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Foreword

This Interim European Telecommunication Standard (I-ETS) has been produced by the Terminal Equipment (TE) Technical Committee of the European Telecommunications Standards Institute (ETSI).

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An ETSI standard may be given I-ETS status either because it is regarded as a provisional solution ahead of a more advanced standard, or because it is immature and requires a "trial period". The life of an I-ETS is limited to three years after which it can be converted into an ETS, have it's life extended for a further two years, be replaced by a new version, or be withdrawn.

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1 Scope

This Interim European Telecommunication Standard (I-ETS) is applicable to Integrated Services Digital Network (ISDN) basic access video telephony terminal equipment for connection at the S-reference point or coincident S/T-reference point. It describes the D-channel signalling procedures which may be implemented by terminals connected to the pan-European ISDN for use in cases where either:

a)   the originating network has not implemented the procedures according to ETS 300 267-1 [1]; or

b)   when interworking with a terminal connected to a digital network which does not support fully compatible procedures.

The implementation of the procedures specified in ETS 300 267-1 [1] are likely to be introduced at different points in time by the various network providers at the access (D-channel signalling, DSS1) or in the network (Signalling system No. 7, ISDN User Part (ISUP)). Some networks (e.g. some non-European networks) may not even implement those procedures at all. The support of this I-ETS by the terminal will ensure an improved probability of success of videotelephony calls and avoid the occurrence of unexpected clearing of calls as long as networks have not fully implemented the procedures according to ETS 300 267-1 [1].

The requirements in this I-ETS are based on the procedures specified in ETS 300 267-1 [1] and ETS 300 403-1 [2] and the use of the Bearer Capability, Low Layer Compatibility and High Layer Compatibility information elements as specified in ETR 018 [3].

>   NOTE: The characteristics of the ISDN user-network interface are specified in ETS 300 012, ETS 300 125 (see annex B), and ETS 300 403-1 [2].

2 Normative references

This I-ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this I-ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1]   ETS 300 267-1 (1994): "Integrated Services Digital Network (ISDN); Telephony 7 kHz and videotelephony teleservices; Digital Subscriber Signalling System No. one (DSS1); Part 1: Protocol specification".

[2]   ETS 300 403-1 (1995): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".

[3]   ETR 018 (Edition 3): "Integrated Services Digital Network (ISDN); Application of the Bearer Capability (BC); High Layer Compatibility (HLC) and Low Layer Compatibility (LLC) information elements by terminals supporting ISDN Services".

[4]   ETS 300 143: "Integrated Services Digital Network (ISDN); Audiovisual services; Inband signalling procedures for audiovisual terminals using digital channels up to 2 048 kbit/s".

[5]   ETS 300 145: "Integrated Services Digital Network (ISDN); Audiovisual services; videotelephone systems and terminal equipment operating on one or two 64 kbit/s channels".

[6]   I-ETS 300 245-5 (1995): "Integrated Services Digital Network (ISDN); Technical characteristics for telephony terminals; Part 5: Wideband (7 kHz) handset telephony".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this I-ETS, the relevant definitions used in ETS 300 143 [4], ETS 300 144 (see annex B) and CCITT Recommendations I.112, I.230 and I.240 (see annex B) apply.

I-channel: The initial (or only) B-channel allocated to a call where inband signalling according to the principles described in ETS 300 144 is applied.

modes of operation: For the videotelephony teleservice in the ISDN, the modes of operation are defined in table 1 of ETS 300 145 [5].

telephony 3,1 kHz teleservice: A teleservice providing speech transmission at an audio bandwidth of 3,1 kHz. The communication is bi-directional, with both directions active during the speech phase. User information is provided over a B-channel, signalling is provided over the D-channel (based on ETS 300 111, clause 5 (see annex B)).

telephony 7 kHz teleservice: A real-time 7 kHz teleservice in which speech (7 kHz or 3,1 kHz bandwith) can be interchanged using one circuit-mode 64 kbit/s connection. The audio bandwith conforms to CCITT Recommendations G.722 and G.711 (see annex B) (based on ETS 300 263, clause 5 (see annex B)).

terminal types: For the videotelephony teleservice in the ISDN, the terminal types are defined in table 2 of ETS 300 145 [5].

videotelephony teleservice: A real-time audiovisual teleservice in which speech and moving pictures are interchanged by means of one or two 64 kbit/s circuit-mode connections in the ISDN (based on ETS 300 264, clause 5 (see annex B)).

3.2 Abbreviations

For the purposes of this I-ETS, the following abbreviations, in addition to those used in CCITT Recommendations I.112, I.230 and I.240 (see annex B), apply.

CLI	Calling Line Identification
CLIR	Calling Line Identification Restriction
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
MSN	Multiple Subscriber Number supplementary service
TE	Terminal Equipment
UDI	Unrestricted Digital Information
UDI-TA	Unrestricted Digital Information with Tones and Announcements

4 Short term D-channel signalling procedures

4.1 General

The procedures of ETS 300 267-1 [1], i.e. provision of the Bearer Capability with information transfer capability "Unrestricted Digital Information with Tones and Announcements (UDI-TA)" and the fallback procedure (use of two Bearer Capability and High Layer Compatibility information elements in the SETUP message), may not be implemented in all European and non-European ISDNs for an interim period of time or at all. As a short term solution, terminals supporting the videotelephony teleservice shall meet, along with the procedures specified in ETS 300 267-1 [1], the requirements described in the following subclauses.

In principle, 3 different types of networks can be distinguished for the transition period:

Network type 1: This type of network supports the procedures specified in ETS 300 267-1 [1], in particular the use of two Bearer Capability/High Layer Compatibility information elements, at the access for the D-channel signalling as well as in the network for the signalling system no. 7 (ISUP).

Network type 2: This type of network supports the procedures specified in ETS 300 267-1 [1] at the access for the D-channel signalling, but not in the network for the signalling system no. 7 (ISUP). In this case, the fallback procedures (use of two Bearer Capability/High Layer Compatibility information elements in the SETUP message), are not supported by the network.

Network type 3: This type of network does not support the procedures described in ETS 300 267-1 [1], neither at the access for the D-channel signalling, nor in the network for the signalling system no. 7 (ISUP).

NOTE 1: The networks type 2 and 3 may support of the Bearer Capability "UDI-TA" independent from the fallback procedures.

NOTE 2: Videotelephony terminals may be connected outside Europe to another type of network, providing only restricted transmission capabilities (e.g. 56 kbit/s).

For videotelephony terminals complying with this I-ETS, it shall be possible to pre-set the terminal to the type of network which it is intended to be connected to. Procedures for changing the preset-value for the network type shall be available for the user.

NOTE 3: The term "network type" is used only in the context of this I-ETS.

NOTE 4: Conformance test requirements for ETS 300 403-1 [2] are given in ETS 300 403 part 4 and part 5 .

NOTE 5: Conformance test requirements for the procedures in ETS 300 267-1 [1] are not yet published.

Conformance test requirements are not included in this I-ETS.

4.2 Outgoing call

4.2.1 Videotelephony teleservice, outgoing call for the initial connection

Dependent on the type of network the terminal is connected to, the information elements contained in the SETUP message for the initial connection shall be chosen according to tables A.1 and A.2 of annex A.1.

4.2.1.1 Outgoing call for network type 1

For network type 1, the procedures of ETS 300 267-1 [1] shall apply.

When the call setup for the initial connection is rejected by the network with a cause value that indicates that the requested Bearer Capability (UDI-TA) is not supported by the destination network or the called terminal, e.g. 31, 47, 65, 88, 127, then the terminal shall automatically repeat the call setup procedures by requesting the "circuit-mode 64 kbit/s unrestricted 8 kHz structured bearer service category". The coding of the Bearer Capability information element is described in ETR 018 [3].

NOTE 1: For further possible cause values, see ETS 300 485 (see annex B).

A High Layer Compatibility information element as described in ETR 018 [3], indicating "videotelephony, CCITT Recommendation F.721" and possibly "initial channel", may be inserted into the SETUP message.

NOTE 2: For an interim period of time it is not guaranteed that all networks will support the transport and/or delivery of the High Layer Compatibility information element to the called terminal. In addition, transport of octet 4 may, in some circumstances be supported, but the transport of octet 4a will not.

4.2.1.2   Outgoing call for network type 2

For network type 2, the procedures of ETS 300 267-1 [1] apply with the following exception:

The terminal shall always send a SETUP message containing only one Bearer Capability information element and one High Layer Compatibility information element according to table A.2 to the network, even in the case where fallback is allowed.

When the call setup for the initial connection is rejected by the network with a cause value that indicates that the requested Bearer Capability (UDI-TA) is not supported by the destination network or the called terminal, e.g. 31, 47, 65, 88, 127, then the terminal shall automatically repeat the call setup procedures by requesting the "circuit-mode 64 kbit/s unrestricted 8 kHz structured bearer service category". The coding of the Bearer Capability information element is described in ETR 018 [3].

        NOTE 1:   For further possible cause values, see ETS 300 403-1 [2].

A High Layer Compatibility information element as described in ETR 018 [3], indicating "videotelephony, CCITT Recommendation F.721" and possibly "initial channel", may be inserted into the SETUP message.

        NOTE 2:   For an interim period of time it is not guaranteed that all networks will support the transport and/or delivery of the High Layer Compatibility information element to the called terminal. In addition, transport of octet 4 may, in some circumstances be supported, but the transport of octet 4a will not.

If this second call attempt is rejected with a cause value 18 (no user responding) and the calling user had allowed fallback, then a third call setup shall automatically be initiated as a request for the telephony 3,1 kHz teleservice.

The human user shall be informed about the repeated call attempts.

        NOTE 3:   For networks of type 2, the procedures of ETS 300 267-1 [1] could apply in principle. However, it should be noted that, when a user requests the videotelephony teleservice with fallback allowed, fallback will always occur. Thus the resulting service will be the telephony 3,1 kHz teleservice.

4.2.1.3   Outgoing call for network type 3

For network type 3, when initiating an outgoing call for the initial connection, the terminal shall request the "circuit-mode 64 kbit/s unrestricted 8 kHz structured bearer service category". The coding of the Bearer Capability information element is described in ETR 018 [3].

A High Layer Compatibility information element as described in ETR 018 [3], indicating "videotelephony, CCITT Recommendation F.721" and possibly "initial channel", may be inserted into the SETUP message.

        NOTE: For an interim period of time it is not guaranteed that all networks will support the transport and/or delivery of the High Layer Compatibility information element to the called terminal. In addition, transport of octet 4 may, in some circumstances, be supported but the transport of octet 4a will not.

If the call attempt is rejected with a cause value 18 and the user had allowed fallback, then another call setup shall automatically be initiated as a request for the telephony 3,1 kHz teleservice.

The user shall be informed about the repeated call attempt.

4.2.1.4 Outgoing call for interworking with restricted networks

When it is known that the called terminal is connected to a restricted network or can only be reached via a restricted network, the Bearer Capability and optionally the Low Layer Compatibility and High Layer Compatibility information elements shall be encoded according to ETR 018 [3], subclause 9.1. If this call is rejected with a cause that indicates that the requested Bearer Capability is not supported by the destination network, then the terminal shall automatically repeat the call setup procedures with the Bearer Capability/Low Layer Compatibility/High Layer Compatibility information elements set according to subclauses 4.2.1.1 to 4.2.1.3, as appropriate.

In the case where the call to a restricted network is requesting the information transfer rate Unrestricted Digital Information (UDI) or UDI-TA, the behaviour of the international gateway or the destination network is not fully standardized and may range from a rejection of the call attempt with an appropriate cause to call processing with information, through a progress information element # 5, that the Bearer Capability has changed to another, i.e. that fallback has occurred.

The calling terminal shall be prepared to:

- repeat the call setup procedures with the Bearer Capability information element encoded as described in ETR 018 [3], clause 9, when the call is rejected by the network;

- receive a CONNECT message including a Bearer Capability information element encoded as described in ETR 018 [3], clause 9;

- initiate the appropriate inband signalling procedures if it supports interworking with such networks;

- clear the call if it does not support such interworking.

  NOTE 1: A High Layer Compatibility information element, as described in ETS 300 403-1 [2] indicating "videotelephony, CCITT Recommendation F.721" and possibly "initial channel", may be required by the international gateway in order to progress the call.

  NOTE 2: The calling terminal should activate its A/μ-law detector in order to properly decode any tones or announcements provided by the local or distant network.

4.2.1.5 Procedures for all types of networks

In order to set the terminal to the appropriate network type or for operation with restricted networks, it shall be possible either:

- to pre-set the terminal to use the relevant coding for the call setup to certain destinations; or

- to use it on a per call basis on request of the user.

Optionally, the calling terminal may insert a Low Layer Compatibility information element into the outgoing SETUP message. The coding shall be according to ETR 018 [3].

The inclusion of the Low Layer Compatibility information element is not permitted when, according to ETS 300 267-1 [1], repeated Bearer Capability and High Layer Compatibility information elements are contained in the outgoing SETUP message.

When the "circuit-mode 64 kbit/s unrestricted 8 kHz structured bearer service category" is used, no tones or announcements will be available for the calling terminal on the B-channel. The terminal shall provide the user with appropriate information about the progress of the call setup, either as visual information e.g. on a display or screen or as information tones. Information on a harmonized set of information tones locally generated on basis of information received on the D-channel can be found in I-ETS 300 245-7 (see annex B).

Optionally, the terminal may insert the Calling Line Identification (CLI) information into the SETUP message.

NOTE: For users, it is recommended not to apply the Calling Line Identification Restriction (CLIR) supplementary service, because in this case the called terminal might not be able to identify the relation between the initial call and the additional call before the acceptance of the call (see subclause 4.3.2).

On receipt of a CONNECT message, the calling terminal shall move to the Active state (according to ETS 300 403-1 [2]) and shall initiate inband signalling procedures as described in ETS 300 143 [4].

4.2.2 Videotelephony teleservice, outgoing call for the second connection

For the establishment of the second connection for network type 3, the same coding for the Bearer Capability information element as for call 1 shall be used. For networks type 1 and type 2, the procedures of ETS 300 267-1 [1] shall apply.

In general, for all types of networks the same addressing information as for call 1 shall be used.

However, it shall be possible on request of the user to use different addressing information for the second connection.

NOTE: Some terminals connected to networks outside Europe may have assigned different ISDN numbers for the first and second connection by using the Multiple Subscriber Number (MSN) supplementary service.

A High Layer Compatibility information element as described in ETR 018 [3] indicating "videotelephony, CCITT Recommendation F.721", and possibly "additional channel", shall be inserted into the SETUP message.

Optionally, the terminal may insert the CLI information into the SETUP message. This shall be done only if the CLI information had also been inserted into the SETUP message of the initial connection.

On receipt of a CONNECT message, the calling terminal shall move to the Active state (according to ETS 300 403-1 [2]), shall check the relationship of the two connections using inband signalling procedures as described in ETS 300 143 [4] and, if the inband procedures for the second connection are not successful, shall send a DISCONNECT message for the second connection and shall move to the appropriate mode according to ETS 300 145 [5].

4.3 Incoming call

4.3.1 Videotelephony teleservice, call request for the initial connection

An incoming call shall, in addition to the procedures described in ETS 300 267-1 [1], be considered as a request for the videotelephony teleservice if a Bearer Capability information element indicating "unrestricted digital information" is contained in the incoming SETUP message, even if octet 5 is missing. If a High Layer Compatibility information element is included in the SETUP message, it shall indicate "videotelephony, CCITT Recommendation F.721" and possibly "initial channel". A call received with any other High Layer Compatibility information element included in the SETUP message shall result in a negative compatibility check and shall generally be ignored (cf. subclause 4.3.3).

Detailed information about the interpretation of the Bearer Capability information element and the High Layer Compatibility information element of the incoming call message is contained in table A.3 of annex A, clause A.2.

The called terminal shall:

- ignore the call request if it does not support the requested service; or

- send an ALERTING message if it supports the requested service.

NOTE 1: When using the "circuit-mode 64 kbit/s unrestricted 8 kHz structured bearer service category", a High Layer Compatibility information element may not be contained in an incoming call SETUP message, even if inserted into the SETUP message by the calling terminal.

NOTE 2:   When the incoming SETUP contains only a Bearer Capability information element indicating "unrestricted digital information" and no High Layer Compatibility information element, it may not be possible to distinguish between a request for a videotelephony and a telephony 7 kHz communication. Then, after acceptance of the call, the inband signalling procedures will determine the appropriate application of the bearer service. A subscriber who needs the answering of videotelephony calls and telephony 7 kHz calls by different terminals may use different addresses (MSN supplementary service).

Inband signalling procedures as described in ETS 300 143 [4] shall be initiated when the D-channel compatibility checks are considered successful, a CONNECT message has been sent to and the CONNECT ACKNOWLEDGE message has been received from the network.

On receipt of this message the terminal shall move to the Active state according to ETS 300 403-1 [2].

4.3.2   Videotelephony teleservice, call request for the second connection

For the call request that is assumed to be the second connection request, no ALERTING message shall be sent prior to sending the CONNECT message to the network.

When receiving an incoming SETUP message for the second call, the following actions shall be performed:

-       check for compatibility of the Bearer Capability information element and High Layer Compatibility information element. Possible values for the Bearer Capability information element are "UDI" and "RDI", for the High Layer Compatibility information element (if included) "Vt";

-       check the relation of this call to the already existing initial connection by using the CLI, if included in the SETUP messages of the initial and second connection;

-       if the CLI information contained in both incoming SETUP messages does not allow the identification of the relationship of the two calls, the relationship of the two connections shall be checked after acceptance of the second call by using inband signalling procedures after a CONNECT ACKNOWLEDGE message has been received from the network;

-       if the CLI information is available, then only if the country and area code, if applicable, of both CLI information are identical, a CONNECT message shall be sent to the network;

-       if the inband negotiation for the second connection is not successful or has proved that this call is not the related additional channel to the initial connection, then the called terminal shall send a DISCONNECT message to the network in order to release the second connection.

4.3.3   Call request for the telephony 7 kHz teleservice

An incoming call shall be considered as a request for the telephony 7 kHz teleservice if a Bearer Capability information element indicating "unrestricted digital information", possibly with octet 5 indicating "ITU-T Recommendations H.221 and H.242", is included in the SETUP message and, if a High Layer Compatibility information element indicating "telephony" is included in the SETUP message, the High Layer Compatibility check is successful.

NOTE 1:   When using the "circuit-mode 64 kbit/s unrestricted 8 kHz structured bearer service category", a High Layer Compatibility information element may not be contained in the incoming call SETUP message, even if inserted into the SETUP message by the calling terminal.

NOTE 2:   When the incoming SETUP message contains only a Bearer Capability information element indicating "unrestricted digital information" without octet 5 and no High Layer Compatibility information element, it may not be possible to distinguish between a request for a 7 kHz and a videotelephony communication. Then, after acceptance of the call, the inband signalling procedures will determine the teleservice.

When the telephony 7 kHz teleservice can be identified by the received High Layer Compatibility information element, the call shall be ignored by a videotelephony terminal programmed to have such behaviour.

Inband signalling procedures as described in I-ETS 300 245-5 [6] shall be initiated when the D-channel compatibility checks are considered successful, a CONNECT message has been sent to and the CONNECT ACKNOWLEDGE message has been received from the network.

4.3.4   Incoming call from restricted networks

For incoming calls from restricted networks, the Bearer Capability and, optionally, the Low Layer Compatibility and High Layer Compatibility information elements shall be encoded as described in ETR 018 [3], subclause 9.2. If the terminal supports interworking with restricted networks (56 kbit/s), it shall accept the call if the D-channel compatibility checks have been successful.

Annex A (normative): Use of the Bearer Capability and High Layer Compatibility information elements in the outgoing and incoming SETUP message

A.1 Call setup by the originating terminal

Unless the terminal is destined for very closely defined conditions of the network and application, the outgoing SETUP message shall be programmable at least on a per-installation basis.

The terminal shall be capable of both single information element types of SETUP message, and shall also be able to make a second call attempt automatically, using a different Bearer Capability/High Layer Compatibility information element combination, if the first is either rejected by the network or rejected/ignored by the destination terminal. Possible combinations of Bearer Capability and High Layer Compatibility information elements are described in table A.1.

Table A.1: Possible combinations of Bearer Capability and High Layer Compatibility information element

Set	BC1	HLC1	BC2	HLC2	
					Vt = videotelephony (Vt) = optionally
1	S	Tp	UDI-TA	Vt	Tp = telephony
2	UDI	Vt			S = Speech
3	S	Tp			UDI = Unrestricted Digital Information
4	UDI-TA	Vt			UDI-TA = Unrestricted Digital Information with Tones and Announcements
5	RDI	(Vt)			RDI = Restricted Digital Information coding (see ETR 018 [3], subclause 9.1).
NOTE: For the call setup of any additional connection, set 2 as specified in ETS 300 267-1 [1] shall apply.					

Table A.2 describes the use of the Bearer Capability/High Layer Compatibility information element for the initial call when the terminal is connected to a specific type of network (see subclause 4.1).

Table A.2: Use of the Bearer Capability and High Layer Compatibility information elements

Type of the network where the calling terminal is connected to (see subclause 4.1)	Type 1	Type 2	Type 3
Videotelephone call, fallback to telephony allowed, first attempt.	Set 1	Set 4	Set 2
Retry after rejection from the network with cause 47, 88, 127 or 65, other values are possible.	Set 2	Set 2	not applicable
Retry after a DISCONNECT message with cause 18 is received.	Set 3	Set 3	Set 3
Videotelephone call, no fallback to telephony allowed, first attempt.	Set 4	Set 4	Set 2
Retry after rejection from the network with cause 31, 47, 88, 127 or 65, other values are possible.	Set 2	Set 2	not applicable
Retry, if the call is rejected and from the cause value it can be derived that this is due to interworking with restricted networks (e.g. cause value 70).	Set 5	Set 5	Set 5
Telephony 3,1 kHz teleservice.	Set 3	Set 3	Set 3
NOTE: For the call setup of any additional connection, set 2 as specified in ETS 300 267-1 [1] shall apply.			

A.2 Alerting of the called terminal

Terminals supporting the videotelephony teleservice shall be programmable in respect of alerting, unless they are destined for a controlled application regime. Therefore, at least all the following SETUP messages should be recognised and treated accordingly.

Table A.3: Alerting of the called terminal

	Information elements in the SETUP message received by the called terminal				Information element in the CONNECT message sent by the called terminal		Reason for alerting
	BC1	HLC1	BC2	HLC2	BC	HLC	
1	S	Tp	UDI-TA	Vt	UDI-TA or S	Vt Tp	Caller desires videotelephony call and allows fallback.
2	S	Tp	UDI-TA	Tp	UDI-TA or S	Vt Tp	Caller desires 7 kHz telephony call and allows fallback.
3	UDI-TA	Vt					Caller desires videotelephony call and destination can support it.
4	UDI-TA	Tp					Caller desires 7 kHz telephony call, destination can support it.
5	UDI-TA						Caller may desire either Vt or 7 kHz or any audiovisual call.
6	S	Tp					Caller desires telephony 3,1 kHz teleservice only
7	3,1 kHz with PI #1						Call from PSTN - could also be a PSTN videotelephone.
8	UDI	Vt					Caller desires videotelephony call and destination can support it.
9	UDI	Tp					caller desires 7 kHz telephony and destination can support it.
10	UDI						Caller may desire either Vt or 7 kHz or any audiovisual call.
11	RDI						Caller is connected to restricted network and destination can support interworking. RDI coding see ETR 018 [3], subclause 9.2.

A.3 CONNECT message

A CONNECT message shall be sent to the network by the called terminal when the call is accepted. When fallback is allowed and no fallback occurs, the CONNECT message shall contain the Bearer Capability and High Layer Compatibility information elements indicating the videotelephony teleservice as the resultant service.

Annex B (informative): Bibliography

For the purposes of this I-ETS, the following informative references have been given.

- ETS 300 012 (1992): "Integrated Services Digital Network (ISDN); Basic user-network interface; Layer 1 specification and test principles".

- ETS 300 125 (1991): "Integrated Services Digital Network (ISDN); User-network interface data link layer specification; Application of CCITT Recommendations Q.920/I.440 and Q.921/I.441".

- ETS 300 144 (1994): "Integrated Services Digital Network (ISDN); Audiovisual teleservices - Frame structure for a 64 kbit/s channel to 1 920 kbit/s channel and associated syntax for inband signalling".

- CCITT Recommendation G.711 (1988): "Pulse Code Modulation (PCM) of voice frequencies".

- CCITT Recommendation G.722 (1988): "7 kHz audio coding within 64 kbit/s".

- CCITT Recommendation I.112 (1993): "Vocabulary of terms for ISDNs".

- CCITT Recommendation I.230 (1988): "Definition of Bearer service categories".

- CCITT Recommendation I.240 (1988): "Definition of teleservices".

- ETS 300 264 (1994): "Integrated Services Digital Network (ISDN); Videotelephony teleservice, Service description".

- ETS 300 111 (1992): "Integrated Services Digital Network (ISDN); Telephony 3,1 kHz teleservice; Service description".

- ETS 300 263 (1994): "Integrated Services Digital Network (ISDN); Telephony 7 kHz teleservice; Service description".

- I-ETS 300 245-7 (1995): "Integrated Services Digital Networks (ISDN); Technical characteristics of telephony terminals; Part 7: Locally generated information tones".

- ETS 300 403-4 (1996): "Integrated Services Digital Networks (ISDN); Digital Subscriber Signalling System No. One (DSS1); Signalling network layer for circuit-mode basic call control; Part 4: Test Suite Structure and Test Purposes (TSS&TP) specification for the user".

- prETS 300 403-5: "Integrated Services Digital Networks (ISDN); Digital Subscriber Signalling System No. One (DSS1) protocol; User-network interface layer 3 specification for basic call control; Part 5: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma for the user".

- prETS 300 485 (1996): "Integrated Services Digital Network (ISDN); Definition and usage of cause and location in Digital Subscriber Signalling System No. one (DSS1) and Signalling System No.7 ISDN User Part (ISUP) (ITU-T Recommendation Q.850 (1993), modified)".

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