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**Zasebno omrežje z integriranimi storitvami (PISN) - Medcentralni signalizacijski protokol - Vodovna osnovna storitev - Omrežna plast (NL) - 1. del: Zgradba preskušalnega niza in nameni preskušanja (TSS&TP) - Specifikacija**

Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Circuit mode basic services; Network Layer (NL); Part 1: Test Suite Structure and Test Purposes (TSS&TP) specification

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# ETSI EN 300 805-1 V1.2.1 (2000-05)

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*European Standard (Telecommunications series)*

**Private Integrated Services Network (PISN);  
Inter-exchange signalling protocol;  
Circuit mode basic services;  
Network Layer (NL);  
Part 1: Test Suite Structure and Test Purposes (TSS&TP)  
specification**

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## Foreword

This European Standard (Telecommunications series) has been produced by European Computer Manufacturers Association (ECMA) on behalf of its members and those of the European Telecommunications Standards Institute (ETSI).

The present document is part 1 of a multi-part EN covering the Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Circuit mode basic services; Network Layer (NL), as identified below:

**Part 1: "Test Suite Structure and Test Purposes (TSS&TP) specification";**

Part 2: "Abstract Test Suite (ATS) specification".

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## 1 Scope

The present document specifies the Test Suite Structure (TSS) and Test Purposes (TPs) for the Network Layer, Circuit Mode Basic Services of the Inter-exchange signalling protocol for Private Integrated Services Networks (PISN).

The objective of this TSS and TPs specification is to provide conformance tests which give a high probability of inter-operability of the Network Layer. The TSS and TPs specification covers the procedures described in EN 300 172 [2]. In addition this TSS&TP specification covers those parts of EN 301 048 [1] which relate to the use of the transit counter in connection with Basic Call procedures.

NOTE 1: The parts of EN 301 048 [1] included are those which are equivalent to ETS 300 172 [3] annex ZB.

NOTE 2: Some or all of the TPs in the present document can be used for testing equipment implemented according to other PSS1 specifications.

The ISO standard for the methodology of conformance testing (ISO/IEC 9646-1 [7] and ISO/IEC 9646-2 [8]) is used as basis for the test methodology.

The present document is applicable to the support of Basic Call, at the Q-reference point between Private Integrated Services Network Exchanges (PINXs) connected together within a PISN. The Q reference point is defined in ETS 300 475-1 [6].

## 2 References

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

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

- [1] ETSI EN 301 048 (V1.1): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Transit counter additional network feature [ISO/IEC 15056 (1997) modified]".
- [2] ETSI EN 300 172 (V1.4): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Circuit-mode basic services [ISO/IEC 11572 (1996) modified]".
- [3] ETSI ETS 300 172: "Private Telecommunication Network (PTN); Inter-exchange signalling protocol; Circuit mode basic services".
- [4] ETSI ETS 300 239 (1995): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Generic functional protocol for the support of supplementary services [ISO/IEC 11582 (1995), modified]".
- [5] 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]".
- [6] ETSI ETS 300 475-1 (1995): "Private Telecommunication Network (PTN); Reference configuration; Part 1: Reference configuration for PTN eXchanges (PTNX) [ISO/IEC 11579-1 (1994), modified]".
- [7] ISO/IEC 9646-1 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".



- [8] ISO/IEC 9646-2 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite specification".
- [9] ISO/IEC 11572: "Information Technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Circuit mode bearer services - Inter-exchange signalling procedures and protocol".
- [10] ISO/IEC 15056 (1997): "Information technology - Telecommunications and information exchange between systems - Private Integrated Services Network - Inter-exchange signalling protocol - Transit counter additional network feature".
- [11] ITU-T Recommendation I.112 (1993): "Vocabulary of terms for ISDNs".
- [12] ITU-T Recommendation Q.931 (1998): "SDN user-network interface layer 3 specification for basic call control".
- [13] ECMA-143: "Private Integrated Services Network (PISN) - Circuit Mode Bearer Services - Inter-exchange Signalling Procedures and Protocol".
- [14] ECMA-225: "Private Integrated Services Network (PISN) - Inter-exchange Signalling Protocol Transit Counter Additional Network Feature".

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## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in ITU-T Recommendation I.112 [11] and the following apply:

**Abstract Test Suite (ATS):** see ISO/IEC 9646-1 [7].

**final test purpose:** test purpose which is intended to be mapped to a single test case (except if it is untestable).

NOTE: In the present document all final test purposes are individual test purposes as there is no combination of test purposes.

**Implementation Under Test (IUT):** see ISO/IEC 9646-1 [7].

**incoming call:** see EN 300 172 [2].

**incoming gateway PINX:** see EN 300 172 [2].

**Individual test purpose:** test purpose focusing on a single conformance requirement, produced before any combining of test purposes. This term is not defined in ISO/IEC 9646-1 [7] but corresponds to the "individual test purpose" referred to in ISO/IEC 9646-2 [8] subclause 10.3.3.

**information elements with invalid contents:** see EN 300 172 [2].

**originating PINX:** see EN 300 172 [2].

**outgoing call:** see EN 300 172 [2].

**outgoing gateway PINX:** see EN 300 172 [2].

**preceding PINX:** see EN 300 172 [2].

**Private Integrated Network Exchange (PINX):** see EN 300 172 [2].

**Private Integrated Services Network (PISN):** see EN 300 172 [2].

**Protocol Implementation Conformance Statement (PICS):** see ISO/IEC 9646-1 [7].

**Protocol Implementation Extra Information For Testing (PIXIT):** see ISO/IEC 9646-1 [7].

**reassembly:** process whereby an implementation on receipt of the parts of a single message which has been segmented for transmission, reassembles these parts to make up the original message.

**segmentation:** process by which a message is divided into parts when the message size exceeds the maximum size of the SCM information field.

**Signalling Carriage Mechanism (SCM):** see EN 300 172 [2].

**subsequent PINX:** see EN 300 172 [2].

**super test purpose:** general test purpose from which one or more test purposes may be derived. These derived test purposes may be more detailed than the Super Test Purpose. This term is not defined in ISO/IEC 9646-1 [7] but corresponds to the "more specific test objectives" referred to in ISO/IEC 9646-2 [8] subclause 10.3.1.

**terminating PINX:** see EN 300 172 [2].

**transit PINX:** see EN 300 172 [2].

**unexpected message:** see EN 300 172 [2].

**unrecognized information element:** see EN 300 172 [2].

## 3.2 Symbols

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

BO	Inopportune Behaviour (TSS group)
BV	Valid Behaviour (TSS group)
CC	Call Clearing (TSS group)
CE	Call Establishing (TSS group)
CR	Call Reference (value)
IG	Incoming Gateway (TSS group)
IV	InValid behaviour tests (TSS group)
IO	InOpportune behaviour test (TSS group)
MS	Message Segmentation (TSS group)
OG	Outgoing Gateway (TSS group)
PC	Protocol Control (TSS group)
PV	Parameter Variations (TSS group)
SE	State Event transitions (TSS group)
TR	TRansit (TSS group)
TE	TErminating (TSS group)

## 3.3 Abbreviations

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

ATS	Abstract Test Suite
IE	Information Element
IUT	Implementation Under Test
PICS	Protocol Implementation Conformance Statement
PINX	Private Integrated Services Network eXchange
PISN	Private Integrated Services Network
PIXIT	Protocol Implementation eXtra Information for Testing
PSS1	Private Integrated Signalling System Number 1
SCM	Signalling Carriage Mechanism
STP	Super Test Purpose
TP	Test purpose
TSS	Test Suite Structure

## 4 Test Suite Structure (TSS)

The test suite is structured as a tree with the following levels:

**1st level:** the name representing the base specification (EN 300 172 [2]):

- PSS1\_BC.

**2nd level:** Call Control for the major roles of the base specification (Originating, Terminating, Transit, Incoming Gateway, Outgoing Gateway) and Protocol Control which is common to all the behaviours:

- Protocol Control (PC);
- call control for OrIginating (OI);
- call control for TErminating (TE);
- call control for TRansit (TR);
- call control for Incoming Gateway (IG);
- call control for Outgoing Gateway (OG).

**3rd level:** the phases of the base specification:

- Call Establishing (CE);
- Call Clearing (CC);
- Message Segmentation (MS) (this group is empty for call control requirements);
- STATUS Procedures (ST) (this group is empty for call control requirements);
- Layer Management (LM) (this group is empty for call control requirements).

**4th level:** the nature of the test:

- Valid behaviour tests (BV);
- InValid behaviour tests (IV);
- InOpportune behaviour tests (IO).

Figure 1 shows the PSS1 Layer 3 Test Suite Structure overview. Not all the branches have been expanded to the final details. Only groups which are expected to contain TPs are shown.

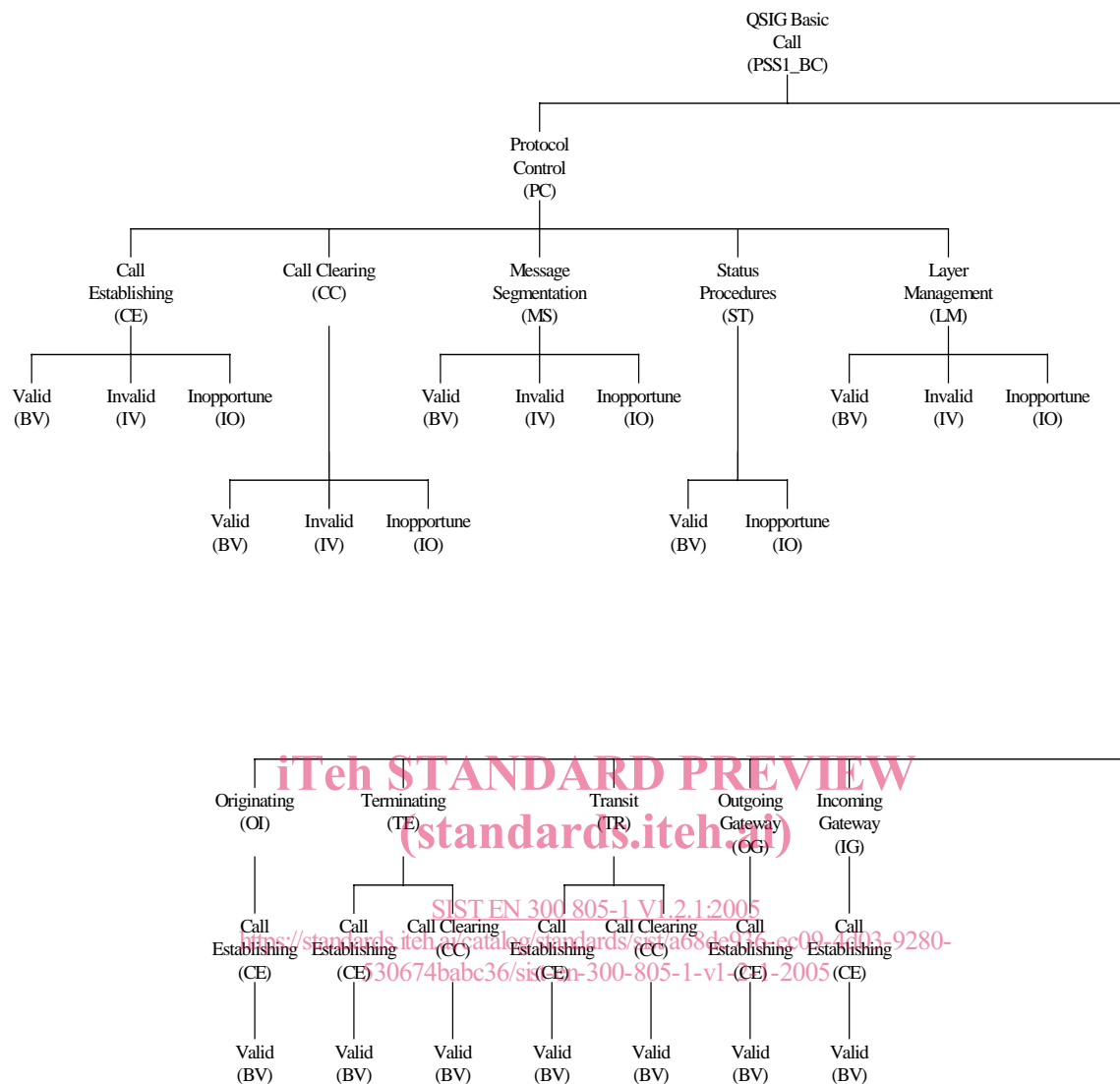


Figure 1: PSS1 Layer 3 Test Suite Structure overview

## 5 Test Purposes (TP)

### 5.1 Introduction to Test Purposes

#### 5.1.1 Test purposes production method

The TPs production method consists of reviewing the standard and specifying everything that should be tested, i.e. all the characteristics that could be determined from the standard, which an implementation is required to conform to.

This first phase led to the production of "Super" Test Purposes (STPs), which are general TPs, reflecting more the functional aspects and the structure of the standard rather than the TSS itself (see clause 4).

The second phase consisted of deriving from each STP several "Final" TPs. These "Final" TPs are the individual TPs as identified in the Abstract Test Suite (ATS) (each of which will give rise to a Test Case). The criteria for deriving these "Final" TPs was to take into account the TSS, in order to ensure good coverage for testing. The objective was to derive "Final" TPs and distribute them over the complete TSS, taking into account all the testing aspects (valid behaviour, inopportune behaviour, timer, parameter variations, state event transition, etc.), while retaining all the requirements of the standard. In this way, one or more "Final" TPs may be derived from an STP.

Although an STP may generate a number of "final" TPs, not all of them may be retained, as they may deal with a requirement which has already been covered by a previous "final" TP. This ensures a more efficient testing with good coverage, avoiding repeatedly testing the same aspect of the standard, probably leading to the same verdict each time.

Some STPs are not decomposed into "final" derived TPs because the requirement of this STP has already been covered by another "final" TP.

## 5.1.2 STP identifier

The STP identifier is described using a 5 digit alphanumeric code, this code is used in the following manner:

- characters 5 - 4: "SP";
- digit 3 - 2 - 1: STP number;
- PATTERN: SP<xyz> with <xyz> = 000 -> 999.

## 5.1.3 "Final" derived TP identifier

The TP identifier is described using a 7 digit alphanumeric code, this code is used in the following manner:

- characters 7-6: "TC";
- digit 5: 2nd level of TSS;
- digit 4: 3rd level of TSS;
- digit 3: 4th level of TSS;
- characters 2 - 1: letters identifying the final TP.

PATTERN: TC<u><v><w><xy> with:

- <u> =
  - 0: protocol control;
  - 1: call control originating;
  - 2: call control terminating;
  - 3: call control transit;
  - 4: call control outgoing gateway;
  - 5: call control incoming gateway.
- <v> =
  - 0: call establishing;
  - 1: call clearing;
  - 2: message segmentation;
  - 3: status procedures;
  - 4: layer management.

- <w> =
  - 2: valid behaviour tests;
  - 3: invalid behaviour test;
  - 4: inopportune behaviour tests.
- <xy> = AA-> ZZ

EXAMPLE 1: TC212KW is the number of the **test purpose KW**, for a **terminating** PINX, to test the **valid behaviour** of the IUT during **call clearing**.

EXAMPLE 2: TC212KU is the number of the **test purpose KU**, for a **terminating** PINX, to test the **valid behaviour** of the IUT during **call clearing**.

### 5.1.4 Standard options

In reviewing the standard to produce TPs, two situations have been identified regarding optional requirements.

The first case is where either the Implementation Under Test (IUT) performs an action which can be tested, or does nothing that can be tested. In this situation there is a TP for the case where the IUT does something testable and a Protocol Implementation eXtra Information for Testing (PIXIT) question should be used to select the associated test case.

The second case is where the IUT always performs a first action which has to be tested and optionally performs a second action which has also to be tested if it occurs. In this situation no PIXIT question is asked for this selection.

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### 5.1.5 Message segmentation

Where a TP refers to a message sent by the IUT, this message may be segmented (unless otherwise stated) without affecting the TP.

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## 5.2 Test purpose writing rules

Writing rules have been defined in order to have consistency between all the TPs. However, in some cases, it is not possible to use them without losing the real objective of the test. Consequently, a small number of TPs may deviate from these rules in a minor way.

## 5.2.1 Terminating, Originating, Incoming/Outgoing Gateway PINX

Table 1 gives the test purposes writing rules for non-transit PINX requirements.

**Table 1: Test Purpose writing rules for non-transit PINX requirements**

TP part	Text	Example
<b>Header</b> (note 2)	<Identifier> <i>tab</i> <subclause number in base EN> <i>tab</i> <type of test> <i>CR</i>	see 5.1.2 and 5.1.3 <b>subclause x.x.x</b> <b>valid, invalid, inopportune etc.</b>
<b>Precondition</b>	Ensure that the IUT in [call] state<basic call state> [and in <layer management or segmentation state>] [<condition> <i>see below for message structure if message</i> ] <b>Stimulus</b> <trigger> <i>see below for message structure</i> or <goal> [<Condition>] <i>CR</i>	0, 1, 2, 3, etc. Reassembly null state after having sent a XXX message. on receiving a XXXX message to request a... as a result of called user action
<b>Reaction</b>	<action> [<conditions> ] <i>if the action is sending see below for message structure</i> [and/or <next action>], <i>etc.</i> and enters [call] state <basic call state> <i>and/or</i> enters <layer management or segmentation state> <i>and/or</i> and remains in the same [call] state(s)	sends, does, discards, etc. for the outgoing call  0, 1, 2, 3, etc. Reassembly null state
<b>Message structure</b>	<message type> message containing a a) <info element> IE with <i>or</i> containing b) a <field name> encoded as <i>or</i> including <coding of the field> and <i>back to a or b,</i>	SETUP, CONNECT etc.  Bearer capability, cause etc. Cause value etc.
NOTE 1: Text in italics does not appear in TPs, text between <> is filled in for each TP and differs from one TP to the next text between [ ] only appear in certain TPs.		
NOTE 2: Where the text of an STP and a TP derived from it are identical there are two headers.		