (BT)	400 £	21 £ (i)	4249,5 £.(j) (k)	223,5 £(i) (l)	0,168 £ (m)	0,126 £ (o)(m)
UK (Merc.)	////////	////////	2750 £ (e)	2888 £	0,132 £	0,102 £

annex 3 B

Warning :

Owing to the differences of the structure of the ISDN tariffs and further facility dependant specificities, this table can only give a simplified overview of the tariffs in the Member States. For full information please refer to the tariffs published by the network operators

(a) For circuit switching

(b) For circuit and. packet switching

(c) rental only by a two months period

(d) discount if installed access lines or for additional system

(e) discount for additional access

(f) 32 FF/channel B incoming

(g) additional fees for access to DATEX-P : 65 DM

(h) additional fees for access to DATEX-P 140 to 340 DM

(i) rental only by a four months period

(j) discount of 500 £ if existing cable

(k) 141,65 £ per additional channel

(l) 7,45 £ per additional channel

(m) idem as per telephone service

(n) 6 FB/unit - 0,50 FB/attempt

(o) + 4,2 p for the first minute

(p) no commercial ISDN service

(q) + 0,0825 fl for call reply

//// no offering of service

ISDN Tariffs

IN ECU	BRA Installation	BRA Monthly	PRA Installation	PRA Monthly	VOLUME (Voice calls) local call (3 min)	VOLUME (Voice calls) nation. long dist. call (/min)
Belgium	284,33	27,84 (a) (c) 98,92 (b) (c)	9359,15 (d)	334,09 (a) (c) 405,17 (b) (c)	0,14 (n)	0,21 (n)
Denmark						
France	96,76	43,00 (e)	602,05	14,91/channel (mini 137,61) (f)	0,09 (m)	0,31 (m)
Germany	63,48 (g)	36,14 (h)	97,66 (g)	252,95 (h)	0,34 (m)	0,42 (m)
Greece (p)						
Ireland (p)						
Italy (p)						
Luxembourg (p)						
Netherlands	346,56	36,82	3465,65	368,22	0,07	0,08 (q)
Portugal (p)						
Spain (p)						
UK (BT)	569,73	29,91 (i)	6052,66 (j) (k)	318,34 (i) (l)	22,93 (m)	17,95 (o) (m)
UK (Merc.)	/////////	/////////	3916,89 (e)	4113,44	0,19	0,14

annex 4 B

Warning :

Owing to the differences of the structure of the ISDN tariffs and further facility dependant specificities, this table can only give a simplified overview of the tariffs in the Member States. For full information please refer to the tariffs published by the network operators

(a) For circuit switching

(b) For circuit and. packet switching

(c) rental only by a two months period

(d) discount if installed access lines or for additional system

(e) discount for additional access

(f) 4,59 ECU/channel B incoming

(g) additional fees for access to DATEX-P : 31,74 ECU

(h) additional fees for access to DATEX-P 68,36 ECU to 166,03 ECU

(i) rental only by a four months period

(j) discount of 712,16 ECU if existing cable

(k) 201,75 ECU per additional channel

(l) 10,61 ECU per additional channel

(m) idem as per telephone service

(n) 0,14 ECU/unit - 0,01 ECU/attempt

(o) + 0,06 ECU for the first minute

(p) no commercial ISDN service

(q) + 0,04 ECU for call reply

//// no offering of service

Foreign exchange rate used to convert country currencies in ECU

1 ECU = 42,204700 FB

1 ECU = 2,047840 DM

1 ECU = 6,976120 FF

1 ECU = 0,702088 £

1 ECU = 2,308370 fl

ANNEX 5

European Telecommunications
Standards Institute

ISM (90)06
Issue 9 January 1991

ETSI
Source: PT17

STATUS LIST

STATUS CLASSES

0	Status of draft unknown
1	No draft available
2	Rapporteur's draft or part draft, not discussed in STC
3	20% complete
4	50% complete
5	80% complete
6	Complete text, awaiting consistency checking
7	Approved by STC
8	Approved by TC
9	Out for public comment
10	Out for ballot
11	Adopted
12	Published

NOTE 1: "DATE 4" indicates the date of receipt of comments by the TC Chairman after the P.E. phase (to be indicated by ETSI Secretariat).

NOTE 2: "EDIT":

N= No editing required; PNE rules assumed to be met.

A= Editing required (prior to the public enquiry)

B= Editing required (during the public enquiry phase)

C= No editing as PNE rules shall not be applied to this standard (Note: shall be an exception).

NOTE 3: "TYPE": Either a (S)tandard, or a (R)eport, or an (I)tem

NOTE 4: For Status 9 and 10, a list with information on P.E. and VO dates is attached to this document.

4.1 *Number Identification supplementary services* (Recommendation I.251)

I.251.1 **Direct Dialling In (DDI)** is a supplementary service which enables a user to directly call another user on a ISPBX or other private system without attendant intervention.

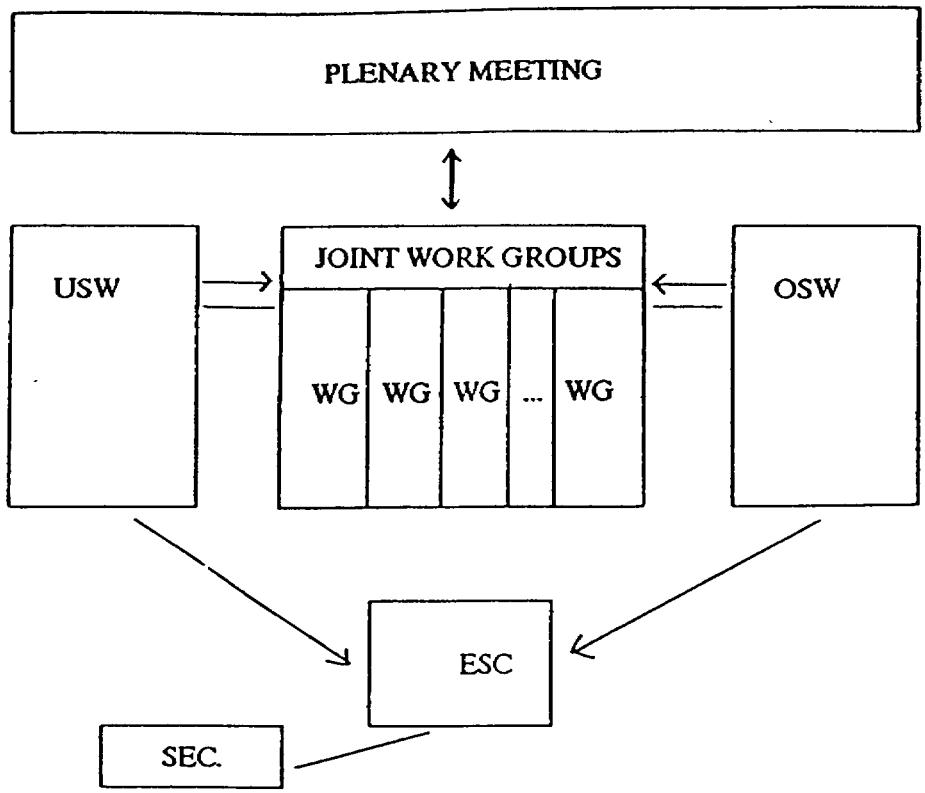
I.251.2 **Multiple Subscriber Number (MSN)** is a supplementary service which provides the possibility for assigning multiple ISDN numbers to a single interface.

I.251.3 **Calling Line Identification Presentation (CLIP)** is a supplementary service offered to the called party which provides the calling party's ISDN-number, possibly with sub-address information, to the called party.

I.251.4 **Calling Line Identification Restriction (CLIR)** is a supplementary service offered to the calling party to restrict presentation of the calling party's ISDN-number and sub-address to the called party.

Terminal Portability (TP)

ANNEX 7



Abbreviations:

USW = User Work Shop

JWG = Joint Work Group

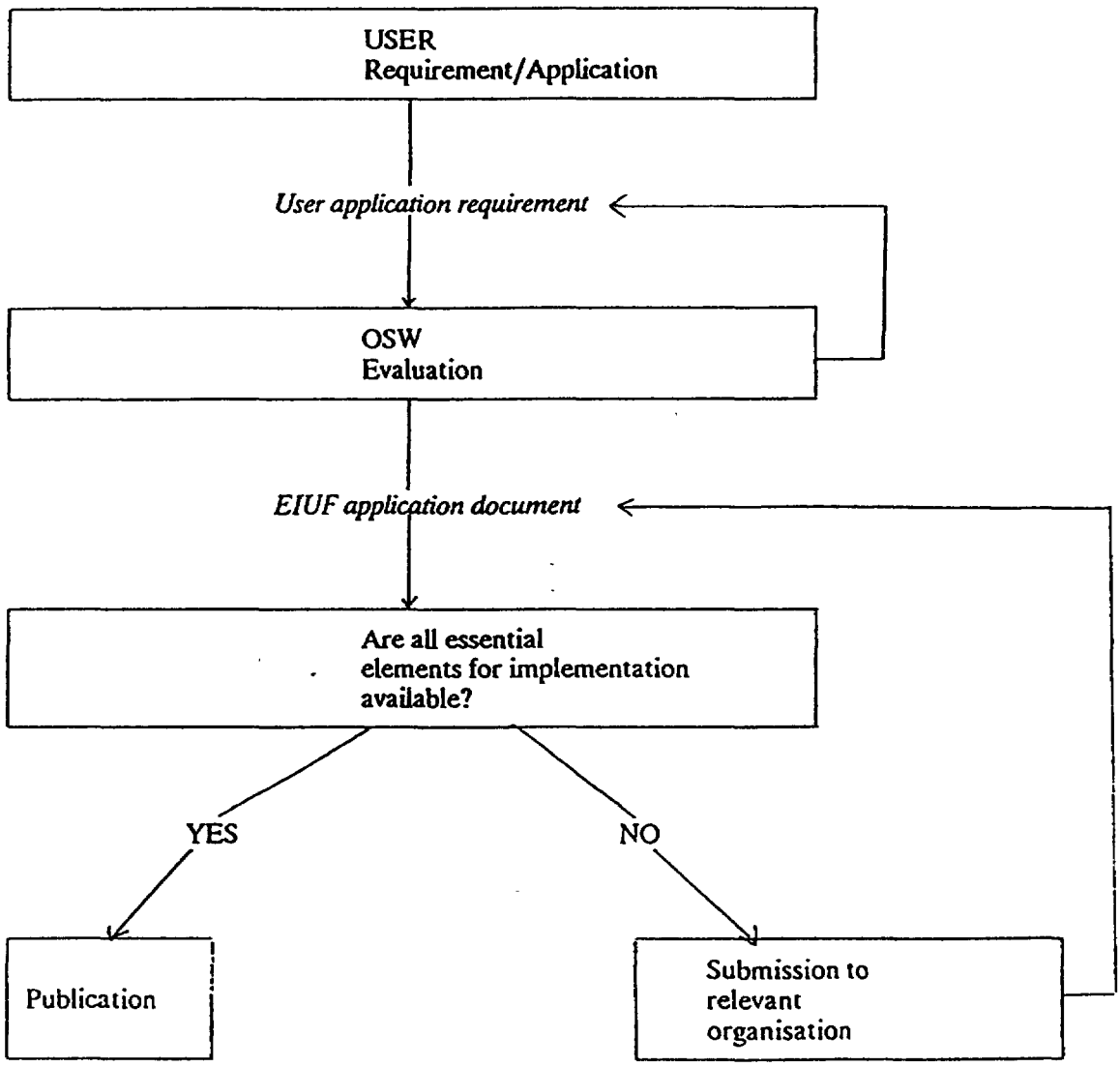
WG = Working Group

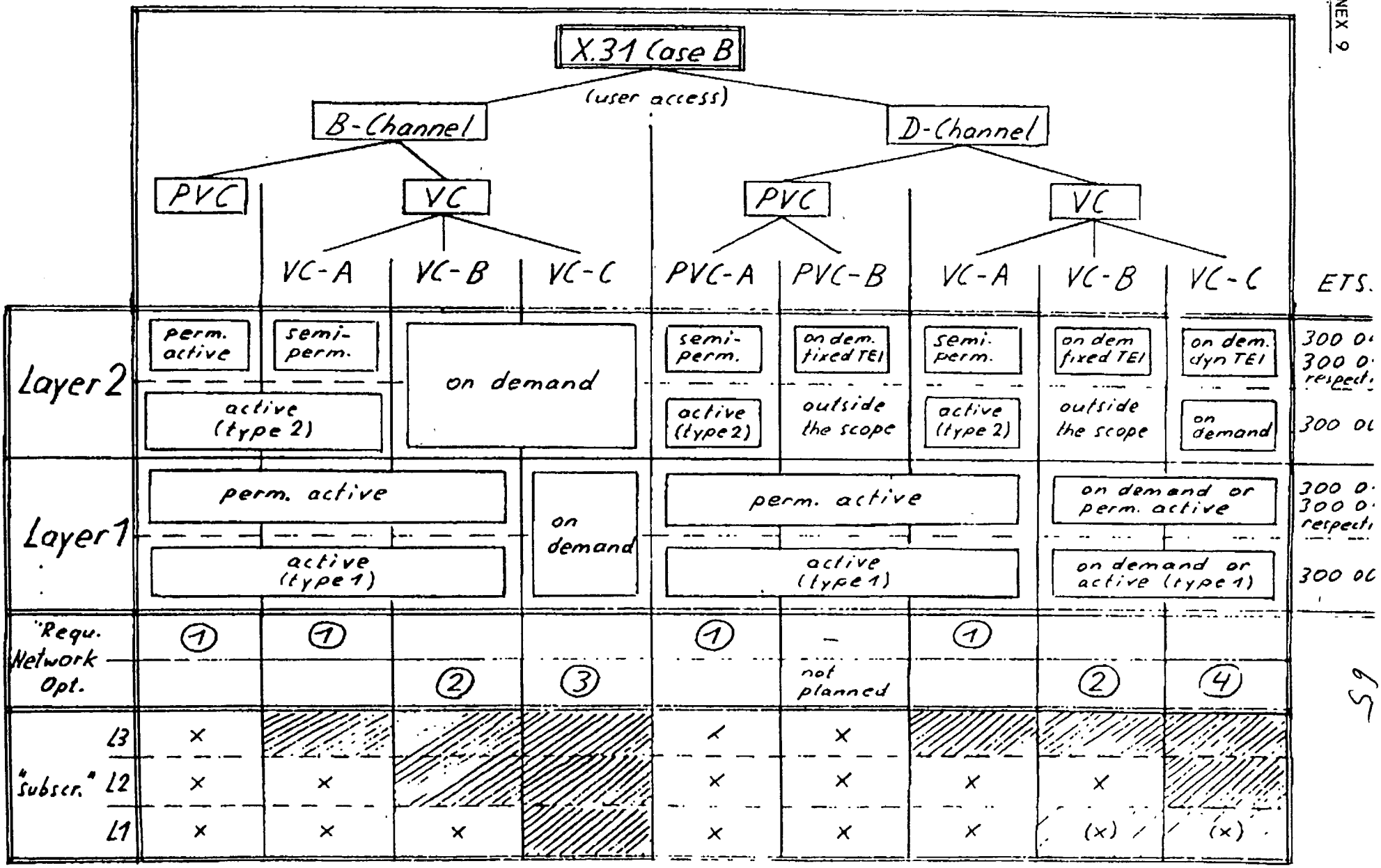
OSW = Operators & Suppliers Workshop

ESC = Executive Steering Committee

Sec. = Secretariat

Principal flow of Work Process in EIUF





× .. definition of the relevant values at subscription time

ANNEX 10

8 August. 1990 (Ver.2)

Draft proposal for Interregional Interconnection Experiments for ISDN Systems

1 Objects

One of the key issues for the development of ISDN is to ensure interoperablity of networks and terminals both at national and international level. To achieve this. a couple of measures have been taken in the field of standardization and implementation.

In the field of standardization national/regional activities are strengthened in addition to the international activities in CCITT and etc.. Further Interregional Telecommunications Standards Conference to support CCITT's standardization activities started February 1990 as an interregional activity in the field of standardization. However. there is no integrated interregional activity to harmonize implementation of ISDN systems although some national/regional activities exsist.

The objects of this interregional interconnection experiments are to harmonize implementation of ISDN systems through the cooperation and information exchanges among participants and as a result to ensure higher end-to-end interoperability of ISDN systems.

2 Scope of the experiments

The scope of the experiments covers interregional interconnection trials among ISDN terminals based on internationally or interregionally harmonized standards. In this process, interconnection of networks using No. 7 signalling system with ISUP will be promoted to realize higher degree of end-to-end interoperability of ISDN terminals.

3 Organization and participation

Organization of the experiments consists of the Interregional Committee, Network to Network Interconnection WG and Terminal to Terminal Interconnection WGs (see the chart in Annex). The Committee and WGs are responsible for the interregional coordination for the experiments (For detailed mandate of the Committee and WGs. see section 4 of this proposal). It is advisable that each nation/region has a coordination group(s) to coordinate nationally/regionally and contribute to interregional level. Participation to the interconnection experiments should be open to every institution and person who support the objects of this project and who has technical and financial capability to

fulfil the experimcnts.

4 Procedures

4.1 Selection of terminals/services to be experimented and scheduling

Selection of terminals/services (including relevant standard(s)) and schedule for the experiments will be determinied in the Interregional Committee. Detailed interregional coordination, for example selection of test items and detailed scheduling, will be coordinated at Working Group level.

4.2 Network to network interconnection

Network operators are invited to prepare necessary international links for the experiments. Network to Network Interconnection WG will be used, if necessary, to exchange information and to carry out necessary coordination for interconnecting networks.

4.3 Network to terminal interconnection

Network operators are encouraged to announce their user-network interface to terminal suppliers well in advance. As a prerequisite of end-to-end experiments, network to terminal interconnection capability should be checked in each nation/region following the legal and non-legal processes in each nation/region.

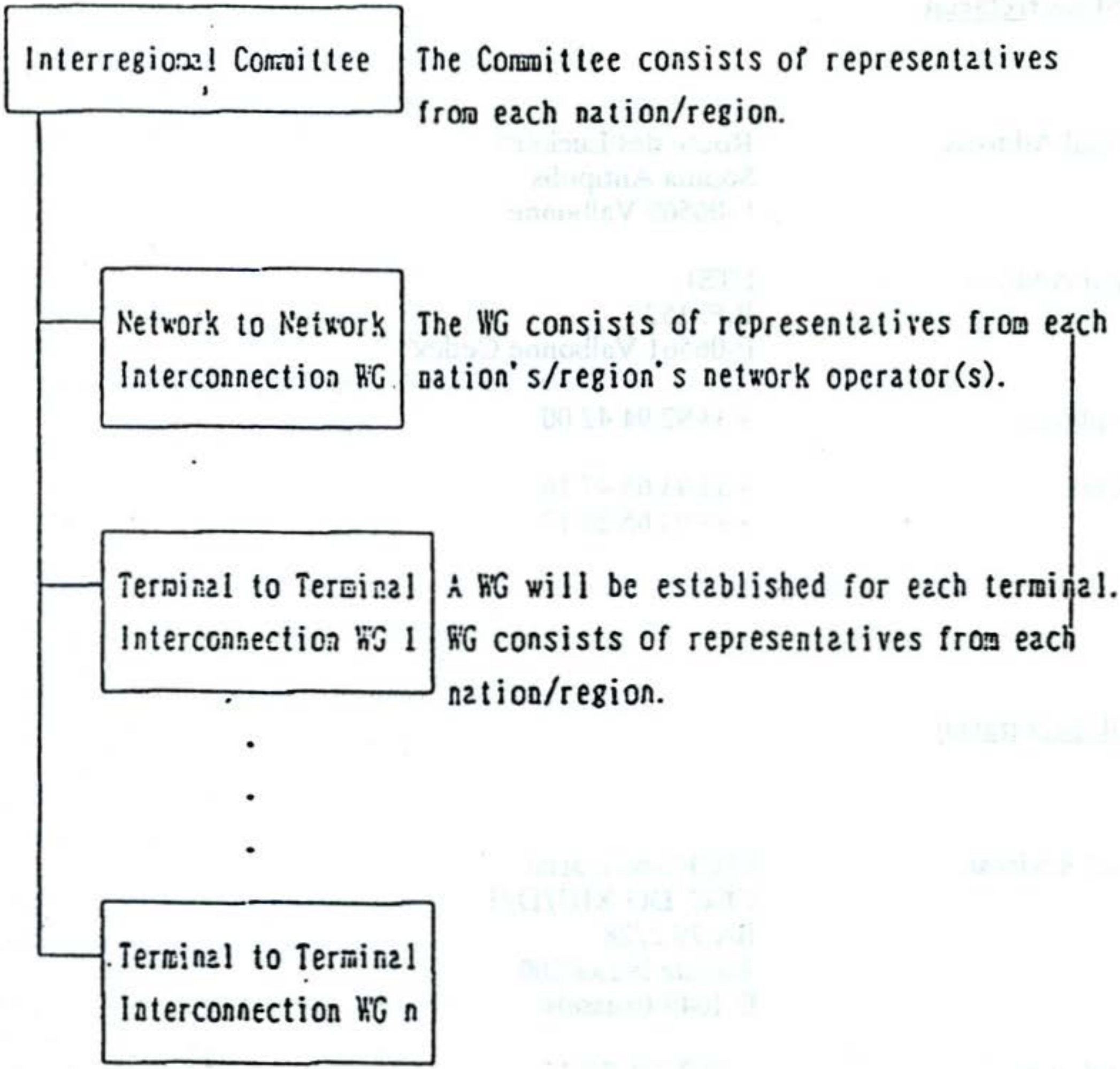
4.4 Terminal to terminal interconnection

In responce to the decision taken in the Interregional Committee and considering network to network interconnection capability, test items and detailed scheduling will be decided in the relevant Terminal to Terminal Interconnection Working Group. The end-to-end experiments may be carried out among terminals reasonably selected in each nation/region when too many terminals participate in the experiment.

4.3 Liaison with relevant standardization bodies

In case some amendments and/or supplements are required to the standards, participants are encouraged to contribute to relevant standardization body(ies) through mechanism established in each nation/region.

Annex


Interregional Committee
The Committee consists of representatives from each nation/region.
Network to Network Interconnection WG
The WG consists of representatives from each nation's/region's network operator(s).
Terminal to Terminal Interconnection WG 1
A WG will be established for each terminal. WG consists of representatives from each nation/region.
Terminal to Terminal Interconnection WG n

ANNEX 11

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