ETSI

AMENDMENT

ETS 300 012

A2

March 1996

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Key words: ISDN, user-network interface, testing

**This amendment A2 modifies
the European Telecommunication Standard ETS 300 012 (1992)**

Integrated Services Digital Network (ISDN);
Basic user-network interface;
Layer 1 specification and test principles

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Foreword

This amendment to ETS 300 012 (1992) has been produced by the Transmission and Multiplexing (TM) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This second amendment incorporates the changes introduced by Amendment 1 (1994) to ETS 300 012. Newly introduced modifications are indicated by a revision bar located at the left margin.

This second amendment adds a new annex F and related references, definitions and abbreviations to ETS 300 012.

Transposition dates	
Date of adoption of this ETS:	22 September 1995
Date of latest announcement of this ETS (doa):	30 June 1996
Date of latest publication or endorsement of this amendment (dop/e):	31 December 1996
Date of withdrawal of any conflicting National Standard (dow):	31 December 1996

Amendments

Page 12, clause 2

Add the following references to the Normative references clause (clause 2):

[17]   CCITT Recommendation I.112 (1988): "Vocabulary of terms for ISDNs".

[18]   CCITT Recommendation Q.9 (1988): "Vocabulary of switching and signalling terms".

[19]   ISO/IEC 9646-1 (1991): "OSI Conformance Testing Methodology and Framework Part 1: General Concepts".

[20]   ISO/IEC 9646-5 (1991): "OSI Conformance Testing Methodology and Framework Part 5: Requirements on test laboratories and clients for the conformance assessment process".

Page 13, clause 3

Add the following definitions to the definitions clause (clause 3):

Integrated Services Digital Network (ISDN): See CCITT Recommendation I.112 [17], § 2.3, definition 308.

basic access: See CCITT Recommendation Q.9 [18], § 1, definition 1551.

Protocol Implementation Conformance Statement (PICS): See ISO/IEC 9646-1 [19], § 3.4.6.

Page 14, clause 4

Add the following abbreviations to the abbreviations clause (clause 4):

APS	Auxiliary Power Source
HDLC	High level Data Link Control
IUT	Implementation Under Test
PCTR	Protocol Conformance Test Report
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation Extra Information for Testing
RSE	Remote Single layer Embedded
SCS	System Conformance Statement
SCTR	System Conformance Test Report

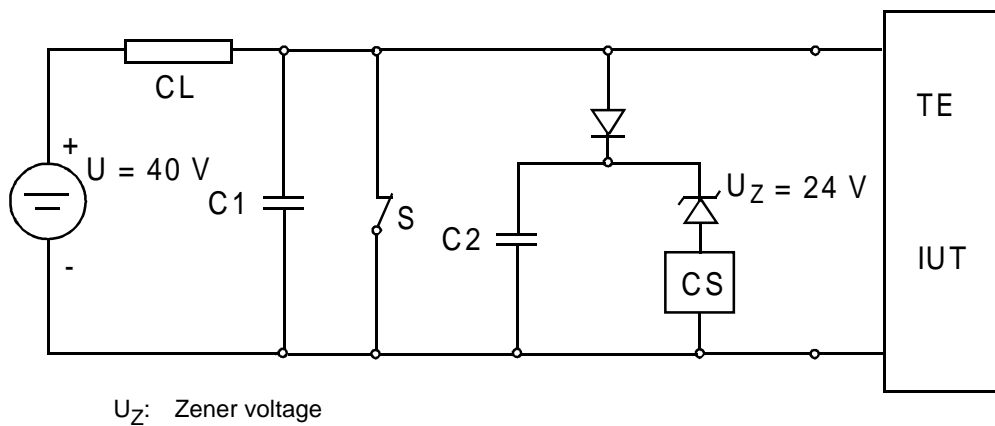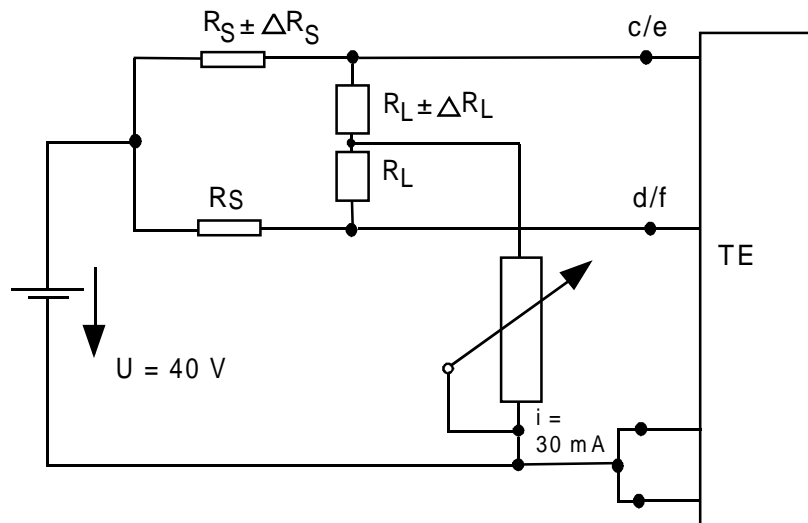**Page 18, figure 3**

Replace figure 3 with the following figure:

U_Z: Zener voltage

Figure 3: Power start up test for TE

Page 22, figure 7

Replace figure 7 with the following figure:

$R_S = 6\ \Omega$	$\triangle R_S = 360\ m\ \Omega$
$R_L = 5\ \Omega$	$\triangle R_L = 300\ m\ \Omega$

$$X = \frac{\triangle R_S}{2\,R_S} = \frac{\triangle R_L}{2\,R_L}$$

Figure 7: Test circuit for applied current unbalance

Page 26, table A.1, table entry A.5.3.2

Replace the table entry A.5.3.2 with the following:

```
A.5.3.2        TEs not powered across the interface

               <The following text is added:
               A TE using the automatic assignment
               procedure shall implement the
               disconnect detector for detection of
               power source 1 or 2 to establish the
               connection status.>
```

Page 29, table A.1, table entry A.6.2.6.1

Replace the final paragraph for table entry A.6.2.6.1 with the following:

```
               <In both paragraphs the term "INFO2"
               shall be replaced (four times) by:
               "INFO2 or INFO4">
```

Page 31, table A.1, table entry A.8.5.4

The statement ("St.-ment") for table entry A.8.5.4 shall be changed to "I" (Informative), as follows:

Clause/ subclause	Title <Comment>	St.- ment
A.8.5.4	Pulse unbalance <The text under this subclause is replaced by:	I

Page 46, subclause D.1.4.4

Replace the fourth instance of "N/R" with "D.3.2.2.1.1", producing a table as follows:

Modes	Clause/ subclause	Test defined in Clause/subclause
Types of wiring configuration	A.4	N/R
Point-to-point configuration	A.4.1	N/R
Point-to-multipoint configuration	A.4.2	N/R
Polarity Integrity (figure 2/I.430 [2])	A.4.3	D.3.2.2.1.1
Interface Ia	A.4.4	N/R
TE associated wiring	A.4.5	N/R

Page 50, subclause D.1.4.11

Replace the final instance of "N/R" with "D.5.1.4.1" and add test for annex B, clause B.6, producing a table as follows:

Requirements	Clause/ subclause	Test defined in Clause/subclause
Test loopbacks defined for the basic user-network interface	Annex A App. I	N/R
Additional requirements applicable to the explicit S reference point	B.1 to B.5 B.6	N/R D.5.1.4.2
TE design to minimise power disturbance	Annex C	D.5.1.4.1

Page 57, subclause D.3.2.1

Replace the table in subclause D.3.2.1 with the following table (modifying states 9, 16, 22, 40 and 46 and adding NOTE 9):

Table to subclause D.3.2.1

STATE NO	CURRENT STATE	STIMULUS	NOTE	NEXT STATE	INFO SENT	COMMENT
1	F1	Power	1	F2	I0	Detection of power
2	F1	T3 expires	2/6	F1	I0	No action
3	F2	Loss of Power		F1	I0	Return to inactive state
4	F2	Rx INFO 0	4	F3	I0	Assume deactivated state
5	F2	Rx INFO 2		F6	I3	Synchronised state
6	F2	Rx INFO 4		F7	I3	Activated
7	F2	Rx any signal	3	F2	I0	No action
8	F2	T3 expires	6	F2	I0	No action
9	F3	Loss of Power	9	F1	I0	Return to inactive
10	F3	PH-AR		F4	I1	Initiate activation & T3
11	F3	Rx INFO 0	4	F3	I0	No action
12	F3	Rx INFO 2		F6	I3	Synchronised state
13	F3	Rx INFO 4		F7	I3	Activated
14	F3	Rx any signal	3	F3	I0	No action
15	F3	T3 expires	2	F3	I0	No action
16	F4	Loss of Power	9	F1	I0	Return to inactive state
17	F4	Rx INFO 0	4	F4	I1	No action
18	F4	Rx INFO 2	7	F6	I3	Synchronised
19	F4	Rx INFO 4	7	F7	I3	Active
20	F4	Rx any signal	3	F5	I0	Detection of signal
21	F4	T3 Expires	2	F3	I0	Deactivated
22	F5	Loss of Power	9	F1	I0	Return to inactive
23	F5	Rx INFO 0	4	F5	I0	No action
24	F5	Rx INFO 2		F6	I3	Synchronised
25	F5	Rx INFO 4		F7	I3	Activated
26	F5	Rx any signal	3	F5	I0	No action
27	F5	T3 Expires	2	F3	I0	Deactivated
28	F6	Loss of Power	8	F1	I0	Return to inactive
29	F6	Lost Framing		F8	I0	Loss of framing signals
30	F6	PH-AR		F6	I3	No action
31	F6	Rx INFO 0	4	F3	I0	Deactivated
32	F6	Rx INFO 2		F6	I3	No action
33	F6	Rx INFO 4		F7	I3	Activated
34	F6	T3 Expires	2	F6	I3	Synchronised
35	F7	Loss of Power	8	F1	I0	Return to inactive
36	F7	Lost Framing		F8	I0	Loss of framing
37	F7	Rx INFO 0	4/5	F3	I0	Deactivated
38	F7	Rx INFO 2		F6	I3	Synchronised
39	F7	Rx INFO 4		F7	I3	No action
40	F8	Loss of Power	9	F1	I0	Return to inactive
41	F8	PH-AR		F8	I0	No action
42	F8	Rx INFO 0	4/5	F3	I0	Deactivation
43	F8	Rx INFO 2		F6	I3	Synchronised
44	F8	Rx INFO 4		F7	I3	Activated
45	F8	Rx any signal	3	F8	I0	No action
46	F8	T3 expires	2	F3	I0	Assume deactivated state

NOTE 1: Because the IUT can be powered in different ways, it is useful to test this IUT with the possible power it is able to detect (PS1, PS2, local power).

NOTE 2: T3 = Implementation dependent, not to exceed 30 sec.

NOTE 3: "Any signal" is simulated by any bit pattern on which the IUT conforming to subclause A.6.3.1.2, ETS 300 012 is not able to synchronise.

NOTE 4: For testing purposes INFO 0 is simulated by a sinusoidal signal having a voltage of 100 mV peak to peak (with a frequency in the range of 2 kHz to 1000 kHz). The TE shall react by transmitting INFO 0 within a period time 250 μs to 25 ms.

NOTE 5: The PH-DI corresponding to the reception of INFO 0 shall be delivered to Layer 2 only if Layer 1 does not re-enter an active state before the expiration of a timer of which the value is in the range of 500 ms to 1 s.

NOTE 6: Applicable only for TEs which are locally powered and able to detect PS1 or PS2.

NOTE 7: If INFO 2 of INFO 4 is not recognised within 5 ms after the appearance of a signal, TE shall go to F5. The result is to be tested 5 ms after generation of the stimulus.

NOTE 8: For TEs which are locally powered and able to detect PS1 or PS2, at the event "disappearance of power" in states F6 or F7, no state change shall be observed.

NOTE 9: Locally powered TEs with disconnected detector shall not assume disconnection and shall not take any action until the voltage of the interface has remained below 24 V for at least 500 ms (refer to subclause 7.1.1).

Page 58, subclause D.3.2.2.1.1

Replace the title of subclause D.3.2.2.1.1 with the following title:

D.3.2.2.1.1   Test A, in state F3 (subclauses A.4.3 and A.6.2.6.1, ETS 300 012)

Page 58, subclause D.3.2.2.1.1

Replace the paragraph "Stimulus:" with the following text:

Stimulus: INFO 2 type frames from the network. This test shall be performed with both normal and reversed polarity of the interchange circuit (NT to TE direction).

Page 68, subclause D.3.3

Replace the results and notes 3 and 4 with the following:

Results:

	STIMULUS	**RESULTS**	**COMMENTS**
a)	1 bad frame	INFO 3	No loss of framing
b)	5 bad frames	INFO 0	Framing lost
c)	2 good frames	INFO 0	Framing not regained
d)	6 good frames (note 3)	INFO 3	Framing regained within 5 frames

> NOTE 3:   Before the test, the TE shall be in state F8. The input shall be applied with "Any signal". Multiframing is not covered by this test.

Page 73, subclause D.4.2

Replace the first paragraph of subclause D.4.2, with a subclause heading as follows:

D.4.2.1   TE jitter measurement characteristics (test A) (subclause A.8.2.2, ETS 300 012)

Page 84, subclause D.4.5.2, "System state:"

Replace the "System state:" text with the following:

System state: a)   Deactivated *(state F3)*, then

                        b)   Synchronised *(state F6)*.

                        IUT transmitting INFO 3 containing all binary ONEs in both B-channels (idle channel code)

Page 95, subclause D.5.1.1

Replace the title of subclause D.5.1.1 with the following title:

D.5.1.1   Normal power conditions (subclauses A.9.3.1.1 and A.9.5.1, ETS 300 012)

Page 100, subclause D.5.1.2

Replace the title of subclause D.5.1.2 with the following title:

D.5.1.2   Restricted power conditions (subclauses A.9.3.1.2 and A.9.5.2, ETS 300 012)

Page 109, subclause D.5.1.4.2

Replace the title of subclause D.5.1.4.2 with the following title:

D.5.1.4.2   Current/time limitation for TE when connecting (subclause 7.1.1, clause B.6, ETS 300 012)

Page 109, subclause D.5.1.4.2, "Stimulus:"

Replace the "Stimulus:" paragraph with the following:

Stimulus: Phantom supply voltage. Restricted mode

$U = -40$ V $R = 15 \, \Omega$

The test setup shall be capable of providing a connection to ground. The measurement shall be done in both wires connecting the power supply to the IUT.

Page 124, subclause E.1.4.4

Replace the fourth instance of "N/R" with "E.3.3.2.1", producing a table as follows:

Modes	Clause/ subclause	Test defined in Clause/subclause
Types of wiring configuration	A.4	N/R
Point-to-point configuration	A.4.1	N/R
Point-to-multipoint configuration	A.4.2	N/R
Polarity Integrity (figure 2/I.430 [2])	A.4.3	E.3.3.2.1
Interface Ib	A.4.4	N/R
NT associated wiring	A.4.5	N/R

Page 137, subclause E.3.3.2.1, Test B

Replace the test name "• **Test B**" with the following:

• **Test B (subclause A.4.3)**

Page 137, subclause E.3.3.2.1, Test B, "Stimulus:"

Replace the "Stimulus:" paragraph with the following:

Stimulus: INFO 3 from the TE simulator.

This test shall be performed with both normal and reversed polarity of the interchange circuit (TE to NT direction).

Page 140, subclause E.3.4, "Results:"

Replace the results and remainder of page 140 (bullet points 1 to 5) with the following:

Results:

|	STIMULUS	RESULTS	COMMENTS
a)	1 bad frame (see note 3)	INFO 4	No loss of framing
b)	5 bad frames (see note 3)	INFO 2	Framing lost
c)	2 good frames (see note 4)	INFO 2	Framing not regained
d)	6 good frames (see notes 4 and 5)	INFO 4	Framing regained within 5 frames

NOTE 3: Before the commencement of the test, the NT shall be in system state G3.

NOTE 4: Before the test, the NT **shall not** be in system state G3.

NOTE 5: Multiframing procedure is not covered by this test.

Page 160, subclause E.5.1.4.3

Replace the figure for the test configuration with the following figure:
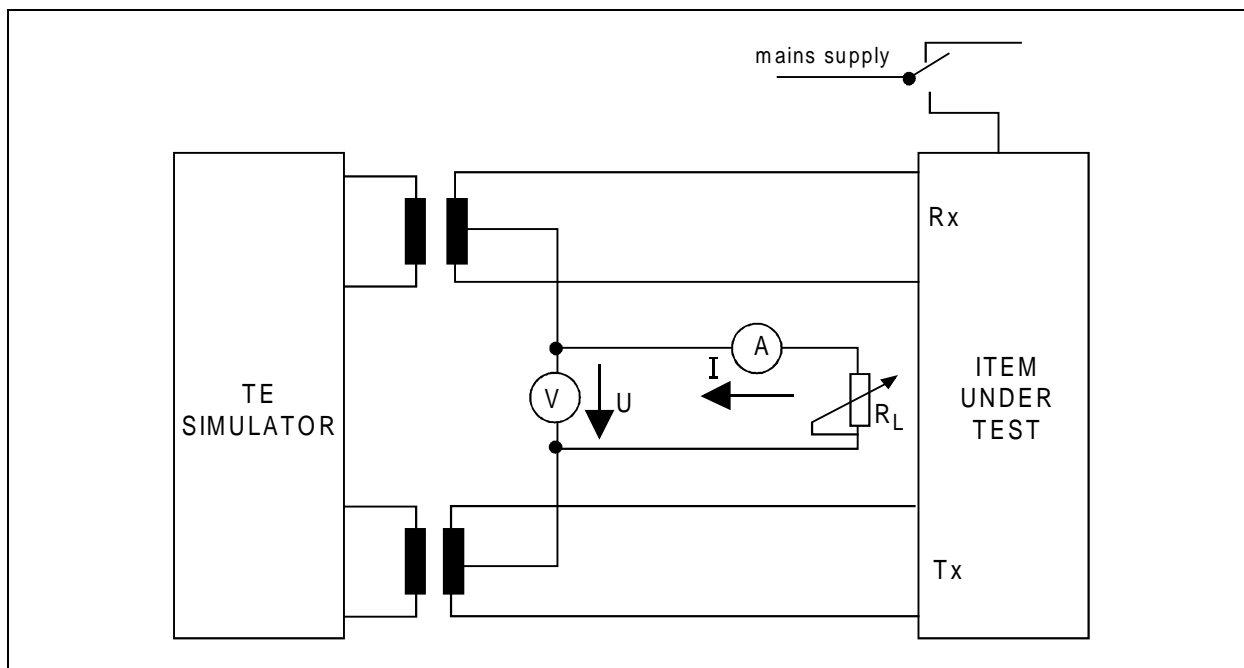
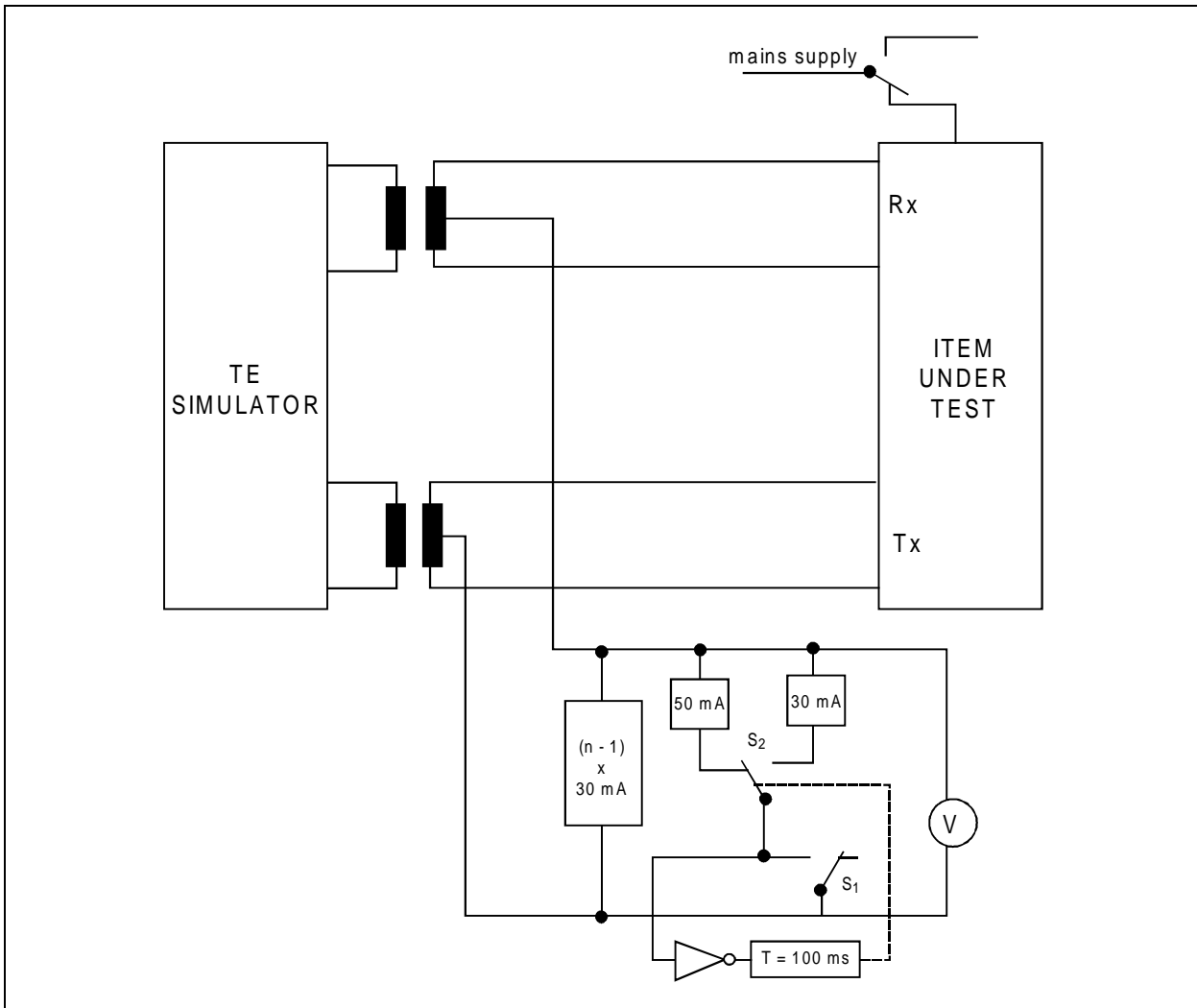**Page 164, subclause E.5.1.7**

Replace the figure for the test configuration with the following figure (modifying the value of the initial load):
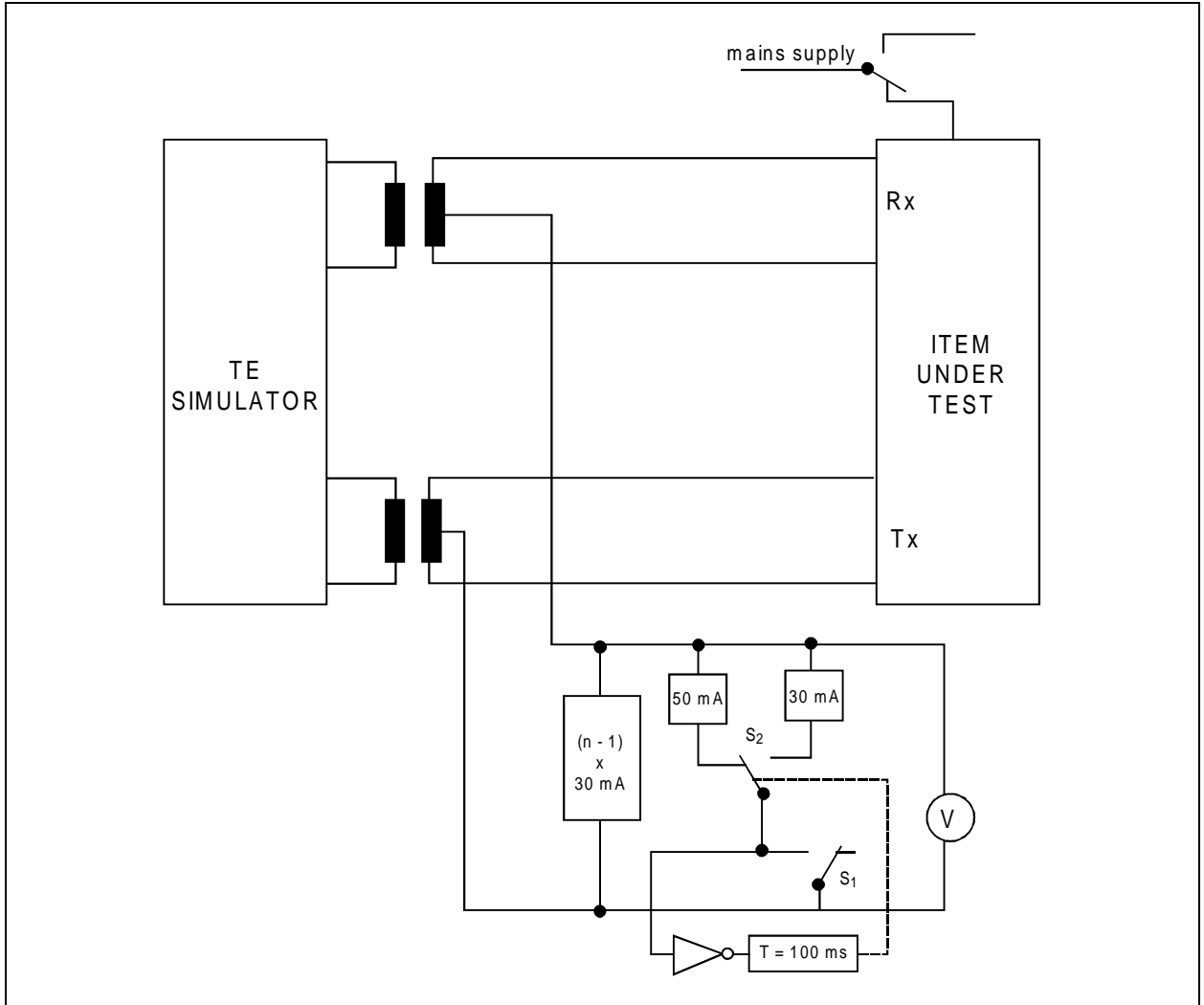
Page 173, subclause E.6.1.5

Replace the figure for the test configuration with the following figure (modifying the value of the initial load):

Page 178, addition of new annex F

Add the following annex F to the end of the document:

Annex F (normative): **System Conformance Statement (SCS), Protocol Implementation Conformance Statement (PICS) and Protocol Implementation Extra Information for Testing (PIXIT) for interface points I$_a$ and I$_b$**

F.1 SCS proforma for interface point I$_a$ (TE)

F.1.1 Introduction

A client who requests a conformance test shall provide to the test laboratory a System Conformance Statement (SCS) and a client checklist. The proforma in this clause may be used to present this SCS.

The main purpose of the SCS is to identify the client organization and the test candidate.

The purpose of the client checklist is to provide a record of test-related information.

F.1.2 Proforma structure and content

The proforma consist of the following tables containing pre-printed guide text:

- **client organization:** for identification of the client organization;

- **test candidate:** for identification and itemizing of the test candidate;

- **test status of the test candidate and testing claims:** for indication of the test status of the test candidate, summarizing of the testing claims, provision of references to associated System Conformance Test Report (SCTR) and Protocol Conformance Test Report (PCTR), and specification of the protocols implemented in the test candidate;

- **client checklist:** for provision of a record of test-related information.

F.1.3   Filling in guidance

The pre-printed guide text in the proforma indicates the kind of information to be filled in by the client.

Table F.1

Client organization

Client name
Street/No.:
Postal code/City:
Country:
Telephone:
Telefax:
Telex:
Teletex:

Client manager
Name:
Location:
Telephone:

Contact person
Name:
Location:
Telephone:

Additional information

Table F.2

Test candidate			
Test candidate identification: Name	Model	Version	Serial number
Configuration (identify/describe separate units (e.g. scanner, keyboard, printer, etc.).			

Table F.3

Test status of the test candidate and testing claims

Layer 1 test status and testing claims Answer by Yes(=Y) or No(=N) according to the claims:			
Tested before? (note)	Test wanted?	PCTR wanted?	Log wanted?

NOTE: If "Yes" in the left column "Tested before?", indicate references to existing test documents (if tested at another test laboratory the existing test documents should be made available to the current test laboratory).

SCTR	PCTR

Test candidate reference (short identification):

Layer 1 implementation Identify layer 1 component	
Name	Version

Other information (indicate any other information that may itemize the test candidate or the testing claims):

Table F.4

Client checklist
Reference: subclauses/notes of subclause 6.3.1.3 of ISO/IEC 9646-5 [20].
Details may be specified in the appropriate PIXIT(s) and reference(s) to the relevant PIXIT(s) indicated in this checklist.

Ref. a)	COMPLIANCE WITH ISO/IEC 9646-5 [20] (list exceptions, if any):
Ref. b)	The information (specification of the test candidate, protocols to be tested) is given in tables F.2 and F.3.
Ref. c)	The Remote Single layer Embedded (RSE) test method is used implying that the degree of terminal equipment testability is sufficient.
Ref. d)	Test co-ordination procedures (explain the procedures suitable for use with the test candidate, and which correspond to the RSE test method or indicate references to clauses of manuals etc. giving such explanations):
Ref. NOTE 1:	Physical requirements and other practical information (indicate any physical test requirements (space, air conditioning etc.) as well as any other information that may be needed/useful):
Ref. NOTE 2:	The information on whom to contact during the conformance assessment process is given in table F.1.

F.2 PICS proforma for interface point I$_a$ (TE)

F.2.1 Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a given protocol. Such a statement is called a PICS. A client who requests a conformance test shall provide to the test laboratory a completed PICS proforma for each OSI layer to be tested.

This clause defines the PICS proforma applying to the OSI layer 1 (physical layer) of equipment having interface Ia (see § 4.4 of CCITT Recommendation I.430 [2]) for the connection to the ISDN basic access at reference points S or S/T (coincident S and T) (see CCITT Recommendation I.411 [1]) and intended to be installed on customers premises.

> NOTE: In addition to the information provided by a PICS, information relating to the implementation and its testing environment is essential. Such extra information is called a PIXIT. Generally PIXIT proforma are produced and provided by the test laboratory.
> The PIXIT proforma provided in clause F.3 should be used.

F.2.2 PICS proforma structure and contents

The PICS proforma consist of tables structured as indicated in references ISO/IEC 9646-1 [19] and ISO/IEC 9646-5 [20].

F.2.3 Pre-printed table contents

The pre-printed contents of the PICS tables provide the following:

- table/item identification, see subclause F.2.4;

- item names or short descriptions;

- references to the standards;

> NOTE: For this ETS, references refer to rows of table A.1 of ETS 300 012, unless otherwise indicated.

- status attributes specifying the status of the items;

- predicates, see "c" below;

- column to be filled in by the client, see subclause F.2.5.

The status attribute in the "Status" column reflects the conformance requirements defined in the referenced standard as follows:

m (mandatory): the capability is required to be implemented, in conformance with the protocol specification. When a mandatory capability is not supported, it is a case of non-conformance, and the client shall give a justification (see subclause F.2.5).

o (optional): the capability may be implemented, and if it is implemented it is required to conform to the protocol specification.

c (conditional): the requirement on the capability depends on the selection of other optional or conditional items; the PICS proforma cannot define in advance a definite status for the capability, it can only indicate that the status depends on the evaluation of a predicate. The predicates are indicated in the table column "Predicate" or in the last table row as item notes.

- (dash): not applicable item, i.e. no requirement can be expressed in a given context.

F.2.4   Table/item identification

The PICS table is provided with a table/item identification label pre-printed to the left in the table headers. The labels are composed as follows:

-       one capital letter, being the first letter of the layer name;

-       a serial number.

Each item in a PICS table is provided with a serial number in the left-hand table column, called "Item No."

To identify an item unambiguously, the table label and the item number are combined by use of a slash character, "/", e.g. in the 2nd table of the **P**hysical layer PICS, the 3rd item is identified by "P2/3".

F.2.5   Filling in guidance

The filling in is done in the rows of right table column named "Support" as follows:

-       for implemented items one of: Y, y, Yes, yes or YES is entered;

-       for not implemented items one of: N, n, No, no or NO is entered.

For each not implemented mandatory item, the client shall give a justification, e.g. as an added note associated with the item.

Table F.5

P1	Optional capabilities				
Item No.	Item	Reference ETS 300 012	Status	Predicate	Support
	TE can be connected at reference point S or S/T by means of:	A.4.3, A.4.5, subclause D.1.1			
1	- a hard wired cord ≤ 10 m with a plug;		o.1	-	
2	- a jack with a cord ≤ 10 m with a plug at each end;		o.1.2	-	
3	- a "standard ISDN basic access TE cord" ≤ 7 m;	A.8.9	o.1.3	-	
4	- a "standard ISDN basic access TE cord" > 7 ≤ 10 m;		o.3	-	
5	- direct wiring (without a detachable cord).		o.1.3	-	
	TE is powered across the interface and able to use:	A.9.1, A.9.1.2, A.9.2.1			
6	- power source 1 (PS1), normal power conditions;		o	-	
7	- power source 1 (PS1), restricted power conditions;		o	-	
8	- power source 2 (PS2), normal power conditions;	A.9.3.2	o	-	
9	- power source 2 (PS2), restricted power conditions.		o	-	
	TE is locally powered and:	A.5.3.2, A.9.1.2			
10	- able to detect PS1 or PS2;		o	-	
11	- unable to detect PS1 or PS2.		o	-	
	TE activation/deactivation and connection status are based on:	A.5.1.8 & 9, A.5.3.1 & 2, A.6.2.3.1 & 2			
12	- detection of PS1 or PS2;		c	P1/6 or P1/8 or P1/10	
13	- presence/absence of local power.		c	P1/10	
	TE priority class is:	A.6.1.4			
14	- fixed;		c	not P1/15	
15	- under control of layer 2.		c	not P1/14	
16	TE cannot initiate activation ("answering only terminal").	A.6.2.2	o	-	
17	TE supports multiframing	A.6.3.3	o	-	
	TE minimises power disturbance according to:	subclause 7.1.1, annex C, figures C.1, C.2 figure C.4			
18	- 1st alternative of annex C of ETS 300 012;		o	-	
19	- 2nd alternative of annex C of ETS 300 012.		o	-	
20	TE is able to switch over from normal to restricted power mode.	subclause 7.1.3.3	c	P1/6 and P1/7	
o.1	The TE shall meet the requirements with a cord having a minimum length of 5 metres.				
o.2	Testing is performed by use of the cord being a part of the TE as well as by use of the reference cord specified in subclause D.1.1 of annex D.				
o.3	Testing is performed by use of the reference cord specified in subclause D.1.1 of annex D.				

Table F.6

P2	Major functional characteristics			
Item No.	Item	Reference ETS 300 012	Status	Support
1	Two bi-directional 64 kbit/s B-channels are provided.	A.5.1.1	m	
2	Bit timing takes place at 192 kbit/s.	A.5.1.2	m	
3	Octet timing takes place at 8 kHz.	A.5.1.3	m	
4	Frame alignment.	A.5.1.4	see table P3	
5	One D-channel for each direction is provided at 16 kbit/s.	A.5.1.5	m	
6	D-channel access.	A.5.1.6	see table P4	
7	Power transfer across the interface is possible.	A.5.1.7	m	
8	Deactivation/activation.	A.5.1.8, A.5.1.9	see table P5	
9	Two interchange circuits, one for each direction, are provided.	A.5.2	m	
11	Each transmitted frame contains 48 bits for all configurations.	A.5.4	m	
12	Nominal transmitted bit rate is 192 kbit/s.	A.5.4.1	m	
13	Binary organisation of the transmitted frame meets the requirements.	A.5.4.2	m	
14	Contents and grouping of the transmitted frame meet the requirements.	A.5.4.2.1	m	
15	Relative bit positions meet the requirements.	A.5.4.2.3	m	
16	Pseudo-ternary line code is used.	A.5.5	m	
17	TE timing is derived from the NT signals.	A.5.6	m	

Table F.7

P3	Frame alignment			
Item No.	Item	Reference ETS 300 012	Status	Support
1	Frame alignment procedure, based on line code violation, is used.	A.6.3	m	
2	Frame alignment, on initial activation of TE, meets the requirements.	A.6.3.1	m	
3	Loss of frame alignment is assumed on the required criterion.	A.6.3.1.1	m	
4	Frame alignment is assumed to occur on the required criterion.	A.6.3.1.2	m	
5	Multiframing is handled as required (extra bits are identified, FA bits are echoed).	A.6.3.3	m	
6	Idle code (binary ONE's) is sent in any not-assigned B-channel.	A.6.4	m	

Table F.8

P4	D-channel access				
Item No.	Item	Reference ETS 300 012	Status	Predicate	Support
1	Interframe (layer 2) time fill is provided using ONEs.	A.6.1.1	m		
2	D-echo monitoring is provided.	A.6.1.3	m	-	
3	Collision detection is provided.	A.6.1.5	m	-	

Table F.9

P5	Activation/deactivation			
Item No.	Item	Reference ETS 300 012	Status	Support
	TE uses the following states as required:			
1	- F1 (inactive);	A.6.2.1.1.1	m	
2	- F2 (sensing);	A.6.2.1.1.2	m	
3	- F3 (deactivated);	A.6.2.1.1.3	m	
4	- F4 (awaiting signal);	A.6.2.1.1.4	m	
5	- F5 (identifying input);	A.6.2.1.1.5	m	
6	- F6 (synchronized);	A.6.2.1.1.6	m	
7	- F7 (activated);	A.6.2.1.1.7	m	
8	- F8 (lost framing).	A.6.2.1.1.8	m	
9	Activate primitives correspond to the specification.	A.6.2.1.3	m	
10	Deactivate primitives correspond to the specification.	A.6.2.1.4	m	
11	Management primitives correspond to the specification.	A.6.2.1.5	m	
12	Signals INFO 0 and INFO 3 can be sent.	A.6.2.2	m	
13	Signal INFO 1 can be sent.		c.1	
14	Signals INFO 0, INFO 2, INFO 4 can be received.		m	
15	Activation/deactivation procedures meet the requirements.	A.6.2.3.1&2	m	
16	Timer T3 is < 30 s.	A.6.2.5	c.1	
17	Activation time in state F3 meets the requirements (respond to INFO 2/INFO 4 by sending of INFO 3 within 100 ms).	A.6.2.6.1	m	
18	Activation time in state F4 meets the requirements (cease INFO 1 sending and initiate sending of INFO 0 within 5 ms and then respond to INFO 2/INFO 4 by sending of INFO 3 within 100 ms).		c.1	
19	Deactivation time meets the requirements (respond to INFO 0 by sending of INFO 0 within 25 ms).	A.6.2.7	m	
	c.1 Predicate: not P1/16.			

Table F.10

P6	Maintenance			
Item No.	Item	Reference ETS 300 012	Status	Support
1	Loopback 4 functions are provided.	A. Appendix I	o	

Table F.11

P7	Electrical characteristics			
Item No.	Item	Reference ETS 300 012	Status	Support
1	Nominal bit rate is 192 kbit/s.	A.8.1.1	m	
2	Bit rate tolerance is ± 100 ppm.	A.8.1.2	m	
3	Timing extraction jitter is within -7% to +7% of a bit period.	A.8.2.1, A.8.2.2	m	
4	Total phase deviation does not exceed -7% to +15% of a bit period.	A.8.2.1, A.8.2.3	m	
5	Transmitter output impedance is: a) at all times except when transmitting a binary ZERO: - from 2 kHz to 1 MHz: exceeding the impedance indicated by the template in figure 12/I.430 [2];	A.8.5.1, A.8.5.1.2 a)	m	
6	- at 96 kHz: peak current resulting from applied 1,2 V does not exceed 0,6 mA;		m	
7	b) when transmitting a binary ZERO: ≥ 20 ohms.	A.8.5.1.2 b)	m	
8	Pulse shape is within the mask of figure 13/I.430 [2].	A.8.5.3.1	m	
9	Nominal pulse amplitude is 750 mV, zero to peak.	A.8.5.3.2	m	
10	Pulse amplitude when transmitting a high density pattern meets the requirements.	A.8.5.4.1	m	
11	Pulse unbalance of an isolated couple of pulses meets the requirements.	A.8.5.4.2	m	
12	Pulse voltage on other transmitter test loads are: - on a 400 ohm load: pulse is within the mask of Figure 14/I.430 [2];	A.8.5.5.1	m	
13	- on a 5,6 ohm load: amplitude (peak) is ≤ 150 mV.	A.8.5.5.2	m	
14	Longitudinal conversion loss of transmitter output is: - 10 kHz ≤ f ≤ 300 kHz: ≥ 54 dB;	A.8.5.6, A.8.5.6.1	m	
15	- 300 kHz < f ≤ 1 MHz: minimum value decreasing from 54 dB at 20 dB/decade.		m	
16	Receiver input impedance, independently of the TE state, is - from 2 kHz to 1 MHz: exceeding the impedance indicated by the template in Figure 12/I.430 [2];	A.8.6.1.1, A.8.5.1.2 a)	m	
17	- at 96 kHz: peak current resulting from applied 1,2 V does not exceed 0,6 mA.		m	
18	Receiver sensitivity - noise and distortion immunity: TE operates with the specified input signals	A.8.6.2, A.8.6.2.1	m	
19	Longitudinal conversion loss of receiver input is: - 10 kHz ≤ f ≤ 300 kHz: ≥ 54 dB;	A.8.6.4	m	
20	- 300 kHz < f ≤ 1 MHz: minimum value decreasing from 54 dB at 20 dB/decade.		m	

Table F.12

P8	"Static" power feeding				
Item No.	Item	Reference ETS 300 012	Status	Predicate	Support
1	TE meets the requirements when the available voltage: a) from PS1 is: - normal power conditions: 24-42 V	A.9.3.1.1	c	P1/6	
2	- restricted power conditions: 32-42 V	A.9.3.1.2	c	P1/7	
3	b) from PS2 is: - normal power conditions: 32-42 V	A.9.3.2.1	c	P1/8	
4	- restricted power conditions: 32-42 V	A.9.3.2.2	c	P1/9	
5	TE current transients do not exceed 5 mA/µs	A.9.4	c	P1/6-9	
6	Maximum TE consumption from PS1 is: a) normal power mode: - activated state: 1 W;	A.9.5, A.9.5.1	c	P1/6	
7	- deactivated state: 100 mW;		c	P1/6	
8	- deactivated/"local action" state: 1 W;		c	P1/6	
9	b) restricted power mode, TE designated for restricted power operation: - activated state: 380 mW;	A.9.5.2.1	c	P1/7	
10	- deactivated state: 25 mW;		c	P1/7	
11	- deactivated/"local action" state: 380 mW;		c	P1/7	
12	c) normal or restricted power mode, TE locally powered and: - can detect PS1/2: 3 mW;	A.9.5.2.2	c	P1/10	
13	- cannot detect PS1/2: 0 mW;		c	P1/11	
14	d) restricted power mode, TE non-designated for restricted power operation and normally powered from PS1 in normal mode: 0 mW.	A.9.5.2.2	c	P1/6	
15	Galvanic isolation of TE meets the requirements.	A.9.6	m		

Table F.13

Item No.	Item	Reference ETS 300 012	Status	Predicate	Support
P9	"Dynamic" power feeding				
	TE meets the current/time limitations during connection, switch-on and switch-over between normal and restricted power modes as follows: a) TE is powered from PS1 in power mode:	subclause 7.1.1, A.9.5, A.9.5.1, A.9.5.2.1,			
1	- normal: from 5 µs to 100 ms: ≤ 55 mA, then: "static" (≤ 1 W/≤ 55 mA);	figure 2 table 2	c	P1/6	
2	- restricted: from 5 µs to 100 ms: ≤ 55 mA, then: "static" (≤ 380 mW/≤ 55 mA);	figure 2 table 3	c	P1/7	
3	b) 1st alternative for PS1 in power mode: - normal: from 5 µs: "static" (≤ 1 W/≤ 55 mA);	annex C, figures C.1, C.3	c	P1/6 and P1/18	
4	- restricted: from 5 µs to 10 ms: ≤ 1 W, then: "static" (≤ 380 mW/≤ 55 mA);	figures C.2, C.3	c	P1/7 and P1/18	
5	c) 2nd alternative for PS1 in power mode: - normal: From 5 µs to B (≤ 900) ms: ≤ 4 mA, from B ms to B+100 ms: ≤ 55 mA, then: "static" (≤ 1 W/≤ 55 mA);	figure C.4	c	P1/6 and P1/19	
6	- restricted: From 5 µs to B (≤ 900) ms: ≤ 4 mA, from B ms to B+100 ms: ≤ 55 mA, then: "static" (≤ 380 mW/≤ 55 mA);	figure C.4	c	P1/7 and P1/19	
7	d) TE is locally powered and: - can detect PS1/2: from 100 µs: ≤ 3 mW;	subclause 7.1.1	c	P1/10	
8	- cannot detect PS1/2: from 100 µs: ≤ 10 µA.		c	P1/11	
9	TE making use of PS detector does not assume disconnection until the interface voltage has remained < 24 V for ≥ 500 ms.	subclause 7.1.1	c	P1/10	
10	TE can reach operational condition when the specified start up parameters are used in power mode: - normal;	subclause 7.1.3.1, figure 3, table 5	c	P1/6 or P1/8	
11	- restricted.	table 4	c	P1/7 or P1/9	
12	TE does not lose on-going communication if power is interrupted ≤ 5 ms in power mode: - normal;	subclause 7.1.3.2	c	P1/6 or P1/8	
13	- restricted.		c	P1/7 or P1/9	
14	TE designated for restricted power operation meets the switch-over requirements when switched: - from normal to restricted power mode;	subclause 7.1.3.3	c	P1/20	
15	- from restricted to normal power mode.		c	P1/20	
16	DC unbalance of power sink 1 is < 3% of phantom pairs current.	subclause 7.2.1.2, figure 6	c	P1/6-7	
17	TE meets the requirements also if 3% DC unbalance is applied.	subclause 7.2.2, figure 7	c	P1/6-7	

Table F.14

Item No.	ITEM	Reference ETS 300 012	Status	Support
P10	Interface connector and contact assignments			
1	Functions at access leads meet the requirements.	A.9.1.1	m	
2	Leads or/and contact assignments meet the requirements.	A.10	m	

F.3 PIXIT proforma for interface point I$_a$ (TE)

F.3.1 Introduction

In order to test a protocol implementation, information relating to the implementation and its testing environment in addition to that provided by the PICS is essential. Such extra information is called a PIXIT. A client who requests a conformance test shall provide to the test laboratory a completed PIXIT proforma for each layer to be tested.

The proforma provided in table F.16 shall be used.

F.3.2 Proforma structure and contents

The PIXIT proforma are tables containing pre-printed guide text and empty table space intended to be used by the client for explanations, specification of details etc.

The proforma given in table F.15 is intended for client indication of the environmental conditions to be used during testing, and test limitations, if any. Note, that in case no environmental value or range is indicated by the client, the test laboratory will use a value within the ranges pre-printed in the proforma.

F.3.3 Table / item identification

Corresponding to the PICS tables, each PIXIT table is provided with an identification label pre-printed to the left in the tables headers. In order to distinguish between PICS and PIXIT identifications, an X is added to the prefix letter. The PIXIT labels are composed as follows:

- two capital letters being the first letter of the layer name and the additional X;

- a serial number.

Each pre-printed item in a PIXIT table is provided with a serial number in the left hand tables column called "Item No.".

To identify a PIXIT item unambiguously, the table label and item number are combined using a slash character, "/", e.g. in the 1st table of the **P**hysical layer PIXIT, the 3rd item is identified by "PX1/3".

F.3.4 Filling in guidance

The PIXIT proforma shall be filled in by the client. The filling in is done according to the pre-printed guide test in the tables.

In order to reduce the test time, it is essential not only that the required explanations, specifications etc. are detailed but also that conditions which cannot be predetermined are explained/specified in details (using empty table space, additional pages or giving references to manuals etc.).

The information provided in a PIXIT shall not conflict with information provided in the corresponding PICS or with the requirements of the standards.

Table F.15

Environmental test conditions and test limitations				
TEST CANDIDATE REFERENCE (short identification; for full identification see table F.2 of the SCS)				

Environmental test conditions (indicate the conditions to be used during testing):

Ambient temperature range	Relative humidity range	Air pressure range	Power supply	
			Voltage	Frequency
ºC	%	kPa	V ± %	Hz ± %
If no values / ranges are indicated above by the client, the Implementation Under Test (IUT) will be tested under the following conditions				
15 - 35 ºC	25 - 75 %	86 - 106 kPa	within ± 5 % of nominal operating voltage	within ± 4 % of nominal operating frequency

OTHER TEST CONDITIONS (indicate any other condition that may be needed / useful during testing):

TEST LIMITATIONS (explain if any of the abstract tests cannot be executed because of non implementation of Abstract Layer Primitives etc.):

Table F.16

PX1	Means of control and observation and test co-ordination procedures etc.		
Item No.	Reference to PICS	ITEM	Answer below if relevant or make reference to table F.18
1	P1/20	How to select the designation for use of restricted power.	
2	P6/1	Explain how specific patterns can be transmitted in looped back B-channels.	

Table F.17

PX2	Means of control and observation and test co-ordination procedures etc.		
Item No.	Reference to PICS	ITEM	VALUE
1	P5/16	State the value of timer T3.	
2	P5/15	State the value of timer T4. Timer T4 is a timer started when leaving state F7 or F8 upon the reception of INFO 0. The range shall be within 500 ms to 1 000 ms.	
3	P3/3	State the value of N for loss of frame alignment.	
4	P3/4	State the value of M for frame alignment.	
5	-	State the duration of the self-test.	
6	P1/14	State the value of the priority class.	
7	-	State the delay time needed by the application to establish a call. (Layer 1 is deactivated).	
8	-	State the delay time needed by the application to disconnect a call. (Layer 3 has established a call).	

Table F.18

PX3   Clients additional information

F.4 SCS proforma for interface point I$_b$ (NT)

F.4.1 Introduction

A client who requests a conformance test shall provide to the test laboratory a SCS and a client checklist. The proforma in this clause may be used to present this SCS.

The main purpose of the SCS is to identify the client organization and the test candidate.

The purpose of the client checklist is to provide a record of test-related information.

F.4.2 Proforma structure and content

The proforma consist of the following tables containing pre-printed guide text:

- **client organization:** for identification of the client organization;

- **test candidate:** for identification and itemizing of the test candidate;

- **test status of the test candidate and testing claims:** for indication of the test status of the test candidate, summarizing of the testing claims, provision of references to associated System Conformance Test Report (SCTR) and Protocol Conformance Test Report (PCTR), and specification of the protocols implemented in the test candidate;

- **client checklist:** for provision of a record of test-related information.

F.4.3 Filling in guidance

The pre-printed guide text in the proforma indicates the kind of information to be filled in by the client.

Table F.19

Client organization
Client name
Street/No.:
Postal code/City:
Country:
Telephone:
Telefax:
Telex:
Teletex:
Client manager
Name:
Location:
Telephone:
Contact person
Name:
Location:
Telephone:
Additional information

Table F.20

Test candidate			
Test candidate identification: Name	Model	Version	Serial number
Configuration (identify/describe separate units (e.g. scanner, keyboard, printer, etc.).			

Table F.21

Test status of the test candidate and testing claims

Layer 1 test status and testing claims Answer by Yes(=Y) or No(=N) according to the claims:			
Tested before? (note)	Test wanted?	PCTR wanted?	Log wanted?

NOTE: If "Yes" in the left column "Tested before?", indicate references to existing test documents (if tested at another test laboratory the existing test documents should be made available to the current test laboratory).

SCTR	PCTR

Test candidate reference (short identification):

Layer 1 implementation Identify layer 1 component	
Name	Version

Other information (indicate any other information that may itemize the test candidate or the testing claims):

Table F.22

Client checklist	
Reference: subclauses/notes of subclause 6.3.1.3 of ISO/IEC 9646-5 [20].	
Details may be specified in the appropriate PIXIT(s) and reference(s) to the relevant PIXIT(s) indicated in this checklist.	
Ref. a)	COMPLIANCE WITH ISO/IEC 9646-5 [20] (list exceptions, if any):
Ref. b)	The information (specification of the test candidate, protocols to be tested) is given in tables F.20 and F.21.
Ref. c)	The Remote Single layer Embedded (RSE) test method is used implying that the degree of terminal equipment testability is sufficient.
Ref. d)	Test co-ordination procedures (explain the procedures suitable for use with the test candidate, and which correspond to the RSE test method or indicate references to clauses of manuals etc. giving such explanations):
Ref. NOTE a:	Physical requirements and other practical information (indicate any physical test requirements (space, air conditioning etc.) as well as any other information that may be needed/useful):
Ref. NOTE b:	The information on whom to contact during the conformance assessment process is given in table F.19.

F.5   PICS proforma for interface point I$_b$ (NT)

F.5.1   Introduction

To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a given protocol. Such a statement is called a PICS. A client who requests a conformance test shall provide to the test laboratory a completed PICS proforma for each OSI layer to be tested.

This clause defines the PICS proforma applying to the OSI Layer 1 (Physical Layer) of equipment having interface Ib (see § 4.4 of CCITT Recommendation I.430 [2]) for the connection to the ISDN basic access at reference points S, T or S/T (coincident S and T) (see CCITT Recommendation I.411 [1]) and intended to be installed on customers premises.

> NOTE: In addition to the information provided by a PICS, information relating to the implementation and its testing environment is essential. Such extra information is called a PIXIT. Generally PIXIT proforma are produced and provided by the test laboratory.
> The PIXIT proforma provided in clause F.6 should be used.

F.5.2   PICS proforma structure and contents

The PICS proforma consist of tables structured as indicated in ISO/IEC 9646-1 [19] and ISO/IEC 9646-5 [20].

F.5.3   Pre-printed table contents

The pre-printed contents of the PICS tables provide the following:

-       table/item identification, see subclause F.5.4;

-       item names or short descriptions;

-       references to the standards;

> NOTE: For this ETS, references refer to rows of table A.1 of ETS 300 012, unless otherwise indicated.

-       status attributes specifying the status of the items;

-       predicate, see "c" below;

-       column to be filled in by the client, see subclause F.5.5.

The status attribute in the "STATUS" column reflects the conformance requirements defined in the referenced standard as follows:

m   (mandatory)   The capability is required to be implemented, in conformance with the protocol specification. When a mandatory capability is not supported, it is a case of non-conformance, and the client shall give a justification (see subclause F.5.5).

o   (optional)   The capability may be implemented, and if it is implemented it is required to conform to the protocol specification.

c   (conditional)   The requirement on the capability depends on the selection of other optional or conditional items; the PICS proforma cannot define in advance a definite status for the capability, it can only indicate that the status depends on the evaluation of a predicate. The predicates are indicated in the table column "Predicate" or in the last table row as item notes.

-    (dash)   Not applicable item, i.e. no requirement can be expressed in a given context.

F.5.4 Table/item identification

The PICS table is provided with a table/item identification label pre-printed to the left in the table headers. The labels are composed as follows:

- one capital letter, being the first letter of the layer name;

- a serial number.

Each item in a PICS table is provided with a serial number in the left-hand table column, called "Item No."

To identify an item unambiguously, the table label and the item number are combined by use of a slash character, "/", e.g. in the 2nd table of the **P**hysical layer PICS, the 3rd item is identified by "P2/3".

F.5.5 Filling in guidance

The filling in is done in the rows of the right table column named "Support" as follows:

- for implemented items one of: Y, y, Yes, yes or YES is entered;

- for not implemented items one of: N, n, No, no or NO is entered.

For each not implemented mandatory item, the client shall give a justification, e.g. as an added note associated with the item.

Table F.23

P1	Optional capabilities				
Item No.	Item	Reference ETS 300 012	Status	Predicate	Support
	NT can be connected to user premises wiring:	clauses 1 and 3, A.4.4, A.4.5			
1	- at reference point T or S/T: NT type is "NT1";		o.1	-	
2	- at reference point S: NT type is "NT2" (or "NT2+NT1");		o	-	
3	- directly without a detachable cord;		o	-	
4	- by means of a hard wired cord ≤ 3 m and a plug;		o	-	
5	- by means of a jack with a cord ≤ 3 m and a plug at each end;		o	-	
6	- with the terminating resistor included in the NT.		o	-	
	Timer T2 value is:	A.6.2.4.1 (table 6)			
7	- 0 (if NT recognizes INFO 1 unambiguously);		o	-	
8	- 25 ms to 100 ms.		o	-	
	NT configuration is designed for:				
9	- short passive bus (fixed timing);	A.8.6.2.2	o	-	
10	- both point-to-point and short passive bus (adaptive timing);	A.8.6.2.3	o	-	
11	- extended bus;	A.8.6.2.4	o	-	
12	- point-to-point only.	A.8.6.2.5	o	-	
13	Power source 1 (PS1) is provided:	A.9.1, A.9.1.2, A.9.2.1,	o	-	
14	- as an integral part of NT;		o	-	
15	- physically separated from NT (Auxiliary Power Source (APS));	subclause 7.3	o.1	-	
16	- for normal power mode, fall back characteristics;	subclause 7.1.4.2 a)	c	P1/14 or P1/15 and not P1/17	
17	- for normal power mode, switch-off/switch-on characteristics;	subclause 7.1.4.2 b)	c	P1/14 or P1/15 and not P1/16	
18	- for restricted power mode;	A.9.2.1 iii)	o	-	
19	- for power feeding of more than one TE.	subclause 7.1.4.4.2	o.2	-	
20	Power source 2 (PS2) is provided:	A.9.1, A.9.1.2, A.9.2.1,	o	-	
21	- as an integral part of NT;		o	-	
22	- physically separated from NT;		o	-	
23	- for normal power mode;	A.9.3.2.1	c	P1/20	
24	- for restricted power mode.	A.9.3.2.2	o	-	
25	If items P1/1 and P1/15 are supported: - NT1 associated with the APS contains normal mode voltage detector for switching-off the restricted mode power source.	subclause 7.4.3 subclause 7.4.1	m	-	
26	If item P1/2 is supported: - NT2 provides multiframing.	A.6.3.3, clause B.5	o.3	-	
o.1	If items P1/1 and P1/15 are supported, the NT1 associated with APS shall not have a PS1 normal mode source.				
o.2	If supported, state the maximum number of TEs to be fed from PS1:				
o.3	If supported, state in the PIXIT whether there is a difference to subclause A.6.3.3 of this ETS.				

Table F.24

P2	Major functional characteristics			
Item No.	ITEM	Reference ETS 300 012	Status	Support
1	Two bi-directional 64 kbit/s B-channels are provided.	A.5.1.1	m	
2	Bit timing takes place at 192 kbit/s.	A.5.1.2	m	
3	Octet timing takes place at 8 kHz.	A.5.1.3	m	
4	Frame alignment.	A.5.1.4	see table P3	
5	One D-channel for each direction is provided at 16 kbit/s.	A.5.1.5	m	
6	D-channel access.	A.5.1.6	see table P4	
7	Power transfer across the interface is possible.	A.5.1.7	m	
8	Deactivation/activation.	A.5.1.8, A.5.1.9	see table P5	
9	Two interchange circuits, one for each direction, are provided.	A.5.2	m	
10	Each transmitted frame contains 48 bits for all configurations.	A.5.4	m	
11	Nominal transmitted bit rate is 192 kbit/s.	A.5.4.1	m	
12	Binary organisation of the transmitted frame meets the requirements.	A.5.4.2	m	
13	Contents and grouping of the transmitted frame meets the requirements	A.5.4.2.2	m	
14	Pseudo-ternary line code is used.	A.5.5	m	
15	NT timing is derived from the network clock.	A.5.6	m	

Table F.25

P3	**Frame alignment**			
Item No.	ITEM	Reference ETS 300 012	Status	Support
1	Frame alignment procedure, based on line code violation, is used.	A.6.3	m	
2	Frame alignment, on initial activation of NT, meets the requirements.	A.6.3.2	m	
3	Loss of frame alignment is assumed on the required criterion.	A.6.3.2.1	m	
4	Frame alignment is assumed on the required criterion.	A.6.3.2.2	m	
5	NT1 multiframing is not provided (F_A bit is set to binary ZERO).	A.6.3.3	c.1	
c.1	Predicate: P1/1.			

Table F.26

P4	**D-channel access**				
Item No.	Item	Reference ETS 300 012	Status	Predicate	Support
	Interframe (layer 2) time fill is provided using:	A.6.1.1			
1	- binary ONEs;		c	not P4/2	
2	- HDLC flags.		c	not P4/1	
3	D-echo channel is provided.	A.6.1.2	m	-	

Table F.27

P5	**Deactivation/activation**			
Item No.	ITEM	Reference ETS 300 012	Status	Support
	NT uses the following states as required:			
1	- G1 (deactive);	A.6.2.1.2.1	m	
2	- G2 (pending activation);	A.6.2.1.2.2	m	
3	- G3 (active);	A.6.2.1.2.3	m	
4	- G4 (pending deactivation).	A.6.2.1.2.4	m	
5	Activate primitives correspond to the specification.	A.6.2.1.3	m	
6	Deactivate primitives correspond to the specification.	A.6.2.1.4	m	
7	Management primitives correspond to the specification.	A.6.2.1.5	m	
8	Signals INFO 0, INFO 2, INFO 4 can be sent.	A.6.2.2	m	
9	Signals INFO 0, INFO 1, INFO 3 can be received.		m	
10	Activation/deactivation of activating/deactivating NT meets the requirements.	A.6.2.4.1	m	
11	Timer T1 is present.	A.6.2.5	m	
12	Activation time in state G1 (deactive) meets the requirements (respond to INFO 1 by sending of INFO 2 normally within 1 s, abnormally within 30 s.	A.6.2.6.2	m	
13	Activation time in state G2 (pending activation) meets the requirements (respond to INFO 3 by sending of INFO 4 normally within 100 ms, abnormally within 15 s if "Da"+"Db" is not greater than 30 s).		m	
14	Deactivation time meets the requirements (respond to INFO 0 or loss of synchronization by sending of INFO 2 within 25 ms).	A.6.2.7	m	

Table F.28

P6	Electrical characteristics				
Item No.	Item	Reference ETS 300 012	Status	Predicate	Support
1	Nominal bit rate is 192 kbit/s.	A.8.1.1	m		
2	Bit rate tolerance is ± 100 ppm.	A.8.1.2	m		
3	Maximum output jitter is 5% of a bit period.	A.8.3	m		
4	Transmitter output impedance is: - at all times, except when transmitting a binary ZERO, from 2 kHz to 1 MHz: Exceeding the impedance indicated by the template in figure 11/I.430 [2];	A.8.5.1,	m		
5	- when transmitting a binary ZERO: ≥ 20 Ω.	A.8.5.1.2 b)	m		
6	Pulse shape is within the mask of figure 13/I.430 [2].	A.8.5.3.1	m		
7	Nominal pulse amplitude is 750 mV, zero to peak.	A.8.5.3.2	m	-	
8	Pulse amplitude when transmitting a high density pattern meets the requirements.	A.8.5.4.1	m		
9	Pulse unbalance of an isolated couple of pulses meets the requirements.	A.8.5.4.2	m		
10	Longitudinal conversion loss of transmitter output is: - 10 kHz ≤ f ≤ 300 kHz: ≥ 54 dB;	A.8.5.6, A.8.5.6.1	m		
11	- 300 kHz < f ≤ 1 MHz: minimum value decreasing from 54 dB at 20 dB/decade.		m		
12	Receiver input impedance at all times is: - from 2 kHz to 1 MHz: exceeding the impedance indicated by the template in figure 12/I.430 [2];	A.8.6.1.2	m		
13	- at 96 kHz: peak current resulting from applied 1,2 V does not exceed 0,5 mA.		m		
14	Receiver sensitivity - noise and distortion immunity: NT operates over the specified full waveform mask range for NT designed for: - short passive bus (fixed timing);	A.8.6.2, A.8.6.2.2	c	P1/9	
15	- both point-to-point and short passive bus (adaptive timing);	A.8.6.2.3	c	P1/10	
16	- extended passive bus;	A.8.6.2.4	c	P1/11	
17	- point to-point only.	A.8.6.2.5	c	P1/12	
18	Receiver input delay: The receiver accommodates the specified round trip delays for NT designed for: - short passive bus: 10-14 μs;	A.8.6.3, A.8.6.3.1	c	P1/9	
19	- both point-to-point: 10-13 μs; and passive bus: 10-42 μs;	A.8.6.3.2	c	P1/10	
20	- extended passive bus: 10-42 μs;	A.8.6.3.3	c	P1/11	
21	- point to-point only: 10-42 μs;	A.8.6.3.4	c	P1/12	
22	Longitudinal conversion loss of receiver input is: - 10 kHz ≤ f ≤ 300 kHz: ≥ 54 dB;	A.8.6.4	m	-	
23	- 300 kHz < f ≤ 1 MHz: minimum value decreasing from 54 dB at 20 dB/decade.		m		

Table F.29

P7	"Static" power feeding				
Item No.	Item	Reference ETS 300 012	Status	Predicate	Support
1	PS1 restricted operation is indicated by polarity reversion.	A.9.2.1 ii)	c	P1/18	
2	Change from normal to restricted power mode takes place at the specified criteria.	A.9.2.1 iii)	c	P1/16-17 or P1/18	
3	NT provided power from: - PS1 normal mode is: 40 V +5/-15% up to the maximum available power (at least 1 W);	A.9.2.2.1	c	P1/16 or 17	
4	- PS1 restricted mode is: 40 V +5/-15% up to 420 mW;	A.9.2.2.2	c	P1/18	
5	- PS2 normal mode is: 40 V +5/-20% at TE when TE draws up to the min. available power of 7 W;	A.9.2.3, A.9.3.2.1	c	P1/23	
6	- PS2 restricted mode is: 40 V +5/-20% at TE when TE draws up to the min. available power of 2 W.	A.9.2.3, A.9.3.2.2	c	P1/24	

Table F.30

P8	"Dynamic" power feeding				
Item No.	Item	Reference ETS 300 012	Status	Predicate	Support
1	Power source switch-over time is < 5 ms.	subclause 7.1.2.1	c	P1/ 16-17 and 18 or P1/23 and 24	
2	Restricted mode power source meets the requirements under overload conditions.	subclause 7.1.2.2	c	P1/18 or 24	
3	Increase of output voltage after removal of short circuit meets the requirements for: - PS1 restricted mode;	subclause 7.1.4, subclause 7.1.4.1	c	P1/18	
4	- PS1 normal mode, limiting the output current.	subclause 7.1.4.3	c	P1/16	
5	Switch-on surge capability meets the requirements.	subclause 7.1.4.4. 1	c	P1/ 16 or 17 or P1/23	
6	PS1 operates as required for TE connection surge current.	subclause 7.1.4.4. 2	c		
7	DC unbalance of PS1 is < 3%.	subclause 7.2.1.1	c	P1/13	
8	NT meets the requirements when 3% external DC unbalance is adjusted and maximum power is drawn from PS1.	subclause 7.2.2	c	P1/13	

Table F.31

P9	Additional capabilities for APS			
Item No.	Item	Reference ETS 300 012	Status	Support
1	Power available from APS is 1 W per terminal multiplied by loading factor (minimum 1,1 or 1,5 if Ia on a short passive bus is used for connection).	subclause 7.3.1	c.1	
2	APS switch-on time is < 2,5 ms.	subclause 7.3.2	c.1	
3	APS switch-off time is < 2,5 ms.	subclause 7.3.3	c.1	
4	APS power consumption from PS1 restricted mode when off is ≤ 3 mW.	subclause 7.3.4	c.1	
5	APS meets the requirements when the number of connected terminals is one more than supported nominally	subclause 7.3.5	c.1	
6	NT1 associated/compatible with the APS - does not have a PS1 normal mode source;	subclause 7.4	c.1	
7	- backs-off to restricted mode: from 5 µs to 100 ms: < 45 mA, then: ≤ 3 mW/< 45 mA;	subclause 7.4.1	c.1	
8	- powers-up to restricted mode: rise time from 2-5 V to ≥ 34 ≤ 42 V: < 2,5 ms, in the range 34-42 V after further < 2,5 ms;	subclause 7.4.2	c.1	
9	- consumes ≤ 3 mW from APS in normal mode when Ib voltage is 24 V to 42 V.	subclause 7.4.3	c.1	
c.1	Predicate: P1/1 and P1/15.			

Table F.32

P10	Interface connector and contact assignments			
Item No.	Item	Reference ETS 300 012	Status	Support
1	Functions at access leads meet the requirements.	A.9.1, A.9.1.1	m	
2	Leads or/and contact assignments meet the requirements.	A.10	m	

F.6   PIXIT proforma for interface point I_b (NT)

F.6.1   Introduction

In order to test a protocol implementation, information relating to the implementation and its testing environment in addition to that provided by the PICS is essential. Such extra information is called a PIXIT. A client who requests a conformance test shall provide to the test laboratory a completed PIXIT proforma for each layer to be tested.

The proforma provided in table F.34 shall be used.

F.6.2   Proforma structure and contents

The PIXIT proforma are tables containing pre-printed guide text and empty table space intended to be used by the client for explanations, specification of details, etc.

The proforma of table 33 is intended for client indication of the environmental conditions to be used during testing, and test limitations, if any.

> NOTE: In case no environmental value or range is indicated by the client, the test laboratory will use a value within the ranges pre-printed in the proforma.

F.6.3   Table/item identification

Corresponding to the PICS tables, each PIXIT table is provided with an identification label pre-printed to the left in the table headers. In order to distinguish between PICS and PIXIT identifications, an X is added to the prefix letter. The PIXIT labels are composed as follows:

-       two capital letters being the first letter of the layer name and the additional X;

-       a serial number.

Each pre-printed item in a PIXIT table is provided with a serial number in the left hand table column called "Item No.".

To identify a PIXIT item unambiguously, the table label and item number are combined using a slash character, "/", e.g. in the 1st table of the Physical layer PIXIT, the 3rd item is identified by "PX1/3".

F.6.4   Filling in guidance

The PIXIT proforma shall be filled in by the client. The filling in is done according to the pre-printed guide test in the tables.

In order to reduce the test time, it is essential not only that the required explanations, specifications etc. are detailed but also that conditions which cannot be predetermined are explained/specified in details (using empty table space, additional pages or giving references to manuals etc.).

The information provided in a PIXIT shall not conflict with information provided in the corresponding PICS or with the requirements of the standards.

Table F.33

ENVIRONMENTAL TEST CONDITIONS and TEST LIMITATIONS				
TEST CANDIDATE REFERENCE (short identification; for full identification see table F.20 of the SCS)				
ENVIRONMENTAL TEST CONDITIONS (indicate the conditions to be used during testing):				
Ambient temperature range	Relative humidity range	Air pressure range	Power supply	
			Voltage	Frequency
°C	%	kPa	V ± %	Hz ± %
If no values / ranges are indicated above by the client, the IUT will be tested under the following conditions				
15 - 35 °C	25 - 75 %	86 - 106 kPa	within ± 5 % of nominal operating voltage	within ± 4 % of nominal operating frequency
OTHER TEST CONDITIONS (indicate any other condition that may be needed / useful during testing):				
TEST LIMITATIONS (explain if any of the abstract tests cannot be executed because of non implementation of abstract layer primitives etc.):				

Table F.34

PX1		Means of control and observation and test co-ordination procedures etc.	
Item No.	Reference to PICS	ITEM	Answer below if relevant or make reference to table F.35
1	P1/9 to P1/12	How to select the different wiring configurations.	

Table F.35

PX2	CLIENTS ADDITIONAL INFORMATION

History

Document history	
April 1992	First Edition
August 1993	Corrigendum to First Edition
December 1994	Amendment 1 to First Edition (including prior Corrigendum)
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