

ü]fc\_cdUgcj bc`X][ ]HJbc`ca fYÿ`Y`n`]bhY[ f]fUbj]a ]`gfcf]hj Ua ]`f6 !=G8 BŁ!`Dfchc\_c`  
X][ ]HJbY`bUfc b]ý\_Y`g][ bU]nUWY`Y`ýh`&fB GG&Ł!`GdYWZ]\_UWY`UfYhY`d`Ugh]`j a Ygb]\_U  
i dcfUVb]\_!ca fYÿ`Y`6 !=G8 B`nU`fa ]`Yb`Y`cgbcj bY[ U`\_]WU#bcg]WU!) "XY.`N[ fUXVU  
dfYg\_i ýUby[ Ub]nU]b`bUa Yb`dfYg\_i ýUb`UfHGG` HDŁ!`GdYWZ]\_UWY`UnUca fYÿ`Y`

Broadband Integrated Services Digital Network (B-ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; B-ISDN user-network interface layer 3 specification for basic call/bearer control; 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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# ETSI EN 300 443-5 V1.3.1 (2001-06)

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*European Standard (Telecommunications series)*

**Broadband Integrated Services Digital Network (B-ISDN);  
Digital Subscriber Signalling System No. two (DSS2) protocol;  
B-ISDN user-network interface layer 3  
specification for basic call/bearer control;  
Part 5: Test Suite Structure and Test Purposes (TSS&TP)  
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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 5 of a multi-part deliverable covering Broadband Integrated Services Digital Network (B-ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; B-ISDN user-network interface layer 3 specification for basic call/bearer control, as identified below:

- Part 1: "Protocol specification [ITU-T Recommendation Q.2931 (1995), modified]";
- 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:   | 15 June 2001      |
| Date of latest announcement of this EN (doa):  | 30 September 2001 |
| Date of latest publication of new National Standard or endorsement of this EN (dop/e): | 31 March 2002     |
| Date of withdrawal of any conflicting National Standard (dow):                         | 31 March 2002     |

---

# 1 Scope

The present document specifies the network Test Suite Structure and Test Purposes (TSS&TP) for the  $T_B$  reference point or coincident  $S_B$  and  $T_B$  reference point (as defined in ITU-T Recommendation I.413 [5]) of implementations conforming to the standards for the signalling user-network layer 3 specification for basic call/bearer control of the Digital Subscriber Signalling System No. two (DSS2) protocol for the pan-European Broadband Integrated Services Digital Network (B-ISDN), EN 300 443-1 [1].

A further part of the present document specifies the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma based on the present document.

---

# 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 300 443-1 (2.0.1): "Broadband Integrated Services Digital Network (B-ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; B-ISDN user-network interface layer 3 specification for basic call/bearer control; Part 1: Protocol specification [ITU-T Recommendation Q.2931 (1995), modified]".
- [2] ETSI EN 300 443-2 (V1.3.1): "Broadband Integrated Services Digital Network (B-ISDN); Digital Subscriber Signalling System No. two (DSS2) protocol; B-ISDN user-network interface layer 3 specification for basic call/bearer control; Parts 2: Protocol Implementation Conformance Statement (PICS) proforma specification".
- [3] ISO/IEC 9646-1 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".
- [4] ISO/IEC 9646-2 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite specification".
- [5] ITU-T Recommendation I.413 (1993): "B-ISDN user-network interface".
- [6] ETSI ETS 300 406: "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".



## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 300 443-1 [1] and the following apply.

#### 3.1.1 Definitions related to conformance testing

**abstract test case:** refer to ISO/IEC 9646-1 [3]

**Abstract Test Method (ATM):** refer to ISO/IEC 9646-1 [3]

**Abstract Test Suite (ATS):** refer to ISO/IEC 9646-1 [3]

**Implementation Under Test (IUT):** refer to ISO/IEC 9646-1 [3]

**lower tester:** refer to ISO/IEC 9646-1 [3]

**Protocol Implementation Conformance Statement (PICS):** refer to ISO/IEC 9646-1 [3]

**PICS proforma:** refer to ISO/IEC 9646-1 [3]

**Protocol Implementation eXtra Information for Testing (PIXIT):** refer to ISO/IEC 9646-1 [3]

**PIXIT proforma:** refer to ISO/IEC 9646-1 [3]

**Test Purpose (TP):** refer to ISO/IEC 9646-1 [3]

#### 3.1.2 Definitions related to EN 300 443-1

**network:** DSS2 protocol entity at the Network side of the user-network interface where a  $T_B$  reference point or coincident  $S_B$  and  $T_B$  reference point applies

**network ( $S_B/T_B$ ):** DSS2 protocol entity at the Network side of the user-network interface where a coincident  $S_B$  and  $T_B$  reference point applies

**network ( $T_B$ ):** DSS2 protocol entity at the Network side of the user-network interface where a  $T_B$  reference point applies (user is the private ISDN)

### 3.2 Abbreviations

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

|        |  |
|--------|--|
| ATM    | Abstract Test Method                           |
| ATS    | Abstract Test Suite                            |
| B-ISDN | Broadband Integrated Services Digital Network  |
| DSS2   | Digital Subscriber Signalling System No. two   |
| IUT    | Implementation Under Test                      |
| N0     | Null call state                                |
| N10    | Active call state                              |
| N12    | Release Indication call state                  |
| N2     | Overlap Sending call state                     |
| N3     | Outgoing Call Proceeding call state            |
| N4     | Call Delivered call state                      |
| N6     | Call Present call state                        |
| N7     | Call Received call state                       |
| N9     | Incoming Call Proceeding call state            |
| N-ISDN | Narrowband Integrated Services Digital Network |
| PICS   | Protocol Implementation Conformance Statement  |

|        |   |
|--------|---|
| PIXIT  | Protocol Implementation eXtra Information for Testing |
| Rest 0 | Restart Null state                                    |
| Rest 1 | Restart Request state                                 |
| Rest 2 | Restart state   |
| TP     | Test Purpose  |
| TSS    | Test Suite Structure                                  |
| VC     | Virtual Channel                                       |
| VCI    | Virtual Channel Identifier                            |
| VP     | Virtual Path  |
| VPC    | Virtual Path Connection                               |
| VPCI   | Virtual Path Connection Identifier                    |

## 4 Test Suite Structure (TSS)

Signalling procedures at the coincident  $S_B/T_B$  and at the  $T_B$  reference points

|   |      |
|---|------|
| Call/connection establishment at the originating interface  |      |
| Connection identifier (VPCI/VCI) allocation/selection ..... | (01) |
| Associated signalling .....                                 | (02) |
| Non-associated signalling .....                             | (03) |
| QOS and traffic parameters selection procedures .....       | (04) |
| Invalid call/connection control information .....           | (05) |
| Call/connection proceeding .....                            | (06) |
| Call/connection confirmation indication .....               | (07) |
| Call/connection acceptance .....                            | (08) |
| Call/connection rejection .....                             | (09) |
| Transit network selection .....                             | (10) |
| Call/connection establishment at the destination interface  |      |
| Incoming call/connection request .....                      | (11) |
| Connection identifier (VPCI/VCI) allocation/selection ..... | (12) |
| Associated signalling .....                                 | (13) |
| Non-associated signalling .....                             | (14) |
| Call/connection confirmation .....                          | (15) |
| Call/connection acceptance .....                            | (16) |
| Call/connection clearing                                    |      |
| Exception conditions .....                                  | (17) |
| Clearing initiated by the user .....                        | (18) |
| Clearing initiated by the network .....                     | (19) |
| Clear collision .....                                       | (20) |
| Restart procedure   |      |
| Sending RESTART .....                                       | (21) |
| Receipt of RESTART .....                                    | (22) |
| Remote user .....   | (23) |
| Handling of error conditions                                |      |
| Error handling in N0 .....                                  | (24) |
| Error handling in N3 .....                                  | (25) |
| Error handling in N4 .....                                  | (26) |
| Error handling in N6 .....                                  | (27) |
| Error handling in N7 .....                                  | (28) |
| Error handling in N9 .....                                  | (29) |
| Error handling in N10 - incoming call .....                 | (30) |
| Error handling in N10 - outgoing call .....                 | (31) |
| Error handling in N12 - incoming call .....                 | (32) |
| Error handling in N12 - outgoing call .....                 | (33) |
| Error handling in Rest 0 .....                              | (34) |
| Error handling in Rest 1 .....                              | (35) |
| Notification procedures .....                               | (36) |

|  |      |
|--|------|
| Signalling procedures for interworking between N-ISDN and B-ISDN |      |
| Interworking N-ISDN -> B-ISDN.....                               | (37) |
| Interworking B-ISDN -> N-ISDN.....                               | (38) |
| End-to-end completion indication procedures .....                | (39) |

**Figure 1: Test suite structure**

## 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 01, within each group. Groups are organized according to the TSS. Additional references are added to identify the actual test suite (see table 1).

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

|             |   |
|-------------|---|
| Identifier: | <suite_id>_<group>_<nnn>  |
| <suite_id>  | = layer + type of IUT: "L3BN" for Layer 3 Basic call/bearer control, IUT = Network    |
| <group>     | = group number: two character field representing the group reference according to TSS |
| <nn>        | = sequential number: (01-99)  |

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#### 5.1.2 Source of TP definition

The TPs are based on EN 300 443-1 [1].

#### 5.1.3 Test strategy

As the base standard EN 300 443-1 [1] 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 300 443-2 [2].

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 [6]).

#### 5.1.4 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 clause 5.6.11 of EN 300 443-1 [1]. According to these procedures, the IUT on receipt of a STATUS ENQUIRY message, shall respond with a STATUS message indicating, in the fifth 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.

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

All PICS items referred to in this clause are as specified in EN 300 443-2 [2] unless indicated otherwise by another numbered reference.

Unless specified:

- the messages indicated are valid and contain at least the mandatory information elements and possibly optional information elements;
- the information elements indicated are valid and contain at least the mandatory parameters and possibly optional parameters.

### 5.2.1 Signalling procedures at the coincident $S_B/T_B$ and at the $T_B$ reference points

Test purposes for EN 300 443-1 [1], clause 5.1.

#### 5.2.1.1 Call/connection establishment at the originating interface

Test purposes for EN 300 443-1 [1], clause 5.1.

##### 5.2.1.1.1 Connection identifier (VPCI/VCI) allocation/selection (01)

Test purposes for EN 300 443-1 [1], clause 5.1.2.

###### L3BN\_01\_01

Ensure that the IUT in N0, on receipt of a SETUP message (Connection identifier present, VP associated signalling = VP associated signalling),

- sends a RELEASE COMPLETE message (Cause value = 36) and remains in N0.

**Selection:** Associated signalling at the originating side NOT supported. PICS: NOT MCn 1.1.

##### 5.2.1.1.1.1 Associated signalling (02)

Test purposes for EN 300 443-1 [1], clause 5.1.2.1.

**Selection:** Associated signalling at the originating side supported. PICS: MCn 1.1.

###### L3BN\_02\_01

Ensure that the IUT in N0, on receipt of a SETUP message (Connection identifier present, VP associated signalling = VP associated signalling, preferred exclusive = exclusive VPCI; any VCI), when a VCI is available in the VPC carrying the signalling VC,

- sends a CALL PROCEEDING message (Connection identifier present, VP associated signalling = VP associated signalling, preferred exclusive = exclusive VPCI; exclusive VCI, virtual channel identifier indicating a specific VCI) and enters N3.

###### L3BN\_02\_02

Ensure that the IUT in N0, on receipt of a SETUP message (Connection identifier present, VP associated signalling = VP associated signalling, preferred exclusive = exclusive VPCI; exclusive VCI, virtual channel identifier indicating a specific VCI), when the requested VCI is available in the VPC carrying the signalling VC,

- sends a CALL PROCEEDING message (Connection identifier present, VP associated signalling = VP associated signalling, preferred exclusive = exclusive VPCI; exclusive VCI, virtual channel identifier indicating the requested VCI) and enters N3.

###### L3BN\_02\_03

Ensure that the IUT in N0, on receipt of a SETUP message (Connection identifier present, VP associated signalling = VP associated signalling, preferred exclusive = exclusive VPCI; any VCI), when no VCI is available in the VPC carrying the signalling VC,

- sends a RELEASE COMPLETE message (Cause value = 45) and remains in N0.

**L3BN\_02\_04**

Ensure that the IUT in N0, on receipt of a SETUP message (Connection identifier present, VP associated signalling = VP associated signalling, preferred exclusive = exclusive VPCI; exclusive VCI, virtual channel identifier indicating a specific VCI), when the requested VCI is not available in the VPC carrying the signalling VC,

- sends a RELEASE COMPLETE message (Cause value = 35) and remains in N0.

## 5.2.1.1.1.2 Non-associated signalling (03)

Test purposes for EN 300 443-1 [1], clause 5.1.2.2.

**L3BN\_03\_01**

Ensure that the IUT in N0, on receipt of a SETUP message (Connection identifier present, VP associated signalling = explicit indication of VPCI, preferred exclusive = exclusive VPCI; any VCI, virtual path connection identifier indicating a specific VPCI), when a VCI is available within the requested VPCI,

- sends a CALL PROCEEDING message (Connection identifier present, VP associated signalling = explicit indication of VPCI, preferred exclusive = exclusive VPCI; exclusive VCI, virtual path connection identifier indicating the requested VPCI, virtual channel identifier indicating a specific VCI) and enters N3.

**L3BN\_03\_02**

Ensure that the IUT in N0, on receipt of a SETUP message (Connection identifier present, VP associated signalling = explicit indication of VPCI, preferred exclusive = exclusive VPCI; exclusive VCI, virtual path connection identifier indicating a specific VPCI, virtual channel identifier indicating a specific VCI), when the requested VCI is available within the requested VPCI,

- sends a CALL PROCEEDING message (Connection identifier present, VP associated signalling = explicit indication of VPCI, preferred exclusive = exclusive VPCI; exclusive VCI, virtual path connection identifier indicating the requested VPCI, virtual channel identifier indicating the requested VCI) and enters N3.

**L3BN\_03\_03**

Ensure that the IUT in N0, on receipt of a SETUP message (Connection identifier absent), when a VCI is available within any VPCI,

- sends a CALL PROCEEDING message (Connection identifier present, VP associated signalling = explicit indication of VPCI, preferred exclusive = exclusive VPCI; exclusive VCI, virtual path connection identifier indicating a specific VPCI, virtual channel identifier indicating a specific VCI) and enters N3.

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**L3BN\_03\_04**

Ensure that the IUT in N0, on receipt of a SETUP message (Connection identifier present, VP associated signalling = explicit indication of VPCI, preferred exclusive = exclusive VPCI; any VCI, virtual path connection identifier indicating a specific VPCI), when the requested VPCI is not available,

- sends a RELEASE COMPLETE message (Cause value = 35) and remains in N0.

**L3BN\_03\_05**

Ensure that the IUT in N0, on receipt of a SETUP message (Connection identifier present, VP associated signalling = explicit indication of VPCI, preferred exclusive = exclusive VPCI; exclusive VCI, virtual path connection identifier indicating a specific VPCI, virtual channel identifier indicating a specific VCI), when the requested VPCI is not available,

- sends a RELEASE COMPLETE message (Cause value = 35) and remains in N0.

**L3BN\_03\_06**

Ensure that the IUT in N0, on receipt of a SETUP message (Connection identifier present, VP associated signalling = explicit indication of VPCI, preferred exclusive = exclusive VPCI; any VCI, virtual path connection identifier indicating a specific VPCI, virtual channel identifier indicating a specific VCI), when no VCI is available within the requested VPCI,

- sends a RELEASE COMPLETE message (Cause value = 45) and remains in N0.

**L3BN\_03\_07**

Ensure that the IUT in N0, on receipt of a SETUP message (Connection identifier present, VP associated signalling = explicit indication of VPCI, preferred exclusive = exclusive VPCI; exclusive VCI, virtual path connection identifier indicating a specific VPCI, virtual channel identifier indicating a specific VCI), when the requested VCI is not available within the requested VPCI,

- sends a RELEASE COMPLETE message (Cause value = 35) and remains in N0.

**L3BN\_03\_08**

Ensure that the IUT in N0, on receipt of a SETUP message (Connection identifier absent), when no VCI is available within any VPCI,

- sends a RELEASE COMPLETE message (Cause value = 45) and remains in N0.

**5.2.1.1.2 QOS and traffic parameter selection procedures (04)**

Test purposes for EN 300 443-1 [1], clause 5.1.3.

**L3BN\_04\_01**

Ensure that the IUT in N0, on receipt of a SETUP message (Valid combination of traffic parameters, Quality of service parameter present, requesting a QOS class that is not supported),

- sends a RELEASE COMPLETE message (Cause value = 49) and remains in N0.

**L3BN\_04\_02**

Ensure that the IUT in N0, on receipt of a SETUP message (Invalid combination of traffic parameters and QOS class),

- sends a RELEASE COMPLETE message (Cause value = 73) and remains in N0.

**L3BN\_04\_03**

Ensure that the IUT in N0, on receipt of a SETUP message (End-to-end transit delay present, invalid combination of transit delay, traffic parameters and QOS class),

- sends a RELEASE COMPLETE message (Cause value = 73) and remains in N0.

**L3BN\_04\_04**

Ensure that the IUT in N0, on receipt of a SETUP message (End-to-end transit delay present, maximum end-to-end transit delay absent),

- sends a RELEASE COMPLETE message (Cause value = 100) and remains in N0.

**L3BN\_04\_05**

Ensure that the IUT in N0, on receipt of a SETUP message (End-to-end transit delay present, cumulative end-to-end transit delay absent),

- sends a RELEASE COMPLETE message (Cause value = 100) and remains in N0.

**L3BN\_04\_06**

Ensure that the IUT in N3, having received a SETUP message (End-to-end transit delay present), to indicate that the call has been accepted at the called user's side,

- sends a CONNECT message (End-to-end transit delay present, maximum end-to-end transit delay absent) and enters N10.

**L3BN\_04\_07**

Ensure that the IUT in N4, having received a SETUP message (End-to-end transit delay present, maximum end-to-end transit delay absent), to indicate that the call has been accepted at the called user's side,

- sends a CONNECT message (End-to-end transit delay present) and enters N10.

**L3BN\_04\_08**

Ensure that the IUT in N0, on receipt of a SETUP message (ATM traffic descriptor present, requesting a peak cell rate that can not be provided),

- sends a RELEASE COMPLETE message (Cause value = 37) and remains in N0.

**5.2.1.1.3 Invalid call/connection control information (05)**

Test purposes for EN 300 443-1 [1], clause 5.1.4.

**L3BN\_05\_01**

Ensure that the IUT in N0, on receipt of a SETUP message ( Called party number present, indicating invalid call information, i.e. unassigned called party number),

- sends a RELEASE message (Cause value = 1) possibly preceded by a CALL PROCEEDING message and enters N12 or sends a RELEASE COMPLETE message (Cause value = 1) and remains in N0.

**L3BN\_05\_02**

Ensure that the IUT in N0, on receipt of a SETUP message ( Called party number present, indicating invalid call information, i.e. no outgoing trunk direction exists for the called party number),

- sends a RELEASE message (Cause value = 3) possibly preceded by a CALL PROCEEDING message and enters N12 or sends a RELEASE COMPLETE message (Cause value = 3) and remains in N0.

**L3BN\_05\_03**

Ensure that the IUT in N0, on receipt of a SETUP message ( Called party number present, indicating invalid call information, i.e. a called party number that has been changed),

- sends a RELEASE message (Cause value = 22) possibly preceded by a CALL PROCEEDING message and enters N12 or sends a RELEASE COMPLETE message (Cause value = 22) and remains in N0.

**L3BN\_05\_04**

Ensure that the IUT in N0, on receipt of a SETUP message ( Called party number present, indicating invalid call information, i.e. an incomplete called party number),

- sends a RELEASE message (Cause value = 28) possibly preceded by a CALL PROCEEDING message and enters N12 or sends a RELEASE COMPLETE message (Cause value = 28) and remains in N0.

**5.2.1.1.4 Call/connection proceeding (06)**

Test purposes for EN 300 443-1 [1], clause 5.1.5.

**L3BN\_06\_01**

Ensure that the IUT in N0, on receipt of a SETUP message (Broadband bearer capability requesting a service that is authorized and available),

- sends a CALL PROCEEDING message and enters N3.

**L3BN\_06\_02**

Ensure that the IUT in N0, on receipt of a SETUP message (Broadband bearer capability requesting a service that is not authorized),

- sends a RELEASE COMPLETE message (Cause value = 57) and remains in N0.

**L3BN\_06\_03**

Ensure that the IUT in N0, on receipt of a SETUP message (Broadband bearer capability requesting a service that is not available),

- sends a RELEASE COMPLETE message (Cause value = 58, 63 or 65) and remains in N0.

**5.2.1.1.5 Call/connection confirmation indication (07)**

Test purposes for EN 300 443-1 [1], clause 5.1.6.

**L3BN\_07\_01**

Ensure that the IUT in N3, to indicate that user alerting has been initiated at the called user's side,

- sends an ALERTING message and enters N4.

**5.2.1.1.6 Call/connection acceptance (08)**

Test purposes for EN 300 443-1 [1], clause 5.1.7.

**L3BN\_08\_01**

Ensure that the IUT in N3, to indicate that the call has been accepted at the called user's side,

- sends a CONNECT message and enters N10.

**L3BN\_08\_02**

Ensure that the IUT in N4, to indicate that the call has been accepted at the called user's side,

- sends a CONNECT message and enters N10.

**L3BN\_08\_03**

Ensure that the IUT in N10, on receipt of a CONNECT ACKNOWLEDGE message,

- sends no message and remains in N10.