

# ETSI EN 301 486-3 V1.1.1 (2001-09)

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*European Standard (Telecommunications series)*

**Broadband Integrated Services Digital Network (B-ISDN);  
Digital Subscriber Signalling System No. two (DSS2) protocol;  
Connection characteristics;  
ATM traffic descriptor modification with negotiation  
by the connection owner;  
Part 3: Test Suite Structure and Test Purposes (TSS&TP)  
specification for the user**

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**Reference**

DEN/SPAN-130202-3

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**Keywords**ATM, B-ISDN, DSS2, TSS&TP, user, UNI,  
broadband**ETSI**

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## Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

The present document is part 3 of a multi-part deliverable covering the Broadband Integrated Services Digital Network (B-ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; Connection characteristics; ATM traffic descriptor modification with negotiation by the connection owner, as identified below:

- Part 1: "Protocol specification [ITU-T Recommendation Q.2963.3, 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 Implementation 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".

<b>National transposition dates</b>	
Date of adoption of this EN:	31 August 2001
Date of latest announcement of this EN (doa):	30 November 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 May 2002
Date of withdrawal of any conflicting National Standard (dow):	31 May 2002

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# 1 Scope

The present document 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 ATM traffic descriptor modification with negotiation by the connection owner of the Digital Subscriber Signalling System No. 2 (DSS2) protocol for the pan-European Broadband Integrated Services Digital Network (B-ISDN), EN 301 486-1 [3].

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.

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# 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.

- [1] ETSI ETS 300 406: "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".
- [2] ETSI 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]".
- [3] ETSI EN 301 486-1: "Broadband Integrated Services Digital Network (B-ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; Connection characteristics; ATM traffic descriptor modification with negotiation by the connection owner; Part 1: Protocol specification [ITU-T Recommendation Q.2963.3, modified]".
- [4] ETSI EN 301 486-2: "Broadband Integrated Services Digital Network (B-ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; Connection characteristics; ATM traffic descriptor modification with negotiation by the connection owner; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".
- [5] ITU-T Recommendation I.413 (1993): "B-ISDN user-network interface".
- [6] ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".
- [7] ISO/IEC 9646-2: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract test suite specification".
- [8] ETSI EN 301 003-1: "Broadband Integrated Services Digital Network (B-ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; Connection characteristics; Peak cell rate modification by the connection owner; Part 1: Protocol specification [ITU-T Recommendation Q.2963.1 (1996), modified]".
- [9] ETSI EN 301 003-3: "Broadband Integrated Services Digital Network (B-ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; Connection characteristics; Peak cell rate modification by the connection owner; Part 3: Test Suite Structure and Test Purposes (TSS&TP) specification for the user".

## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 301 486-1 [3], EN 301 003-1 [8], EN 300 443-1 [2] and the following apply.

#### 3.1.1 Definitions related to conformance testing

**abstract test case:** Refer to ISO/IEC 9646-1.

**Abstract Test Method (ATM):** Refer to ISO/IEC 9646-1.

**Abstract Test Suite (ATS):** Refer to ISO/IEC 9646-1.

**Implementation Under Test (IUT):** Refer to ISO/IEC 9646-1.

**lower tester:** Refer to ISO/IEC 9646-1.

**Protocol Implementation Conformance Statement (PICS):** Refer to ISO/IEC 9646-1.

**PICS proforma:** Refer to ISO/IEC 9646-1.

**Protocol Implementation eXtra Information for Testing (PIXIT):** Refer to ISO/IEC 9646-1.

**PIXIT proforma:** Refer to ISO/IEC 9646-1.

**Test Purpose (TP):** Refer to ISO/IEC 9646-1.

#### 3.1.2 Definitions related to the IUT

**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
IE_AI	Information element action indicator
IE_flag	Information element instruction indicator flag
IUT	Implementation Under Test
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
TP	Test Purpose
TSS	Test Suite Structure
U10	Active call state
U11	Release Request call state
U13	Modify Requested call state
U14	Modify Received call state

## 4 Test Suite Structure (TSS)

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

Modification/Negotiation procedures at the requesting entity	
Modification/Negotiation request	(01)
Modification/Negotiation acceptance	(02)
Modification/Negotiation procedures at the responding entity	
Modification/Negotiation confirmation	(03)

Figure 1: Test suite structure

## 5 Test Purposes (TP)

### 5.1 Introduction

The procedures for ATM traffic descriptor modification with negotiation by the connection owner are based on the modification procedures of EN 301 003-1 [8]. Therefore the test purposes defined in EN 301 003-3 [9] apply. Consequently, only for test requirements in addition to the requirements of EN 301 003-1 [8] TPs are 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>_<nn>		
<suite_id>	=	type of IUT:	"AMNU" for <b>ATM</b> traffic descriptor <b>M</b> odification with <b>N</b> egotiation, IUT = <b>U</b> 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 301 486-1 [3].

#### 5.1.3 Test strategy

As the base standard EN 301 486-1 [3] 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 301 486-2 [4].

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 [1]).

## 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 clause 5.6.11 of EN 300 443-1 [2]. 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 ATM traffic descriptor modification with negotiation, user

All PICS items referred to in this clause are as specified in EN 301 486-2 [4] 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 Modification/Negotiation procedures at the requesting entity

**Selection:** The IUT support the requirements for the modification requesting entity. PICS: R 2.1.

##### 5.2.1.1.1 Modification/Negotiation request (01)

Test purposes for EN 301 486-1 [3] clause 9.1.1.

###### AMNU\_01\_01

Ensure that the IUT in U10, in order to initiate the modification with negotiation of the traffic parameters, sends a MODIFY REQUEST message with both the ATM traffic descriptor information element and the alternative ATM traffic descriptor information element included and enters U13.

**Selection:** Modification with negotiation of alternative ATM traffic descriptor. PICS: MC 3.

###### AMNU\_01\_02

Ensure that the IUT in U10, in order to initiate the modification with negotiation of the traffic parameters, sends a MODIFY REQUEST message with both the ATM traffic descriptor information element and the minimum acceptable ATM traffic descriptor information element included and enters U13.

**Selection:** Modification with negotiation of minimum acceptable ATM traffic descriptor. PICS: MC 4.



### 5.2.1.1.2 Modification/Negotiation acceptance (02)

Test purposes for EN 301 486-1 [3] clause 9.1.2.

#### AMNU\_02\_01

Ensure that the IUT in U13 (having sent a MODIFY REQUEST message with the alternative ATM traffic descriptor information element), on receipt of a MODIFY ACKNOWLEDGE message including an acceptable ATM traffic descriptor information element,

sends no message and enters U10.

**Selection:** Modification with negotiation of alternative ATM traffic descriptor. PICS: MC 3.

#### AMNU\_02\_02

Ensure that the IUT in U13 (having sent a MODIFY REQUEST message with the minimum acceptable ATM traffic descriptor information element), on receipt of a MODIFY ACKNOWLEDGE message including an acceptable ATM traffic descriptor information element,

sends no message and enters U10.

**Selection:** Modification with negotiation of minimum acceptable ATM traffic descriptor. PICS: MC 4.

#### AMNU\_02\_03

Ensure that the IUT in U13 (having sent a MODIFY REQUEST message with the alternative ATM traffic descriptor information element), on receipt of a MODIFY ACKNOWLEDGE message without ATM traffic descriptor information element,

sends no message and enters U10.

**Selection:** Modification with negotiation of alternative ATM traffic descriptor. PICS: MC 3.

#### AMNU\_02\_04

Ensure that the IUT in U13 (having sent a MODIFY REQUEST message with the minimum acceptable ATM traffic descriptor information element), on receipt of a MODIFY ACKNOWLEDGE message without ATM traffic descriptor information element,

sends no message and enters U10.

**Selection:** Modification with negotiation of minimum acceptable ATM traffic descriptor. PICS: MC 4.

#### AMNN\_02\_05

Ensure that the IUT in U13, on receipt of a MODIFY ACKNOWLEDGE message with an ATM traffic descriptor information element (IE\_flag = 0) including a different set of parameters as contained in the ATM traffic descriptor information element of the MODIFY REQUEST message,

sends no message or optionally sends a STATUS message with a Cause information element indicating a cause value 100 "invalid information element contents" and with a Call state information element indicating U10 and enters U10.

#### AMNN\_02\_06

Ensure that the IUT in U13, on receipt of a MODIFY ACKNOWLEDGE message with an ATM traffic descriptor information element (IE\_flag = 1, IE\_AI = clear call) including a different set of parameters as contained in the ATM traffic descriptor information element of the MODIFY REQUEST message,

sends a RELEASE message with a Cause information element indicating a cause value 100 "invalid information element contents" and enters U11.

#### AMNN\_02\_07

Ensure that the IUT in U13, on receipt of a MODIFY ACKNOWLEDGE message with an ATM traffic descriptor information element (IE\_flag = 1, IE\_AI = discard message and report status) including a different set of parameters as contained in the ATM traffic descriptor information element of the MODIFY REQUEST message,

sends a STATUS message with a Cause information element indicating a cause value 100 "invalid information element contents" and with a Call state information element indicating U10 and remains in U13.

#### AMNN\_02\_08

Ensure that the IUT in U13, on receipt of a MODIFY ACKNOWLEDGE message with an ATM traffic descriptor information element (IE\_flag = 1, IE\_AI = discard message) including a different set of parameters as contained in the ATM traffic descriptor information element of the MODIFY REQUEST message,

sends no message and remains in U13.

**AMNN\_02\_09**

Ensure that the IUT in U13, on receipt of a MODIFY ACKNOWLEDGE message with an ATM traffic descriptor information element (IE\_flag = 1, IE\_AI = discard information element, proceed and report status) including a different set of parameters as contained in the ATM traffic descriptor information element of the MODIFY REQUEST message, sends a STATUS message with a Cause information element indicating a cause value 100 "invalid information element contents" and with a Call state information element indicating U10 and enters U10.

**AMNN\_02\_10**

Ensure that the IUT in U13, on receipt of a MODIFY ACKNOWLEDGE message with an ATM traffic descriptor information element (IE\_flag = 1, IE\_AI = discard information element and proceed) including a different set of parameters as contained in the ATM traffic descriptor information element of the MODIFY REQUEST message, sends no message and enters U10.

### 5.2.1.2 Modification/Negotiation procedures at the responding entity

**Selection:** The IUT support the requirements for the modification requesting entity. PICS: R 2.2.

#### 5.2.1.2.1 Modification/Negotiation confirmation (03)

Test purposes for EN 301 486-1 [3] clause 9.2.

**AMNU\_03\_01**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST 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 MODIFY ACKNOWLEDGE message with the ATM traffic descriptor information element including the same parameter as received in the ATM traffic descriptor information element and re-enters U10.

**AMNU\_03\_02**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST 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 such, that the IUT is able to provide traffic rates between the two sets of values, to indicate the acceptance of the request, sends a MODIFY ACKNOWLEDGE message with the ATM traffic descriptor information element with the adapted traffic parameters and re-enters U10.

**AMNU\_03\_03**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST 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 MODIFY ACKNOWLEDGE message with the ATM traffic descriptor information element including the same parameter as received in the minimum acceptable ATM traffic descriptor information element and re-enters U10.

**AMNU\_03\_04**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST 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 MODIFY ACKNOWLEDGE message with the ATM traffic descriptor information element including the same parameter as received in the ATM traffic descriptor information element and re-enters U10.

**AMNU\_03\_05**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST 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, to indicate the acceptance of the request, sends a MODIFY ACKNOWLEDGE message with the ATM traffic descriptor information element (including the same parameter as received in the alternative ATM traffic descriptor information element) and re-enters U10.

**AMNU\_03\_06**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST 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 MODIFY REJECT message with a Cause information element indicating a cause value 47 "Resources not available, unspecified" and re-enters U10.

**AMNU\_03\_07**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST 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 MODIFY REJECT message with a Cause information element indicating a cause value 47 "Resources not available, unspecified" and re-enters U10.

**AMNU\_03\_08**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST message with both alternative ATM traffic descriptor information element, and minimum acceptable ATM traffic descriptor information element included,

sends a MODIFY REJECT message with a Cause information element indicating a cause value 73 "unsupported combination of traffic parameters" and re-enters U10.

**AMNU\_03\_09**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST 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,

optionally sends a STATUS message with a Cause information element indicating a cause value 100 "invalid information element contents" and with a Call state information element indicating U14, sends a MODIFY ACKNOWLEDGE message and re-enters U10.

**AMNU\_03\_10**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST 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 message with a Cause information element indicating a cause value 100 "invalid information element contents" and enters U11.

**AMNU\_03\_11**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST message with an ATM traffic descriptor information element and an alternative ATM traffic descriptor information element (IE\_flag = 0, 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 with a Cause information element indicating a cause value 100 "invalid information element contents" and with a Call state information element indicating U10 and remains in U10.

**AMNU\_03\_12**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST message with an ATM traffic descriptor information element and an alternative ATM traffic descriptor information element (IE\_flag = 0, IE\_AI = discard message) containing traffic parameters increased compared to those in the ATM traffic descriptor information element,

sends no message and remains in U10.

**AMNU\_03\_13**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST message with an ATM traffic descriptor information element and an alternative ATM traffic descriptor information element (IE\_flag = 0, IE\_AI = discard information element, proceed and report status) containing traffic parameters increased compared to those in the ATM traffic descriptor information element,

sends a STATUS message with a Cause information element indicating a cause value 100 "invalid information element contents" and with a Call state information element indicating U14, sends a MODIFY ACKNOWLEDGE message and re-enters U10.

**AMNU\_03\_14**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST message with an ATM traffic descriptor information element and an alternative ATM traffic descriptor information element (IE\_flag = 0, IE\_AI = discard information element and proceed) containing traffic parameters increased compared to those in the ATM traffic descriptor information element,

sends a MODIFY ACKNOWLEDGE message and re-enters U10.

**AMNU\_03\_15**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST message with an ATM traffic descriptor information element and a minimum acceptable ATM traffic descriptor information element (IE\_flag = 0) containing traffic parameters increased compared to those in the ATM traffic descriptor information element,

optionally sends a STATUS message with a Cause information element indicating a cause value 100 "invalid information element contents" and with a Call state information element indicating U14, sends a MODIFY ACKNOWLEDGE message and re-enters U10.

**AMNU\_03\_16**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST message with an ATM traffic descriptor information element and a minimum acceptable 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 message with a Cause information element indicating a cause value 100 "invalid information element contents" and enters U11.

**AMNU\_03\_17**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST message with an ATM traffic descriptor information element and a minimum acceptable ATM traffic descriptor information element (IE\_flag = 0, 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 with a Cause information element indicating a cause value 100 "invalid information element contents" and with a Call state information element indicating U10 and remains in U10.

**AMNU\_03\_18**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST message with an ATM traffic descriptor information element and a minimum acceptable ATM traffic descriptor information element (IE\_flag = 0, IE\_AI = discard message) containing traffic parameters increased compared to those in the ATM traffic descriptor information element,

sends no message and remains in U10.

**AMNU\_03\_19**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST message with an ATM traffic descriptor information element and a minimum acceptable ATM traffic descriptor information element (IE\_flag = 0, IE\_AI = discard information element, proceed and report status) containing traffic parameters increased compared to those in the ATM traffic descriptor information element,

sends a STATUS message with a Cause information element indicating a cause value 100 "invalid information element contents" and with a Call state information element indicating U14, sends a MODIFY ACKNOWLEDGE message and re-enters U10.

**AMNU\_03\_20**

Ensure that the IUT in U10, on receipt of a MODIFY REQUEST message with an ATM traffic descriptor information element and a minimum acceptable ATM traffic descriptor information element (IE\_flag = 0, IE\_AI = discard information element and proceed) containing traffic parameters increased compared to those in the ATM traffic descriptor information element,

sends a MODIFY ACKNOWLEDGE message and re-enters U10.

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## 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 [7].

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.

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## 7 Requirements for a comprehensive testing service

As a minimum the Remote test method, as specified in ISO/IEC 9646-2 [7], shall be used by any organization claiming to provide a comprehensive testing service for network equipment claiming conformance to EN 301 486-1 [3].

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## Annex A (informative): Bibliography

ISO/IEC 9646-3: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN)".

ITU-T Recommendation Q.2963.3: "Digital Subscriber Signalling System No. 2 - Connection modification: ATM traffic descriptor modification with negotiation by the connection owner".

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## History

<b>Document history</b>		
V1.1.1	January 2001	Public Enquiry PE 20010601: 2001-01-31 to 2001-06-01
V1.1.1	July 2001	Vote V 20010831: 2001-07-02 to 2001-08-31
V1.1.1	September 2001	Publication