# ETSI EG 201 730-1 V2.1.4 (2006-03)

ETSI Guide

Terminals' access to Public Telecommunications Networks; Application of the Directive 1999/5/EC (R&TTE), article 4.2; Guidelines for the publication of interface specifications; Part 1: General and common aspects

ETSI

Reference

REG/AT-010137

Keywords

access, ISDN, POTS, PSTN, regulation, terminal

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

Individual copies of the present document can be downloaded from:
http://www.etsi.org

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at
http://portal.etsi.org/tb/status/status.asp

If you find errors in the present document, please send your comment to one of the following services:
http://portal.etsi.org/chaircor/ETSI_support.asp

Copyright Notification

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://webapp.etsi.org/IPR/home.asp).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This ETSI Guide (EG) has been produced by ETSI Technical Committee Access and Terminals (AT).

The present document is part 1 of a multi-part deliverable covering Terminals' access to Public Telecommunications Networks; Application of the Directive 1999/5/EC (R&TTE), article 4.2; Guidelines for the publication of interface specifications, as identified below:

> **Part 1:** **"General and common aspects";**
>
> Part 2: "Analogue narrow-band wire-line interfaces";
>
> Part 3: "Digital wire-line interfaces";
>
> Part 4: "Broad-band multimedia cable network interfaces".

Introduction

This multi-part deliverable is based on the information from the following documents:

Table 1: Interface specifications under Directive 1999/5/EC [1]

TR 101 730 [18]	Publication of interface specification under directive 1999/5/EC; Guidelines for describing analogue interfaces
TR 101 731 [19]	Access and Terminals (AT); Digital access to the public telecommunications network; Publication of interface specification under Directive 1999/5/EC; Guidelines for describing digital interfaces
TR 101 845 [20]	Fixed Radio Systems; Technical Information on RF Interfaces applied by Fixed Service Systems including Fixed Wireless Access (FWA) in the light of the R&TTE Directive (article 4.2)
TR 101 857 [21]	Access and Terminals (AT); Broadband access to the Public Telecommunications Network; Publication of interface specification under Directive 1999/5/EC, art. 4.2; Guidelines for describing Multimedia Cable Network Interfaces
EG 201 838 [22]	ElectroMagnetic Compatibility and Radio Spectrum Matters (ERM); Publication of interface specifications under Directive 1999/5/EC; Guidelines for describing radio access interfaces

The experience of the application of the above mentioned documents and therefore of the article 4.2 of the R&TTE Directive [1] demonstrated that the relevant guidance being distributed by several documents may lead to different interpretations of the same principle implying difficulties for the market players.

Additionally some misunderstandings were identified, e.g. some confusion between the contents of the articles 4.1 and 4.2 of the R&TTE Directive [1], and additional guidance introduced to reduced the negative impact of these issues.

The fact that the regulatory definition of the Network Termination Point (NTP) was changed in the Directive(s) applicable to Telecommunications Networks and the new definition is clearly converging with the one earlier established by the R&TTE Directive [1], determined also somehow the obsolescence of some parts of above mentioned deliverables and therefore the need of updating the contents.

It is nevertheless recognized that different technologies need different type of clarifications to facilitate the correct application of the legislation.

The R&TTE Directive [1] introduced a fundamental change in the area of terminal equipment inter-working with public telecommunications networks. Formerly there were specifications that applied to terminal equipment ensuring, to varying degrees of confidence, inter-working with and via different networks.

As a consequence of the R&TTE Directive [1] an obligation is placed on Public Network Operators (PNO) to publish specifications of network interfaces they provide to the end user, whatever is the connection of the end user with the PNO, direct or indirect. Consequently Public Service Providers (PSPs) such as Internet Service Providers (ISPs) should also publish their interface specifications.

The R&TTE Directive [1], article 4.2 states:

"...Member States shall ensure that such operators publish accurate and adequate technical specifications of such interfaces before services provided through those interfaces are made publicly available, and regularly publish any updated specifications. The specifications shall be in sufficient detail to permit the design of telecommunications terminal equipment capable of utilizing all services provided through the corresponding interface. The specifications shall include, inter alia, all the information necessary to allow manufacturers to carry out, at their choice, the relevant tests for the essential requirements applicable to the telecommunications terminal equipment. Member States shall ensure that those specifications are made readily available by the operators."

However, it recognized that PNOs can only publish information under their direct control or which has been disclosed to them.

This multi-part deliverable describes the obligation on PNOs as determined by the R&TTE Directive [1] for the publication of radio access interfaces. There has been an extensive discussion on the content of this multi-part deliverable, using documents provided from the TCAM and ADHoc groups of the European Commission.

The publication of a series of Directives "electronic communications networks and services" changed the regulatory environment and clarified in particular the relationship with the R&TTE Directive [1]. This overruled some earlier definitions, e.g. the one of Network Termination Point (NTP) which is of central importance for the application of the article 4.2 of the R&TTE Directive [1].

There was also generally identified a need to improve the application of this article 4.2 of the R&TTE Directive [1] on the market and it is believed that a more consistent set of information and guidance will facilitate an improvement of the situation.

1 Scope

The present document gives guidance on the procedures that Public Network Operators (PNOs) should follow when publishing technical information about their publicly offered Telecommunications access interfaces as a result of the application of the Radio Equipment and Telecommunications Terminal Equipment (R&TTE Directive [1]).

The present document is applicable to the obligations placed upon fixed and mobile PNOs in publishing publicly offered Telecommunication access interfaces, what the publication should contain, and any legal issues that have to be resolved in publication.

The present document does not specify how proprietary interfaces which are not in the public domain are published but may facilitate some aspects of the publication of the interface characteristics for such documents.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

[1]   Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).

[2]   Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities (Access Directive).

NOTE: OJ L 108, 24.4.2002.

[3]   Directive 2002/20/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services (Authorisation Directive).

NOTE: OJ L 108, 24.4.2002.

[4]   Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive).

NOTE: OJ L 108, 24.4.2002.

[5]   Directive 2002/22/EC of the European Parliament and of the Council of 7 march 2002 on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive).

NOTE: OJ L 108, 24.4.2002.

[6]   Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications).

NOTE: OJ L 201, 31.7.2002.

[7]   Commission Directive 2002/77/EC of 16 September 2002 on competition in the markets for electronic communications networks and services.

NOTE: OJ L 249, 17.09.2002.

[8]   Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC.

[9]   Decision No 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community (Radio Spectrum Decision).

NOTE: OJ L 108, 24.4.2002.

[10]   Regulation (EC) No 2887/2000 of the European Parliament and of the Council of 18 December 2000 on unbundled access to the local loop.

[11]   Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (Low Voltage Directive (LVD)).

NOTE: OJ L 077, 26.03.1973 P. 0029 - 0033.

[12]   Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive).

NOTE: OJ L 139, 23.05.1989 P. 0019 - 0026.

[13]   ETSI TR 101 092: "Network Aspects (NA); Report on Carrier Selection".

[14]   CLC/TR 62102: "Electrical safety - Classification of interfaces for equipment to be connected to information and communications technology networks".

[15]   ETSI EG 201 450: "Guidance on the identification of Harmonized Standards and/or other technical specifications for Radio equipment and Telecommunications Terminal Equipment (R&TTE) covering requirements under article 3.1 of Directive 1999/5/EC".

[16]   ETSI SR 001 262: "ETSI drafting rules".

[17]   ETSI SR 002 211: "Electronic communications networks and services; Candidate list of standards and/or specifications in accordance with Article 17 of Directive 2002/21/EC".

[18]   ETSI TR 101 730: "Publication of interface specification under R&TTE directive 1999/5/EC; Guidelines for describing analogue interfaces".

[19]   ETSI TR 101 731: "Access and Terminals (AT); Digital access to the public telecommunications network; Publication of interface specification under Directive 1999/5/EC".

[20]   ETSI TR 101 845: "Fixed Radio Systems; Technical Information on RF Interfaces applied by Fixed Service Systems including Fixed Wireless Access (FWA) in the light of the R&TTE Directive (article 4.2)".

[21]   ETSI TR 101 857: "Access and Terminals (AT); Broadband access to the Public Telecommunications Network; Publication of interface specification under Directive 1999/5/EC, art. 4.2; Guidelines for describing Multimedia Cable Network Interfaces".

[22]   ETSI EG 201 838: "ElectroMagnetic Compatibility and Radio Spectrum Matters (ERM); Publication of interface specifications under Directive 1999/5/EC; Guidelines for describing radio access interfaces".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in SR 002 211 [17] and the following apply:

interface:

- network termination point, which is a physical connection point at which a user is provided with access to public telecommunications network; and/or

- air interface specifying the radio path between radio equipment and their technical specifications

    NOTE: According to article 2.e of the R&TTE Directive [1].

national regulatory authority: body or bodies charged by a Member State with any of the regulatory tasks assigned in this Directive and the specific Directives

    NOTE: See Framework Directive [4].

Network Termination Point (NTP): physical point at which a subscriber is provided with access to a public communications network

    NOTE 1: In the case of networks involving switching or routing, the NTP is identified by means of a specific network address, which may be linked to a subscriber number or name (Universal Service Directive [5]).

    NOTE 2: Also see the definition of interface and consider discussions in clauses 6 and 7 of the present document.

    NOTE 3: The NTP is often referred to as "access interface" in the present document.

Public Network Operator (PNO): anyone providing publicly available telecommunications services over a network to which terminal equipment can be connected, either via a fixed network terminating point or an air interface for radio terminals

Public Service Provider (PSP): provider of publicly available telecommunications service(s) who provides service from one or more sets of apparatus connected to a Public Network, but does not itself operate a network

3.2 Abbreviations

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

ADSL	Asymmetrical Digital Subscriber Line
ATM	Asynchronous Transfer Mode
CATV	Common Antenna TeleVision
CEC	Commission of the European Communities
CSC	Carrier Selection Code
ECN	Electronic Communications Network
ECN&S	Electronic Communications Networks and Services
EMC	Electro-Magnetic Compatibility
ESD	Electro-Static Discharge
EU	European Union
GSM	Group Special Mobile
HFC	Hybrid Fibre Cable
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronic Engineers
IPR	Intellectual Property Rights
ISDN	Integrated Services Digital Network
ISO	International Standards Organization
ISP	Internet Service Provider
ITU	International Telecommunications Union
LVD	Low Voltage Directive

NE	Network Equipment
NRA	National Regulatory Authority
NRR	New Regulatory Regime

NOTE: See clause 4.1 of the e-communications Directives.

NSO	National Standards Organization
NTE	Network Terminating Equipment
NTP	Network Termination Point
PATS	Public Available Telephony Service
PECN	Public ECN
PICS	Protocol Implementation Conformance Statements
PIXIT	Partial Protocol Implementation eXtra Information for Testing

NOTE: Refer to ISO/IEC 9646-1.

PNO	Public Network Operator
POTS	Plain Old Telephony Service
PSP	Public Service Provider
PSTN	Public Switched Telephone Network
R&TTE	Radio and Telecommunications Terminal Equipment
R&TTED	R&TTE Directive
SP	Service Provider
SS	Supplementary Services
TCAM	Telecommunications Conformity Assessment and Market surveillance committee
TE	Terminal Equipment
ULL	Unbundled Local Loop
VDSL	Very high speed Digital Subscriber Line
WLL	Wireless Local Loop
xDSL	x (a number of) Digital Subscriber Line (technologies)

4   EU most relevant Directives

SR 002 211 [17] in clause 4.2 presents an overview of the e-communications Directives and in clause 4.4 studies the relationship of them to the R&TTE Directive [1]. Clauses 4.1 to 4.5 are widely based on these clauses of SR 002 211 [17].

4.1   The e-communications Directives

The basis for the New Regulatory Regime (NRR) for ECN&S is through five major EU Communications Directives that are intended to converge and harmonize as appropriate the electronic communications regulation throughout the community. These five Directives are:

- Directive 2002/21/EC [4] on a common regulatory framework for electronic communications networks and services (the Framework Directive);

- Directive 2002/20/EC [3] on the authorisation of electronic communications networks and services (the Authorisation Directive);

- Directive 2002/19/EC [2] on access to, and interconnection of, electronic communications networks and associated facilities (the Access Directive);

- Directive 2002/22/EC [5] on universal service and users' rights relating to electronic communications networks and services (the Universal Service Directive);

- Directive 2002/58/EC [6] concerning the processing of personal data and the protection of privacy in the electronic communications sector (the Privacy Directive).

In addition, there is a further Directive 2002/77/EC [7] on competition matters consolidating the existing "liberalization" Directives applicable to telecommunications.

Finally, there is also a Commission Decision on a regulatory framework for radio spectrum policy in the European Community (Radio Spectrum Decision [9]), which establish a policy and legal framework in the Community in order to achieve the harmonization of the use of the radio spectrum. This may impact the technologies used to offer the end user access to Telecommunications Networks.

There is also the unbundling of the local loop regulation [10] and other documents related to this nucleus of Directives. In this case NRAs may (or not) force a certain physical point to be used as NTP.

Further regularly updated information can be found on following addresses:

- http://portal.etsi.org/public-interest/EU_regulatory_framework.asp

- http://portal.etsi.org/public-interest/overview_EC_directives.asp

4.2 The R&TTED and the other Directives

The R&TTE Directive [1] entered into force throughout the European Community on 7 April 1999 and was both an enhancement and relaxation from the earlier legislative measures covering Telecommunications Terminals and Satellite Earth Stations. Further regularly updated information can be found on following addresses:

- http://www.europa.eu.int/comm/enterprise/rtte/guides.htm

- http://portal.etsi.org/radio

In simplistic terms, the R&TTE Directive [1]:

- Covers in its scope (up to some exceptions according to article 1 and annex 1 of this Directive):

  1) all radio equipment;

  2) all telecommunications terminal equipment.

- And specifies the mechanisms for:

  1) placing all radio equipment (terminals and base stations) and all telecommunications terminal equipment on the market (article 6, largely based upon manufacturers' declaration of conformity) and putting them into service (article 7); and

  2) network operators to declare the network interface technical characteristics (Network interfaces, article 4.2) in sufficient detail to enable manufacturers to design terminals to inter-work with the network, this applies to both radio (including mobile and satellite), fixed and cable public networks;

  3) radio interfaces to be harmonized (article 5) or published by national Authorities according article 4.1.

Figure 1 demonstrates that, whilst the Radio Equipment (Network, Terminals and others not related with Telecom) as well as the Telecommunications Terminal Equipment are within the scope of the R&TTE Directive [1], the services provided to Telecom Terminals and the communications networks are not. Figure 1 illustrates that the Telecommunication access presented to end-user terminal equipment together with core network of public networks are covered within the scope of the new EU Regulatory Framework (New Regulatory Regime "NRR", e-communications Directives).

As seen from the regulatory point of view, the Network Termination Point (NTP) defines the border line between the terminals and the networks. While the R&TTE Directive [1] requires the NTP to be specified and publicly available (article 4.2) to facilitate the interoperation and appropriate design of the terminals, the Universal Service Directive [5] recommends and may require only specific implementations for some types of ECNs and ECSs, i.e. the fulfilment of some standards. The combinations of the application of both Directives should ensure appropriate availability of services to the user in one competitive environment. Both Directives allow for later measures in case the market players would not be serving appropriately the needs of the community.

For Radio Equipment and Networks there is no border line, both the R&TTE Directive [1] and the new EU Framework and associated specific Directives (NRR) apply.
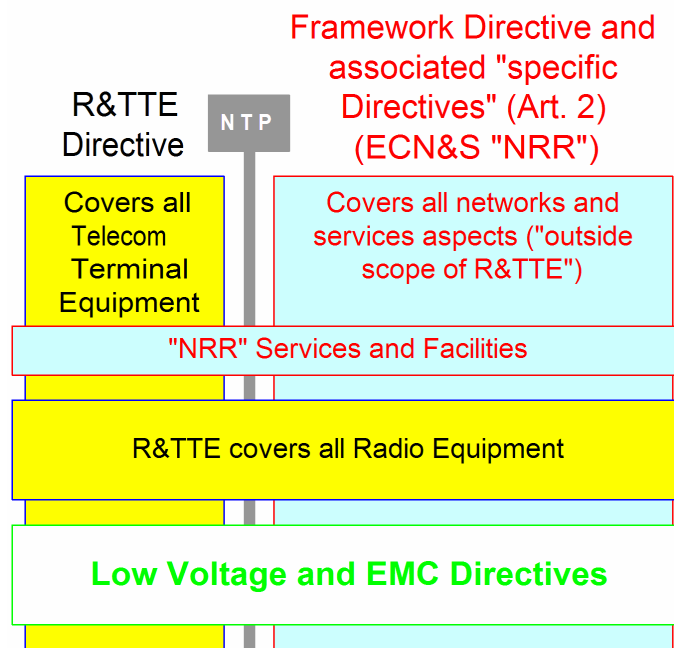
NOTE: It is not exact to say that the Low Voltage Directive [11] and EMC Directive [8] cover equipment under the
R&TTE Directive [1] but in general the requirements do not differ.

Figure 1: R&TTE Directive versus ECN&S Directives (NRR)

4.3   NTP, the border line between terminals and public network

Figure 2 compares article 4 of the Universal Service Directive [5] and article 4.2 of the R&TTE Directive [1].
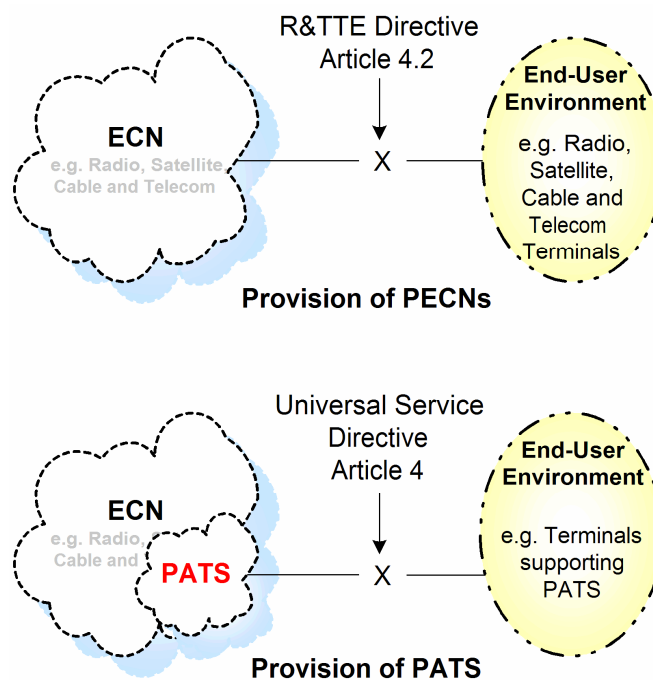

Source: European Technology Services (telecomlaw.info)

Figure 2: R&TTE Directive article 4.2 versus Universal Service Directive article 4

Article 4.2 of the R&TTE Directive [1] places an obligation on PNOs to publish and make publicly available the interface technical characteristics for each of the end-user access points (NTP) to their network irrespective of the services provided.

Article 4 of the Universal Service Directive [5] may justify specific requirements in relation to the provision of PATS at a fixed location, forcing that PATS services are provided over a standardized interface (for any given technology), to ensure interoperability and freedom of choice for the user.

PNOs have therefore the following obligations related to their publicly offered NTP:

- Always specify, publish and make publicly available the interface technical characteristics (R&TTE Directive [1]).

- If they offer PATS, in some cases, have obey to specific requirements (Universal Service Directive [5]).

NOTE: More detailed discussions on definitions and positions of the publicly offered NTP are in clause 6.

4.4   R&TTE Directive articles 4.1 and 4.2, different scopes

Interface, according to article 2.e of the R&TTE Directive [1] may have two meanings:

"(i) a network termination point, which is a physical connection point at which a user is provided with access to public telecommunications network,

and/or

(ii) an air interface specifying the radio path between radio equipment

and their technical specifications"

Meaning (i) is clearly related to article 4.2 and meaning (ii) is clearly related to article 4.1.

Article 4.1 of the R&TTE Directive [1] refers to the obligation put on Member States to notify the interfaces which they have regulated. This refers to radio interfaces using radiofrequency bands not harmonized in Europe and therefore managed by NRAs.

Article 4.2 of the R&TTE Directive [1] clearly refers to publicly offered Telecom interfaces and the application is completely independent from the application of article 4.1.

Article 4.1 and 4.2 may apply to the same physical interface, e.g. some country specific regulated radio interfaces publicly offered to mobile terminals. Some physical interfaces, e.g. analogue PSTN wire-line interfaces offered to legacy terminals, are exclusively under article 4.2. Some other national specific (non-harmonized) radio regulated interfaces not offered to the public, independently of their function in Telecom or non-Telecom systems, are exclusively under article 4.1.

Also article 4.1 is an obligation for member states while article 4.2 represents primarily an obligation for PNOs.

NOTE 1: The present document does not cover the application of article 4.1 and this clause was introduced to clarify repeated cases of confusion expressed by Telecom experts less familiar with regulatory matters.

The literal copy of R&TTE Directive [1], article 4 states:

"Article 4

Notification and publication of interface specifications

1. Member States shall notify the interfaces which they have regulated to the Commission insofar as the said interfaces have not been notified under the provisions of Directive 98/34/EC. After consulting the committee in accordance with the procedure set out in article 15, the Commission shall establish the equivalence between notified interfaces and assign an equipment class identifier, details of which shall be published in the Official Journal of the European Communities.

2. Each Member State shall notify to the Commission the types of interface offered in that State by operators of public telecommunications networks. Member States shall ensure that such operators publish accurate and adequate technical specifications of such interfaces before services provided through those interfaces are made publicly available, and regularly publish any updated specifications. The specifications shall be in sufficient detail to permit the design of telecommunications terminal equipment capable of utilizing all services provided through the corresponding interface. The specifications shall include, inter alia, all the information necessary to allow manufacturers to carry out, at their choice, the relevant tests for the essential requirements applicable to the telecommunications terminal equipment. Member States shall ensure that those specifications are made readily available by the operators."

NOTE 2: The **notification** aspects referred to in the title of the article seem to refer mainly to article 4.1 and the **publication** mainly related with article 4.2. Member States also have to notify EU Commission, but only after the publication made by the PNO.

4.5   The Safety and EMC Directives

As expressed in figure 1, in addition to above mentioned Directives, the essential requirements and the applicable standards of the Low Voltage [11] and EMC [8] Directives apply to all types of equipment and go beyond communications networks and terminals. Somehow, the two first essential requirements of the R&TTE Directive [1] are similar to the requirements of the Low Voltage [11] and EMC [8] Directives.

NOTE 1: In fact Low Voltage [11] and EMC [8] Directives do not apply to equipment under R&TTE Directive [1], but the essential requirements and the applicable standards are often the same. The following text is suggested near the graphic representing the scope of the most relevant EU Directives.

NOTE 2: Low Voltage Directive [11] and corresponding amendments can be found on: http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=en&numdoc=31973L0023&model=guicheti.

NOTE 3: EMC Directive [8] replacing (transitional period up to July 2009) earlier EMC Directive [12] can be found on new EMC Directive [8]: http://europa.eu.int/eur-lex/lex/LexUriServ/site/en/oj/2004/l_390/l_39020041231en00240037.pdf.

5   Guidance for publication

Clauses 5.1 to 5.4 give guidance to the PNOs and NRAs on the content and the format of the publication of Telecom access interfaces with public telecommunication networks, including Supplementary Services (SS).

Further guidance is available on the sources cited in the bibliography of the present document.

5.1   Intellectual Property Rights (IPR) and Copyright

As part of the access interface description publication, the PNO publishing the interface description should make aware of the potential for IPR rights in the implementation of the interface. However, it is the sole responsibility of the individual manufacturer to ensure that IPR issues are cleared. In so far as the publisher is aware of the same, the publisher should ensure that the publication itself contains a clear indication of:

1)   any IPR and/or copyright asserted over the contents of the publication (including any specifications referred out to);

2)   the rights granted and restrictions made to users of the specification; and

3)   how details of any licensing requirements associated with such IPR may be obtained.

NOTE: These IPR/copyrights however does not limit the operator's obligation of publishing his public interface. There is no requirement for the contents of an existing specification to be reproduced in the interface publication. In line with clause 4.2 on reference to standards, it is recommended that the interface refers out to the published specification and/or provides details of where the specification may be obtained.

If the interface publication published by the PNO contains any sort of IPR or copyright, the PNO is recommended to give appropriate information of existing IPRs in the publication.

There is no obligation for PNOs to publish the IPRs which are needed or may be needed for the design of equipment compliant with the specified interface. There is also no obligation for PNOs to make IPRs owned by others available to terminal manufacturers.

5.2 Content of access interface publications

Clause 7 indicates characteristics to be specified by the PNO in his publication and annex A contains an example of structured document that may be used in the declaration of access interface specifications. The presentation style of annex A is provided for illustrative purposes only.

The publication should contain information to enable terminal manufacturers to design terminal equipment to inter-work and for use of all services offered by the PNO with the public telecommunications network for the purpose of establishing, modifying, charging for, holding and clearing real or virtual connections and to prevent the misuse of network resources.

The access interface publication should contain at least the information described under the headings given in the annex A proforma where relevant to that interface.

Guidance notes are contained in the pro-forma to explain the nature and level of detail of the information required. PNOs may, if they choose, provide additional information e.g. relating to the interface definition, the services provided over that interface, facilities provided to terminal designers/users for interoperability testing.

In producing the access interface publication, the following points should be considered:

1) Wherever possible, the interface specification should refer out to published standards. The following list gives an indication of standards and specifications that may be referenced for the purposes of the publication:

   a) Standards whose reference is published in the Official Journal of the European Communities.

   b) European standards or specifications adopted by ETSI.

   c) International standards or recommendations adopted by the International Telecommunications Union (ITU), the International Standards Organization (ISO) or the International Electrotechnical Commission (IEC).

   d) National standards or specifications; and

   e) Proprietary specifications in the public domain.

This list does not preclude reference to accepted industry standards in the absence of a standard that is in any one of the categories above (e.g. IEEE, Wireless ATM Forum, and Bluetooth).

2) When a standard referred to contain options, the access interface specification should indicate which option(s) have been implemented. For some protocols there may be standards or specifications defining the associated Protocol Implementation Conformance Statements (PICS) which may be used for this purpose.

3) All supplementary services provided have to be published, along with the service codes used for their actuation.

5.3 Tests for "essential requirements" (R&TTED)

The PNO, when publishing the description of the access interface, when applicable, should indicate the tests under his responsibility required to comply with the sub items of article 3 of the R&TTE Directive [1], relating to the provided description of the access interface.

NOTE: At present normally wire-line access does not require tests in this context.

Furthermore guidance on other requirements can be found as follows:

- article 3.1a (Safety) refer to guidance on this issue which may be found in EG 201 450 [15] (or any other ETSI Guidance document on the subject);

- article 3.1b (EMC): refer to guidance on this issue which may be found in EG 201 450 [15] (or any other ETSI Guidance document on the subject);

- article 3.2 (Spectrum): refer to Harmonized Standards for the radio products. If no Harmonized Standard exists the PNO should advise the manufacturer to refer to a Notified Body under the R&TTE Directive [1] to determine the essential requirements.

The same should apply relating to invoked requirements under R&TTE Directive [1] article 3.3 or other legal obligations, e.g. related to the objectives and principles specified in article 8 of the Framework Directive [4].

5.4 Publication

5.4.1 Format

Where reference is made to existing standards the style of the Standards Body is accepted. However, in the absence of a standard it is recognized that different companies have a "house style" for all of their documentation. Access interface publications may be made using the company "house style" but the PNO should ensure that the contents of the publication provides the same information as indicated in the proforma given in annex A, and that all technical requirements for the interface are clearly identified. Guidance on specific verbal requirements statements may be found in the ETSI Drafting rules, SR 001 262 [16], clause 6.6.1.

There is no requirement to have a separate publication for each access interface; it is recognized that where interfaces are very similar, it may be beneficial to have all of those interfaces in a single document indicating the alternative options. Similarly, it may be desirable to specify some characteristics that are common to a number of interfaces in a separate publication. The criteria for deciding how to document the technical characteristics of the access interfaces should be based on clarity, removal of ambiguity, maintainability and ease of use for the users of these publications.

5.4.2 Language and document issue control

When the access interface is published in one of the recognized European languages, it is suggested that an English version is available as a minimum additional language.

NOTE: Referenced international or regional standards will normally be in English and may be in the local language after transposition by the National Standards Organization (NSO).

All access interface publications should have strict issue controls to ensure that it is clear which document is currently in force.

5.4.3 Availability

As a minimum, the PNO should provide details for a single point of contact to the NRA that can provide access to all access interface publications provided by that PNO. The PNO shall inform the NRA immediately of any change to the given contact details to ensure that they remain current. Additionally, it is recommended that a PNO provide within the specific access interface publications, contact details to enable users of the publication to contact the PNO for the purposes of, e.g. clarification of the text or reporting errors in the publication.

In order to minimize cost and complexity associated with distribution of publications, it is recommended that, wherever possible, PNOs should make the access interface publications available by electronic means. Where this is not possible, the publisher may levy reasonable costs for reproduction and distribution on an organization or individuals requesting a copy of a particular access interface publication.

6   The Network Termination Point (NTP)

6.1   Formal definitions

The NTP is according the Universal Service Directive [5]:

Network termination point (NTP): means **the physical point at which a subscriber is provided with access to a public communications network;** *in the case of networks involving switching or routing, the NTP is identified by means of a specific network address, which may be linked to a subscriber number or name*

This corresponds to the Telecom interface as defined by The R&TTE Directive [1] in article 2.e) (i):

a network termination point, which is **a physical connection point at which a user is provided with access to public telecommunications network,**

The geographical definition of the NTP is therefore one of the most important information to be specified by the PNO. Depending on the offer of a PNO, the interface to be described may refer to different technologies, connection methods and facilities. The next clause discusses the relationship of some examples of access network configurations with the possible localizations of the NTP. It should be noted that NRA under some circumstances, normally related with the market power and competition aspects, may determine a localization to the NTP different to the one initially proposed by the PNO.

6.2   Position and interfaces to be described

Since the PNO may offer the telecom interface in different points of the access network, different scenarios may be considered. This clause offers a generic overview of some typical cases in order to identify general principles and typical situations occurring on the market.

In the scenarios described in clauses 6.2.1 to 6.2.3 (in figure 3 and tables 2 and 3), for direct or indirect access and for access before or after the NTE, the interface at the NTP has to be published in accordance with article 4.2 of the R&TTE Directive [1].

The specific technology parts of the present set of deliverables may need to investigate and study at different levels these aspects applied to their type of technologies. Further, some parts of this multi-part deliverable may refer or recommend some of the most common standards used in the corresponding area.

There may be further scenarios that have not been considered in the present document.

6.2.1   NTP and access network main technologies

6.2.1.1   Scenarios

The NTP technology is the one determining the description required in the article 4.2 of the R&TTE Directive [1]. The access network may nevertheless introduce some type of influences, which in some cases may be relevant to the description.

Both the cases of scenarios 1 and 2 represented in the figure 3 are possible to exist. The PNO normally decides the point where the NTP will be, except for situations where the regulating authority may interfere.

This opens the possibility of a PNO to offer interfaces for the most standardized technologies and keep under his own control, for an optimization of the network management, less standardized interfaces. The offer of a less well standardized interface may lead to a lack of interoperability or other difficulties for the user, impacting later in the image and income of the PNO.

A scenario 3 can easily be imagined where no NTE is required and the TE is directly connected to the main Network Equipment, this is the case of GSM mobile phones and simple analogue PSTN legacy local loops.
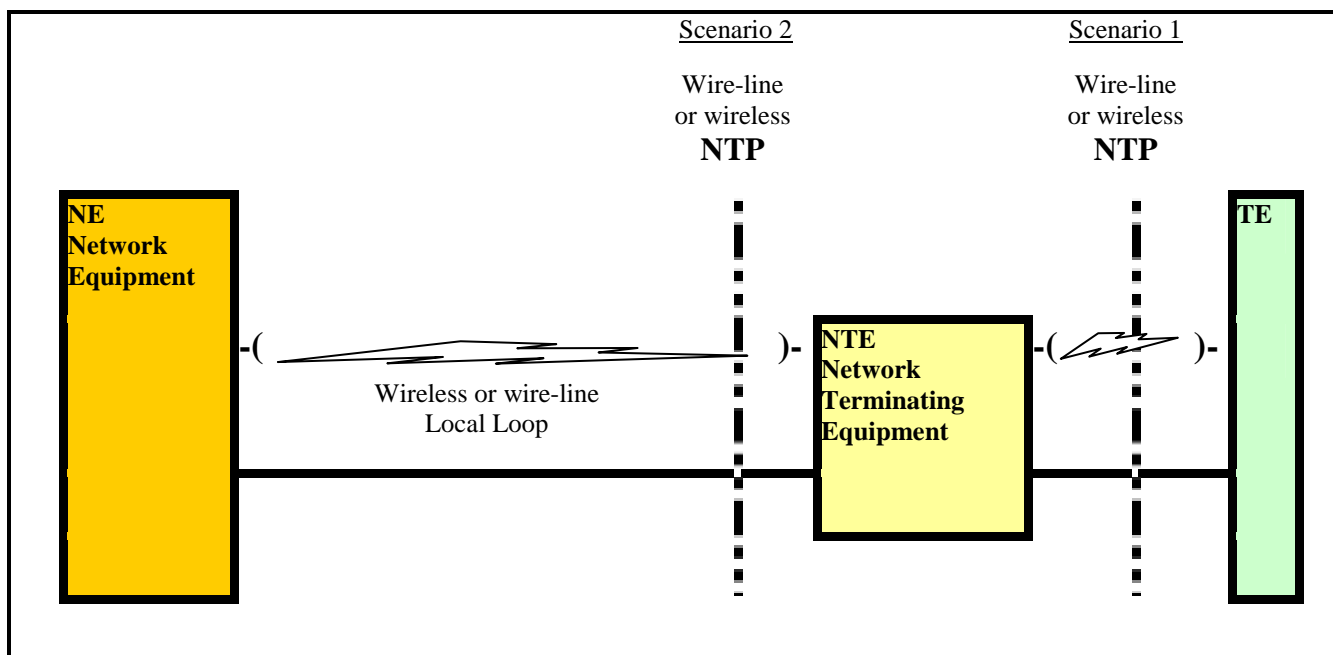
NOTE: A PNO offering or supporting both scenarios is requested to fulfil the conditions associated with each of them.

Figure 3: Position of the NTP

6.2.1.2 Examples

A PNO may offer internet services based on Ethernet technologies interfaces at the NTP and for some reason use Wireless Local Loop technologies in some cases, CATV infrastructures in other cases and VDSL technologies in special regions.

The interface has to be described at the NTP as offered by the PNO and will be in principle a single description of the Ethernet interface if scenario 1 of figure 3 represents the situation. If this PNO would have decided not to supply the NTE, he would have to specify the radio interface for the case of using WLL, the HFC interface when using the CATV infrastructures and the VDSL, when using this type of technology at the NTP (scenario 2 of figure 3).
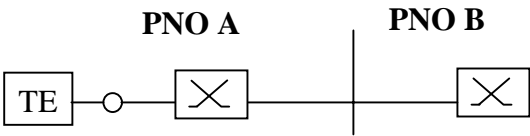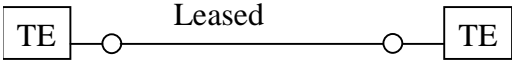
6.2.2 Direct access to telecommunications networks

6.2.2.1 Scenarios

Direct access to public telecommunications networks is described in table 2. It is assumed that PNO B does not influence the interface offered by PNO A. PNO B may be seen from the user as a Service Provider (SP).

Cases of some services or facilities offered by PNO B over the access established by PNO A requiring specific behaviour at the NTP, have to be covered and should be treated as indirect access (see clause 6.2.2.2).

Table 2: Methods of direct access to PNO

Scenario	Who Publishes	Comments
Scenario 1 **PNO A** **PNO B** TE —○— ⊠ ——|—— ⊠	**Network Operator A** Only publishes specifications relating to Network A.	Standard Interconnect.
Scenario 2 **PNO A** Leased TE —○— ———— —○— TE	**Network Operator A** publishes specification.	Standard Interconnect.
Key TE Terminal Equipment ⊠ Switch ○ NTP		
NOTE: The PNO indicates the person or body responsible for the Network. It is assumed that PNO B can also be the PSP.		

6.2.2.2 Examples

The most common example is the offer of common telephony services, where mobile or fix PNO have to describe the analogue (POTS) or digital (ISDN) or mobile telephony interfaces (GSM). These most common examples are widely covered by standardization publications.

6.2.3 Indirect access to telecommunications networks

6.2.3.1 Scenarios

Indirect access to public telecommunications networks may also be considered by a PNO.

The most common scenarios in this case are described in table 3. In these scenarios, the additional details (PNO B) become the most relevant and also have to be published where these are required for terminal design and are not contained in the direct access interface publication (PNO A).

A good understanding and cooperation between PNO A and PNO B is required. In many cases a single description made by PNO B including the impairments introduced by the network components supplied by PNO A might be the most effective solution.

NOTE: This influence of PNO A in the interface offered by PNO B to the users is part of interconnection agreements, not covered in the present document.

Table 3: Methods of indirect access to PNO

Scenario	Who Publishes	Comments
Scenario 1 PNO A PNO B ULL TE ──○────── │ ──✕	**Network Operator B** (PNO A will need to supply PNO B with technical information on local access network used by PNO B).	Unbundled Local Loop (ULL).
Scenario 2 PNO A PNO B Leased TE ──○────── │ ──✕	**Network Operator B** (and Network Operator A in the case where the user has a direct contract with PNO A for the leased line).	PNO A provides lease line connection between TE and PNO B.
Scenario 3 PNO A PNO B CSC TE ─○─✕─── │ ──✕	**Network Operator A** and **Network Operator B.** For PNO A it is likely to be the same interface specification as in Scenario 1 of direct access (table 2). For PNO B, only the information above and beyond information already provided by PNO A needs to be published e.g. second dial tone, Call Party Answer signal.	Indirect Access (where CSC is the carrier selection code as described in TR 101 092 [13]). Carrier pre-selection is also covered in this scenario except that no carrier selection codes will be dialled by the customer.
Key TE Terminal Equipment ✕ Switch ○ NTP		

6.2.3.2   Examples

The most common examples of the indirect access are suggested in table 3.

The technology used by PNO A to support the offer of PNO B may nevertheless cause significant impairments and limitations to the offer planed by PNO B.

As an example, if the PNO B wishes to offer real time services and the PNO A transmission is based on packet switching technology, additional delays, jitter and packet loss impairments have to be considered when determining the offer at the NTP. In this case a careful study of the impairments should be made and the interconnection agreement between the two operators should cover appropriately the subject.

Another example is related to the mutual influence that xDSL technologies may have with analogue PSTN services in the case where an ADSL interface is offered by PNO B, the analogue PSTN interface is offered by PNO A and the physical local loop is entirely owned by PNO A.

7   Characteristics to be specified

The characteristics to be specified depend very much from the type of interface offered (radio, analogue or digital, broad or narrow-band, etc). They are therefore described in further detail in the appropriate part of this multi-part deliverable. The present clause gives a generic guidance on some most relevant aspects treated at a level that allows a common approach to all technologies but also a more accurate treatment in the appropriate part handling that specific technology.

7.1   General

Article 4.2 of the R&TTE Directive [1] obliges Member States to ensure that PNOs provide a detailed technical description of their interfaces (see copy of this article in the introduction of the present document). Sufficient information must be published to allow manufacturers to design, manufacture, test their equipment and place the terminal equipment on the market conforming to the interface specification and with the relevant essential requirements and capable of utilizing all services provided by the interface.

In order that the manufacturer can advise customers about the suitability of the TE for specific PNO Services, the description of the interface should either include or reference details of the services the PNO provides using that interface.

PNOs should include any information concerning inter-working with the network that the PNO is aware would be relevant to the design and operation of appropriate terminal equipment.

Where the value of any particular parameter will be significantly affected by the method of measurement, then the method of measurement should also be stated.

Annex A offers a further guidance suggesting a possible structure for the required publication of the NTP. The characteristics generically suggested in this clause should be specified and structured depending on the technology used and according decision of the PNO.

The technology specific parts offer a more detailed treatment, discussing some typical characteristics of the interface of such technologies and referring to most common standardization deliverables available in each one of the treated areas.

Annex B contains an extract from a report presented to TCAM in July 1999 by the European Commission. The present document was used by the EU Commission in deriving guidance documents on interface publication partly copied in annex C and referred to in the bibliography of the present document. From annex B the following can be deduced:

1)   For interfaces based on the Open Systems Interconnection model – parameters for layers 1, 2 and 3 will need to be considered as appropriate. Some parameters within any specific layer may not be relevant for all types of interface. In the case of Tele-services some parameters in higher levels may also need to be described.

2)   For other types of interfaces similar levels of detail will need to be provided, Networks should be defined where possible by reference to ETSI deliverables or other International Standards. Where networks are generally based on an International or ETSI standard but differ in some way the preferred manner of declaring the interface is to declare the source standard and then indicate where the interface is different (Provide a "delta" document).

3)   Whilst the provision of a PICS and PIXIT taken from the source standard may be desirable, the provision of the network interface description in this format is not mandatory. However, if the PICS and PIXIT are not used, the format used should provide at least an equivalent level of clarity, removal of ambiguity and ease of use. This allows commonality between network interfaces to be assessed.

Interfaces should be defined where possible by reference to publicly available standards indicating which options have been implemented, where applicable. Where a published PICS proforma exists, consideration should be given to using the PICS proforma as a means of publication of the relevant interface specification, or appropriate part of the interface specification. Where a published PICS proforma does exist and it is decided not to use it, then the network operator should present information in a sufficient level of detail to allow a reader to clearly and unambiguously understand the implementation of all optional and conditional requirements identified in the published PICS proforma.

Whilst the provision of PICS and PIXITs may be desirable, the provision of the network description in this format is not mandatory.

Where networks are generally based on a publicly available standard but differ in some way, the preferred manner of declaring the interface is to declare the source standard, indicate the options that have been implemented and indicate the differences by the use of a "delta" document.

NOTE: There is no requirement for the contents of an existing specification to be reproduced in the interface publication. In line with guidance given in the present document on reference to standards, it is recommended that the interface refers out to the published specification and/or provides details of where the specification may be obtained.

Where a terminal equipment standard exists that would help a terminal designer to achieve a satisfactory design, this standard may be referenced as additional information. Publication should be made using ETSI terminology where possible.

Not all of the characteristics described in the present set of documents are applicable to every network interface. Guidance on applicability may be found in each part of this multi-part deliverable.

7.2   Safety

The safety status of the network interface should be described according the classifications detailed in IEC 62102 [14]. The type (GTD, Gas Tube Discharge or others), configuration and level of the NTP protection against effects like ESD or other high voltage discharges should be referred.

There are several product safety standards already available from CENELEC that have been published in the Official Journal of the European Commission in connection with the Low Voltage Directive [11].

Requirements for safety are outside the scope of the present document. Safety standards are published by CENELEC.

NOTE 1: An example of such a CENELEC product safety standard is EN 60950 (see bibliography).

NOTE 2: The classification of interfaces for equipment to be connected to information and communications technology networks has recently been revised by IEC.

7.3   EMC

It would be helpful for the operator to provide any available information that would assist terminal suppliers to determine their EMC strategy. The type (Gas Tube Discharge or others), configuration and level of the NTP protection against effects like ESD or others immunity effects if referred will help a more appropriate design of TE protection and a matched operation of the network and terminals protection devices.

7.4   Installation, and other general physical characteristics

Relevant installation guidance, possibly including site engineering or dimensioning/ sizing the installation, connection methods, pin assignment, wiring arrangements and other physical aspects need to be covered as appropriate.

7.5   Electrical characteristics

Signal characteristics, synchronization, power feed and other relevant conditions need to be specified to the extent required.

7.6   Protocol and service related aspects

Where applicable, these aspects have to be covered.

7.7   Other aspects

Where additional NTP characteristics are relevant for the design of the TE in order for the user to be able to take advantage of using all services provided through the corresponding NTP, these aspects have to be covered in the publication.

Annex A (informative):
Generic guidance for the publication of a NTP, proposed proforma

A.1   Introduction

This clause can be used by the PNO as required.

A.2   Table of contents

The contents list for the interface publication.

A.3   Scope

This clause should identify the applicability of the present document to fulfil the requirements of article 4.2 of the R&TTE Directive [1].

It should contain the information covered by the present document and the applicability, including text that defines the actual service offerings, to which the present document applies. Reference should be made to the applicable National Interface declaration to which the interface applies (if available).

A.4   References

This clause should contain a list of reference material that is required to describe the network interface at the NTP and necessary to implement a terminal able to inter-work with this network interface. This may also be a reference to an on-line location to access the necessary references.

A.5   Definitions, symbols and abbreviations

This clause may be used, if required, to identify any specific definitions given in the publication. It should also contain a list of all abbreviations used in the present document and their explanations.

A.6   Background information

This clause is available for the PNO to include any legal material or operational limitations etc. which gives additional information to the manufacturer. It may also be used to provide details of any IPR issues that may be relevant.

This clause should also include the address, telephone number, fax number, e-mail, etc. to which queries arising from the publication of the present document should be addressed.

This clause could also contain the procedures for the notification of changes to the network, and how they will be published, which may affect the correct working of the TE.

A.7 Description

A.7.1 General

This clause should contain a brief description of the system (radio or other) and the clear identification of the interface or interfaces being published. This may include diagrams to give clearer description of the system and the interface.

A.7.2 The Network Termination Point (NTP)

This clause should identify the access NTP covered by the present document.

A.7.3 Transmission layer characteristics

For systems that are standardized or where the proprietary specification is in the public domain refer to the appropriate standards or specifications.

A.7.4 Call control/mobility management/radio or other resource procedures

For systems that are standardized or where the proprietary specification is in the public domain refer to the appropriate standards or specifications.

If a layered structure is used then the following clauses apply.

A.7.4.1 Layer 1 protocol

For systems that are standardized or where the proprietary specification is in the public domain refer to the appropriate standards or specifications.

A.7.4.2 Layer 2 protocol

For systems that are standardized or where the proprietary specification is in the public domain refer to the appropriate standards or specifications.

A.7.4.3 Layer 3 protocol

For systems that are standardized or where the proprietary specification is in the public domain refer to the appropriate standards or specifications.

A.7.5 Bearer services

This clause should contain a list of the bearer services supported by the network.

A.7.6 Supplementary services

This clause should contain a list of supplementary services supported by the network and directly under the control of the PNO, with the codes used to invoke the service.

NOTE: For supplementary services supported by ETSI standardization the invocation codes are published in the ETSI Registry of supplementary codes.

A.7.7   Tele-services

This clause should contain a list of tele-services supported by the network.

A.7.8   Other characteristics

This clause should identify any other characteristics that the PNO is aware of to assist the manufacturer in his implementation of the terminal equipment. This could cover such issues under any other considerations e.g. the essential requirements of R&TTE Directive [1] article 3, applicable to the terminal.

Annex B (informative):
Initial R&TTED studies, extract from Ad-hoc Group C Report

The present annex reproduces the contents of guidance documents produced by an Ad-hoc Group C created by the CEC services during the initial period (1998) of studies about the impact and application of the R&TTE Directive [1]. Later, CEC services produced the documents copied in annex C, which may also be obsolete. Nevertheless, for the benefit of experts less familiar with the EU regulatory environment evolution the most relevant text of these documents is copied in the different clauses of the present annexes B and C.

Part 3 - Guidelines for Public Network Operators when publishing interfaces, and NRAs/Member States when supervizing such publication.

1) Public Network Operators and NRAs should take account of any guidance published by the Commission concerning the publication of interfaces under the R&TTE Directive.

2) Publication is required for each type of public network interface. Such interfaces include not only direct interfaces with terminal equipment (the Network Terminating Point), but also indirect interfaces where the Public Network Operator has a contractual relationship with end-users. (See annex 2 (of the Ad-hoc Group C report) for the different configurations to be considered). In the case of indirect connection, only those details additional to the publication relating to the direct interface need be published, that is, the publication is a "delta" to the direct interface publication.

3) Specifications of existing interfaces, as well as new and modified interfaces, must be published in accordance with any published guidelines or rules produced by NRAs, national competition authorities or from Europe. The withdrawal of any existing published interface must be notified including, ideally, any phased withdrawal process.

4) NRAs may specify guidelines or rules for appropriate lead-times for publication of existing, new and modified interfaces. These should be the minimum consistent with the need to allow manufacturers to design equipment, or to provide modified equipment in the case of modified interfaces. NRAs ought to take account of the need to promote innovation and competition in markets and should therefore allow shorter lead times where this can be justified.

5) Sufficient detail must be published to allow manufacturers to design, manufacture, test and place equipment on the market, including information concerning any Essential Requirements. The annexed templates (to the Ad-hoc Group C report and others being produced by ETSI) provide details of the expected content of analogue, digital and radio interfaces.

6) Interface publications may be produced using the Public Network Operator's own "house style" so long as the contents of the publication provide the same information as indicated in the templates. Clarity would be improved by cross-referencing to the template clause numbers and by using ETSI terminology wherever possible. There is no requirement to have a separate publication for each customer interface; it is recognized that where customer interfaces are very similar, it may be beneficial to have all of those interfaces in a single document. Similarly, it may be desirable to specify some characteristics which are common to a number of customer interfaces (e.g. tones and announcements) in a separate publication. The criteria for deciding how to document the technical characteristics of the customer interfaces should be based on clarity, removal of ambiguity, maintainability and ease of use for the users of these publications.

7) Publications should contain sufficient information to permit the design of terminal equipment so that it can interwork with the public telecommunications network for the purpose of establishing, modifying, charging for, holding and clearing real or virtual connections and to meet all Essential Requirements. They should also contain details of any supplementary services or enhanced features provided by the network that is important for the design and operation of terminal equipment. The PNO should not exclude any information concerning interworking with the network that it is aware would be relevant to the design and operation of terminal equipment. Sufficient information must be published to allow manufacturers to test that their equipment conforms to the interface specification, including the relevant Essential Requirements. The level of detail should be comparable to that previously provided in TBRs, excluding test specifications unless the test method needs to be declared in order to clarify the meaning of a given parameter.

8) Interface publications should refer to published standards where available and specify any options, additions or modifications selected by the PNO within them. For example, ISDN PICS and PIXIT documents could be used where available. PNOs may refer out to other published company documentation for all or part of their interface publication, as long as such documentation defines the interface from the network rather than the terminal viewpoint. Where such references are made, the PNO should ensure that the same ease of access exists for the referenced document(s) as that applied to the interface publication.

9) The PNO should ensure it does not knowingly publish in breach of any associated IPR and/or copyright. The PNO should at least consult the network equipment supplier. In so far as the PNO is aware of any relevant property rights, it should ensure that the publication contains a clear indication of:

    -    any IPR and/or copyright asserted over the contents of the publication (including any specifications referred out to);

    -    the rights granted and restrictions made to users of the specification; and

    -    how details of any licensing requirements associated with such IPR may be obtained.

10) The language of publication is a matter for each Member State. NRAs are encouraged not to place onerous translation requirements on PNOs.

11) Publications should be version controlled with a document history.

12) It is recommended that PNOs should make publications available electronically, i.e. on the World Wide Web. NRAs or other bodies may create hyperlinks to individual publication sites and to similar sites in other Member States. Paper copies should be made available on request, for which the PNO may levy a reasonable charge.

13) NRAs should promote the establishment of a national forum for the discussion of draft and published specifications with Public Network Operators, Public Service Providers, manufacturers and other interested parties, with the purpose of ensuring that publications conform to any relevant guidelines, meet the needs of terminal manufacturers and that the integrity of the network is maintained. Any such forum should take account of any harmonizing guidelines at the European level.

14) NRAs should require PNOs to republish any specifications that are found to be inadequate for their intended purpose. Any such decision should be based on published rules or guidelines or the templates in the level.

NOTE: References to the present document or annexes, refer to the report of Ad-hoc Group C, not to the present document.

Annex C (informative):
Copy of initial guidance offered by CEC services in 1999

The present annex reproduces the contents of guidance documents produced by the CEC services during the initial period of implementation of the R&TTE Directive (second half of 1999).

Some of the material, e.g. references to earlier network and services regulatory documents, may need some updates and CEC services may wish to consider new versions of the same documents or new documents replacing these. Nevertheless, for the benefit of experts less familiar with the EU regulatory environment the text of these documents is copied in the different clauses of the present annex. Some guiding notes were included to explain the impact of the obsolescence of some parts of the text.

NOTE: Annex B reproduces text produced prior to the present annex C.

C.1 On network operators publication

GUIDANCE ON INTERFACE PUBLICATION BY PUBLIC TELECOMMUNICATIONS NETWORK OPERATORS

C.1.1 Description of issue

Under article 4.2 of Directive 1999/5/EC, Member States shall ensure that operators of public telecommunication networks publish information on the types of interface offered in that Member State. The directive does not specify:

- which operators should be subject to the obligation to publish;

- which types of interface are covered;

- what degree of detail should be published;

- the timing of publication;

- the handling of existing, new, modified and withdrawn interfaces.

The guidance given below is derived from the work of an Ad Hoc Group, and takes account of comments made at meetings of the Telecommunications Conformity Assessment and Market Surveillance Committee (TCAM), in which Member States assist the Commission in the management of the Directive.

C.1.2 Guidance

C.1.2.1 Operators subject to the obligation to publish

1) **Direct operators:** The Directive states that operators of public telecommunication networks must publish. This means anyone providing publicly available telecommunications services over a network to which terminal equipment can be connected, either via a fixed network terminating point or an air interface for radio terminals. Throughout this guide the term Public Network Operator (PNO) is used to describe these operators.

2) It does not include private networks or operators providing non-public services, such as to a limited group of end-users.

3) **Indirectly connected operators:** However, it should include Public Network Operators who provide services under contract to customers but who do not themselves provide the direct interface to the terminal equipment. There are various cases to be considered, including connections using unbundled local copper loops, private circuits and switched access. Annex 1 shows the configurations of such operators, who would have to publish relevant interworking specifications that impact on terminal design and operation.

4) **Service providers:** It should be noted that terminal equipment design may require details of features and functions of indirectly connected Public Service Providers, as well as Public Network Operators, but the former providers are not covered by the Directive. For the purposes of this guide, the term "Public Service Provider" (PSP) means a provider of publicly available telecommunications service(s) who provides service from one or more sets of apparatus connected to a Public Network, but does not itself operate a network. It is recommended that NRAs should encourage Public Service Providers to publish interface specifications wherever possible. Where publication does not occur, this may, however, be a matter for existing national regulations or Competition Law.

C.1.2.2   Types of interface covered

1) In principle all types of publicly available interface should be published. This includes both switched and non-switched interfaces. It includes interfaces for leased lines, telephony, ISDN, data, telex and other non-voice services. It includes both fixed and radio interfaces, including publicly available satellite services.

2) It does not include internal interfaces within networks, or interconnect interfaces with other operators. It does not cover interfaces of private networks.

3) It does not cover interfaces of non-Public Network Operators or Service Providers, that is, interfaces provided solely to a limited number of closed user groups, but does include interfaces such as Centrex and Virtual Private Networks commonly provided by Public Network Operators to customers on request.

4) Public Network Operators with Significant Market Power must provide special network access under the terms of article 16 of the Revised Voice Telephony Directive (98/10/EC). These interfaces should also be published.

C.1.2.3   Degree of detail to be published

1) The Directive says that sufficient details must be published to permit the design of terminal equipment to be capable of using all the services provided through the corresponding interface. As discussed in section 1 paragraph 3 above, this objective can only be fully achieved if indirectly connected Public Network Operators also publish specifications - and perhaps Public Service Providers as well, as mentioned in section 1 paragraph 4 although they are not obliged to do this.

2) It has been questioned whether the Directive could be interpreted as requiring all details of value added services offered through the interface to be published, but this is not seen as being in all cases realistic or proportionate. However, in addition to basic conveyance services, it is felt important that supplementary services or tele-services that are directly controlled by the Public Network Operators should be published. (See Part 3 paragraph 7 of these guidelines).

3) Additionally, there may be some details that should not be freely published, such as details of encryption systems used to secure radio-based communications such as GSM and service features that may relate to lawful interception. These details should only be made available subject to non-disclosure agreements.

4) It is also recognized that some terminal functionality can be supplied by the Public Network Operator or Service Provider direct to the end-user in the form of software. In some cases, it may be downloaded directly to the terminal over the network. In such cases, the terminal manufacturer may not need to know the precise details of the service, only that it assumes the provision of a particular Operating System (e.g. Windows) or an Applications Programming Interface (API). It is noted that the functionality of the terminal can be significantly altered by such software changes and this might change the conformity to any Essential Requirements. It would be desirable to limit such downloads to cases where they can be controlled by the Public Network Operator or supplier/manufacturer, so no unintended alterations can be made. Member States are advised that it may not be appropriate to apply article 9 of the directive in those cases where it is the end-user that causes the apparatus to no longer conform to the essential requirements. In cases where some functionality of the terminal is defined by software supplied by the PNO, there need be no detailed declaration by the PNO of this functionality. Only the mechanism for downloading needs to be declared.

5)   In many cases, the publications will refer out to published standards. Where this is not possible, PNOs should base the content of what should be published on such guidance as is available (see section 7).

C.1.2.4   Timing of publication

NOTE: The original text of the CEC document was not deleted even if it referred to regulatory documents no longer applicable. The conclusion seems to be important and not strongly dependent of regulatory changes observed.

1)   Article 4.2 of the Directive states that accurate and adequate technical interface specifications must be published before services provided through those interfaces are made publicly available. Recital 24 states that the purpose of such publication is to enable manufacturers to design terminal equipment. Therefore the adequacy of such specifications will depend, amongst other things, on whether there was sufficient advance publication before service launch to allow manufacturers to design equipment. However, recognizing that the Terminals Directives have always related to placing equipment on the market, it is considered that the term design should here be taken to include manufacturing, testing, and other aspects of placing the equipment on the market.

2)   This raises a number of important tensions. For PNOs, on the one hand, early interface publication will encourage a healthy terminal market for their planned new services. On the other hand, early publication might provide information that will forewarn competing PNOs of those new services. A long advance publication period would also have the effect of delaying innovation in the market place. Public Network Operators may be motivated therefore to arrange for the supply of suitable terminal equipment from one or a limited number of terminal suppliers who are made subject of a confidentiality agreement concerning the new service. This might have the effect of restricting competition in the terminal equipment. This can be said to contravene the principle of equal, transparent and non-discriminatory treatment of technical specifications, as set out in Recital 25. Where a Public Network Operator shares information in a discriminatory manner, this may breach the competition rules of the Treaty.

3)   Therefore, advance publication is usually in the terminal manufacturers' interest and therefore in users' interests too, but less so for the Public Network Operators', and a balance needs to be struck between the interests of all market players.

4)   There are several approaches to this problem that might meet the requirement of Recital 25 to "ensure that the regulatory framework created by this Directive is fair". Guidelines could be published by the Commission, in conjunction with TCAM, or by national regulators or competition authorities. In some cases, national regulations may already be relevant, particularly those implementing previous Directives which have publication requirements, such as 98/10/EC (The Revised Voice Telephony Directive). Whatever method is used, any rules or guidelines should be published. Where a service is to be launched across several Member States, there are strong arguments for consistent treatment of publication rules across all Member States.

5)   Without prejudice to competition law, the following issues might be taken into account:

-   Whether an adequate supply of terminal equipment already exists or can be readily modified.

-   Whether an adequate supply of terminal equipment is likely to emerge due to participation in earlier trials or R&D activities.

-   Whether the interface is based on a published standard, particularly an ETSI standard.

-   Whether the interface is based on a proprietary specification for which one manufacturer might have prior or exclusive knowledge.

-   Whether there are any conflicts from one or more terminal manufacturers also supplying network equipment to the PNO.

-   Whether the interface is for a service which is likely to be a mass-market service, as opposed to a specialized service which might not be expected to attract many terminal suppliers.

-   Different conditions need to apply to cases where an existing interface is modified or withdrawn. Shorter notice periods may be appropriate than those for new interfaces.

-   The impact that publication periods might have on innovation in the market by delaying customers' access to a new service.

- The need for rapid modification of interfaces to correct errors, where there is no negative impact on terminal equipment.

- Interfaces provided as Special Network Access are initially provided reactively to service providers' requests and may not be able to be published until the interface has been provided.

- The position of the Network Terminating Point may need to be taken into account: a novel interface may lead to difficulties in stimulating the production of matching terminal equipment, so adoption of a different, perhaps existing, NTP may, for a period, lead to a successful service launch.

6)   Because the situation is complex, a single period of advance publication will not be appropriate. It might be concluded that each case should be considered on its merits, but this could lead to uncertainties for both PNO and terminal suppliers. Flexible rules or guidelines may be preferable. Not all the issues can be left to general competition rules, since, if this were the case, there would be no need for the R&TTE Directive or sector specific rules at all.

7)   However, Member States and NRAs should ensure that any national rules or guidelines are published and represent a fair balance between the interests of PNOs, PSPs, terminal manufacturers, terminal suppliers, users and other market players; and are consistent with the competition rules of the Treaty, and also with these guidelines.

8)   Some regulations already exist in some Member States as a result of earlier ONP Directives that contain publication obligations, e.g. 98/10/EC. One approach is to require a defined period of advance notification but with the NRA having the power to waive or reduce the period if the individual case merits it. This provides a degree of certainty with flexibility.

9)   Another approach is to oblige the PNO to publish in adequate time for manufacturers to react. This places the onus on the operator to judge what is fair and act accordingly, which is comparable to the situation under general competition law. This can be supplemented by requiring a defined minimum period, together with the power to waive or reduce this minimum period, as above.

10)   Other approaches that attempt to reflect all the issues described above are possible, but given the desirability of handling some cases on their particular merits, it may not be worthwhile developing a complex set of rules to meet all eventualities.

11)   One possibility would be for publications to be made to terminal manufacturers only and be subject of a non-disclosure agreement until the service is launched. This has some obvious advantages, but some drawbacks too. It could lead to different PNOs proposing different interface standards and thereby fragmenting the market for terminal equipment. The view is taken that operators with market power in the relevant market for a given interface should not be able to use such agreements, even if any non-disclosure agreement was supervised by the NRA.

12)   To sum up, the view is taken that those aspects of the network interface that affect terminal design should preferably be developed in an open forum, and that competition should focus instead on matters such as speed, added value, and quality of service delivered to customers. In this context the timing of interface publication becomes less of an issue. In ensuring proper publication, NRAs should take account of the factors given above. The NRAs may co-operate in determining a maximum period in advance of service provision that could be imposed for the publication of interface details. If no such agreement is reached, a period of one year, as suggested by some Member States. In applying the factors given above to specific cases, the NRA can reduce the period as may seem appropriate, provided that the rules or guidelines for doing so are non-discriminatory and publicly available. In no case can the period be reduced beyond zero - in other words, the publication of accurate and adequate technical specifications of such interfaces must always be made before services provided through those interfaces are made publicly available.

C.1.2.5   Handling of existing, new, modified and withdrawn interfaces

The wording of the Directive is slightly ambiguous concerning the treatment of existing interfaces, as opposed to new interfaces. However, both existing and new interfaces need to be published. In the case of existing interfaces, NRAs should determine a suitable period after the Directive comes into force during which specifications of existing interfaces should be published. Modified interfaces should also be published, where matching changes to terminal equipment are required, and, to ensure that the list of specifications is kept up to date, any interfaces that are withdrawn also need to be notified and should follow the timing procedures and/or guidelines for new interfaces. There are two possible stages of withdrawal that may be relevant. Firstly, the cessation of "new supply", which means manufacturers may no longer need to supply new terminal equipment and secondly, the final withdrawal of existing service, which may imply no further need to support the interface.

C.1.2.6   Relationship with publication obligations under other directives

NOTE: The original text of the CEC document was deleted because it referred to regulatory documents no longer applicable. Clause 4 in the present document covers the subject.

C.1.2.7   Guidance on contents of interface specifications

NOTE: The original text of the CEC document was deleted because it recommended the earlier versions of the present document and referred to earlier ETSI TBs.

C.1.2.8   Protection of the network

NOTE: The original text of the CEC document was not deleted even if it referred to regulatory documents no longer applicable. The conclusion seems to be important and independent of regulatory changes observed.

During discussion of the problem of self-protection mechanisms at network interfaces, concern was expressed about a possible mismatch between the rights and obligations of Public Network Operators as expressed in article 7.5 of the R&TTE-D and article 13 of Directive 98/10/EC (The Revised Voice Telephony Directive). The issue will further be considered. However, regarding publication, it is clear that PNOs cannot be obliged to publish details of network self-protection mechanisms.

C.1.2.9   Other advice relevant to the network interface to terminal equipment

NOTE: The original text of the CEC document was deleted because it referred to regulatory documents no longer applicable. Clauses 4 and 6 in the present document cover the subject of the localization of the NTP and relationship between the R&TTE Directive and other regulatory documents.

C.1.3   Conclusions

1)   The Guidance on Interface Publication by Public Telecommunications Network Operators is given above. In carrying out their tasks, NRAs should take notice of this Guidance, noting in particular:

-    The need for a clear definition of the interfaces offered, and the obligation on PNOs to publish in all cases, including existing, new, modified and withdrawn interfaces, as in section 5 above.

-    The possibility of mandating PNO publication of interface details sufficiently in advance of services being provided through those interfaces as to be considered by the NRA as adequate in view of the considerations given in section 4 paragraph 5 above.

-    The desirability of consistent treatment of publication rules by NRAs where a service is to be launched across several Member States.

2)   The Ad Hoc Group has suggested that a support group, with full industry participation, may be useful to the Commission and TCAM. Such a group could be tasked to develop EU harmonized guidelines on publication, guidance documents on interface specification contents, and advice on the effectiveness of the publications made by PNOs. This group could be supported by ETSI concerning maintenance of the guidance documents. The Commission is open to the establishment of such a group, which should report to the Commission and TCAM.

C.1.4   Indirect public network operators (*annex 1 in the original document*)

NOTE: A table including four scenarios of indirect access to the public network was not copied to prevent confusion with the tables presented in clause 6 of the present document.

C.2   For network operators and EU members states

GUIDANCE FOR PUBLIC NETWORK OPERATORS WHEN PUBLISHING INTERFACES, AND NRAS/MEMBER STATES WHEN SUPERVIZING SUCH PUBLICATION

C.2.1   Description of issue

Under article 4.2 of Directive 1999/5/EC, Member States shall ensure that operators of public telecommunication networks publish information on the types of interface offered in that Member State. The directive does not specify:

- appropriate practical considerations to be borne in mind by PNOs and NRAs.

The guidance given below is derived from the work of an Ad Hoc Group, and takes account of comments made at meetings of the Telecommunications Conformity Assessment and Market Surveillance Committee (TCAM), in which Member States assist the Commission in the management of the Directive.

C.2.2   Guidance

1)   Public Network Operators and NRAs should take account of guidance published by the Commission concerning the publication of interfaces under the R&TTE Directive.

2)   Publication is required for each type of public network interface. Such interfaces include not only direct interfaces with terminal equipment (the Network Terminating Point), but also indirect interfaces where the Public Network Operator has a contractual relationship with end-users (different configurations are to be considered). In the case of indirect connection, only those details additional to the publication relating to the direct interface need be published, that is, the publication is a "delta" to the direct interface publication.

3)   Specifications of existing interfaces, as well as new and modified interfaces, must be published in accordance with any published guidelines or rules produced by NRAs, national competition authorities or the Commission. The withdrawal of any existing published interface must be notified including, ideally, any phased withdrawal process.

4)   NRAs may specify guidelines or rules for appropriate lead-times for publication of existing, new and modified interfaces. These should be the minimum consistent with the need to allow manufacturers to design equipment, or to provide modified equipment in the case of modified interfaces. NRAs ought to take account of the need to promote innovation and competition in markets and should therefore allow shorter lead times where this can be justified. Further guidance for NRAs can be found above.

5)   Sufficient detail must be published to allow manufacturers to design, manufacture, test and place equipment on the market, including information concerning any Essential Requirements. "Templates" providing details of the expected content of analogue, digital and radio interfaces should be followed, when available.

6)   Interface publications may be produced using the Public Network Operator's own "house style" so long as the contents of the publication provide the same information as indicated in the templates. Clarity would be improved by cross-referencing to the template paragraph numbers and by using ETSI terminology wherever possible. There is no requirement to have a separate publication for each customer interface; it is recognized that where customer interfaces are very similar, it may be beneficial to have all of those interfaces in a single document. Similarly, it may be desirable to specify some characteristics which are common to a number of customer interfaces (e.g. tones and announcements) in a separate publication. The criteria for deciding how to document the technical characteristics of the customer interfaces should be based on clarity, removal of ambiguity, maintainability and ease of use for the users of these publications.

7)   Publications should contain sufficient information to permit the design of terminal equipment so that it can interwork with the public telecommunications network for the purpose of establishing, modifying, charging for, holding and clearing real or virtual connections and to meet all Essential Requirements. They should also contain details of any supplementary services or enhanced features provided by the network that is important for the design and operation of terminal equipment. The PNO should not exclude any information concerning interworking with the network that it is aware would be relevant to the design and operation of terminal equipment. Sufficient information must be published to allow manufacturers to test that their equipment conforms to the interface specification, including the relevant Essential Requirements. The level of detail should be comparable to that provided in harmonized standards covering essential requirements, excluding test specifications unless the test method needs to be declared in order to clarify the meaning of a given parameter.

8)   Interface publications should refer to published standards where available and specify any options, additions or modifications selected by the PNO within them. For example, ISDN PICS and PIXIT documents could be used where available. PNOs may refer out to other published company documentation for all or part of their interface publication, as long as such documentation defines the interface from the network rather than the terminal viewpoint. Where such references are made, the PNO should ensure that the same ease of access exists for the referenced document(s) as that applied to the interface publication.

9)   The PNO should ensure it does not knowingly publish in breach of any associated IPR and/or copyright. The PNO should at least consult the network equipment supplier. In so far as the PNO is aware of any relevant property rights, it should ensure that the publication contains a clear indication of:

   -   any IPR and/or copyright asserted over the contents of the publication (including any specifications referred out to);

   -   the rights granted and restrictions made to users of the specification; and

   -   how details of any licensing requirements associated with such IPR may be obtained.

10) The language of publication is a matter for each Member State. NRAs are encouraged not to place onerous translation requirements on PNOs.

11) Publications should be version controlled with a document history.

12) It is recommended that PNOs should make publications available electronically, i.e. on the World Wide Web. NRAs or other bodies may create hyperlinks to individual publication sites and to similar sites in other Member States. Paper copies should be made available on request, for which the PNO may levy a reasonable charge.

13) NRAs should promote the establishment of a national forum for the discussion of draft and published specifications with Public Network Operators, Public Service Providers, manufacturers and other interested parties, with the purpose of ensuring that publications conform to any relevant guidelines, meet the needs of terminal manufacturers and that the integrity of the network is maintained. Any such forum should take account of any harmonizing guidelines at the European level.

NRAs should require PNOs to republish any specifications that are found to be inadequate for their intended purpose.

C.3   To terminal manufacturers and suppliers

COMMISSION GUIDANCE TO TERMINAL MANUFACTURERS AND SUPPLIERS CONCERNING INTERFACE PUBLICATION

C.3.1   Description of issue

Under article 4.2 of Directive 1999/5/EC, Member States shall ensure that operators of public telecommunication networks publish information on the types of interface offered in that Member State. The Directive does not specify:

- appropriate practical considerations to be borne in mind by terminal manufacturers and suppliers.

The guidance given below is derived from the work of an Ad Hoc Group, and takes account of comments made at meetings of the Telecommunications Conformity Assessment and Market Surveillance Committee (TCAM), in which Member States assist the Commission in the management of the Directive.

C.3.2   Guidance

1) Terminal manufacturers and suppliers are encouraged to take part in any forum set up to discuss interface specifications.

2) Terminal manufacturers and suppliers are encouraged to provide feedback on the adequacy of published specifications.

3) Terminal manufacturers and suppliers should note that the purpose of the publication is to permit the design of terminals capable of functioning correctly. Assuming that the information published is adequate and accurate, the task of ensuring the interworking with and via the network rests with terminal manufacturers, as does the compliance to Essential Requirements. Statements relating to IPR or copyright in Interface publications may not be complete.

4) Terminal manufacturers and suppliers should note that in a multi-operator environment, it will be prudent to consider the interface publications of several operators (including indirect access operators) before deciding what terminals might be suitable for a given market.

5) Under the terms of article 6.3 of Directive 1999/5/EC, terminal manufacturers or suppliers provide information to users concerning the intended use and identification of interfaces for connection should, in addition to the possible use of familiar or branded names, refer to the PNOs' publications under article 4.2. A declaration of intended purpose is not itself a guarantee of interworking. It will be a matter of consumer protection and the courts to decide whether any such statements are misleading.

C.4   To EU member states notification

GUIDANCE ON INTERFACE NOTIFICATION BY MEMBER STATES

C.4.1   Description of issue

Under article 4.2 of Directive 1999/5/EC, each Member State shall notify the types of interface offered in that State by operators of public telecommunications networks. The Directive does not specify:

- the level of detail, or the timing, of these notifications.

The guidance given below is derived from the work of an Ad Hoc Group, and takes account of comments made at meetings of the Telecommunications Conformity Assessment and Market Surveillance Committee (TCAM), in which Member States assist the Commission in the management of the Directive.

C.4.2   Guidance

1)   Notifications made by Member States to the Commission under article 4.2 should contain information in sufficient detail to identify the high level classification of the interface and allow broad equivalence of interfaces to be established. The term "equivalence" is meant to imply that the functional characteristics of interfaces are similar, any variations being minor differences of detailed parameters which might either be encompassed within a single realization, or provided for by configuration processes. A possible classification of fixed network interfaces is annexed (clause C.4.3 of the present document). This classification is not intended to imply anything relating to Essential Requirements, but might in future be used as a super set of Equipment Class Identifiers.

2)   These notifications should be made when the relevant interface is provided and not in advance, as is the case with the interface publication by the Public Network Operators.

3)   Member States should also continue to notify regulated interfaces under article 4.1.

C.4.3   Guidance on classification of fixed network interfaces *(annex 1 in the original document)*

NOTE: If classifications are used to assist in defining Essential Requirements, it may also be useful to take account of the medium used to deliver the service, e.g. copper, fibre or radio. However, where multiple means of delivery are used, terminal users will not be in a position to know what actual medium is employed, so terminals will need to comply with the "worst case".

C.4.3.1   PSTN/ISDN

- Analogue single line.

- Analogue multi-line (with/without DDI).

- ISDN Basic Rate.

- ISDN Primary Rate.

- ISDN U interface.

- Broadband ISDN ATM interfaces.

- Centrex interfaces.

- Virtual Private Network interfaces.

C.4.3.2   Leased lines/transport

- 2w and 4w analogue leased lines (baseband).

- 2w and 4w analogue leased lines (voiceband).

- Digital leased lines.

- SDH bearer interfaces.

- Optical interfaces.

C.4.3.3   Data interfaces

- X25.

- X21.

- TCP/IP.

- IEEE 802.x interfaces (e.g. Ethernet, Token Ring, SMDS).

- Frame Relay.

C.4.3.4   Broadcast interfaces

- Unswitched vision/sound.

- Switched vision/sound.

C.4.3.5   Telex interfaces

- Single line.

- Multi-line.

C.4.3.6   Indirect Access "interfaces" (deltas for indirect access services)

Void.

C.4.3.7   Specialized interfaces for Value Added Services (e.g. Voicemail)

Void.

C.4.3.8   Special Network Access interfaces

Void.

Annex D (informative):
Bibliography

On safety aspects following documents are relevant:

- CENELEC EN 60950: "Safety of information technology equipment".

- Directive 98/10/EC of the European Parliament and of the Council of 26 February 1998 on the application of open network provision (ONP) to voice telephony and on universal service for telecommunications in a competitive environment.

The following material gives supporting information and was partly copied in the informative annexes B and C.

- Guidance on Interface Notification by Member States.

- Guidance on Interface Publication by Public Telecommunications Network Operators.

- Guidance for Public Network Operators when publishing interfaces, and NRAs/Member States when supervizing such publication.

- Commission Guidance to terminal manufacturers and suppliers concerning interface publication.

Additionally a Commission web page (see: http://www.europa.eu.int/comm/enterprise/rtte/guides.htm) gives guidance in this respect to Member States, National Regulatory Authorities, Network Operators and Terminal Manufacturers. Another Commission web page (see http://europa.eu.int/comm/enterprise/rtte/weblinks.htm), under the column "interface publications" offers links to national authorities where the required publications are available.

NOTE: A number of links to web-pages were included in the present document. Websites may be deleted. At the date of the publication of the present document the ones included in it were of relevance and are recommended as important source of wide information.

History

Document history		
V1.1.1	January 2000	Publication as TR 101 730
V2.1.1	August 2005	Publication
V2.1.2	October 2005	Publication
V2.1.3	January 2006	Publication
V2.1.4	March 2006	Publication