

8 [[ ]HJbc`ca fYy`n]bhY[ f]fUb]a ]glcf]hj Ua ]f!G8 BŁ!`Dfclrc\_c`X][ ]HJbY`bUfc b]y\_Y  
g][ bU]nUWY`yH`%fB GG%Ł!`Cgbcj b]\_`]W!`F Uny]f]hYj`df]glcf]hj Yb]df]glc db]hc \_]  
`V`nU Ud`\_ UWY`bUj ]XYnbY[ UnUgYVbY[ Uca fYy`UfU DBŁ!) "XY. N[ fUXVU  
dfYg\_i yU bY[ Ub]nU]b`bUa Yb`dfYg\_i yUb`UfHGG' HDŁ!`GdYWZ] UWY`UnUca fYy`

Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Basic call control; Enhancement at the b service entry point for Virtual Private Network (VPN) applications; Part 5: Test Suite Structure and Test Purposes (TSS&TP) specification for the network

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**ICS:**

33.080	Digitalno omrežje z integriranimi storitvami (ISDN)	Integrated Services Digital Network (ISDN)
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# EN 301 060-5 V1.1.3 (1998-11)

*European Standard (Telecommunications series)*

**Integrated Services Digital Network (ISDN);  
Digital Subscriber Signalling System No. one (DSS1) protocol;  
Basic call control;  
Enhancement at the "b" service entry point for  
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# Contents

Intellectual Property Rights.....	5
Foreword .....	5
1 Scope.....	6
2 Normative references .....	6
3 Definitions and abbreviations .....	7
3.1 Definitions .....	7
3.1.1 Definitions related to conformance testing.....	7
3.1.2 Definitions related to EN 301 060-1 .....	8
3.2 Abbreviations.....	8
4 Test Suite Structure (TSS) .....	8
5 Test Purposes (TP).....	10
5.1 Introduction.....	10
5.1.1 TP naming convention.....	10
5.1.2 Source of TP definition .....	10
5.1.3 TP structure.....	10
5.1.4 Test strategy .....	11
5.1.5 Test of call states.....	11
5.1.6 Test of point-to-multipoint configurations .....	12
5.1.7 Test of inopportune and syntactically invalid behaviour.....	12
5.2 TPs for the basic call control VPN, layer 3, network.....	12
5.2.1 Null call state N00.....	12
5.2.1.1 Valid .....	12
5.2.1.1.1 Outgoing call.....	12
5.2.1.1.2 Incoming call - point-to-point configuration.....	17
5.2.1.2 Inopportune.....	18
5.2.1.3 Syntactically invalid .....	19
5.2.2 Overlap sending call state N02.....	20
5.2.2.1 Valid .....	20
5.2.2.2 Inopportune .....	22
5.2.2.3 Syntactically invalid .....	22
5.2.3 Outgoing call proceeding call state N03 .....	23
5.2.3.1 Valid.....	23
5.2.3.2 Inopportune .....	24
5.2.3.3 Syntactically invalid .....	25
5.2.4 Call delivered call state N04 .....	26
5.2.4.1 Valid .....	26
5.2.4.2 Inopportune .....	27
5.2.4.3 Syntactically invalid .....	27
5.2.5 Call present call state N06.....	28
5.2.5.1 Valid .....	28
5.2.5.1A Point-to-point configuration .....	28
5.2.5.2 Inopportune .....	32
5.2.5.3 Syntactically invalid .....	33
5.2.6 Call received call state N07.....	34
5.2.6.1 Valid .....	34
5.2.6.1A Point-to-point configuration .....	34
5.2.6.2 Inopportune .....	35
5.2.6.3 Syntactically invalid .....	36
5.2.7 Incoming call proceeding call state N09 .....	36
5.2.7.1 Valid.....	36
5.2.7.1A Point-to-point configuration .....	36
5.2.7.2 Inopportune .....	37
5.2.7.3 Syntactically invalid .....	38

5.2.8	Active call state N10 (incoming call) .....	39
5.2.8.1	Valid .....	39
5.2.8.2	Inopportune .....	40
5.2.8.3	Syntactically invalid .....	41
5.2.9	Active call state N10 (outgoing call).....	41
5.2.9.1	Valid .....	41
5.2.9.2	Inopportune .....	42
5.2.9.3	Syntactically invalid .....	43
5.2.10	Disconnect indication call state N12 (incoming call) .....	44
5.2.10.1	Valid .....	44
5.2.10.2	Inopportune .....	44
5.2.10.3	Syntactically invalid .....	45
5.2.11	Disconnect indication call state N12 (outgoing call).....	46
5.2.11.1	Valid .....	46
5.2.11.2	Inopportune .....	46
5.2.11.3	Syntactically invalid .....	47
5.2.12	Release request call state N19 (incoming call).....	47
5.2.12.1	Valid .....	47
5.2.12.2	Inopportune .....	48
5.2.12.3	Syntactically invalid .....	48
5.2.13	Release request call state N19 (outgoing call).....	49
5.2.13.1	Valid .....	49
5.2.13.2	Inopportune .....	49
5.2.13.3	Syntactically invalid .....	50
5.2.14	Overlap receiving call state N25 .....	51
5.2.14.1	Valid .....	51
5.2.14.1A	Point-to-point configuration .....	51
5.2.14.2	Inopportune .....	51
5.2.14.3	Syntactically invalid .....	52
5.2.15	Restart null call state R00 (incoming call) .....	53
5.2.15.1	Valid .....	53
5.2.15.2	Inopportune .....	54
5.2.15.3	Syntactically invalid .....	54
5.2.16	Restart null call state R00 (outgoing call) .....	55
5.2.16.1	Valid .....	55
5.2.16.2	Inopportune .....	56
5.2.16.3	Syntactically invalid .....	56
5.2.17	Restart request call state R01 .....	57
5.2.17.1	Valid .....	57
5.2.17.2	Inopportune .....	57
5.2.17.3	Syntactically invalid .....	58
5.2.18	Message segmentation procedure.....	59
5.2.18.1	Valid .....	59
5.2.18.2	Inopportune .....	59
5.2.18.3	Syntactically invalid .....	59
6	Compliance .....	60
7	Requirements for a comprehensive testing service.....	60
History	.....	61

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## Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Signalling Protocols and Switching (SPS).

The present document is part 5 of a multi-part standard covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) basic call control extensions at the "b" service entry point for VPN applications, as described 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".

### National transposition dates

Date of adoption of this EN:	20 November 1998
Date of latest announcement of this EN (doa):	28 February 1999
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## 1 Scope

This fifth part of EN 301 060 is applicable to the basic call control extensions at the "b" service entry point for Virtual Private Network (VPN) applications for the pan-European Integrated Services Digital Network (ISDN) as provided by European public telecommunications operators at the T reference point (as defined in ITU-T Recommendation I.411 [13]) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol. Stage three identifies the protocol procedures and switching functions needed to support a telecommunications service (see CCITT Recommendation I.130 [12]).

The present document specifies the Test Suite Structure and Test Purposes (TSS&TP) for the network side for the ISDN DSS1 basic call control extensions at the "b" service entry point for VPN applications as specified in EN 301 060-1 [1] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [11].

## 2 Normative references

References may be made to:

- a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or
- b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or
- c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or
- d) publications without mention of a specific version, in which case 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] EN 301 060-1 (V1.2): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Basic call control; Enhancement at the "b" service entry point for Virtual Private Network (VPN) applications; Part 1: Protocol specification".
- [2] EN 301 060-2 (V.1.1): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Basic call control; Enhancement at the "b" service entry point for Virtual Private Network (VPN) applications; Part 2: Protocol implementation Conformance Statement (PICS) proforma specification".
- [3] 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]".
- [4] ETS 300 403-2: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 2: Specification and Description Language (SDL) diagrams".
- [5] EN 300 403-3: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 3: Protocol Implementation Conformance Statement (PICS) proforma specification".
- [6] ETS 300 403-5: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 5: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user".
- [7] ETS 300 406 (1995): "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".



- [8] ISO/IEC 9646-1: "Information technology; Open systems interconnection; Conformance testing methodology and framework; Part 1: General concepts".
- [9] ISO/IEC 9646-2: "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 2: Abstract Test Suite specification".
- [10] ISO/IEC 9646-3: "Information technology; Open Systems Interconnection; Conformance testing methodology and framework; Part 3: The Tree and Tabular Combined Notation (TTCN)".
- [11] ISO/IEC 9646-7: "Information technology; Open systems interconnection; Conformance testing methodology and framework; Part 7: Implementation Conformance Statements".
- [12] CCITT Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".
- [13] 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 definitions apply:

#### 3.1.1 Definitions related to conformance testing

**abstract test case:** refer to ISO/IEC 9646-1 [8].

**Abstract Test Suite (ATS):** refer to ISO/IEC 9646-1 [8].

**active test:** a test case where the Implementation Under Test (IUT) is required to send a particular message, but not in reaction to a received message. This would usually involve the use of PIXIT information to see how this message can be generated and quite often is specified in an ATS using an implicit send event.

**Implementation Under Test (IUT):** refer to ISO/IEC 9646-1 [8].

**implicit send event:** refer to ISO/IEC 9646-3 [10].

**lower tester:** refer to ISO/IEC 9646-1 [8].

**passive test:** a test case where the IUT is required to respond to a protocol event (e.g. received message) with another protocol event (e.g. send message) which normally does not require any special operator intervention as associated with the implicit send event.

**point of control and observation:** refer to ISO/IEC 9646-1 [8].

**Protocol Implementation Conformance Statement (PICS):** refer to ISO/IEC 9646-1 [8].

**PICS proforma:** refer to ISO/IEC 9646-1 [8].

**Protocol Implementation eXtra Information for Testing (PIXIT):** refer to ISO/IEC 9646-1 [8].

**PIXIT proforma:** refer to ISO/IEC 9646-1 [8].

**system under test:** refer to ISO/IEC 9646-1 [8].

**Test Purpose (TP):** refer to ISO/IEC 9646-1 [8].

### 3.1.2 Definitions related to EN 301 060-1

**dummy call reference:** see EN 300 403-1 [3], subclause 4.3.

**Integrated Services Digital Network (ISDN):** see ITU-T Recommendation I.112 [9], definition 308.

**ISDN number:** a number conforming to the numbering and structure specified in CCITT Recommendation E.164 [10].

**service; telecommunication service:** see ITU-T Recommendation I.112 [9], definition 201.

**supplementary service:** see ITU-T Recommendation I.210 [11], subclause 2.4.

**T:** the DSS1 protocol entity at the User side of the user-network interface where a T reference point applies (User is a Private ISDN).

## 3.2 Abbreviations

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

ATS	Abstract Test Suite
ISDN	Integrated Services Digital Network
IUT	Implementation Under Test
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
TP	Test Purpose
TSS	Test Suite Structure
VPN	Virtual Private Network

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## 4 Test Suite Structure (TSS)

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- Null call state N00
  - Valid
    - Outgoing call
    - Incoming call - point-to-point configuration
  - Inopportune
  - Syntactically invalid
- Overlap Sending call state N02
  - Valid
  - Inopportune
  - Syntactically invalid
- Outgoing Call Proceeding call state N03
  - Valid
  - Inopportune
  - Syntactically invalid
- Call Delivered call state N04
  - Valid
  - Inopportune
  - Syntactically invalid
- Call Present call state N06
  - Valid
    - Point-to-point configuration
  - Inopportune
  - Syntactically invalid

- Call Received call state N07
  - Valid
    - Point-to-point configuration
  - Inopportune
  - Syntactically invalid
- Incoming Call Proceeding call state N09
  - Valid
    - Point-to-point configuration
  - Inopportune
  - Syntactically invalid
- Active call state N10 (Incoming call)
  - Valid
  - Inopportune
  - Syntactically invalid
- Active call state N10 (Outgoing call)
  - Valid
  - Inopportune
  - Syntactically invalid
- Disconnect Indication call state N12 (Incoming call)
  - Valid
  - Inopportune
  - Syntactically invalid
- Disconnect Indication call state N12 (Outgoing call)
  - Valid
  - Inopportune
  - Syntactically invalid
- Release Request call state N19 (Incoming call)
  - Valid
  - Inopportune
  - Syntactically invalid
- Release Request call state N19 (Outgoing call)
  - Valid
  - Inopportune
  - Syntactically invalid
- Call Abort call state N22
- Overlap Receiving call state N25
  - Valid
    - Point-to-point configuration
  - Inopportune
  - Syntactically invalid
- Restart Null call state R00 (Incoming call)
  - Valid
  - Inopportune
  - Syntactically invalid
- Restart Null call state R00 (Outgoing call)
  - Valid
  - Inopportune
  - Syntactically invalid
- Restart Request call state R01
  - Valid
  - Inopportune
  - Syntactically invalid
- Message segmentation procedure
  - Valid
  - Inopportune
  - Syntactically invalid

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## 5 Test Purposes (TP)

### 5.1 Introduction

For each test requirement, a TP is defined.

#### 5.1.1 TP naming convention

TPs are numbered, starting at 001, within each group. Groups are organized according to the TSS. Additional references are added to identify the actual test suite and whether it applies to the network or the user (see table 1).

**Table 1: TP identifier naming convention scheme**

Identifier:	<layer iut>_<state>_<group>_<nnn>		
<layer iut>	=	layer + type of IUT:	e.g. "L3N" for layer 3, IUT = network
<state>	=	call state:	e.g. N10 for Active call state
<group>	=	group:	one character field representing the group reference according to TSS V: Valid stimulus I: Inopportune stimulus S: Syntactically invalid stimulus
<nnn>	=	sequential number:	(001-999)

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#### 5.1.2 Source of TP definition

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The TPs are based on EN 300 403-1 [3] and ETS 300 403-2 [4].

#### 5.1.3 TP structure

Each TP has been written in a manner which is consistent with all other TPs. The intention of this is to make the TPs more readable and checkable. A particular structure has been used which is illustrated in table 2. This table should be read in conjunction with any TP, i.e. please use a TP as an example to facilitate the full comprehension of table 2.

Table 2: Structure of a single TP

TP part	Text	Example
<b>Header</b>	<Identifier> <i>tab</i> <subclause number in base EN 300 403-1 [3] or other defined> <VPNxxx>	see table 1 subclause 2.3.4, subclause 9.3.1.1 [3] (see note 3)  VPNxxx (see note 4)
<b>Stimulus</b>	Ensure that the IUT in the <basic call state> <trigger> <i>see below for message structure</i>  <i>or</i> <goal>	N00, N10, etc. on receipt of a XXXX message (see note 2) to request a ...
<b>Reaction</b>	<action> <conditions> <i>if the action is sending</i> <i>see below for message structure</i> <next action>, etc. <i>and</i> remains in the same state <i>or</i> and enters state <state>	sends, saves, does, etc. using en bloc sending, etc.
<b>Message structure</b>	<message type> message a) with a <info element> information element b) indicating in the <field name> <coding of the field> and <i>back to a) or b)</i>	SETUP, FACILITY, CONNECT, etc. (see note 2) Bearer capability, Facility, etc.
<p>NOTE 1: Text in italics will not appear in TPs and text between &lt;&gt; is filled in for each TP and may differ from one TP to the next.</p> <p>NOTE 2: All messages shall be considered as "valid and compatible" unless otherwise specified in the test purpose.</p> <p>NOTE 3: The subclause indicated there refers directly to the EN 300 403-1 [3] unless otherwise specified, i.e. subclause 9.3.1.1 [6] refers directly to EN 301 060-1 [1].</p> <p>NOTE 4: VPNxxx indicates the origin of the test purpose.</p> <p><b>VPNMOD:</b> indicates that the test purpose was taken from ETS 300 403-5 [6] and modified in accordance with the VPN context.</p> <p><b>VPNNEW:</b> indicates that the test purpose did not exist in ETS 300 403-5 [6] and was created to cover a VPN specific procedure.</p> <p>No indication is used when the test purposes was directly taken from ETS 300 403-5 [6] without modification.</p>		

### 5.1.4 Test strategy

As the base standard EN 300 403-1 [3] contains no explicit requirements for testing, the TPs were generated as a result of an analysis of the base standard and the PICS specification EN 300 403-3 [5].

The TPs are only based on conformance requirements related to the externally observable behaviour of the IUT, and are limited to conceivable situations to which a real implementation is likely to be faced (ETS 300 406 [7]).

### 5.1.5 Test of call states

Many TPs include a reference to the IUT's final call state after the realization of the TP. In these cases the TP includes the requirement to ensure that the IUT has entered this particular final call state. Ensuring that the IUT is in a particular call state shall be realized by following the procedures described in subclause 5.8.10 of EN 300 403-1 [3]. According to these procedures, the IUT on receipt of a STATUS ENQUIRY message, shall respond with a STATUS message indicating, in the third octet of the Call state information element, the current call state of the IUT. This exchange of messages is not mentioned explicitly in each TP but is considered to be implicit in the reference to the final call state. This way of phrasing the TPs has been used to avoid over-complicating the text and structure of the TPs and to improve the readability.

The call state being reached by the IUT in the following test purpose is intended for a call in a VPN context.

## 5.1.6 Test of point-to-multipoint configurations

There is no configuration point-to-multipoint in the VPN context.

## 5.1.7 Test of inopportune and syntactically invalid behaviour

In the test groups for inopportune and syntactically invalid behaviour the procedures as described in subclause 5.8 of EN 300 403-1 [3] are tested. This is done in each call state with one message for each of the described error cases. Messages have been chosen that are, if they are received without the inopportune or erroneous coding, expected messages in the call states under test.

Test purposes for inopportune behaviour that is described outside the subclause 5.8 of EN 300 403-1 [3] are found in the valid test groups. This was done, as these procedures are seen more as a part of the basic call procedures than as a part of the error handling procedures.

## 5.2 TPs for the basic call control VPN, layer 3, network

All PICS items referred to in this subclause are as specified in ETS 301 060-2 [2] unless indicated otherwise by another numbered reference.

### 5.2.1 Null call state N00

#### 5.2.1.1 Valid

##### 5.2.1.1.1 Outgoing call

##### **L3N\_N00\_V\_001 subclause 5.1.1 VPNMOD**

Ensure that the IUT in the Null call state N00, on receipt of a SETUP message in a VPN context during an all channels busy condition, sends a RELEASE COMPLETE message with a Cause information element indicating the cause value 34 "no circuit / channel available" and remains in the Null call state N00.

##### **L3N\_N00\_V\_002 subclauses 5.1.2 a), 5.1.3 VPNMOD**

Ensure that the IUT in the Null call state N00, on receipt of a SETUP message in a VPN context without Called party number and Sending complete information element and with the Channel identification information element indicating a B-channel that is available and indicating in the preferred / exclusive bit "exclusive: only the indicated channel is acceptable", sends SETUP ACKNOWLEDGE message with the Channel identification information element indicating the requested B-channel and indicating in the preferred / exclusive bit "exclusive: only the indicated channel is acceptable" and enters the Overlap Sending call state N02.

##### **L3N\_N00\_V\_003 subclauses 5.1.2 a), 5.1.5.1 VPNMOD**

Ensure that the IUT in the Null call state N00, on receipt of a SETUP message in a VPN context with a Called party number information element providing the complete called party information, with a Sending complete information element and with the Channel identification information element indicating a B-channel that is available and indicating in the preferred / exclusive bit "exclusive: only the indicated channel is acceptable", sends CALL PROCEEDING message with the Channel identification information element indicating the requested B-channel and indicating in the preferred / exclusive bit "exclusive: only the indicated channel is acceptable" and enters the Outgoing Call Proceeding call state N03.

##### **L3N\_N00\_V\_004 subclause 5.1.2 a) VPNMOD**

Ensure that the IUT in the Null call state N00, on receipt of a SETUP message in a VPN context with the Channel identification information element indicating a B-channel that is not available and indicating in the preferred / exclusive bit "exclusive: only the indicated channel is acceptable", sends a RELEASE COMPLETE message with a Cause information element indicating the cause value 34 "no circuit / channel available" or 44 "requested circuit / channel not available" and remains in the Null call state.

##### **L3N\_N00\_V\_005 subclause 5.1.2 a) VPNMOD**

Ensure that the IUT in the Null call state N00, on receipt of a SETUP message in a VPN context with the Channel identification information element indicating a B-channel that is not subscribed and indicating in the preferred / exclusive bit "exclusive: only the indicated channel is acceptable", sends a RELEASE COMPLETE message with a Cause information element indicating the cause value 82 "identified channel does not exist" and remains in the Null call state.

**Selection:** IUT is a primary rate access. PICS: R 6.2.

**L3N\_N00\_V\_006 subclauses 5.1.2 b), 5.1.3 VPNMOD**

Ensure that the IUT in the Null call state N00, on receipt of a SETUP message in a VPN context without Called party number and Sending complete information element and with the Channel identification information element indicating a B-channel that is available and indicating in the preferred / exclusive bit "indicated channel is preferred", sends a SETUP ACKNOWLEDGE message with the Channel identification information element indicating the requested B-channel and indicating in the preferred / exclusive bit "exclusive: only the indicated channel is acceptable" and enters the Overlap Sending call state N02.

**L3N\_N00\_V\_007 subclauses 5.1.2 b), 5.1.3 VPNMOD**

Ensure that the IUT in the Null call state N00, on receipt of a SETUP message in a VPN context without Called party number and Sending complete information element and with the Channel identification information element indicating a B-channel that is not available and indicating in the preferred / exclusive bit "indicated channel is preferred", sends a SETUP ACKNOWLEDGE message with the Channel identification information element indicating a B-channel that is available and indicating in the preferred / exclusive bit "exclusive: only the indicated channel is acceptable" and enters the Overlap Sending call state N02.

**L3N\_N00\_V\_008 subclauses 5.1.2 b), 5.1.5.1 VPNMOD**

Ensure that the IUT in the Null call state N00, on receipt of a SETUP message in a VPN context with a Called party number information element providing the complete called party information, with a Sending complete information element and with the Channel identification information element indicating a B-channel that is available and indicating in the preferred / exclusive bit "indicated channel is preferred", sends CALL PROCEEDING message with the Channel identification information element indicating the requested B-channel and indicating in the preferred / exclusive bit "exclusive: only the indicated channel is acceptable" and enters the Outgoing Call Proceeding call state N03.

**L3N\_N00\_V\_009 subclauses 5.1.2 b), 5.1.5.1 VPNMOD**

Ensure that the IUT in the Null call state N00, on receipt of a SETUP message in a VPN context with a Called party number information element providing the complete called party information, with a Sending complete information element and with the Channel identification information element indicating a B-channel that is not available and indicating in the preferred / exclusive bit "indicated channel is preferred", sends CALL PROCEEDING message with the Channel identification information element indicating a B-channel that is available and indicating in the preferred / exclusive bit "exclusive: only the indicated channel is acceptable" and enters the Outgoing Call Proceeding call state N03.

**L3N\_N00\_V\_010 subclause 5.1.2 b) VPNMOD**

Ensure that the IUT in the Null call state N00, on receipt of a SETUP message in a VPN context with the Channel identification information element indicating a B-channel and indicating in the preferred / exclusive bit "indicated channel is preferred", when there is no channel available, sends a RELEASE COMPLETE message with a Cause information element indicating the cause value 34 "no circuit / channel available" or 44 "requested circuit / channel not available" and remains in the Null call state.

**L3N\_N00\_V\_011 subclauses 5.1.2 c), 5.1.3 VPNMOD**

Ensure that the IUT in the Null call state N00, on receipt of a SETUP message in a VPN context without Called party number and Sending complete information element and with the Channel identification information element indicating in the Info channel selection "any channel", sends a SETUP ACKNOWLEDGE message with the Channel identification information element indicating a B-channel that is available and indicating in the preferred / exclusive bit "exclusive: only the indicated channel is acceptable" and enters the Overlap Sending call state N02.

**L3N\_N00\_V\_012 subclauses 5.1.2 c), 5.1.3 VPNMOD**

Ensure that the IUT in the Null call state N00, on receipt of a SETUP message in a VPN context without Called party number and Sending complete information element and without the Channel identification information element, sends a SETUP ACKNOWLEDGE message with the Channel identification information element indicating a B-channel that is available and indicating in the preferred / exclusive bit "exclusive: only the indicated channel is acceptable" and enters the Overlap Sending call state N02.

**L3N\_N00\_V\_013 subclauses 5.1.2 c), 5.1.5.1 VPNMOD**

Ensure that the IUT in the Null call state N00, on receipt of a SETUP message in a VPN context with a Called party number information element providing the complete called party information, with a Sending complete information element and with the Channel identification information element indicating in the Info channel selection "any channel", sends CALL PROCEEDING message with the Channel identification information element indicating a B-channel that is available and indicating in the preferred / exclusive bit "exclusive: only the indicated channel is acceptable" and enters the Outgoing Call Proceeding call state N03.