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SERIES Q: SWITCHING AND SIGNALLING

Broadband ISDN – B-ISDN application protocols for  
access signalling

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**Abstract test suite for the network integration  
testing for B-ISDN and B-ISDN/N-ISDN: ICS &  
IXIT and ATS**

ITU-T Recommendation Q.2991.2

(Formerly CCITT Recommendation)

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## **ITU-T Recommendation Q.2991.2**

### **Abstract test suite for the network integration testing for B-ISDN and B-ISDN/N-ISDN: ICS & IXIT and ATS**

#### **Summary**

This ITU-T Recommendation contains the end-to-end test specification for the network integration testing within DSS2 based B-ISDN networks. The main body of the Recommendation presents the requirements regarding the ICS and IXIT.

This Recommendation includes an electronic attachment containing the ATS in machine processable form and in pdf form.

#### **Source**

ITU-T Recommendation Q.2991.2 was prepared by ITU-T Study Group 11 (1997-2000) and approved under the WTSC Resolution 1 procedure on 3 December 1999.

## FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSC Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

## NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

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## ITU-T Recommendation Q.2991.2

### Abstract test suite for the network integration testing for B-ISDN and B-ISDN/N-ISDN: ICS & IXIT and ATS

#### 1 Scope

This ITU-T Recommendation contains the Implementation Conformance Statement (ICS) proforma and the Implementation Extra Information (IXIT) proforma for the End-to-end Network Integration Tests to verify the overall compatibility of B-ISDN and B-ISDN/N-ISDN over the national and international networks.

#### 2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

- [1] ITU-T Recommendation Q.850 (1998), *Usage of cause and location in the Digital Subscriber Signalling System No. 1 and the Signalling System No. 7 ISDN User Part.*
- [2] ITU-T Recommendation Q.931 (1998), *ISDN user-network interface layer 3 specification for basic call control.*
- [3] ITU-T Recommendation Q.955, *Stage 3 description for community of interest supplementary services using DSS1.*
- [4] ITU-T Recommendation Q.2660 (1999), *Interworking between signalling system No. 7 broadband ISDN User Part (B-ISUP) and digital subscriber Signalling System No. 2.*
- [5] ITU-T Recommendation Q.2931 (1995), *Digital Subscriber Signalling System No. 2 (DSS2) – User-network Interface (UNI) Layer 3 specification for basic call/connection control.*
- [6] ITU-T Recommendation Q.2951, *Stage 3 description for number identification supplementary services using B-ISDN Digital Subscriber Signalling system No. 2 (DSS2) – Basic call.*
- [7] ITU-T Recommendation Q.2957.1 (1995), *Stage 3 description for additional information transfer supplementary services using B-ISDN Digital Subscriber Signalling System No. 2 (DSS2) – Basic Call: User-to-user signalling (UUS).*
- [8] ITU-T Recommendation Q.2961.1 (1995): *Digital Subscriber Signalling System No. 2 – Additional Traffic Parameters: Additional signalling capabilities to support traffic parameters for the tagging option and the sustainable cell rate parameter set.*
- [9] ITU-T Recommendation Q.2961.2 (1997), *Digital Subscriber Signalling System No. 2 – Additional Traffic Parameters: Support of ATM Transfer Capability in the Broadband Bearer Capability Information Element 2.*
- [10] ITU-T Recommendation Q.2962 (1998), *Digital Subscriber Signalling System No. 2 – Connection characteristics negotiation during call/connection establishment phase.*

- [11] ITU-T Recommendation Q.2971 (1995), *Digital Subscriber Signalling System No. 2 (DSS2) – User-network interface layer 3 specification for point-to-multipoint call/connection control*.
- [12] ISO/IEC 9646-1:1994, *Information Technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts*.
- [13] ISO/IEC 9646-2:1994, *Information Technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 2: Abstract Test Suite specification*.
- [14] ISO/IEC 9646-4:1994, *Information Technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 4: Test realization*.
- [15] ISO/IEC 9646-5:1994, *Information Technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 5: Requirements on test laboratories and clients for the conformance assessment process*.

### **3 Definitions**

This ITU-T Recommendations defines the following:

- terms defined in the B-ISDN/ISDN reference specifications [1-11];
- terms defined in ISO/IEC 9646-1 [12] and in ISO/IEC 9646-2 [13].

In particular, the following terms defined in ISO/IEC 9646-1 [12] apply:

- Abstract Test Case;
- PICS proforma;
- Test Purpose.

### **4 Abbreviations**

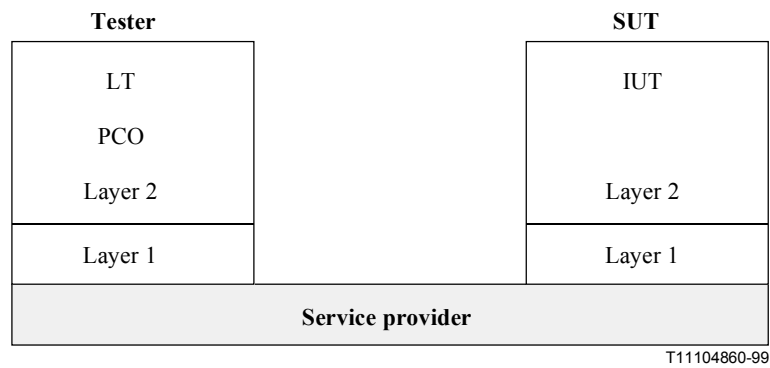
This ITU-T Recommendation uses the following abbreviations:

AAL	ATM Adaptation Layer
ABR	Available Bit Rate
ATC	ATM Transfer capability
ATM	Asynchronous Transfer Mode
ATS	Abstract Test Suite
BTC	Broadband Transfer Capability
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
COLP	Connected Line Identification Presentation
COLR	Connected Line Identification Restriction
CS-1	Capability Set 1
CS-2.1	Capability Set 2.1
CUG	Closed User Group
DBR	Deterministic Bit Rate
DDI	Direct Dialling In

DSS1	Digital Subscriber Signalling System No. 1
DSS2	Digital Subscriber Signalling System No. 2
HLC	High Layer Compatibility
HLI	High Layer Information
ICS	Implementation Conformance Statement
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
IUT	Implementation Under Test
IWU	Interworking Unit
IXIT	Implementation eXtra Information for Testing
LLC	Low Layer Compatibility
LLI	Low Layer Information
MOT	Means of Testing
MSN	Multiple Subscriber Number
NIT	Network Integration Testing
OSI	Open Systems Interconnection
PCO	Point of Control and Observation
PDU	Protocol Data Unit
PNO	Public Network Operator
SBR	Statistical Bit Rate
SUB	Sub-addressing
SUT	System Under Test
TSS&TP	Test Suite Structure & Test Purposes
TTCN	Tree and Tabular Combined Notation
UUS	User-to-User Signalling

## 5 Abstract Test Method (ATM)

The remote test method is applied for the user ATS. The Point of Control and Observation (PCO) resides at the service access point between layers 2 and 3. This PCO is named "L0" (for Lower). The L0 PCO is used to control and observe the behaviour of the Implementation Under Test (IUT) and test case verdicts are assigned depending on the behaviour observed at this PCO.



**Figure 1/Q.2991.2 – Remote test method**

ISO/IEC 9646-2 [13] allows the informal expression of Test Coordination Procedures (TCP) between the System Under Test (SUT) upper layer(s) and the Lower Tester (LT). In the ATS contained in Annex C, TCP is achieved by use of a second "informal" PCO, called "O" (for Operator). This PCO is used to specify control but not observation above the IUT and consequently, events at this PCO are never used to generate test case verdicts. The use of this O PCO is regarded as a preferred alternative to the use of the implicit send event, in that it allows the ATS to specify in a clear and meaningful way what actions are required to be performed on the IUT.

## 6 Untestable test purposes

There are no untestable test purposes associated with this ATS.

## 7 ATS to TP map

The identifiers used for the TPs are reused as test case names. Thus there is a straightforward one-to-one mapping.

## 8 PCTR conformance

A test laboratory, when requested by a client to produce a PCTR, is required, as specified in ISO/IEC 9646-5 [15], to produce a PCTR conformant with the PCTR template given in Annex B of ISO/IEC 9646-4 [14].

Furthermore, a test laboratory, offering testing for the ATS specification contained in Annex C, when requested by a client to produce a PCTR, is required to produce a PCTR conformant with the PCTR proforma contained in Annex A of this Recommendation.

A PCTR which conforms to this PCTR proforma specification shall preserve the content and ordering of the subclauses contained in Annex A. Subclause A.6 of the PCTR may contain additional columns. If included, these shall be placed to the right of the existing columns. Text in italics may be retained by the test laboratory.

## 9 PIXIT conformance

A test releaser, producing an executable test suite for the Abstract Test Suite (ATS) specification contained in Annex C, is required, as specified in ISO/IEC 9646-4 [14], to produce an augmented partial PIXIT proforma conformant with this partial PIXIT proforma specification.

An augmented partial PIXIT proforma which conforms to this partial PIXIT proforma specification shall, as a minimum, have contents which are technically equivalent to Annex B. The augmented partial PIXIT proforma may contain additional questions that need to be answered in order to prepare the Means Of Testing (MOT) for a particular Implementation Under Test (IUT).

A test laboratory, offering testing for the ATS specification contained in Annex C, is required, as specified in ISO/IEC 9646-5 [15], to further augment the augmented partial PIXIT proforma to produce a PIXIT proforma conformant with this partial PIXIT proforma specification.

A PIXIT proforma which conforms to this partial PIXIT proforma specification shall, as a minimum, have contents which are technically equivalent to Annex B. The PIXIT proforma may contain additional questions that need to be answered in order to prepare the test laboratory for a particular IUT.

## **10      ATS Conformance**

The test releaser, producing a Means Of Testing (MOT) and Executable Test Suite (ExTS) for this Abstract Test Suite (ATS) specification, shall comply with the requirements of ISO/IEC 9646-4 [14]. In particular, these concern the realization of an Executable Test Suite (ExTS) based on each ATS. The test releaser shall provide a statement of conformance of the MOT to this ATS specification.

An ExTS which conforms to this ATS specification shall contain test groups and test cases which are technically equivalent to those contained in the ATS in Annex C. All sequences of test events comprising an abstract test case shall be capable of being realized in the executable test case. Any further checking which the test system might be capable of performing is outside the scope of this ATS specification and shall not contribute to the verdict assignment for each test case.

Test laboratories running conformance test services using this ATS shall comply with ISO/IEC 9646-5 [15].

A test laboratory which claims to conform to this ATS specification shall use an MOT which conforms to this ATS.

## **ANNEX A**

### **Implementation Conformance Statement (ICS) proforma for Broadband End-to-end tests<sup>1</sup>**

#### **A.1      Guidance for completing the ICS proforma**

##### **A.1.1    Purposes and structure**

The purpose of this ICS proforma is to provide a mechanism whereby a network provider of an implementation of the requirements for the network side for the Broadband Integrated Services Digital Network (B-ISDN), may provide information about the implementation in a standardized manner.

The proforma is subdivided into subclauses for the following categories of information:

- guidance for completing the proformas;
- identification of the implementation;
- global statement of conformance.

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<sup>1</sup> **Copyright release for ICS proforma**

Users of this Recommendation may freely reproduce the ICS proforma in this annex so that it can be used for its intended purpose, and may further publish the completed ICS.

### A.1.2 Abbreviations and conventions

The ICS proforma contained in Annex B is comprised of information in tabular form in accordance with the guidelines presented in ISO/IEC 9646-7.

#### Item column

The item column contains a number which identifies the item in the table.

#### Item description column

The item description column describes in free text each respective item (e.g. parameters, timers, etc.). It implicitly means "is <item description> supported by the implementation?".

#### Status column

The following notations, defined in ISO/IEC 9646-7, are used for the status column:

- m mandatory – the capability is required to be supported.
- o optional – the capability may be supported or not.
- n/a not applicable – in the given context, it is impossible to use the capability.
- x prohibited (excluded) – there is a requirement not to use this capability in the given context.
- o.i qualified optional – for mutually exclusive or selectable options from a set. "i" is an integer which identifies a unique group of related optional items and the logic of their selection which is defined immediately following the table.
- ci conditional – the requirement on the capability ("m", "o", "x" or "n/a") depends on the support of other optional or conditional items. "i" is an integer identifying an unique conditional status expression which is defined immediately following the table.

#### Support column

The support column shall be filled in by the network provider of the implementation. The following common notations, defined in ISO/IEC 9646-7, are used for the support column:

- Y or y supported by the implementation;
- N or n not supported by the implementation;
- N/A, n/a or – no answer required (allowed only if the status is n/a, directly or after evaluation of a conditional status).

It is also possible to provide a comment to an answer in the space provided at the bottom of the table.

#### Values allowed column

The values allowed column contains the type, the list, the range, or the length of values allowed. The following notations are used:

- range of values: <min value> .. <max value>  
example: 5 .. 20
- list of values: <value1>, <value2>, ....., <valueN>  
example: 2 ,4 ,6 ,8, 9  
example: '1101'B, '1011'B, '1111'B  
example: '0A'H, '34'H, 2F'H
- list of named values: <name1>(<val1>),<name2>(<val2>),..., <nameN>(<valN>)  
example: reject(1), accept(2)
- length: size (<min size> .. <max size>)  
example: size (1 ... 8)

## **Values supported column**

The values supported column shall be filled in by the network provider of the implementation. In this column, the values or the ranges of values supported by the implementation shall be indicated.

### **A.1.3 Instructions for completing the ICS proforma**

The network provider of the implementation shall complete the ICS proforma in each of the spaces provided. In particular, an explicit answer shall be entered, in each of the support or supported column boxes provided, using the notation described in subclause A.1.2.

If necessary, the network provider may provide additional comments in space at the bottom of the tables, or separately on sheets of paper.

More detailed instructions may be given at the beginning of the different subclauses of the ICS proforma.

## **A.2 Identification of the implementation**

Identification of the Implementation Under Test (IUT), the Integrated Services Digital Network provided by the public telecommunications operator, should be filled in so as to provide as much detail as possible regarding version numbers and configuration options.

The product network provider information and client information should both be filled in if they are different.

A person who can answer queries regarding information supplied in the ICS and IXIT should be named as the contact person.

### **A.2.1 Date of the statement**

.....

### **A.2.2 Implementation Under Test (IUT) identification**

IUT name:

IUT version:

### **A.2.3 ICS contact person**

(A person to contact if there are any queries concerning the content of the ICS or IXIT)

Name:

Telephone number:

Facsimile number:

Email address:

Additional information:

### A.3 Identification of the document

This ICS proforma applies to the following standards:

**ITU Q.2931 (1995)**, Digital Subscriber Signalling System No. 2 (DSS2) – User-Network Interface (UNI) layer 3 specification for basic call/connection control.

**ITU Q.2951 (1995)**, Stage 3 description for number identification supplementary services using B-ISDN Digital Subscriber Signalling System No. 2 (DSS2) – Basic Call.

**ITU Q.2955.1 (1997)**, Supplementary services using B-ISDN Digital Subscriber Signalling System No. 2 (DSS2) – Closed User Group (CUG).

**ITU Q.2957.1 (1995)**, User-to-User Signalling (UUS).

**ITU Q.2961.2 (1997)**, Support of ATM transfer capability in the broadband bearer capability information element.

**ITU Q.2961.3 (1997)**, Signalling capabilities to support traffic parameters for the available bit rate (ABR) ATM transfer capability.

**ITU Q.2962 (1998)**, Digital Subscriber Signalling System No. 2 – Connection characteristics negotiation during call/connection establishment phase.

**ITU Q.2963.1 (1999)**, Peak cell rate modification by the connection owner.

**ITU Q.2963.2 (1997)**, Modification procedures for sustainable cell rate parameters.

**ITU Q.2971 (1995)**: Broadband integrated services digital network (B-ISDN) – Digital Subscriber Signalling System No. 2 (DSS2) – User-network interface layer 3 specification for point-to-multipoint call/connection control.

Other ITU Standards related to B-ISDN, DSS2 signalling, layer 3 testing.

### A.4 Basic B-ISDN capabilities

**Table A.1/Q.2991.2 – Access characteristics**

Item	Access	Reference	Status	Support
1	Physical layer access protocol conform to I.432	I.432	m	
2	B-ISDN ATM layer access protocol conform to I.361	I.361	m	
3	B-ISDN ATM Adaptation Layer – AAL access protocol conform to I.363	I.363	m	
4	B-ISDN ATM Adaptation Layer – SSCOP access protocol conform to Q.2110	Q.2110	m	
5	Base standard Q.2931	Q.2931	o	
6	Overlap sending	6.5/Q.2931	o	
7	Base standard ATM UNI 3.1	UNI 3.1	o	
Please specify any national deviations:				

**Table A.2/Q.2991.2 – Network signalling protocol**

Item	Network	Reference	Status	Support
1	Functional description of the B-ISDN User Part (B-ISUP) of Signalling System No. 7; General functions of messages and signals of B-ISDN User Part (B-ISUP) of Signalling System No. 7	Q.2761...Q.2764 Q.2721...Q.2726 Q.2730...Q.2735 Q.2660	m	
Please specify any national deviations:				

**Table A.3/Q.2991.2 – Bearer service**

Item	Service	Reference	Status	Support
1	Bearer service BCOB-A	4.5.7/Q.2931	m	
2	Bearer service BCOB-C	4.5.7/Q.2931	m	
3	Bearer service BCOB-X	4.5.7/Q.2931	m	
Please specify any national deviations:				

**Table A.4/Q.2991.2 – ATM Traffic Descriptor**

Item	Service	Reference	Status	Support
1	Peak cell rate for CLP = 0+1	4.5.6/Q.2931	m	
2	Sustainable Cell Rate for CLP=0+1	Q.2961	o	
3	Maximum Burst Size for CLP=0+1	Q.2961	o	
4	Peak cell rate for CLP = 0	4.5.6/Q.2931	o	
5	Sustainable Cell Rate for CLP=0	Q.2961	o	
6	Maximum Burst Size for CLP=0	Q.2961	o	
Please specify any national deviations:				

**Table A.5/Q.2991.2 – Quality of service**

Item	Service	Reference	Status	Support
1	Unspecified quality of service	4.5.18/Q.2931	o	
Please specify any national deviations:				

**Table A.6/Q.2991.2 – ATM adaptation layer**

Item	Service	Reference	Status	Support
1	AAL type 1	4.5.5/Q.2931	o	
2	AAL type 5	4.5.5/Q.2931	o	
3	AAL for voice	4.5.5/Q.2931	o	
Please specify any national deviations:				

**Table A.7/Q.2991.2 – OAM traffic descriptor**

Item	Service	Reference	Status	Support
1	OAM traffic descriptor – OAM F5 cells transported optionally	4.5.24/Q.2931	o	
2	OAM traffic descriptor descriptor – OAM F5 cells transported mandatory	4.5.24/Q.2931	o	
Please specify any national deviations:				

**Table A.8/Q.2991.2 – End-to-end transit delay**

Item	Service	Reference	Status	Support
1	End-to-end transit delay	4.5.17/Q.2931	o	
Please specify any national deviations:				

**Table A.9/Q.2991.2 – Connection Identifier**

Item	Service	Reference	Status	Support
1	Connection identifier	4.5.16/Q.2931	o	
Please specify any national deviations:				

**Table A.10/Q.2991.2 – Broadband High Layer Information type**

Item	Service	Reference	Status	Support
1	ISO/IEC	4.5.8/Q.2931	o	
2	User-Specific	4.5.8/Q.2931	o	
3	Vendor-Specific Application Identifier	4.5.8/Q.2931	o	
4	ITU-T SG 1 B-ISDN teleservice recommend.	4.5.8/Q.2931	o	
Please specify any national deviations:				

**Table A.11/Q.2991.2 – Broadband High Layer Information**

Item	Service	Reference	Status	Support
1	User Info Layer 2 Q.922; User Info Layer 3 X.25 Packet Layer	4.5.9/Q.2931	o	
2	User Info Layer 2 Q.922; User Info Layer 3 X.25 Packet Layer; Packet size 1024; window size 7	4.5.9/Q.2931	o	
3	User Info Layer 2 Q.922; User Info Layer 3 X.25 Packet Layer; Packet size 512; window size 3	4.5.9/Q.2931	o	
4	User Info Layer 2 Q.922; User Info Layer 3 X.25 Packet Layer; Packet size 2048; window size 63	4.5.9/Q.2931	o	
5	User Info Layer 2 Q.922; User Info Layer 3 X.25 Packet Layer; Packet size 1024; window size 63	4.5.9/Q.2931	o	
Please specify any national deviations:				

**Table A.12/Q.2991.2 – N-ISDN services within B-ISDN**

Item	Service	Reference	Status	Support
1	Call establishment for "3.1 kHz audio" within B-ISDN	E.2.1/Q.2931.6	m	
2	Call establishment for "unrestricted digital information" within B-ISDN	E.2.2/Q.2931.6	m	
3	Call establishment for "telephony" within B-ISDN	E.2.3/Q.2931.6	o	
4	Call establishment for "videotelephony" within B-ISDN	E.2.4/Q.2931.6	o	
5	Call establishment for "telefax G4" within B-ISDN	E.2/Q.2931.6	o	
6	Call establishment for "telephony 7 kHz" within B-ISDN	E.2/Q.2931.6	o	
7	Call establishment for "facsimile group 2/3" within B-ISDN	E.2/Q.2931.6	o	
Please specify any national deviations:				

**A.5 B-ISDN Supplementary services****Table A.13/Q.2991.2 – CLIP service**

Item	Service	Reference	Status	Support
1	Calling line identification presentation (CLIP) implemented	3/Q.2951	o	
2	NO SCREENING option implemented	3/Q.2951	o	
3	Calling line identification presentation (CLIP) implemented, with CLI provided by the network without subaddress	3/Q.2951	o	
4	Calling line identification presentation (CLIP) implemented, with CLI provided by the network, including subaddress	3/Q.2951	o	

**Table A.13/Q.2991.2 – CLIP service (continued)**

<b>Item</b>	<b>Service</b>	<b>Reference</b>	<b>Status</b>	<b>Support</b>
5	Calling line identification presentation (CLIP) implemented, with CLI provided by the user, verified and passed	3/Q.2951	o	
6	Calling line identification presentation (CLIP) implemented, with CLI provided by the user, verified and passed including subaddress	3/Q.2951	o	
7	Calling line identification presentation (CLIP) implemented, with CLI provided by the user, not screened, including subaddress	3/Q.2951	o	
8	Calling line identification presentation (CLIP) implemented, with CLI provided by the user, verified and failed, including subaddress	3/Q.2951	o	
9	Calling line identification presentation (CLIP) implemented, with CLI provided by the user, not screened international call, including subaddress	3/Q.2951	o	
10	Two calling party number information elements delivery option	3/Q.2951	o	
11	Calling party number order is User provided, Network provided	3/Q.2951	o	
Please specify any national deviations:				

**Table A.14/Q.2991.2 – CLIR service**

<b>Item</b>	<b>Service</b>	<b>Reference</b>	<b>Status</b>	<b>Support</b>
1	Calling line identification restriction (CLIR) implemented	4/Q.2951	o	
Please specify any national deviations:				

**Table A.15/Q.2991.2 – COLP service**

Item	Service	Reference	Status	Support
1	Connected line identification presentation (COLP) implemented	5/Q.2951	o	
2	Connected line identification presentation (COLP) implemented, with COL provided by the network, without connected subaddress	5/Q.2951	o	
3	Connected line identification presentation (COLP) implemented, with COL provided by the network, including connected subaddress	5/Q.2951	o	
4	Connected line identification presentation (COLP) implemented, with COL provided by the user, verified and passed	5/Q.2951	o	
5	Connected line identification presentation (COLP) implemented, with COL provided by the user, verified and passed, including connected subaddress	5/Q.2951	o	
6	Connected line identification presentation (COLP) implemented, with COL provided by the user, not screened, including subaddress	5/Q.2951	o	
Please specify any national deviations:				

**Table A.16/Q.2991.2 – COLR service**

Item	Service	Reference	Status	Support
1	Connected line identification restriction (COLR) implemented	6/Q.2951	o	
Please specify any national deviations:				

**Table A.17/Q.2991.2 – SUB service**

Item	Service	Reference	Status	Support
1	Subaddressing (SUB) implemented	8/Q.2951	o	
Please specify any national deviations:				

**Table A.18/Q.2991.2 – UUS service**

Item	Service	Reference	Status	Support
1	User-user signalling (UUS) service 1 implicitly request (SETUP, ALERTING, CONNECT, RELEASE, RELEASE COMPLETE messages) implemented	Q.2957	o	
Please specify any national deviations:				

**Table A.19/Q.2991.2 – CUG service**

Item	Service	Reference	Status	Support
1	Closed user group (CUG) implemented	Q.2955.1, Q.955	o	
2	Closed user group (CUG) implemented – explicit request	Q.2955.1, Q.955	o	
3	Closed user group (CUG) implemented – implicit request, preferential CUG	Q.2955.1, Q.955	o	
4	Incoming access (IA)	Q.2955.1, Q.955	o	
5	Outgoing access (OA)	Q.2955.1, Q.955	o	
6	Incoming calls barred (ICB)	Q.2955.1, Q.955	o	
7	Both parties are within same CUG	Q.2955.1, Q.955	o	
Please specify any national deviations:				

**A.6 Interworking with N-ISDN**

When performing network integration testing between B-ISDN and N-ISDN users, the following tables related to the implemented interworking capabilities should be filled in.

**Table A.20/Q.2991.2 – B-ISDN interworking capabilities, basic call**

Item	Service	Reference	Status	Support
1	Call establishment using a N-ISDN bearer service "unrestricted digital information" to a N-ISDN user	E.2.2/Q.2931.6	m	
2	Call establishment using a N-ISDN bearer service "3.1 kHz audio" to a N-ISDN user	E.2.1/Q.2931.6	m	
3	Call establishment using a N-ISDN bearer service "UDI/TA" to a N-ISDN user	E.2.2/Q.2931.6	m	
4	Call establishment using a N-ISDN service "telephony" to a N-ISDN user	E.2.3/Q.2931.6	o	
5	Call establishment using a N-ISDN service "videotelephony" to a N-ISDN user	E.2.4/Q.2931.6	o	
6	Call establishment using a N-ISDN service "telefax G4" to a N-ISDN user	E.2/Q.2931.6	o	
7	Call establishment using a N-ISDN service "telephony 7 kHz" to a N-ISDN user	E.2/Q.2931.6	o	
8	Call establishment using a N-ISDN service "facsimile group 2/3" to a N-ISDN user	E.2/Q.2931.6	o	
9	Cause values according to Q.850 on unsuccessful calls	6/Q.2931.6	m	
Please specify any national deviations:				

**Table A.21/Q.2991.2 – B-ISDN interworking capabilities, supplementary services**

Item	Service	Reference	Status	Support
1	CLIP implemented in B-ISDN to N-ISDN users	3/Q.2951	o	
2	Two calling party number information elements delivery option	3/Q.2951	o	
3	CLIR implemented in B-ISDN to N-ISDN users	4/Q.2951	o	
4	COLP implemented in B-ISDN to N-ISDN users	5/Q.2951	o	
5	COLR implemented in B-ISDN to N-ISDN users	6/Q.2951	o	
6	SUB implemented in B-ISDN to N-ISDN users	8/Q.2951	o	
7	UUS implemented in B-ISDN to N-ISDN users	Q.2957	o	
8	CUG implemented	Q.2955.1, Q.955	o	
Please specify any national deviations:				

**Table A.22/Q.2991.2 – N-ISDN interworking capabilities, basic call**

Item	Service	Reference	Status	Support
1	Call establishment from N-ISDN using bearer service "3.1 kHz audio" to a B-ISDN user	Q.931	m	
2	Call establishment from N-ISDN using bearer service "unrestricted digital information" to a B-ISDN user	Q.931	m	
3	Call establishment from N-ISDN using bearer service "speech" to a B-ISDN user	Q.931	m	
4	Call establishment from N-ISDN using bearer service "UDI/TA" to a B-ISDN user	Q.931	m	
5	Call establishment from N-ISDN using service "telephony" to a B-ISDN user	Q.931	o	
6	Call establishment from N-ISDN using service "telephony" to a B-ISDN user	Q.931	o	
7	Call establishment from N-ISDN using service "videotelephony" to a B-ISDN user	Q.931	o	
8	Call establishment from N-ISDN using service "telex G4" to a B-ISDN user	Q.931	o	
9	Call establishment from N-ISDN using service "telephony 7 kHz" to a B-ISDN user	Q.931	o	
10	Call establishment from N-ISDN using service "facsimile group 2/3" to a B-ISDN user	Q.931	o	
11	Cause values according to Q.931 on unsuccessful calls	Q.931	m	
Please specify any national deviations:				

**Table A.23/Q.2991.2 – N-ISDN interworking capabilities, supplementary services**

Item	Service	Reference	Status	Support
1	CLIP implemented in N-ISDN to B-ISDN users	3/Q.2951	o	
2	Two calling party number information elements delivery option	3/Q.2951	o	
3	CLIR implemented in N-ISDN to B-ISDN users	4/Q.2951	o	
4	COLP implemented in N-ISDN to B-ISDN users	5/Q.2951	o	
5	COLR implemented in N-ISDN to B-ISDN users	6/Q.2951	o	
6	SUB implemented in N-ISDN to B-ISDN users	8/Q.2951	o	
7	UUS implemented in N-ISDN to B-ISDN users	Q.2957	o	
8	CUG implemented	Q.2955.1, Q.955	o	
Please specify any national deviations:				

**A.7 B-ISDN Capability Set 2.1****Table A.24/Q.2991.2 – Access characteristics to CS2.1**

Item	Access	Reference	Status	Support
1	Base standard Q.2961	Q.2961	o	
2	Base standard Q.2971	Q.2971	o	
Please specify any national deviations:				

**Table A.25/Q.2991.2 – Access characteristics for point-to-multipoint call/connection control**

Item	Access	Reference	Status	Support
1	Base standard Q.2971	Q.2971	o	
Please specify any national deviations:				

**Table A.26/Q.2991.2 – Access characteristics for Bandwidth Negotiation**

Item	Access	Reference	Status	Support
1	Base standard Q.2962	Q.2962	o	
Please specify any national deviations:				

**Table A.27/Q.2991.2 – Access characteristics for Bandwidth Modification**

Item	Access	Reference	Status	Support
1	Base standard Q.2963.1	Q.2963.1	o	
2	Base standard Q.2963.2	Q.2963.2	o	
Please specify any national deviations:				

**Table A.28/Q.2991.2 – Access characteristics for Available Bit Rate**

Item	Access	Reference	Status	Support
1	Base standard Q.2961.3	Q.2961.3	o	
Please specify any national deviations:				

## ANNEX B

### Implementation Extra Information (IXIT) proforma for Broadband End-to-end tests<sup>2</sup>

#### B.1 Instructions for completing the IXIT proforma

Before running the B-ISDN End-to-end test suite each participating public network operator will need to supply information concerning the allocation and availability of suitable B-ISDN and N-ISDN test numbers which will be required for setting up international connections.

This subclause contains a questionnaire, which shall be completed before performing the international B-ISDN end-to-end test suite. Additional information is used by the testing personnel for selecting and for setting the correct parameters on the test equipment.

This questionnaire contains only the information required to perform the tests.

#### B.2 Identification summary

PIXIT number:

Date of issue:

Issued to:

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<sup>2</sup> **Copyright release for IXIT proforma**

Users of this Recommendation may freely reproduce the IXIT proforma in this annex so that it can be used for its intended purpose, and may further publish the completed IXIT.

### B.3 Abstract test suite summary

Protocol specification: Q.2931, Q.2951, Q.2955, Q.2957, Q.2961.2, Q.2961.3, Q.2962, Q.2963.1, Q.2963.2, Q.2971.

ATS specification: End\_c4.mp

Abstract test method: Remote test method (see ISO/IEC 9646-2)

### B.4 IXIT items

**Table B.1/Q.2991.2 – Access numbers**

Item	Parameter	Number
1	B-ISDN access number	
2	B-ISDN access subaddress	
3	Unallocated B-ISDN access number	
4	B-ISDN number with no route	
5	Changed B-ISDN number	
6	Incomplete B-ISDN number	
7	Wrong B-ISDN number	
8	N-ISDN access number	
9	N-ISDN access subaddress	
10	Unallocated N-ISDN access number	
11	N-ISDN number with no route	
12	Changed N-ISDN number	
13	Incomplete N-ISDN number	
14	Wrong N-ISDN number	
15	B-ISDN number not supporting requested user cell rate	
16	B-ISDN number not supporting requested quality of service	
17	B-ISDN number not supporting requested bearer service	
18	Second B-ISDN access number	

**Table B.2/Q.2991.2 – Additional information**

Item	Parameter	Range	Value
1	Call reference value for Broadband Network	23 bits	
2	Call reference value for Narrow-band Network	7 bits	
3	Virtual path identifier	32...65535	
4	Virtual channel identifier	32...65535	
5	Forward peak cell rate (CLP=0)		
6	Backward peak cell rate (CLP=0)		
7	Forward peak cell rate (CLP=0+1)		
8	Backward peak cell rate (CLP=0+1)		
9	Forward Sustainable cell rate (CLP=0)		

**Table B.2/Q.2991.2 – Additional information (continued)**

Item	Parameter	Range	Value
10	Backward Sustainable cell rate (CLP=0)		
11	Forward Sustainable cell rate (CLP=0+1)		
12	Backward Sustainable cell rate (CLP=0+1)		
13	Forward Maximum Burst size (CLP=0)		
14	Backward Maximum Burst size (CLP=0)		
15	Forward Maximum Burst size (CLP=0+1)		
16	Backward Maximum Burst size (CLP=0+1)		
17	High layer information – ISO/IEC	Hexstring [2...16]	
18	High layer information – user specific	Hexstring [2...16]	
19	High layer information – vendor specific	Hexstring [2...16]	
20	High layer information – ITU network identification	Hexstring [2...16]	
21	Forward Maximum CPCS	0...65535	
22	Backward Maximum CPCS	0...65535	
23	Forward end-to-end OAM F5 flow indicator	3 bits:000,001 or 100	
24	Backward end-to-end OAM F5 flow indicator	3 bits:000, 001 or 100	
25	Network identification	Hexstring [2...40]	
26	Content of the UUS	Hexstring [2...40]	
27	CUG index code for B-ISDN	Hexstring [4]	
28	SSCS-Type in AAL Parameter	Hexstring [2]	
29	Maximum end-to-end transit delay		
30	Timer for waiting activity on called side	Suggested 4 min	
31	Timer for no activity	Suggested 1 min	
32	Timer for waiting for completion of both sides of the test	Suggested 6 min	
33	Test System Configuration 0=both A and B side supported (COMPLETE) 1=B side only ( B_ONLY) 2=A side only (A_ONLY)	Integer (0, 1, 2)	
34	Type of number used in the Called and Calling Party Number Information Element 000=unknown, 001=international, 010=national	3 bits	
35	Alternative Forward peak cell rate (CLP=0+1)		
36	Alternative Backward peak cell rate (CLP=0+1)		
37	Alternative Forward Sustainable cell rate (CLP=0)		
38	Alternative Backward Sustainable cell rate (CLP=0)		
39	Alternative Forward Maximum Burst size (CLP=0)		
40	Alternative Backward Maximum Burst size (CLP=0)		
41	Not supported Alternative Forward peak cell rate (CLP=0+1)		

**Table B.2/Q.2991.2 – Additional information (continued)**

<b>Item</b>	<b>Parameter</b>	<b>Range</b>	<b>Value</b>
42	Not supported Alternative Backward peak cell rate (CLP=0+1)		
43	Not supported Forward peak cell rate (CLP=0+1)		
44	Not supported Backward peak cell rate (CLP=0+1)		
45	Minimum acceptable Forward peak cell rate (CLP=0+1)		
46	Minimum acceptable Backward peak cell rate (CLP=0+1)		
47	Value between Forward peak cell rate (CLP=0+1) and minimum Forward peak cell rate (CLP=0+1)		
48	Value between Backward peak cell rate (CLP=0+1) and minimum Backward peak cell rate (CLP=0+1)		
49	Forward Peak cell rate (CLP=0+1) bigger than ATM_PCR_F01 for modification request		
50	Backward Peak cell rate (CLP=0+1) bigger than ATM_PCR_B01 for modification request		
51	Forward Peak cell rate (CLP=0) bigger than ATM_PCR_F01 for modification request		
52	Backward Peak cell rate (CLP=0) bigger than ATM_PCR_B0 for modification request		
53	Forward Peak cell rate (CLP=0+1) smaller than ATM_PCR_F01 for modification request		
54	Backward Peak cell rate (CLP=0+1) smaller than ATM_PCR_B01 for modification request		
55	Forward Peak cell rate (CLP=0) smaller than ATM_PCR_F0 for modification request		
56	Backward Peak cell rate (CLP=0) smaller than ATM_PCR_B0 for modification request		
57	Forward Sustainable cell rate (CLP=0+1) bigger than ATM_SCR_F01 for modification request		
58	Backward Sustainable cell rate (CLP=0+1) bigger than ATM_PCR_F01 for modification request		
59	Forward Sustainable cell rate (CLP=0+1) smaller than ATM_SCR_F01 for modification request		
60	Backward Sustainable cell rate (CLP=0+1) smaller than ATM_SCR_B01 for modification request		
61	Forward Maximum Burst Size (CLP=0+1) bigger than ATM_MBS_F01 for modification request		
62	Backward Maximum Burst Size (CLP=0+1) bigger than ATM_MBS_B01 for modification request		
63	Forward Maximum Burst Size (CLP=0+1) smaller than ATM_MBS_F01 for modification request		
64	Backward Maximum Burst Size (CLP=0+1) smaller than ATM_MBS_B01 for modification request		
65	Forward ABR minimum cell rate (CLP=0+1)		

**Table B.2/Q.2991.2 – Additional information (concluded)**

<b>Item</b>	<b>Parameter</b>	<b>Range</b>	<b>Value</b>
66	Backward ABR minimum cell rate (CLP=0+1)		
67	Forward ABR initial cell rate (CLP=0+1)		
68	Backward ABR initial cell rate (CLP=0+1)		
69	Forward ABR transient buffer exposure		
70	Backward ABR transient buffer exposure		
71	Cumulative RM fixed round-trip time		
72	Forward rate increase factor		
73	Backward rate increase factor		
74	Forward rate decrease factor		
75	Backward rate decrease factor		
76	Invoke Identifier	-32768...32767	
77	CUGindex code for N-ISDN	9...99	

## ANNEX C

### **Implementation Conformance Test Report (ICTR) Proforma for Broadband End-to-end tests<sup>3</sup>**

The ICTR Proforma is based on ISO/IEC 9646-5 [15]. Any additional information needed can be found in this document.

#### **C.1 Identification summary**

##### **C.1.1 Implementation conformance test report**

ICTR Number:	
ICTR Date:	
Test Laboratory Identification:	
Test Laboratory Manager:	
Signature:	

##### **C.1.2 IUT identification**

Name:	
Version:	
Protocol specification:	
ICS:	
Previous ICTR if any:	

<sup>3</sup> **Copyright release for ICTR proforma**

Users of this Recommendation ICTR may freely reproduce the ICTR proforma in this annex so that it can be used for its intended purpose, and may further publish the completed ICTR.

**C.1.3 Testing environment**

IXIT Number:	
ATS Specification:	
Abstract Test Method:	
Means of Testing identification:	
Date of testing:	
Conformance Log reference(s):	
Retention Date for Log reference(s):	

**C.1.4 Limits and reservation**

*Additional information relevant to the technical contents or further use of the test report, or the rights and obligations of the test laboratory and the client, may be given here. Such information may include restriction on the publication of the report.*

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**C.1.5 Comments**

*Additional comments may be given by either the client or the test laboratory on any of the contents of the ICTR, for example, to note disagreement between the two parties.*

.....  
.....  
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.....

**C.2 IUT Conformance status**

This IUT has/has not been shown by conformance assessment to be non-conforming to the referenced protocol specification.

*Strike the appropriate words in this sentence. If the ICS for this IUT is consistent with the static conformance requirements (as specified in clause C.3 in this report) and there are no "FAIL" verdicts to be recorded (in clause C.6) strike the word "has/". Otherwise strike the words "/has not".*

**C.3 Static conformance summary**

The ICS for this IUT is/is not consistent with the static conformance requirements in the specified protocol.

*Strike the appropriate words in this sentence.*

**C.4 Dynamic conformance summary**

The test campaign did/did not reveal errors in the IUT.

*Strike the appropriate words in this sentence. If there are no "FAIL" verdicts to be recorded (in clause C.6 of this report) strike the word "did/". Otherwise strike the words "/did not".*

Summary of the results of groups of test:

.....  
.....  
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.....

**C.5 Static conformance review report**

*If clause C.3 indicates non-conformance, this subclause itemizes the mismatches between the ICS and the static conformance requirements of the specified protocol specification.*

.....  
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**C.6 Test campaign report**

ATS Reference	Selected [Y/N]	Run [Y/N]	Verdict [P/F/I]	Reference to any observations made
TC11111				
TC11112				
TC11113				
TC11114				
TC11115				
TC11116				
TC11117				
TC11118				
TC11119				
TC111110				
TC111111				
TC111112				
TC111113				
TC111114				
TC111115				

<b>ATS Reference</b>	<b>Selected [Y/N]</b>	<b>Run [Y/N]</b>	<b>Verdict [P/F/I]</b>	<b>Reference to any observations made</b>
TC111116				
TC111117				
TC111118				
TC111119				
TC111120				
TC11121				
TC11122				
TC11123				
TC11124				
TC11125				
TC11131				
TC11132				
TC11211				
TC11212				
TC11213				
TC11214				
TC11215				
TC11216				
TC11217				
TC11218				
TC11219				
TC112110				
TC112111				
TC112112				
TC112113				
TC11311				
TC11312				
TC11313				
TC12111				
TC12112				
TC12113				
TC12114				
TC12115				
TC12116				
TC12117				
TC12118				
TC12119				
TC121110				
TC124111				

<b>ATS Reference</b>	<b>Selected [Y/N]</b>	<b>Run [Y/N]</b>	<b>Verdict [P/F/I]</b>	<b>Reference to any observations made</b>
TC124112				
TC124113				
TC124114				
TC124115				
TC124211				
TC124212				
TC124213				
TC124214				
TC124215				
TC124216				
TC124217				
TC124218				
TC124311				
TC124312				
TC124313				
TC12511a				
TC12511b				
TC12512a				
TC12512b				
TC12513a				
TC12513b				
TC12514				
TC12515				
TC12516				
TC12517				
TC12518				
TC12519				
TC125110				
TC125111				
TC125112				
TC125113				
TC125114				
TC12521				
TC12522				
TC12523				
TC12611a				
TC12611b				
TC12612a				
TC12612b				

<b>ATS Reference</b>	<b>Selected [Y/N]</b>	<b>Run [Y/N]</b>	<b>Verdict [P/F/I]</b>	<b>Reference to any observations made</b>
TC12613a				
TC12613b				
TC12614a				
TC12614b				
TC12615a				
TC12615b				
TC12621				
TC12622				
TC12711				
TC12712				
TC12713				
TC12714				
TC12721				
TC311				
TC312				
TC313				
TC314				
TC315				
TC316				
TC317				
TC318				
TC319				
TC3110				
TC321				
TC322				
TC323				
TC324				
TC325				
TC326				
TC327				
TC331				
TC332				
TC333				
TC334				
TC335				
TC336				
TC337				
TC341				
TC342				

<b>ATS Reference</b>	<b>Selected [Y/N]</b>	<b>Run [Y/N]</b>	<b>Verdict [P/F/I]</b>	<b>Reference to any observations made</b>
TC343				
TC344				
TC345				
TC351				
TC352				
TC361				
TC362				
TC363				
TC364				
TC365				
TC366				
TC367				
TC368				
TC371				
TC372				
TC373				
TC374				
TC375				
TC376				
TC377				
TC378				
TC379				
TC3710				
TC3711				
TC3712				
TC3713				
TC3714				
TC3715				
TC3716				
TC3717				
TC3718				
TC3719				
TC3720				
TC3721				
TC3722				
TC3723				
TC3724				
TC3726				
TC3727				

<b>ATS Reference</b>	<b>Selected [Y/N]</b>	<b>Run [Y/N]</b>	<b>Verdict [P/F/I]</b>	<b>Reference to any observations made</b>
TC3728				
TC3729				
TC3730				
TC3731				
TC3732				
TC21111a				
TC21111b				
TC21112				
TC21113				
TC21114				
TC21115				
TC21116				
TC21117				
TC21118				
TC21121				
TC21122				
TC21123				
TC21124				
TC21125				
TC21126				
TC21127				
TC21128				
TC21129				
TC21131				
TC21132				
TC21133				
TC21211				
TC21212				
TC21213				
TC21214				
TC21215				
TC21216				
TC21218				
TC21221				
TC21222				
TC21223				
TC21224				
TC21225				
TC21226				

<b>ATS Reference</b>	<b>Selected [Y/N]</b>	<b>Run [Y/N]</b>	<b>Verdict [P/F/I]</b>	<b>Reference to any observations made</b>
TC21227				
TC21228				
TC21229				
TC21231				
TC21232				
TC21233				
TC22111				
TC22112				
TC22113				
TC22114				
TC22115				
TC22116				
TC22117				
TC22118				
TC22119				
TC221110				
TC22121				
TC22122				
TC22123				
TC22124				
TC22125				
TC22126				
TC22127				
TC22131				
TC22132				
TC22133				
TC22134				
TC22136				
TC22137				
TC22141				
TC22142				
TC22143				
TC22144				
TC22145				
TC22151				
TC22152				
TC22161				
TC22162				
TC22163				

<b>ATS Reference</b>	<b>Selected [Y/N]</b>	<b>Run [Y/N]</b>	<b>Verdict [P/F/I]</b>	<b>Reference to any observations made</b>
TC22164				
TC22165				
TC22166				
TC22167				
TC22168				
TC22171				
TC22172				
TC22173				
TC22174				
TC22175				
TC22176				
TC22177				
TC22178				
TC22179				
TC221710				
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TC221734				
TC221735				

<b>ATS Reference</b>	<b>Selected [Y/N]</b>	<b>Run [Y/N]</b>	<b>Verdict [P/F/I]</b>	<b>Reference to any observations made</b>
TC221736				
TC221737				
TC22211				
TC22212				
TC22213				
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TC22215				
TC22216				
TC22217				
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TC22261				
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TC22263				
TC22264				
TC22265				
TC22266				
TC22267				

<b>ATS Reference</b>	<b>Selected [Y/N]</b>	<b>Run [Y/N]</b>	<b>Verdict [P/F/I]</b>	<b>Reference to any observations made</b>
TC22268				
TC22271				
TC22272				
TC22273				
TC22274				
TC22275				
TC22276				
TC22277				
TC22278				
TC22279				
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TC222737				

## C.7 Observations

*Additional information relevant to the technical content of the ICTR are given here.*

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### ANNEX D

#### **Graphical Representation (GR) format of ATS**

The TTCN GR file corresponding to this is contained in the attached pdf file detailed below:

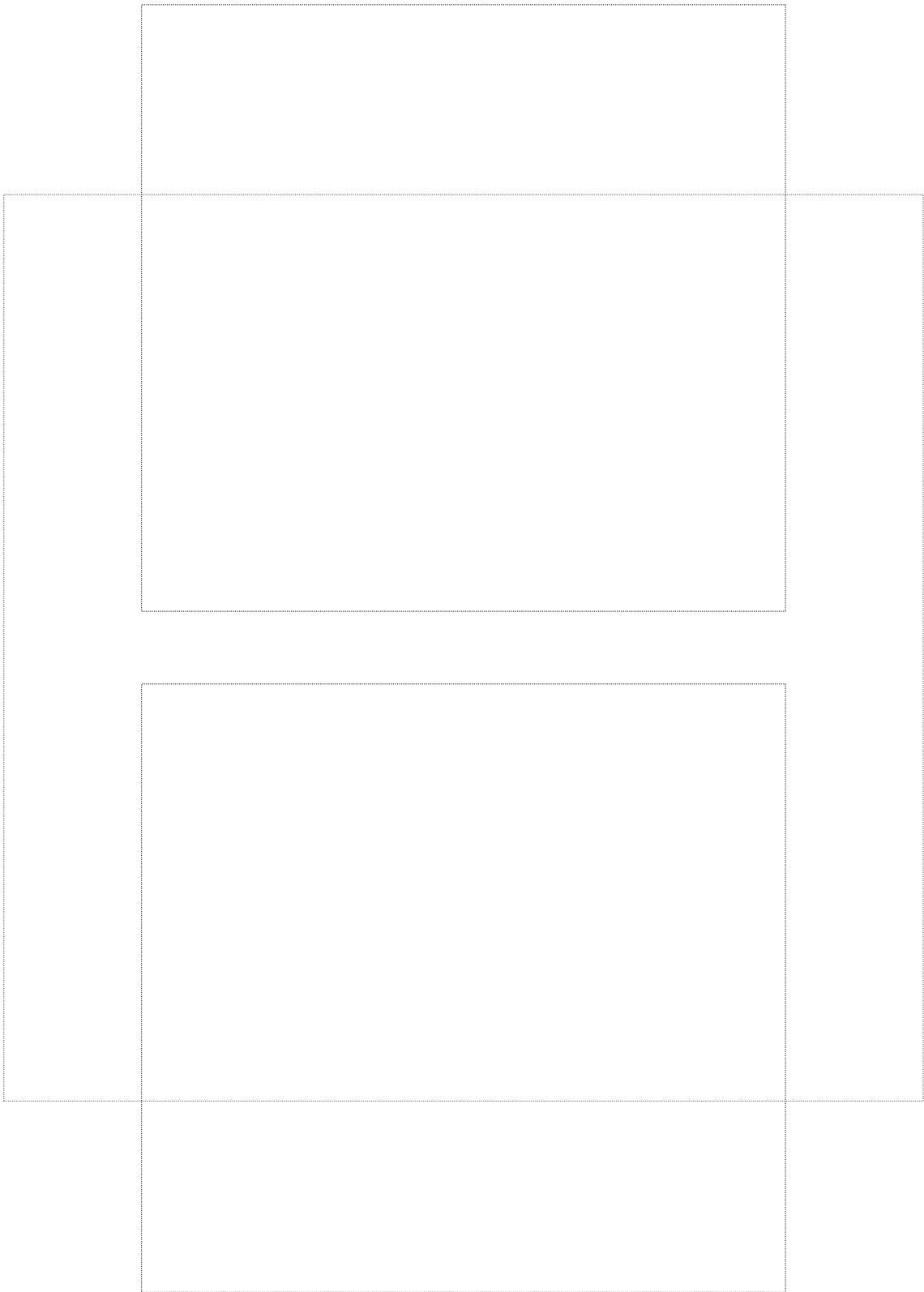
End\_c4.pdf

### ANNEX E

#### **Machine Processable (MP) format of the ATS**

The TTCN MP file corresponding to this is contained in the attached machine processable file detailed below:

End\_c4.mp



## SERIES OF ITU-T RECOMMENDATIONS

Series A	Organization of the work of ITU-T
Series B	Means of expression: definitions, symbols, classification
Series C	General telecommunication statistics
Series D	General tariff principles
Series E	Overall network operation, telephone service, service operation and human factors
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media, digital systems and networks
Series H	Audiovisual and multimedia systems
Series I	Integrated services digital network
Series J	Transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Construction, installation and protection of cables and other elements of outside plant
Series M	TMN and network maintenance: international transmission systems, telephone circuits, telegraphy, facsimile and leased circuits
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Telephone transmission quality, telephone installations, local line networks
<b>Series Q</b>	<b>Switching and signalling</b>
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks and open system communications
Series Y	Global information infrastructure and Internet protocol aspects
Series Z	Languages and general software aspects for telecommunication systems