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European Standard (Telecommunications series)

**Integrated Services Digital Network (ISDN);
Digital Subscriber Signalling System No. one (DSS1) protocol;
Call Waiting (CW) supplementary service;
Part 4: Abstract Test Suite (ATS) and partial Protocol
Implementation eXtra Information for Testing (PIXIT)
proforma specification for the user**



Reference

REN/SPAN-130271-4

Keywords

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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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Foreword

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

The present document is part 4 of a multi-part deliverable covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) Call Waiting (CW) supplementary service, as identified below:

- Part 1: "Protocol specification";
- Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification";
- Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification for the user";
- Part 4: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user";**
- Part 5: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network";
- Part 6: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network".

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1 Scope

The present document specifies the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma for the User side of the T reference point or coincident S and T reference point (as defined in ITU-T Recommendation I.411 [10]) of implementations conforming to the stage three standard for the Call Waiting (CW) supplementary service for the pan-European Integrated Services Digital Network (ISDN) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol, EN 300 058-1 [2].

EN 300 058-3 [4] specifies the Test Suite Structure and Test Purposes (TSS&TP) related to this ATS and partial PIXIT proforma specification. Other parts specify the TSS&TP and the ATS and partial PIXIT proforma for the Network side of the T reference point or coincident S and T reference point of implementations conforming to EN 300 058-1 [2].

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

- [1] ETSI EN 300 403-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".
- [2] ETSI EN 300 058-1 (V1.2.4): "Integrated Services Digital Network (ISDN); Call Waiting (CW) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".
- [3] ETSI EN 300 058-2 (V1.2.4): "Integrated Services Digital Network (ISDN); Call Waiting (CW) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".
- [4] ETSI EN 300 058-3 (V1.2.4): "Integrated Services Digital Network (ISDN); Call Waiting (CW) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 3: Test Suite Structure and Test Purposes (TSS&TP) specification for the user".
- [5] ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".
- [6] ISO/IEC 9646-2: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite specification".
- [7] ISO/IEC 9646-3: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN)".
- [8] ISO/IEC 9646-4: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 4: Test realization".
- [9] ISO/IEC 9646-5: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 5: Requirements on test laboratories and clients for the conformance assessment process".
- [10] ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces - Reference configurations".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

Abstract Test Suite (ATS): See ISO/IEC 9646-1 [5].

Implementation Under Test (IUT): See ISO/IEC 9646-1 [5].

Lower Tester (LT): See ISO/IEC 9646-1 [5].

Point Of Control And Observation (PCO): See ISO/IEC 9646-1 [5].

Protocol Implementation Conformance Statement (PICS): See ISO/IEC 9646-1 [5].

PICS proforma: See ISO/IEC 9646-1 [5].

Protocol Implementation Extra Information For Testing (PIXIT): See ISO/IEC 9646-1 [5].

PIXIT proforma: See ISO/IEC 9646-1 [5].

System Under Test (SUT): See ISO/IEC 9646-1 [5].

Upper Tester (UT): See ISO/IEC 9646-1 [5].

3.2 Abbreviations

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

ATM	Abstract Test Method
ATS	Abstract Test Suite
CW	Call Waiting
DSS1	Digital Subscriber Signalling No1
ExTS	Executable Test Suite
ISDN	Integrated Services Digital Network
IUT	Implementation Under Test
LT	Lower Tester
MOT	Means Of Testing
PCO	Point of Control and Observation
PCTR	Protocol Conformance Test Report
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
SUT	System Under Test
TCP	Test Co-ordination Procedures
TP	Test Purpose
TTCN	Tree and Tabular Combined Notation
UT	Upper Tester

4 Abstract Test Method (ATM)

The remote test method is applied for the CW user ATS. The Point of Control and Observation (PCO) resides at the service access point between layers 2 and 3. This PCO is named "L" (for Lower). The L 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.

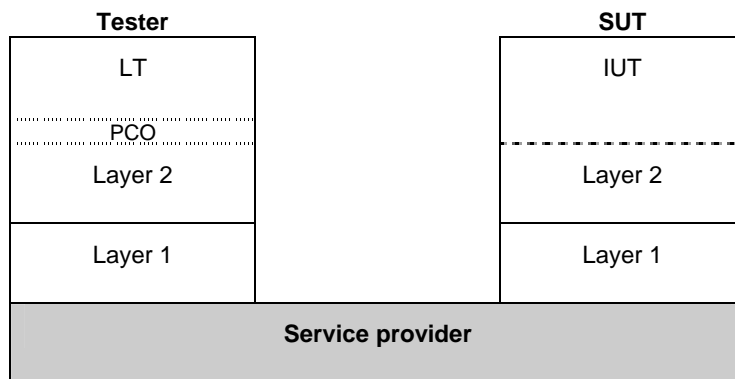


Figure 1: Remote test method

ISO/IEC 9646-2 [6] allows the informal expression of Test Co-ordination 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.

5 Untestable test purposes

There are no untestable test purposes associated with this ATS.

6 ATS conventions

6.1 Version of TTCN used

The version of TTCN used is that defined in ISO/IEC 9646-3 [7].

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 [9], to produce a PCTR conformant with the PCTR template given in annex B of ISO/IEC 9646-5 [9].

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 the present document.

A PCTR which conforms to this PCTR proforma specification shall preserve the content and ordering of the clauses contained in annex A. Clause 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 realizer, producing an executable test suite for the ATS specification contained in annex C, is required, as specified in ISO/IEC 9646-4 [8], 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 IUT.

A test laboratory, offering testing for the ATS specification contained in annex C, is required, as specified in ISO/IEC 9646-5 [9], 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 realizer, producing MOT and ExTS for this ATS specification, shall comply with the requirements of ISO/IEC 9646-4 [8]. In particular, these concern the realization of an ExTS based on each ATS. The test realizer 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 [9].

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

Annex A (normative): Protocol Conformance Test Report (PCTR) proforma

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the PCTR proforma in this annex so that it can be used for its intended purposes and may further publish the completed PCTR.
--

A.1 Identification summary

A.1.1 Protocol conformance test report

PCTR number:	
PCTR date:	
Corresponding SCTR number:	
Corresponding SCTR date:	
Test laboratory identification:	
Test laboratory manager:	
Signature:	

A.1.2 IUT identification

Name:	
Version:	
Protocol specification:	EN 300 058-1
PICS:	
Previous PCTRs (if any):	

A.1.3 Testing environment

PIXIT reference number:	
ATS specification:	EN 300 058-4
Abstract test method:	Remote test method (see ISO/IEC 9646-2)
Means of testing identification:	
Dates of testing:	
Conformance log reference(s):	
Retention date for log reference(s):	

A.1.4 Limits and reservations

Additional information relevant to the technical contents or further use of the test report, or to 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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A.1.5 Comments

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

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.....

A.2 IUT conformance status

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

Strike the appropriate words in this sentence. If the PICS for this IUT is consistent with the static conformance requirements (as specified in clause A.3 of the present document) and there are no "FAIL" verdicts to be recorded (in clause A.6) strike the words "has", otherwise strike the words "has not".

A.3 Static conformance summary

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

Strike the appropriate words in this sentence.

A.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 A.6 of the present document) strike the word "did", otherwise strike the words "did not".

Summary of the results of groups of tests:

.....

.....

.....

.....

A.5 Static conformance review report

If clause A.3 indicates non-conformance, this clause itemizes the mismatches between the PICS and the static conformance requirements of the specified protocol specification.

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A.6 Test campaign report

ATS reference	Selected? (Y/N)	Run? (Y/N)	Verdict	Observations
CW_U01_001				
CW_U01_002				
CW_U01_003				
CW_U01_004				
CW_U01_005				
CW_U01_006				
CW_U01_007				
CW_U01_008				
CW_U01_009				
CW_U02_001				
CW_U03_001				
CW_U04_001				
CW_U05_001				

A.7 Observations

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

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Annex B (normative): Partial PIXIT proforma

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the partial PIXIT proforma in this annex so that it can be used for its intended purposes and may further publish the completed PIXIT.

B.1 Identification summary

PIXIT number:

.....

Test laboratory name:

.....

Date of issue:

.....

Issued to:

.....

B.2 Abstract test suite summary

Protocol specification: EN 300 058-1

ATS specification: EN 300 058-4

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

B.3 Test laboratory

Test laboratory identification:

.....

Accreditation status of the test service:

.....

Accreditation reference:

.....

Test laboratory manager:

.....

Test laboratory contact:

.....

Means of testing:

.....

Test laboratory instructions for completion:

.....

B.4 Client (of the test laboratory)

Client identification:

.....

Client test manager:

.....

Client contact:

.....

Test facilities required:

.....

B.5 System Under Test (SUT)

Name:

.....

Version:

.....

SCS reference:

.....

Machine configuration:

.....

Operating system identification:

.....

IUT identification:

.....

PICS (all layers):

.....

.....

Limitations of the SUT:

.....

Environmental conditions:

.....

B.6 CW Protocol information

B.6.1 Protocol identification

Specification reference: EN 300 058-1

Protocol version:

PICS reference:

NOTE: The PICS reference should reference a completed PICS which is conformant with the PICS proforma contained in EN 300 058-2.

B.6.2 IUT information

B.6.2.1 Parameters

Table B.1: Parameters

Item	Question	Supported? (Y/N)	Value
1.1	Does the IUT support CW for basic access point-to-multipoint?		N/A
1.2	Does the IUT support CW for basic access point-to-point?		N/A
1.3	Does the IUT support CW for primary rate access?		N/A
1.4	Is IUT a private network?		N/A
1.5	Is timer T-CW implemented?		N/A
1.6	IUT is unable to process a waiting call (e.g. CW not activated)		N/A

B.6.2.2 Parameter values

No items requiring response.

B.6.2.3 Timer values

Table B.2: Timer values

Item	Question	Supported? (Y/N)	Allowed values	Value (default)
2.1	TCWmax		T301 + 5%	(189 s)
2.2	Wait for the IUT to respond to a stimulus sent by the tester (TAC)			
2.3	Control that the IUT does not respond to a stimulus sent by the tester (TNOAC)			
2.4	Wait for a test operator initiated test event			
NOTE: The IUT provider may fill in a value range rather than a fixed value for the test management timers. During test execution the test laboratory will choose specific values for the timers dependant on the means of testing used. These specific values may be beyond the range given by the IUT provider, if this is necessary for achieving satisfactory test results.				

B.6.2.4 Sending of message by IUT

Table B.3: Actions required to stimulate IUT to send messages

Item	Action: What actions, if possible, have to be taken to cause the IUT to send a ...	Supported? (Y/N)	Stimulus (action taken)
3.1	HOLD message (BXHOL)		

B.7 Basic call PIXIT items

B.7.1 Parameter values - information element codings

Table B.4: Codings of information elements

Item	Information element: provide, if possible, ...	Supported? (Y/N)	Value
BC1.1	a coding of a Bearer Capability information element, which the IUT is compatible with, for the purpose of accepting received SETUP messages and which may be used in SETUP messages to be transmitted		
BC1.2	a coding of a High layer compatibility information element, which the IUT is compatible with, for the purpose of accepting received SETUP messages and which may be used in SETUP messages to be transmitted		
BC1.3	a coding of a Low layer compatibility information element, which the IUT is compatible with, for the purpose of accepting received SETUP messages and which may be used in SETUP messages to be transmitted		
BC1.4	a Called party number information element, which the IUT is compatible with, for ...		
BC1.4.1	party number length value		
BC1.4.2	party number value		
BC1.5	channel number		

B.7.2 Sending of message by IUT

Table B.5: Actions required to stimulate IUT to send messages

Item	Action: What actions, if possible, have to be taken to cause the IUT to send a ...	Supported? (Y/N)	Stimulus (action taken)
BC2.1	CONNECT message		
BC2.2	DISCONNECT message		
BC2.3	SETUP message		
BC2.4	CONNECT message with a channel Identifier		

Annex C (normative): Abstract Test Suite (ATS)

This ATS has been produced using the Tree and Tabular Combined Notation (TTCN) according to ISO/IEC 9646-3 [7].

The ATS was developed on a separate TTCN software tool and therefore the TTCN tables are not completely referenced in the table of contents. The ATS itself contains a test suite overview part which provides additional information and references (see also annex D).

C.1 The TTCN Graphical form (TTCN.GR)

C.1.1 ATS for basic access

The TTCN.GR representation of this ATS is contained in a Portable Document Format file (CW_user_BA1.PDF contained in archive en_30005804v010301p0.zip) which accompanies the present document.

This ATS shall be used where the IUT claims to support CW and basic access. It is specified for **point-to-multipoint** configuration. To re-configure for **point-to-point** operation it is necessary to make the following modification:

In the "Alias Definitions" table locate the expansion DL_UDAT_RQ and replace with DL_DAT_RQ.

C.1.2 ATS for primary rate access

The TTCN.GR representation of this ATS is contained in an Adobe Portable Document Format™ file (CW_user_PA1.PDF contained in archive en_30005804v010301p0.zip) which accompanies the present document.

This ATS shall be used where the IUT claims to support CW and primary rate access.

C.2 The TTCN Machine Processable form (TTCN.MP)

C.2.1 ATS for basic access

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (CW_user_BA1.MP contained in archive en_30005804v010301p0.zip) which accompanies the present document.

NOTE: Where an ETSI Abstract Test Suite (in TTCN) is published in both .GR and .MP format these two forms shall be considered equivalent. In the event that there appears to be syntactical or semantic differences between the two then the problem shall be resolved and the erroneous format (whichever it is) shall be corrected.

This ATS shall be used where the IUT claims to support CW and basic access. It is specified for **point-to-multipoint** configuration. To re-configure for **point-to-point** operation it is necessary to make the following modification:

Replace the pattern "\$ExpandedId DL_UDAT_RQ" with "\$ExpandedId DL_DAT_RQ".

C.2.2 ATS for primary rate access

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (CW_user_PA1.MP contained in archive en_30005804v010301p0.zip) which accompanies the present document.

This ATS shall be used where the IUT claims to support CW and primary rate access.

Annex D (informative): Change record

D.1 Changes between ETS 300 058-4 and EN 300 058-4 V1.2.4

The following comments received in document 4DT174 (for the Plenary Meeting 11-2000) were analysed and included when needed. In addition, revisions including the update of the PIXIT tables and the removal of superfluous and out of date material from clause 6 and old annex D were done.

- The test suite parameter CW_NOT_ACTIVATED has been added to test the test case CW_U01_04, when the IUT is unable to process the waiting call. For further explanation see 5.3.
- The test suite parameters PX_TAC, PX_TWAIT and PX_TNOAC have been added to receive the value of timers TAC, TWAIT and TNOAC.
- The test suite parameter FREE_RESOURCES_RELEASING has been created, to indicate whether the IUT is able or not to free resources to accept a waiting call. This parameter should have been declared as a PICS ref A.2/4.
- The test suite parameter BX_CON_CHI has been created to indicate whether the IUT is able or not to send a CONECT message including the channel Id.
- The test suite parameter REJECT_WAITING_CALL has been created to indicate if the IUT is capable to reject a waiting call. This parameter should have been declared as a PICS ref A.2/3.
- The selection expression SEL_CONNECT_CW_NOT_ACT has been added, in order to select the test case CW_U01_004 when the IUT is unable to process the waiting call. The selection expression is: BXCON AND CW_NOT_ACTIVATED.
- The selection expression SEL_CONNECT_RELEASING has been created to select tests case for which the IUT is able to send a CONNECT message and the IUT free resources to accept a waiting call. The selection expression is SEL_CONNECT AND FREE_RESOURCES_RELEASING. The test case CW_U01_005 and CW_U01_009 are selected with this selection expression.
- The selection expression SEL_CONNECT_CHI_RELEASING has been created with the expression: SEL_CONNECT_CHI AND FREE_RESOURCES_RELEASING. The test case CW_U01_007 is selected with this selection expression.
- The selection expression SEL_CONDIS_RJECT_CW has been created with the expression: BXCON AND BXDIS AND REJECT_WAITING_CALL. The test case CW_U01_008 is selected with this selection expression.
- The fields cau_e3_eb and cau_E3_cs are missing in the structured type constraint CAU1, CAU2 and CAU4, they shall be inserted before the field cau_e3_loc. In CAU1 and CAU4, insert cau_e3_eb and cau_e3_cs with the value? In CAU2, insert cau_e3_eb and cau_e3_cs with the values, respectively, '1'B and '000'B, the value of cau_e3_loc shall be replaced by '1000'B.
- The name of the constraint CN1 is a reserved word of the K1197 ISDN simulation software. To avoid problems, CN1 was replaced by CON1 in the ATS.
- The wildcards (*) in the constraint RC1 have been replaced by the value CAU1 IF_PRESENT, as the cause structure contains optional fields.
- CW_U01_004: The purpose of the test is to test the case when the IUT is unable to process the waiting call. This is the case when the CW service is not supported or not activated. A PIXIT CW_NOT_ACTIVATED and a test case selection expression SEL_CONNECT_CW_NOT_ACT have been created, to select this test case.

- CW_U03_001 and CW_U05_001: The call reference value (CREF) shall be assigned when receiving the SETUP message. Replace line 3 by L?SETUPr (CREF:= SETUP_PDU.cr.cr_r) CANCEL TWAIT
- CW_U02_001 and CW_U02_002 have been merged. The test case 1 is testing the timer T-CW and the receipt of a DISCONNECT message, the test 2 was testing the timer T-CW and the receipt of the DISCONNECT message containing the cause value 19. The test 1 has been deleted and the test 2 has been renamed CW_U02_001.

D.2 Changes between EN 300 058-4 V1.2.4 and ETS 300 058-4 Edition 1

The following changes have been done:

- conversion to EN layout;
- replacement of references to ETS 300 102 with EN 300 403-1 [1];
- substitution of non-specific references to basic standards where the intention is to refer to the latest version.

Annex E (informative): Bibliography

ETSI ETS 300 102 (all parts): "Integrated Services Digital Network (ISDN); User-network interface layer 3".

History

Document history		
Edition 1	May 1997	Publication as ETS 300 058-4
V1.2.4	June 1998	Publication
V1.3.1	December 2001	One-step Approval Procedure OAP 20020419: 2001-12-19 to 2002-04-19
V1.3.1	April 2002	Publication