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Application of ISDN User Part (ISUP) version 2 for the
ISDN-Public Land Mobile Network (PLMN) signalling interface;
Part 3: Test Suite Structure and Test Purposes (TSS&TP)
specification

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Contents

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Signalling Protocols and Switching (SPS) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS is part 3 of a multi-part standard covering the application of Integrated Services Digital Network (ISDN) User Part (ISUP) version 2 for the ISDN-Public Land Mobile Network (PLMN) signalling interface as described below:

Part 1: "Protocol specification (GSM 09.12)";

Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification";

Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification";

Part 4: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification".

Transposition dates	
Date of adoption of this ETS:	6 March 1998
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1 Scope

This third part of ETS 300 646 provides the Test Suite Structure and Test Purposes (TSS&TP) for the second version of the Integrated Services Digital Network (ISDN) - Global System for Mobile communications (GSM) Public Land Mobile Network (PLMN) signalling interface defined in ETS 300 646-1 [5] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-1 [7].

2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1]   ETS 300 356-1 (1995): "Integrated Services Digital Network (ISDN); Signalling System No.7; ISDN User Part (ISUP) version 2 for the international interface; Part 1: Basic services [ITU-T Recommendations Q.761 to Q.764 (1993), modified]".

[2]   ETS 300 356-15 (1995): "Integrated Services Digital Network (ISDN); Signalling System No.7; ISDN User Part (ISUP) version 2 for the international interface; Part 15: Diversion supplementary services [ITU-T Recommendation Q.732, clauses 2 to 5 (1993), modified]".

[3]   ETS 300 356-31 (1997): "Integrated Services Digital Network (ISDN); Signalling System No.7; ISDN User Part (ISUP) version 2 for the international interface; Part 31: Protocol Implementation Conformance Statement (PICS) proforma specification for basic services".

[4]   ETS 300 356-34: "Integrated Services Digital Network (ISDN); Signalling System No.7; ISDN User Part (ISUP) version 2 for the international interface; Part 34: Protocol Implementation Conformance Statement (PICS) proforma specification for supplementary services".

[5]   ETS 300 646-1 (1997): "Integrated Services Digital Network (ISDN); Signalling System No.7; Digital cellular telecommunication systems (Phase 2); Application of the ISDN User Part (ISUP) version 2 for the ISDN-Public Land Mobile Network (PLMN) signalling interface; Part 1: Protocol specification (GSM 09.12 version 4.1.1)".

[6]   ETS 300 646-2: "Integrated Services Digital Network (ISDN); Signalling System No.7; Digital cellular telecommunication systems (Phase 2); Application of the ISDN User Part (ISUP) version 2 for the ISDN-Public Land Mobile Network (PLMN) signalling interface; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

[7]   ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".

[8]   ISO/IEC 9646-2: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite specification".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS, the following definitions apply:

- terms defined in ETS 300 646-1 [5];
- terms defined in ISO/IEC 9646-1 [7] and in ISO/IEC 9646-2 [8].

3.2 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

ACM	Address Complete Message
ANM	Answer Message
CCBS	Completion of Calls to Busy Subscriber
CFNRc	Call Forwarding on mobile subscriber Not Reachable
CLIP	Calling Line Identification Presentation
COLP	Connected Line Identification Presentation
CON	Connect Message
CPG	Call Progress Message
GMSC	Gateway MSC
GSM	Global System for Mobile communications
IAM	Initial Address Message
IncGateway	Incoming fixed network Gateway
IncGMSC	Incoming GMSC
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
IUT	Implementation Under Test
MOC	Mobile Originated Call
MS	Mobile Station
MSC	Mobile-service Switching Centre
MSRN	Mobile Station Roaming Number
MTC	Mobile Terminated Call
OutGateway	Outgoing fixed network Gateway
OutGMSC	Outgoing GMSC
PICS	Protocol Implementation Conformance Statement
PLMN	Public Land Mobile Network
TP	Test Purpose
TSS	Test Suite Structure
VMSC	Visited MSC

4 Test Suite Structure (TSS)

ISUP_v2_ISDN_PLMN

BC

SS
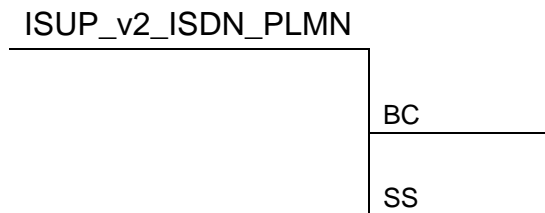
Figure 1: Test suite structure

TSS naming conventions

BC	Basic Call
SS	Supplementary Services

V	Valid behaviour stimulus
I	Inopportune stimulus

5 Test Purposes (TP)

5.1 Introduction

For each test requirement a TP is defined.

5.1.1 TP naming convention

TPs are numbered ascending within each group. Groups are organized according to the TSS down to the last but one level. The classification in the V/I groups is done by the inclusion of V or I in the test case name (see table 1).

Table 1: TP identifier naming convention scheme

Identifier:	**IPB_<group>_<N>_{<n>}**	
	IPS_<group>_<N>_{<n>}	
IPB	**=**	**ISUP version 2 on the ISDN-PLMN interface Basic services**
IPS	**=**	**ISUP version 2 on the ISDN-PLMN interface Supplementary services**
<group>	=	One character field representing the group reference according to the test suite structure V: Valid stimulus I: Inopportune stimulus
<N>	=	Sequence number
<n>	=	Optional additional number

5.1.2 Source of TP definition

The TPs cover validation testing aspects and are based on ETS 300 646-1 [5].

5.1.3 TP structure

The TP structure overlaps with the TSS.

TPs that test normal behaviour are grouped in the **V** (Valid behaviour) group.

TPs that test the Implementation Under Test (IUT) behaviour in situations that are not normal operation are grouped in the **I** (Inopportune stimulus) group.

5.2 TPs for the ISDN-PLMN signalling interface

All of the following TPs belong to the main group ISUP_v2_ISDN_PLMN. Each TP is presented in a separate table.

The first row of the table contains the following items:

TSS   identifier in the test suite structure (test group/subgroup identifier);

TP   identifier of the test purpose;

ISDN-PLMN reference   the reference to the requirement in the appropriate ISUP standard, which led to the TP.

Selection expression   selection criterion for the TP taking into account the exchange's role and the answers to the specified PICS questions. If the PICS questions refer to features of the basic call control procedures (see ETS 300 356-31 [3]) they are preceded by the identifier "BCall". If the PICS questions refer to features of supplementary services (see ETS 300 356-34 [4]) they are preceded by the identifier "SServ". All other PICS questions refer to ETS 300 646-2 [6].

The next row defines the TP itself, each having a *title* in *italics* and a text body.

ISUP **messages** and **parameter** names are highlighted **bold** to ease the readability.

In order to check the specified behaviour for some TPs a special prerequisite test condition has to be fulfilled. If such a condition is needed, it is presented after the TP under the heading "Pre-test conditions".

5.2.1 Basic call

TSS	TP	ISDN-PLMN reference	Selection expression
BC/	IPB_V_1	5.2.3.1.1/ETS 300 646-1 [5]	OutGMSC

Test purpose

Convey the mobile station roaming number in the IAM

To verify that the IUT can successfully originate a call having a **called party number** with the internal network number indicator set to "0 - routing to internal network number allowed", if the MSRN is included.

TSS	TP	ISDN-PLMN reference	Selection expression
BC/	IPB_V_2	5.2.3.1.1/ETS 300 646-1 [5]	IncGateway

Test purpose

Complete a call with the mobile station roaming number in the IAM

To verify that the IUT can successfully complete a call having a **called party number** with the internal network number indicator set to "0 - routing to internal network number allowed", if the MSRN is included.

TSS	TP	ISDN-PLMN reference	Selection expression
BC/	IPB_V_3	5.2.4.2.1/ETS 300 646-1 [5]	IncGMSC AND PICS A.2/5

Test purpose

Early ACM

To verify that the IUT can successfully send an early ACM after $T_{earlyACM}$ timer expiry.
The **ACM** shall contain the **backward call indicators** set to "0" except for the:
- charge indicator: 00 - no indication, 01 - no charge or 10 - charge,
- ISDN access indicator: 1 - ISDN (preferred value),
- echo control device indicator: 0 or 1,
- ISDN user part indicator: 1 - ISDN user part used all the way.

TSS	TP	ISDN-PLMN reference	Selection expression
BC/	IPB_V_4	5.2.4.2.1/ETS 300 646-1 [5]	IncGMSC

Test purpose

Mapping of information from the ACM to CPG

To verify that the IUT, after having sent an early ACM, can successfully map a subsequently received **ACM** to a **CPG**.

TSS BC/	TP IPB_V_5	ISDN-PLMN reference ETS 300 356-15 [2]	Selection expression IncGMSC
Test purpose			

Mapping of information from the CON to ANM

To verify that the IUT, after having sent an early ACM, can successfully map a subsequently received **CON** to a **ANM**.

TSS BC/	TP IPB_V_6	ISDN-PLMN reference 5.2.1/ETS 300 646-1 [5]	Selection expression IncGMSC AND PICS A.2/1
Test purpose			

Fallback in the GMSC

To verify that the IUT is able to perform fallback according to ETS 300 356-1 [1].

TSS BC/	TP IPB_V_7	ISDN-PLMN reference 5.2.2; E.3.4/ETS 300 646-1 [5]	Selection expression GMSC AND PICS A.2/2
Test purpose			

Echo control procedure - including an outgoing echo control device

To verify that the IUT is able to set the echo control device indicator in the **nature of connection indicators** of the **IAM** to "1 - outgoing echo control device included". The incoming **IAM** has this indicator set to "0 - outgoing echo control device not included".

TSS BC/	TP IPB_V_8	ISDN-PLMN reference 5.2.2; E.3.5/ETS 300 646-1 [5]	Selection expression GMSC AND PICS A.2/2
Test purpose			

Echo control procedure - passing on the indication that an outgoing echo control device is included

To verify that the IUT is able to pass on the echo control device indicator in the **nature of connection indicators** set to "1 - outgoing echo control device included". No outgoing echo control device is included.

TSS BC/	TP IPB_V_9	ISDN-PLMN reference 5.2.2; E.3.2/ETS 300 646-1 [5]	Selection expression GMSC AND PICS A.2/2
Test purpose			

Echo control procedure - including an incoming echo control device

To verify that the IUT is able to set the echo control device indicator in the **backward call indicators** of the **ACM** to "1 - incoming echo control device included". The incoming **ACM** has this indicator set to "0 - incoming echo control device not included".

TSS BC/	TP IPB_V_10	ISDN-PLMN reference 5.2.2; E.3.3/ETS 300 646-1 [5]	Selection expression GMSC AND PICS A.2/2

Test purpose

Echo control procedure - passing on the indication that an incoming echo control device is included

To verify that the IUT is able to pass on the echo control device indicator in the **backward call indicators** set to "1 - incoming echo control device included". The reserved incoming echo control device is disabled.

TSS BC/	TP IPB_V_11	ISDN-PLMN reference D.3/ETS 300 646-1 [5]	Selection expression IncGMSC AND PICS A.2/3

Test purpose

Coding of ISDN access indicator in the backward call indicators in case of bilateral agreements

To verify that the IUT can successfully terminate a call with the ISDN access indicator (bit M) in the **backward call indicators** in the **ACM** set to "0 - terminating access non ISDN".
NOTE: In this case the IncGMSC is also the VMSC.

TSS BC/	TP IPB_V_12	ISDN-PLMN reference D.3/ETS 300 646-1 [5]	Selection expression OutGMSC AND PICS A.2/4

Test purpose

Coding of ISDN access indicator in the forward call indicators in case of bilateral agreements

To verify that the IUT can successfully originate a call with the ISDN access indicator (bit I) in the **forward call indicators** in the **IAM** set to "0 - originating access non ISDN".
NOTE: In this case the OutGMSC is also the VMSC.

TSS BC/	TP IPB_V_13	ISDN-PLMN reference 5.2.3.1.1/ETS 300 646-1 [5]	Selection expression OutGMSC

Test purpose

Include the user service information in the IAM

To verify that the IUT includes the **user service information** parameter in the **IAM** when the ISDN access indicator (bit I) in the **forward call indicators** set to "1 - originating access ISDN".

5.2.2   Supplementary services

5.2.2.1   Calling Line Identification Presentation (CLIP)

TSS SS/	TP IPS_V_1	ISDN-PLMN reference 6.1.1.1/ETS 300 646-1 [5]	Selection expression OutGMSC AND PICS A.3/2

Test purpose

Mapping of the calling line identity to the calling party number

To verify that the IUT maps the calling line identity to the **calling party number** for MOCs.
NOTE: In this case the OutGMSC is also the VMSC.

TSS SS/	TP IPS_V_2	ISDN-PLMN reference 6.1.1.1/ETS 300 646-1 [5]	Selection expression IncGMSC
Test purpose

Mapping of the calling party number to the calling line identity

To verify that the IUT maps the **calling party number** to the calling line identity for MTCs.
NOTE: In this case the IncGMSC is also the VMSC. | | | |

TSS SS/	TP IPS_V_3	ISDN-PLMN reference 6.1.1.1/ETS 300 646-1 [5]	Selection expression IncGMSC AND PICS A.3/3
Test purpose

Discard the additional calling party number received in the IAM

To verify that the IUT discards the **generic number** containing the additional calling party number from the **IAM**.
NOTE: In this case the IncGMSC is also the VMSC. | | | |

5.2.2.2 Connected Line Identification Presentation (COLP)

TSS SS/	TP IPS_V_4	ISDN-PLMN reference 6.1.1.2/ETS 300 646-1 [5]	Selection expression IncGMSC AND PICS A.3/4
Test purpose

Mapping of the connected line identity to the connected number

To verify that the IUT maps the connected line identity to the **connected number** for MTCs.
NOTE: In this case the IncGMSC is also the VMSC. | | | |

TSS SS/	TP IPS_V_5	ISDN-PLMN reference 6.1.1.2/ETS 300 646-1 [5]	Selection expression OutGMSC
Test purpose

Mapping of the connected number to the connected line identity

To verify that the IUT maps the **connected number** to the connected line identity for MOCs.
NOTE: In this case the OutGMSC is also the VMSC. | | | |

TSS SS/	TP IPS_V_6	ISDN-PLMN reference 6.1.1.2/ETS 300 646-1 [5]	Selection expression OutGMSC AND PICS A.3/5
Test purpose

Discard the additional connected number received in the ANM or CON

To verify that the IUT discards the **generic number** containing the additional connected number from the **ANM** or **CON**.
NOTE: In this case the OutGMSC is also the VMSC. | | | |

5.2.2.3 Completion of Calls to Busy Subscriber (CCBS)

TSS SS/	TP IPS_V_7	ISDN-PLMN reference 6.1.1.13/ETS 300 646-1 [5]	Selection expression IncGMSC AND PICS A.3/6
Test purpose *CCBS not possible to destination B* To verify that the IUT is able to generate in a **REL** message with cause #17 "user busy" or cause #34 "no circuit available" and the **diagnostic field** containing a CCBS indicator with "CCBS not possible". NOTE: In this case the IncGMSC is also the VMSC.			

5.2.2.4 Call Forwarding on mobile subscriber Not Reachable (CFNRc)

TSS SS/	TP IPS_V_8	ISDN-PLMN reference 6.2.1.1/ETS 300 646-1 [5]	Selection expression PICS A.3/7
Test purpose *Pass on the redirecting reason in the redirection information in the IAM* To verify that the IUT can successfully pass on the redirecting reason in the **redirection information** set to "0110 - mobile subscriber not reachable".			

TSS SS/	TP IPS_V_9	ISDN-PLMN reference ETS 300 356-15 [2]	Selection expression PICS A.3/7
Test purpose *Pass on the redirection reason in the call diversion information in the ACM* To verify that the IUT can successfully pass on the redirection reason in the **call diversion information** set to "0110 - mobile subscriber not reachable".			

TSS SS/	TP IPS_V_10	ISDN-PLMN reference 6.2.1.1/ETS 300 646-1 [5]	Selection expression GMSC AND PICS A.3/1
Test purpose *Setting the redirecting reason in the redirection information in the IAM* To verify that the IUT can successfully divert a call and set the redirecting reason in the **redirection information** to "0110 - mobile subscriber not reachable".			

TSS SS/	TP IPS_V_11	ISDN-PLMN reference ETS 300 356-15 [2]	Selection expression GMSC AND PICS A.3/1
Test purpose *Setting the redirection reason in the call diversion information in the ACM* To verify that the IUT can successfully divert a call and set the redirection reason in the **call diversion information** to "0110 - mobile subscriber not reachable".			

History

Document history			
February 1997	Public Enquiry	PE 9726:	1997-02-28 to 1997-06-27
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