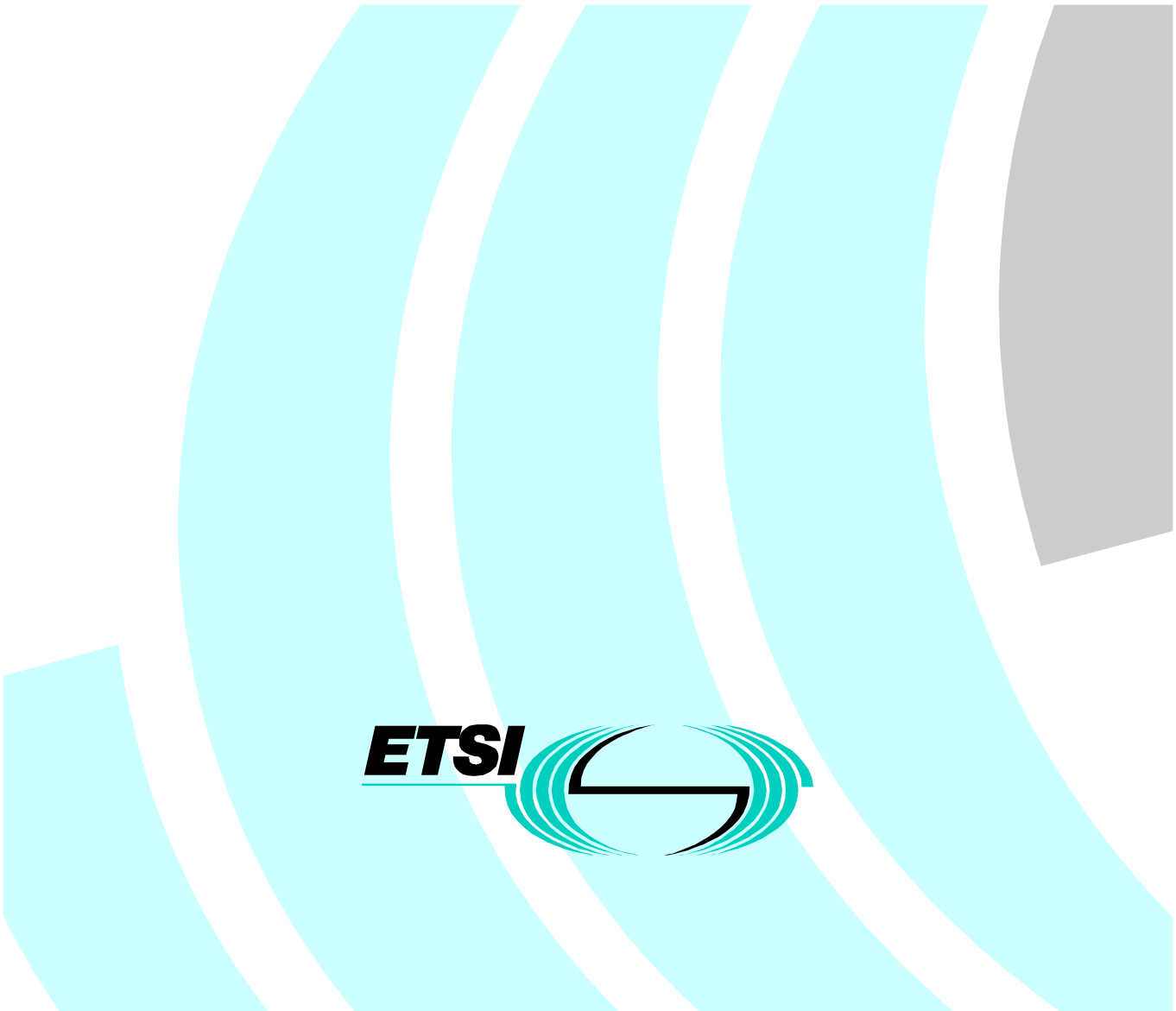
ETSI EN 301 067-3 V1.1.3 (1999-11)

European Standard (Telecommunications series)

**Broadband Integrated Services Digital Network (B-ISDN);
Digital Subscriber Signalling System No. two (DSS2) protocol;
Connection characteristics;
Negotiation during call/connection establishment phase;
Part 3: Test Suite Structure and Test Purposes (TSS&TP)
specification for the user**



Reference
DEN/SPS-05151-3 (9vor0ie0.PDF)

Keywords
ATM, B-ISDN, broadband, DSS2, ISDN, layer 3,
TSS&TP, UNI, user

ETSI

Postal address
F-06921 Sophia Antipolis Cedex - FRANCE

Office address
650 Route des Lucioles - Sophia Antipolis
Valbonne - 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

Internet
secretariat@etsi.fr
Individual copies of this ETSI deliverable
can be downloaded from
http://www.etsi.org
If you find errors in the present document, send your
comment to: editor@etsi.fr

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 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://www.etsi.org/ipr).

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 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 European Standard (Telecommunications series) has been produced by ETSI Technical Committee Signalling Protocols and Switching (SPS).

The present document is part 3 of a multi-part standard covering the Digital Subscriber Signalling System No. 2 (DSS2) protocol specification for the B-ISDN connection negotiation during call/connection establishment phase, as identified below:

Part 1: "Protocol specification [ITU-T Recommendation Q.2962 [8] (1996), modified]";

Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification";

Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification for the user";

Part 4: "Abstract Test Suite (ATS) and Partial Protocol Implementations eXtra Information for Testing (PIXIT) proforma specification for the user";

Part 5: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network";

Part 6: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network".

National transposition dates	
Date of adoption of this EN:	29 October 1999
Date of latest announcement of this EN (doa):	31 January 2000
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 July 2000
Date of withdrawal of any conflicting National Standard (dow):	31 July 2000

1 Scope

This third part of EN 301 067 specifies the user Test Suite Structure and Test Purposes (TSS&TP) for the T_B reference point or coincident S_B and T_B reference point (as defined in ITU-T Recommendation I.413 [5]) of implementations conforming to the standards for the signalling user-network layer 3 specification for connection negotiation during call/connection establishment phase of the Digital Subscriber Signalling System No. two (DSS2) protocol for the pan-European Broadband Integrated Services Digital Network (B-ISDN), EN 301 067-1 [1].

A further part of the present document specifies the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma based on the present document.

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, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] EN 301 067-1 (V1.1): "Broadband Integrated Services Digital Network (B-ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; Connection characteristics; Negotiation during call/connection establishment phase - Part 1: Protocol specification [ITU-T Recommendation Q.2962 (1996), modified]".

[2] EN 301 067-2 (V1.1): "Broadband Integrated Services Digital Network (B-ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; Connection characteristics; Negotiation during call/connection establishment phase - Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

[3] ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General Concepts".

[4] ISO/IEC 9646-2: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite specification".

[5] ITU-T Recommendation I.413 (1993): "B-ISDN user-network interface".

[6] ETS 300 406: "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

[7] EN 300 443-1: "Broadband Integrated Services Digital Network (B-ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; B-ISDN user-network interface layer 3 specification for basic call/bearer control - Part 1: Protocol specification [ITU-T Recommendation Q.2931 (1995), modified]".

[8] ITU-T Recommendation Q.2963.1: "Digital Subscriber Signalling System No. 2 - Connection modification: Peak cell rate modification by the connection owner".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 301 067-1 [1] and EN 300 443-1 [7] and the following apply:

3.1.1 Definitions related to conformance testing

abstract test case: refer to ISO/IEC 9646-1 [3]

Abstract Test Method (ATM): refer to ISO/IEC 9646-1 [3]

Abstract Test Suite (ATS): refer to ISO/IEC 9646-1 [3]

Implementation Under Test (IUT): refer to ISO/IEC 9646-1 [3]

lower tester: refer to ISO/IEC 9646-1 [3]

Protocol Implementation Conformance Statement (PICS): refer to ISO/IEC 9646-1 [3]

PICS proforma: refer to ISO/IEC 9646-1 [3]

Protocol Implementation eXtra Information for Testing (PIXIT): refer to ISO/IEC 9646-1 [3]

PIXIT proforma: refer to ISO/IEC 9646-1 [3]

Test Purpose (TP): refer to ISO/IEC 9646-1 [3]

3.1.2 Definitions related to EN 301 067-1

user: DSS2 protocol entity at the User side of the user-network interface where a T_B reference point or coincident S_B and T_B reference point applies

user (S_B/T_B): DSS2 protocol entity at the User side of the user-network interface where a coincident S_B and T_B reference point applies

user (T_B): DSS2 protocol entity at the User side of the user-network interface where a T_B reference point applies (user is a private ISDN)

3.2 Abbreviations

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

ATM	Abstract Test Method
ATS	Abstract Test Suite
B-ISDN	Broadband Integrated Services Digital Network
DSS2	Digital Subscriber Signalling System No. two
IUT	Implementation Under Test
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
TP	Test Purpose
TSS	Test Suite Structure
U0	Null link state
U1	Call Initiated link state
U10	Active link state
U3	Outgoing Call Proceeding link state
U4	Call Delivered link state
U6	Call Present link state
U7	Call Received link state
U8	Connect Request link state
U9	Incoming Call Proceeding link state
VC	Virtual Channel
VP	Virtual Path
VPC	Virtual Path Connection

4 Test Suite Structure (TSS)

Signalling procedures at the coincident S_B/T_B and at the T_B reference points

- Negotiating the traffic parameters at the origination interface
  - Negotiation request ..... (01)
  - Negotiation acceptance ..... (02)
- Negotiating the traffic parameters at the destination interface
  - Traffic parameter negotiation procedures ..... (03)
  - Negotiation confirmation ..... (04)

Figure 1: Test suite structure

5 Test Purposes (TP)

5.1 Introduction

For each test requirement a TP is defined.

5.1.1 TP naming convention

TPs are numbered, starting at 01, within each group. Groups are organized according to the TSS. Additional references are added to identify the actual test suite (see table 1).

Table 1: TP identifier naming convention scheme

Identifier:	**<suite_id>_<group>_<nnn>**		
<suite_id>	=	service + type of IUT:	"NEGU" for connection **NEG**otiation, IUT = **U**ser
<group>	=	group number:	two character field representing the group reference according to TSS
<nn>	=	sequential number:	(01-99)

5.1.2 Source of TP definition

The TPs are based on EN 301 067-1 [1].

5.1.3 Test strategy

As the base standard EN 301 067-1 [1] contains no explicit requirements for testing, the TPs were generated as a result of an analysis of the base standard and the PICS specification EN 301 067-2 [2].

The TPs are only based on conformance requirements related to the externally observable behaviour of the IUT, and are limited to conceivable situations to which a real implementation is likely to be faced (ETS 300 406 [6]).

5.1.4 Test of call states

Many TPs include a reference to the IUT's final call state after the realization of the TP. In these cases the TP includes the requirement to ensure that the IUT has entered this particular final call state. Ensuring that the IUT is in a particular call state shall be realized by following the procedures described in subclause 5.6.11 of EN 300 443-1 [7]. According to these procedures, the IUT on receipt of a STATUS ENQUIRY message, shall respond with a STATUS message indicating, in the fifth octet of the Call state information element, the current call state of the IUT. This exchange of messages is not mentioned explicitly in each TP but is considered to be implicit in the reference to the final call state. This way of phrasing the TPs has been used to avoid over-complicating the text and structure of the TPs and to improve the readability.

5.2 TPs for the traffic parameters negotiation, user

All PICS items referred to in this subclause are as specified in EN 301 067-2 [2] unless indicated otherwise by another numbered reference.

Unless specified:

- the messages indicated are valid and contain at least the mandatory information elements and possibly optional information elements;
- the information elements indicated are valid and contain at least the mandatory parameters and possibly optional parameters.

5.2.1 Signalling procedures at the coincident S_B/T_B and at the T_B reference points

5.2.1.1 Negotiating the traffic parameters at the origination interface.

Test purposes for EN 301 067-1 [1] subclause 9.1.

5.2.1.1.1 Negotiation request (01)

Test purposes for EN 301 067-1 [1] subclause 9.1.1.

NEGU_01_01
Ensure that the IUT in U0, in order to initiate the negotiation of the traffic parameters,
- sends a SETUP message with the alternative ATM traffic descriptor information element included and enters U1.

Selection: Negotiation of alternative ATM traffic descriptor. PICS: MCu 1

NEGU_01_02
Ensure that the IUT in U0, in order to initiate the negotiation of the traffic parameters,
- sends a SETUP message with the minimum acceptable ATM traffic descriptor information element included and enters U1.

Selection: Negotiation of minimum acceptable ATM traffic descriptor. PICS: MCu 2

5.2.1.1.2 Negotiation acceptance (02)

Test purposes for EN 301 067-1 [1] subclause 9.1.3.

NEGU_02_01
Ensure that the IUT in U3 (having sent a SETUP message with the alternative ATM traffic descriptor information element), on receipt of a CONNECT message including an acceptable ATM traffic descriptor information element,
- sends a CONNECT ACKNOWLEDGE message and enters U10.

Selection: Negotiation of alternative ATM traffic descriptor. PICS: MCu 1

NEGU_02_02
Ensure that the IUT in U3 (having sent a SETUP message with the minimum acceptable ATM traffic descriptor information element), on receipt of a CONNECT message including an acceptable ATM traffic descriptor information element,
- sends a CONNECT ACKNOWLEDGE message and enters U10.

Selection: Negotiation of minimum acceptable ATM traffic descriptor. PICS: MCu 2

NEGU_02_03
Ensure that the IUT in U3 (having sent a SETUP message with the alternative ATM traffic descriptor information element), on receipt of a CONNECT message without ATM traffic descriptor information element included,
- sends a CONNECT ACKNOWLEDGE message and enters U10.

Selection: Negotiation of alternative ATM traffic descriptor. PICS: MCu 1

NEGU_02_04
Ensure that the IUT in U3 (having sent a SETUP message with the minimum acceptable ATM traffic descriptor information element), on receipt of a CONNECT message without ATM traffic descriptor information element included,
- sends a CONNECT ACKNOWLEDGE message and enters U10.

Selection: Negotiation of minimum acceptable ATM traffic descriptor. PICS: MCu 2

NEGU_02_05
Ensure that the IUT in U4 (having sent a SETUP message with the alternative ATM traffic descriptor information element), on receipt of a CONNECT message including an acceptable ATM traffic descriptor information element,
- sends a CONNECT ACKNOWLEDGE message and enters U10.

Selection: Negotiation of alternative ATM traffic descriptor. PICS: MCu 1

NEGU_02_06
Ensure that the IUT in U4 (having sent a SETUP message with the minimum acceptable ATM traffic descriptor information element), on receipt of a CONNECT message including an acceptable ATM traffic descriptor information element,
- sends a CONNECT ACKNOWLEDGE message and enters U10.

Selection: Negotiation of minimum acceptable ATM traffic descriptor. PICS: MCu 2

NEGU_02_07
Ensure that the IUT in U4 (having sent a SETUP message with the alternative ATM traffic descriptor information element), on receipt of a CONNECT message without ATM traffic descriptor information element included,
- sends a CONNECT ACKNOWLEDGE message and enters U10.

Selection: Negotiation of alternative ATM traffic descriptor. PICS: MCu 1

NEGU_02_08
Ensure that the IUT in U4 (having sent a SETUP message with the minimum acceptable ATM traffic descriptor information element), on receipt of a CONNECT message without ATM traffic descriptor information element included,
- sends a CONNECT ACKNOWLEDGE message and enters U10.

Selection: Negotiation of minimum acceptable ATM traffic descriptor. PICS: MCu 2

5.2.1.2 Negotiating the traffic parameters at the destination interface

Test purposes for EN 301 067-1 [1] subclause 9.2.

5.2.1.2.1 Traffic parameter negotiation procedures (03)

Test purposes for EN 301 067-1 [1] subclause 9.2.2.

NEGU_03_01
Ensure that the IUT in U0, on receipt of a SETUP message, with acceptable traffic parameters included in the ATM traffic descriptor information element,
- sends any of a CALL PROCEEDING, ALERTING or CONNECT message and enters the relevant call state U9, U7 or U8.

NEGU_03_02
Ensure that the IUT in U0, on receipt of a SETUP message, with unacceptable traffic parameters included in the ATM traffic descriptor information element, but with acceptable traffic parameters included in the minimum acceptable ATM traffic descriptor information element,
- sends any of a CALL PROCEEDING, ALERTING or CONNECT message and enters the relevant call state U9, U7 or U8.

NEGU_03_03
Ensure that the IUT in U0, on receipt of a SETUP message, with unacceptable traffic parameters included in the ATM traffic descriptor information element, but with acceptable traffic parameters included in the alternative ATM traffic descriptor information element,
- sends any of a CALL PROCEEDING, ALERTING or CONNECT message and enters the relevant call state U9, U7 or U8.

NEGU_03_04
Ensure that the IUT in U0, on receipt of a SETUP message, with unacceptable traffic parameters included in the ATM traffic descriptor information element, and unacceptable traffic parameters included in the minimum acceptable ATM traffic descriptor information element,

- sends a RELEASE COMPLETE message with a cause information element indicating a cause value 47 "Resources not available, unspecified" and remains in U0.

NEGU_03_05
Ensure that the IUT in U0, on receipt of a SETUP message, with unacceptable traffic parameters included in the ATM traffic descriptor information element, and unacceptable traffic parameters included in the alternative ATM traffic descriptor information element,

- sends a RELEASE COMPLETE message with a cause information element indicating a cause value 47 "Resources not available, unspecified" and remains in U0.

NEGU_03_06 subclause 9.1.2
Ensure that the IUT in U0, on receipt of a SETUP message, with both alternative ATM traffic descriptor information element, and minimum acceptable ATM traffic descriptor information element included,

- sends a RELEASE COMPLETE message with a cause information element indicating a cause value 73 "unsupported combination of traffic parameters" and remains in U0.

NEGU_03_07
Ensure that the IUT in N0, on receipt of a SETUP message, with an ATM traffic descriptor information element and an alternative ATM traffic descriptor information element (IE_flag = 0) containing traffic parameters increased compared to those in the ATM traffic descriptor information element,

- sends a RELEASE COMPLETE message with a cause information element indicating a cause value 100 "invalid information element contents" and remains in N0.

NEGU_03_08
Ensure that the IUT in N0, on receipt of a SETUP message, with an ATM traffic descriptor information element and an alternative ATM traffic descriptor information element (IE_flag = 1, IE_AI = clear call) containing traffic parameters increased compared to those in the ATM traffic descriptor information element,

- sends a RELEASE COMPLETE message with a cause information element indicating a cause value 100 "invalid information element contents" and remains in N0.

NEGU_03_09
Ensure that the IUT in N0, on receipt of a SETUP message, with an ATM traffic descriptor information element and an alternative ATM traffic descriptor information element (IE_flag = 1, IE_AI = discard IE and proceed) containing traffic parameters increased compared to those in the ATM traffic descriptor information element,

- discards the alternative ATM traffic descriptor information element (sends a SETUP at the remote interface with ATM traffic descriptor information element including original traffic parameter values only) and enters N1.

NEGU_03_10
Ensure that the IUT in N0, on receipt of a SETUP message, with an ATM traffic descriptor information element and an alternative ATM traffic descriptor information element (IE_flag = 1, IE_AI = discard IE, proceed and report status) containing traffic parameters increased compared to those in the ATM traffic descriptor information element,

- discards the alternative ATM traffic descriptor information element (sends a SETUP at the remote interface with ATM traffic descriptor information element including original traffic parameter values only), sends a STATUS message (cause value = 100, call state value = 1) and enters N1.

NEGU_03_11
Ensure that the IUT in N0, on receipt of a SETUP message, with an ATM traffic descriptor information element and an alternative ATM traffic descriptor information element (IE_flag = 1, IE_AI = discard message and ignore) containing traffic parameters increased compared to those in the ATM traffic descriptor information element,

- sends no message and remains in N0.

NEGU_03_12
Ensure that the IUT in N0, on receipt of a SETUP message, with an ATM traffic descriptor information element and an alternative ATM traffic descriptor information element (IE_flag = 1, IE_AI = discard message and report status) containing traffic parameters increased compared to those in the ATM traffic descriptor information element,

- sends a STATUS message (cause value = 100, call state value = 0) and remains in N0.

5.2.1.2.2 Negotiation confirmation (04)

Test purposes for EN 301 067-1 [1] subclause 9.2.3.

NEGU_04_01
Ensure that the IUT in U6, U9 or U7, having received a SETUP message, with acceptable traffic parameters included in the ATM traffic descriptor information element and with a valid minimum acceptable ATM traffic descriptor information element, to indicate the acceptance of the request,

- sends a CONNECT message with the ATM traffic descriptor information element (including the same parameter as received in the ATM traffic descriptor information element) and enters U10.

NEGU_04_02
Ensure that the IUT in U6, U9 or U7, having received a SETUP message with traffic parameters included in the ATM traffic descriptor information element and in the minimum acceptable ATM traffic descriptor information element, such that the IUT is able to provide traffic rates between the two set of values, to indicate the acceptance of the request,

- sends a CONNECT message with an ATM traffic descriptor information element including parameter values between those received in the ATM traffic descriptor and the minimum acceptable ATM traffic descriptor information elements and enters U10.

NEGU_04_03
Ensure that the IUT in U6, U9 or U7, having received a SETUP message, with unacceptable traffic parameters included in the ATM traffic descriptor information element, and traffic parameters included in the minimum acceptable ATM traffic descriptor information element, which are the highest values the IUT is able to support, to indicate the acceptance of the request,

- sends a CONNECT message with an ATM traffic descriptor information element including the same parameter values as received in the minimum acceptable ATM traffic descriptor information element and enters U10.

NEGU_04_04
Ensure that the IUT in U6, U9 or U7, having received a SETUP message, with acceptable traffic parameters included in the ATM traffic descriptor information element and with a valid alternative ATM traffic descriptor information element, to indicate the acceptance of the request,

- sends a CONNECT message with the ATM traffic descriptor information element (including the same parameter as received in the ATM traffic descriptor information element) and enters U10.

NEGU_04_05
Ensure that the IUT in U6, U9 or U7, having received a SETUP message, with unacceptable traffic parameters included in the ATM traffic descriptor information element, and acceptable traffic parameters included in the alternative ATM traffic descriptor information element which are the highest values the IUT is able to support, to indicate the acceptance of the request,

- sends a CONNECT message with a ATM traffic descriptor information element including the same parameter set and values as received in the alternative ATM traffic descriptor information element and enters U10.

6 Compliance

An ATS which complies with this TSS&TP specification shall:

a) consist of a set of test cases corresponding to the set or to a subset of the TPs specified in clause 5;

b) use a TSS which is an appropriate subset of the whole of the TSS specified in clause 4;

c) use the same naming conventions for the test groups and test cases;

d) maintain the relationship specified in clause 5 between the test groups and TPs and the entries in the PICS proforma to be used for test case deselection;

e) comply with ISO/IEC 9646-2 [4].

In the case of a) or b) above, a subset shall be used only where a particular Abstract Test Method (ATM) makes some TPs untestable. All testable TPs from clause 5 shall be included in a compliant ATS.

7 Requirements for a comprehensive testing service

As a minimum the Remote test method, as specified in ISO/IEC 9646-2 [4], shall be used by any organization claiming to provide a comprehensive testing service for network equipment claiming conformance to EN 301 067-1 [1].

History

Document history				
V1.1.1	December 1998	Public Enquiry	PE 9917:	1998-12-25 to 1999-04-23
V1.1.2	August 1999	Vote	V 9945:	1999-08-24 to 1999-10-22
V1.1.3	November 1999	Publication		