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Recommendation Q.781

MTP LEVEL 2 TEST SPECIFICATION

1 Introduction

This Recommendation contains a set of detailed tests of signalling system No. 7 MTP level 2 protocol. These tests intend to validate the protocol specified in Recommendation Q.703.

This Recommendation conforms to Recommendation Q.780 which describes the basic rules of the Test Specification. In addition the conditions which are specific to level 2 tests are described in the following sections.

2 General principles of level 2 tests

2.1 *Presentation of test descriptions*

The level 2 tests aim at testing the level 2 protocol conformance in a given implementation.

Each test description indicates in the ‘‘type of test’’ column; ‘‘Validation’’ (VAT) or ‘‘Validation’’ (VAT) and ‘‘compatibility’’ (CPT).

Although signal units are transmitted and received continuously on level 2, only the signal units which cause and/or indicate the changes of level 2 status are shown in the EXPECTED SIGNAL UNIT SEQUENCE column of each test description.

2.2 *Presentation of the test list*

These tests as a whole, aim at a complete validation of the level 2 protocol without redundancies. Each test is described as simply as possible to check precisely each elementary function of the protocol, which is referred in the columns ‘‘reference’’, ‘‘title’’ and ‘‘sub-title’’ of each test description.

This list is presented in the form of a succession of tests. The presentation order is essentially functional. However, the operator performing these tests may change this order, taking into account some other practical criteria such as: use pre-test conditions to order the list, the end of a given test may be the pre-test condition of another test.

3 Test configuration

A single link will be used for level 2 tests. Figure 1/Q.781 shows a single link between SP A and SP B. Test specifications are written to test the level 2 of the SP A.

4 Test environment

See Recommendation Q.780, § 6.2.

5 Test list

Note — Compatibility test items are indicated in this list by an asterisk (*).

— The abbreviations *PO* , *LPO* , *RPO* , *EM* and *EDA* are used for processor outage, local processor outage, remote processor outage, emergency and expected delay of acknowledgement respectively.

1 *Link State Control — Expected signal units/orders* (Figures 8/Q.703 and 9/Q.703)

* 1.1 Initialisation (Power-up)

* 1.2 Timer T2

1.3 Timer T3

1.4 Timer T1 and T4 (Normal)

* 1.5 Normal alignment — correct procedure (FISU)

1.6 Normal alignment — correct procedure (MSU)

1.7 SIO received during normal proving period

1.8 Normal alignment with PO set (FISU)

1.9 Normal alignment with PO set (MSU)

1.10 Normal alignment with PO set and clear

1.11 Set RPO when ‘‘Aligned not ready’’

1.12 SIOS received when ‘‘Aligned not ready’’

1.13 SIO received when ‘‘Aligned not ready’’

1.14 Set and clear LPO when ‘‘Initial alignment’’

1.15 Set and clear LPO when ‘‘Aligned ready’’

1.16 Timer T1 in ‘‘‘‘Aligned not ready’’ state

1.17 No SIO sent during normal proving period

1.18 Set and cease emergency prior to ‘‘start alignment’’

* 1.19 Set emergency while in ‘‘not aligned state’’

1.20 Set emergency when ‘‘aligned’’

1.21 Both ends set emergency

1.22 Individual end sets emergency

1.23 Set emergency during normal proving

1.24 No SIO sent during emergency alignment

* 1.25 Deactivation during initial alignment

1.26 Deactivation during aligned state

1.27 Deactivation during aligned not ready

1.28 SIO received during link in service

* 1.29 Deactivation during link in service

1.30 Deactivation during LPO

1.31 Deactivation during RPO

* 1.32 Deactivation during the proving period

1.33 SIO received instead of FISUs

1.34 SIOS received instead of FISUs

1.35 SIPO received instead of FISUs

2 *Link State Control — Unexpected signal units/orders* (Figure 8/Q.703)

2.1 Unexpected signal units/orders in ‘‘Out of service’’ state

2.2 Unexpected signal units/orders in ‘‘Not aligned’’ state

2.3 Unexpected signal units/orders in ‘‘Aligned’’ state

2.4 Unexpected signal units/orders in ‘‘Proving’’ state

2.5 Unexpected signal units/orders in ‘‘Aligned ready’’ state

2.6 Unexpected signal units/orders in ‘‘Aligned not ready’’ state

2.7 Unexpected signal units/orders in ‘‘In service’’ state

2.8 Unexpected signal units/orders in ‘‘Processor outage’’ state

3 *Transmission failure* (Figure 8/Q.703)

3.1 Link aligned ready (Break Tx path)

3.2 Link aligned ready (Corrupt FIBs)

3.3 Link aligned not ready (Break Tx path)

3.4 Link aligned not ready (Corrupt FIBs)

* 3.5 Link in service (Break Tx path)

3.6 Link in service (Corrupt FIBs)

3.7 Link in processor outage (Break Tx path)

3.8 Link in processor outage (Corrupt FIBs)

4 *Processor Outage Control* (Figure 10/Q.703)

4.1 Set and clear LPO while link in service

4.2 RPO during LPO

4.3 Clear LPO when ‘‘Both processor outage’’

5 *SU Delimitation, Alignment, Error Detection and Correction* (Figures 11/Q.703 and 12/Q.703)

5.1 More than seven ‘‘1’’s between MSU opening and closing flags

5.2 Greater than maximum signal unit length

5.3 Below minimum signal unit length

5.4 Reception of single and multiple flags between FISUs

5.5 Reception of single and multiple flags between MSUs

6 *SUERM Check* (Figure 18/Q.703)

6.1 Error rate of 1 in 256 — Link remains in service

6.2 Error rate of 1 in 254 — Link into out of service

6.3 Consecutive corrupted SUs

6.4 Time controlled break of the link

7 *AERM check* (Figure 17/Q.703)

7.1 Error rate below the normal threshold

7.2 Error rate at the normal threshold

7.3 Error rate above the normal threshold

7.4 Error rate at the emergency threshold

8 *Transmission and reception control (Basic)* (Figures 13/Q.703 and 14/Q.703)

8.1 MSU transmission and reception

8.2 Negative acknowledgement of MSU

8.3 Check RTB full

8.4 Single MSU with erroneous FIB

8.5 Duplicated FSN

8.6 Erroneous retransmission — Single MSU

8.7 Erroneous retransmission — Multiple FISUs

8.8 Single FISU with corrupt FIB

8.9 Single FISU prior to RPO being set

8.10 Abnormal BSN — Single MSU

8.11 Abnormal BSN — Two consecutive FISUs

8.12 Excessive delay of acknowledgement

8.13 Level 3 Stop Command

9 *Transmission and reception control (PCR)* (Figures 15/Q.703 and 16/Q.703)

* 9.1 MSU transmission and reception

9.2 Priority control

9.3 Forced retransmission with the value N1

9.4 Forced retransmission with the value N2

9.5 Forced retransmission cancel

9.6 Repetition of forced retransmission

9.7 MSU transmission while RPO set

9.8 Abnormal BSN — Single MSU

9.9 Abnormal BSN — Two MSUs

9.10 Unexpected FSN

9.11 Excessive delay of acknowledgement

9.12 FISU with FSN expected for MSU

9.13 Level 3 Stop Command

10 *Congestion Control* (Figure 19/Q.703)

10.1 Congestion abatement

10.2 Timer T7

10.3 Timer T6

6 Test descriptions

Blanc

H.T. [T1.781]
MTP, LEVEL 2

TEST NUMBER: 1.1	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 8; Fig. 12; Fig. 13
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Initialization (Power-up)
}	

{
PURPOSE: To check that the No. 7 terminal equipment enters the correct state on power-up
}	

{
PRE-TEST CONDITIONS: Line equipment — ON;
No. 7 equipment— OFF
}	

CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link 1 — 0	SIOS	---------->	Link	: | ower ON SIOS
		<----------	1 — 0	

TEST DESCRIPTION	
1. Check link enters correct state. }	{
2. At ‘‘Power — On’’ or Initialization the FIB, BIB, FSN, and BSN shall be as follows: FIB = BIB = 1 : FSN = BSN = 127 (HEX 7F). }	{
3. Repeat test in reverse direction. }	{

Tableau [T1.781], p.

H.T. [T2.781]
MTP, LEVEL 2

TEST NUMBER: 1.2	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 8; Fig. 9, Fig. 11, Fig. 13;
Fig. 14
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

SUB TITLE: Timer T2	

{
PURPOSE: To check ‘‘Not Aligned’’ Timer T2
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}

	SP B		Link	SP A
Link 1 — 0	SIOS	---------->		
		<----------	1 — 0	SIOS : | tart
		{		
<---------- <----------				
} SIO | | T2 | SIOS }	1 — 0 1 — 0	{		

TEST DESCRIPTION

1. Timer T2 shall be in the range 5 secs to 150 secs. }	{

Tableau [T2.781], p.

H.T. [T3.781]
MTP, LEVEL 2

TEST NUMBER: 1.3	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 9; Fig. 14
}

{
TITLE: Link State Control — Expected signal units/orders
}

SUB TITLE: Timer T3

{
PURPOSE: To check ‘‘Aligned’’ Timer T3
}

{
PRE-TEST CONDITIONS: Link out of service
}

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
				|
				| T3
				|
		<----------	1 — 0	SIOS

TEST DESCRIPTION

1. Timer T3 shall be in the range 1 sec to 1.5 secs. }	{

Tableau [T3.781], p.

H.T. [T4.781]
MTP, LEVEL 2

TEST NUMBER: 1.4	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 8; Fig. 9
}

{
TITLE: Link State Control — Expected signal units/orders
}

{
SUB TITLE: Timer T1 & Timer T4 (Normal)
}

{
PURPOSE: To check ‘‘Aligned ready’’ Timer T1 and ‘‘Proving period’’ Timer T4 (Normal)
}

{
PRE-TEST CONDITIONS: Link out of service
}

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		|
				| T4 (Pn)
				|
		<----------	1 — 0	FISU
				|
				| T1
				|
		<----------	1 — 0	SIOS

TEST DESCRIPTION

1. At 64 kbit/s Timer T4 shall be in the range 7.5 secs (nominally 8.2 secs) and Timer T1 shall be in the range 40 secs to 50 secs. }	{
2. At 4.8 kbit/s Timer 74 shall be in the range 100 secs to 120 secs (nominally 110 secs) and Timer T1 shall be in the range 500 secs to 600 secs. }	{

Tableau [T4.781], p.

H.T. [T5.781]
MTP, LEVEL 2

TEST NUMBER: 1.5	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 8; Fig. 9
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Normal alignment — correct procedure (FISU)
}	

{
PURPOSE: To check normal alignment procedure
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	FISU
1 — 0	FISU	---------->		

TEST DESCRIPTION

1. Start normal alignment procedure. }	{
2. Check link aligns and enters ‘‘In service’’ state. }	{
3. Check that ‘‘In service’’ state is maintained. }	{

Tableau [T5.781], p.

H.T. [T6.781]
MTP, LEVEL 2

TEST NUMBER: 1.6	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 8; Fig. 9
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Normal alignment — correct procedure (MSU)
}	

{
PURPOSE: To check normal alignment procedure
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
1 — 0	SIOS	<----------	1 — 0	SIOS
		---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	FISU
1 — 0	MSU	---------->		

TEST DESCRIPTION

1. Start normal alignment procedure. }	{
2. Check link aligns and enters ‘‘In service’’ state. }	{
3. Check that ‘‘In service’’ state is maintained. }	{

Tableau [T6.781], p.

H.T. [T7.781]
MTP, LEVEL 2

TEST NUMBER: 1.7	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 10.3
STD: Fig. 9; Fig. 17
}

{
TITLE: Link State Control — Expected signal units/orders
}

{
SUB TITLE: SIO received during normal proving period
}

{
PURPOSE: To test the response to the reception of an SIO during the normal proving period.
}

{
PRE-TEST CONDITIONS: Link out of service
}

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		| T4
				| Stopped
				—
1 — 0	SIN (one only)	---------->		
1 — 0	SIN	---------->		|
		<----------	1 — 0	| SIN
				| T4 (Pn)
				|
		<----------	1 — 0	FISU

TEST DESCRIPTION	
1. Send an SIO at B during normal proving period. }	{
2. Check that new normal proving period is entered. }	{

Tableau [T7.781], p.

H.T. [T8.781]
MTP LEVEL 2

TEST NUMBER: 1.8	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 8
STD: Fig. 8
}

{
TITLE: Link State Control — Expected signal units/orders
}

{
SUB TITLE: Normal alignment with PO set (FISU)
}

{
PURPOSE: To check the response following normal alignment when PO has been set
}

{
PRE-TEST CONDITIONS: Link out of service
}

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | et LPO
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	SIPO
1 — 0	FISU	---------->		
		<----------	1 — 0	SIPO

TEST DESCRIPTION

1. Check that normal alignment is carried out with PLO set at A. }	{
2. Check that SIPO is returned when aligned, and that A stays in ‘‘processor outage’’ state. }	{
3. Repeat test with LPO set at B. }	{

Tableau [T8.781], p.

H.T. [T9.781]
MTP, LEVEL 2

TEST NUMBER: 1.9	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 8
STD: Fig. 8
}

{
TITLE: Link State Control — Expected signal units/orders
}

{
SUB TITLE: Normal alignment with PO set (MSU)
}

{
PURPOSE: To check the response following normal alignment when PO has been set
}

{
PRE-TEST CONDITIONS: Link out of service
}

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | et LPO
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	SIPO
1 — 0	MSU	---------->		
		<----------	1 — 0	SIPO

TEST DESCRIPTION	
1. Check that normal alignment is carried out with LPO set at A. }	{
2. Check that SIPO is returned when aligned, and that A stays in ‘‘processor outage’’ state. }	{
3. Repeat test with LPO set at B. }	{

Tableau [T9.781], p.

H.T. [T10.781]
MTP, LEVEL 2

TEST NUMBER: 1.10	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 8
STD: Fig. 8
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Normal alignment with PO set and clear
}	

{
PURPOSE: To check the response following normal alignment when PO has been set and cleared
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | et LPO
				: | lear LPO
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	FISU
1 — 0	FISU	---------->		

TEST DESCRIPTION

1. Check that normal alignment is carried out. }	{
2. Check that link aligns and enters ‘‘In service’’ state. }	{

Tableau [T10.781], p.

H.T. [T11.781]
MTP, LEVEL 2

TEST NUMBER: 1.11	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 8
STD: Fig. 8
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Set RPO when ‘‘Aligned not ready’’
}	

{
PURPOSE: To check the response following normal alignment when PO has been set
}	

{
PRE-TEST CONDITIONS: Link out of service; ability to set PO
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
	: | et LPO			: | et LPO
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	SIPO
1 — 0	SIPO	---------->		

TEST DESCRIPTION

1. 2. 3. Check that both LPO and RPO after alignment completes. }	Set LPO at A and B. Start alignment. {

Tableau [T11.781], p.

H.T. [T12.781]
MTP, LEVEL 2

TEST NUMBER: 1.12	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 8
STD: Fig. 8
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: SIOS received when ‘‘Aligned not ready’’
}	

{
PURPOSE: To check the response following normal alignment when PO has been set
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | et LPO
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	SIPO
	: | top			
1 — 0	SIOS	---------->		
		<----------	1 — 0	SIOS

TEST DESCRIPTION

1. Soon after alignment completes, A enters ‘‘Aligned not ready’’. }	{
2. Before alignment completes, stop command is given at B. }	{
3. Check that, on reception of SIOS, A enters ‘‘Out of service’’ state. }	{
4. Repeat test with LPO set at B. }	{

Tableau [T12.781], p.

H.T. [T13.781]
MTP, LEVEL 2

TEST NUMBER: 1.13	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 8
STD: Fig. 8
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: SIO received when ‘‘Aligned not ready’’
}	

{
PURPOSE: To check the response following normal alignment when PO has been set
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | et LPO
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	SIPO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIOS

TEST DESCRIPTION	
1. Soon after alignment completes, A enters ‘‘Aligned not ready’’. }	{
2. Before alignment completes at B, SIO is sent to A. }	{
3. Check that, on reception of SIO, A enters ‘‘Out of service’’ state. }	{
4. Repeat test with LPO set at B. }	{

Tableau [T13.781], p.

H.T. [T14.781]
MTP, LEVEL 2

TEST NUMBER: 1.14	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 8
STD: Fig. 8
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Set and clear LPO when ‘‘Initial alignment’’
}	

{
PURPOSE: To check normal alignment with PO set and clear during ‘‘Initial alignment’’
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

SP B			SP A
Link		Link	
	<----------	1 — 0	SIOS
1 — 0 SIOS	---------->		
			: | tart
	<----------	1 — 0	SIO
1 — 0 SIO	---------->		
	<----------	1 — 0	SIN
			: | et LPO
1 — 0 SIN	---------->		
			: | lear LPO
	<----------	1 — 0	FISU
1 — 0 FISU	---------->		
	<----------	1 — 0	FISU

TEST DESCRIPTION

1. Set LPO at A during ‘‘Initial alignment’’ state. }	{
2. Check A remains in ‘‘Initial alignment’’ state. }	{
3. Clear LPO before alignment completes at A. }	{
4. Check A enters ‘‘In service’’ state after normal alignment. }	{
5.	Repeat the test at B.

Tableau [T14.781], p.

H.T. [T15.781]
MTP, LEVEL 2

TEST NUMBER: 1.15	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 8
STD: Fig. 8
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Set and clear LPO when ‘‘aligned ready’’
}	

{
PURPOSE:
To test the response to LPO when ‘‘aligned ready’’ and to
ensure that the aligned ready state resumes when LPO is cleared.
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	FISU
				: | et LPO
		<----------	1 — 0	SIPO
				: | ait 5 secs.
				: | lear LPO
		<----------	1 — 0	FISU

TEST DESCRIPTION	
1.	Start link at A.
2. At ‘‘aligned ready’’ state set LPO at A. (Suppress return of FISUs at B to maintain ‘‘aligned ready’’ state). }	{
3.	Clear LPO at A.
4. Check A resumes ‘‘aligned ready’’ state. }	{

Tableau [T15.781], p.

H.T. [T16.781]
MTP, LEVEL 2

TEST NUMBER: 1.16	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 8
STD: Fig. 8
}

{
TITLE: Link State Control — Expected signal units/orders
}

{
SUB TITLE: Timer T1 in ‘‘aligned not ready’’ state
}

{
PURPOSE: To test the operation of Timer T1 when in the ‘‘aligned not ready’’ state.
}

{
PRE-TEST CONDITIONS: Link out of service
}

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | et LPO
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	SIPO
				|
				| T1
				|
		<----------	1 — 0	SIOS

TEST DESCRIPTION

1.	Set LPO and start link at A.
2.	{
Check A enters the ‘‘aligned not ready’’ state.	
}	
3.	{
Check A takes the link out of service after time T1.	
}	
4.	{
Timer T1 shall be in the range 40 secs to 50 secs.	
}	

Tableau [T16.781], p.

H.T. [T17.781]
MTP, LEVEL 2

TEST NUMBER: 1.17	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 9
}

{
TITLE: Link State Control — Expected signal units/orders
}

{
SUB TITLE: No SIO sent during normal proving period
}

{
PURPOSE: To ensure that normal alignment still occurs when SIO is
omitted
}

{
PRE-TEST CONDITIONS: Link out of Service
}

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO not aligned
1 — 0	SIN	---------->		
		<----------	1 — 0	SIN
				—
1 — 0	SIN	---------->		| T3
				—
				|
				| T4 (Pn)
				|
		<----------	1 — 0	FISU

TEST DESCRIPTION	
1. Check normal alignment occurs with no SIO sent from SP B. }	{

Tableau [T17.781], p.

H.T. [T18.781]
MTP, LEVEL 2

TEST NUMBER: 1.18	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 8
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Set and cease emergency prior to ‘‘start alignment’’
}	

{
PURPOSE: To test the normal proving period is employed having ‘‘emergency’’
set and cleared
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | et Em
				: | lear Em
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		—
				|
				| T4 (Pn)
				|
				—
		<----------	1 — 0	FISU

TEST DESCRIPTION	
1. Check emergency set and cleared prior to start of alignment. }	{
2. Check normal proving period is carried out. }	{

Tableau [T18.781], p.

H.T. [T19.781]
MTP, LEVEL 2

TEST NUMBER: 1.19	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 8; Fig. 9
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Set emergency while in ‘‘not aligned state’’
}	

{
PURPOSE: To test that emergency proving can be set during normal initial alignment.
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			PS A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
				: | et EM
1 — 0	SIO	---------->		
		<----------	1 — 0	SIE
1 — 0	SIN	---------->		—
				|
				| T4 (Pe)
				|
		<----------	1 — 0	FISU

TEST DESCRIPTION	
1. Check that emergency proving period is used after set EM during normal initial alignment. }	{
2. The timing of this test is critical, emergency must be set once the start command has been given and before SIO is received. (i.e. during Timer T2 operation). }	{
3. At 64 kbit/s Timer T4 shall be in the range 0,4 sec to 0,6 sec (nominally 0,5 sec). }	{
4. At 4,8 kbit/s, Timer T4 shall be in the range 6 secs to 8 secs (nominally 7 secs). }	{

Tableau [T19.781], p.

H.T. [T20.781]
MTP, LEVEL 2

TEST NUMBER: 1.20	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 9
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Set emergency when ‘‘aligned’’
}	

{
PRE-TEST CONDITIONS: To test that emergency proving period is used when emergency set prior to receiving SIN
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
				: | et EM
		<----------	1 — 0	SIE
1 — 0	SIN	---------->		|
				| T4 (Pe)
				|
		<----------	1 — 0	FISU
TEST DESCRIPTION				
1. Check that emergency proving period is used after SIE sent during ‘‘aligned’’ state. }	{			
2. The timing of this test is critical. Emergency must be set once SIN has been sent but before Timer T3 expires. }	{			

Tableau [T20.781], p.

H.T. [T21.781]
MTP, LEVEL 2

TEST NUMBER: 1.21	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 8; Fig. 9
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Both ends set emergency
}	

{
PURPOSE: To check the emergency alignment procedure and Timer T4 (Pe)
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | et EM
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIE
1 — 0	SIE	---------->		|
				| T4 (Pe)
				|
		<----------	1 — 0	FISU

TEST DESCRIPTION	
1. Check correct emergency alignment procedure is performed. }	{

Tableau [T21.781], p.

H.T. [T22.781]
MTP, LEVEL 2

TEST NUMBER: 1.22	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 9
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Individual end sets emergency
}	

{
PURPOSE: To check emergency alignment procedure, Emergency set
at the other end
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
1 — 0	SIO	---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIE	---------->		
		<----------	1 — 0	SIN
				|
				| T4 (Pe)
				|
		<----------	1 — 0	FISU

TEST DESCRIPTION	
1. 2. 3. Check that alignment occurs with the emergency proving period. }	Emergency alignment set at B. Start alignment at A. {

Tableau [T22.781], p.

H.T. [T23.781]
MTP, LEVEL 2

TEST NUMBER: 1.23	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 9
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Set emergency during normal proving
}	

{
PURPOSE:
To test that setting emergency during normal proving stops
normal proving and starts the emergency proving
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
				: | et EM
		<----------	1 — 0	SIE
1 — 0	SIN	---------->		|
				| T4 (Pe)
				|
		<----------	1 — 0	FISU

TEST DESCRIPTION	
1. Set emergency during normal proving period at A. }	{
2.	Check A sends SIE.
3. Repeat test in reverse direction. }	{

Tableau [T23.781], p.

H.T. [T24.781]
MTP, LEVEL 2

TEST NUMBER: 1.24	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 9
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: No SIO sent during emergency alignment
}	

{
PURPOSE: To ensure that emergency alignment still occurs when
SIE is received following SIOS
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | et EM
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIE	---------->		
		<----------	1 — 0	SIE
				|
				| T4 (Pe)
				|
		<----------	1 — 0	FISU

TEST DESCRIPTION	
1. Set emergency and start link at A.	{ }
2. A receives SIE after sending SIO.	{ }
3. Check that link aligns OK after emergency proving.	{ }

Tableau [T24.781], p.

H.T. [T25.781]
MTP, LEVEL 2

TEST NUMBER: 1.25	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 8; Fig. 9
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Deactivation during initial alignment
}	

{
PURPOSE:
To test the response to the receipt of the stop command while
in the initial alignment state (initial alignment is Not Aligned State)
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
				: | ait 5 secs.
				: | top
		<----------	1 — 0	SIOS

TEST DESCRIPTION	
1. Check that alignment ceases after Stop command given. }	{
2. The stop command must be issued before timer T2 expires. }	{
3. Timer T2 shall be in the range 5 secs to 150 secs. }	{

Tableau [T25.781], p.

H.T. [T26.781]
MTP, LEVEL 2

TEST NUMBER: 1.26	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 8; Fig. 9
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Deactivation during aligned state
}	

{
PURPOSE:
To test the response to the receipt of the stop command while in the initial alignment state (initial alignment is aligned state).
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
				: | top
		<----------	1 — 0	SIOS
TEST DESCRIPTION				
1. Check that alignment ceases after STOP command given. }	{			
2. The stop command must be issued before timer T3 expires. }	{			
3. Timer T3 shall be in the range 1 sec to 1.5 secs. }	{			

Tableau [T26.781], p.

H.T. [T27.781]
MTP, LEVEL 2

TEST NUMBER: 1.27	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 8
STD: Fig. 8
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Deactivation during aligned not ready
}	

{
PURPOSE: To check the response following normal alignment when PO has been set
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | et LPO
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	SIPO
				: | top
		<----------	1 — 0	SIOS

TEST DESCRIPTION	
1. Soon after alignment completes, A enters ‘‘Aligned not ready’’. }	{
2. Before alignment completes at B, stop command is given at A. }	{
3. Check that A enters ‘‘Out of service’’ state. }	{
4. Repeat test with LPO set at B. }	{

Tableau [T27.781], p.

H.T. [T28.781]
MTP, LEVEL 2

TEST NUMBER: 1.28	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 8; Fig. 14
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: SIO received during link in service
}	

{
PURPOSE: To check the deactivation of a signalling link from the ‘‘In Service’’ state.
}	

{
PRE-TEST CONDITIONS: Link in service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link 1 — 0	FISU	---------->	Link	
		<----------	1 — 0	FISU
1 — 0	SIO	---------->		
		<----------	1 — 0	SIOS
TEST DESCRIPTION				
1. SIO is sent to A during link in service. }	{			
2. Check that an ‘‘in service’’ link can be taken out of service at A. }	{			

Tableau [T28.781], p.

H.T. [T29.781]
MTP, LEVEL 2

TEST NUMBER: 1.29	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 8; Fig. 14
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Deactivation during link in service
}	

{
PURPOSE: To check the deactivation of a signalling link from the ‘‘In service’’ state
}	

{
PRE-TEST CONDITIONS: Link in service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link 1 — 0	FISU	---------->	Link	
		<----------	1 — 0	FISU
	: | top			
1 — 0	SIOS	---------->		
		<----------	1 — 0	SIOS

TEST DESCRIPTION	
1. Check that an ‘‘In service’’ link can be taken out of service by command at B. }	{
2. Repeat test, command given at A. }	{

Tableau [T29.781], p.

H.T. [T30.781]
MTP, LEVEL 2

TEST NUMBER: 1.30	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 8
STD: Fig. 10
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Deactivation during LPO
}	

{
PURPOSE: To check the response to the stop command during LPO
}	

{
PRE-TEST CONDITIONS: Link in service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	FISU
1 — 0	FISU	---------->		
				: | et LPO
		<----------	1 — 0	SIPO
1 — 0	FISU	---------->		
				: | top
		<----------	1 — 0	SIOS

TEST DESCRIPTION	
1. SIPO sent from A, stop command given at A, check link enters out of service state. }	{
2. Repeat test, SIPO sent from B, stop command at B, check link enters out of service state. }	{

Tableau [T30.781], p.

H.T. [T31.781]
MTP, LEVEL 2

TEST NUMBER: 1.31	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 8
STD: Fig. 10
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Deactivation during RPO
}	

{
PURPOSE: To test the response to the stop command during RPO
}	

{
PRE-TEST CONDITIONS: Link in service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
1 — 0	FISU	---------->		
		<----------	1 — 0	FISU
1 — 0	SIPO	---------->		
				: | top
		<----------	1 — 0	SIOS

TEST DESCRIPTION	
1. SIPO received at A, stop command given at A, check link enters out of service state. }	{
2. Repeat test, SIPO received at B, stop command given at B, check link enters out of service state. }	{

Tableau [T31.781], p.

H.T. [T32.781]
MTP, LEVEL 2

TEST NUMBER: 1.32	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 10.3
STD: Fig. 8; Fig. 9
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Deactivation during the proving period
}	

{
PURPOSE: To test the response to the receipt of SIOS during the proving period
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT, CPT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
	: | top			
1 — 0	SIOS	---------->		
		<----------	1 — 0	SIOS

TEST DESCRIPTION	
1. Check link enters out of service state when SIOS is received at A during the proving period. }	{
2. Repeat test, SIOS received at B during proving period. }	{

Tableau [T32.781], p.

H.T. [T33.781]
MTP, LEVEL 2

TEST NUMBER: 1.33	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 8
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: SIO received instead of FISUs
}	

{
PURPOSE: To check the response to the receipt of SIO instead of FISUs in the aligned ready state
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	FISU
1 — 0	SIO	---------->		
		<----------	1 — 0	SIOS

TEST DESCRIPTION	
1. Check link enters out of service state when SIO is received at A instead of FISUs in the aligned ready state. }	{

Tableau [T33.781], p.

H.T. [T34.781]
MTP, LEVEL 2

TEST NUMBER: 1.34	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 7
STD: Fig. 8
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: SIOS received instead of FISUs
}	

{
PURPOSE: To check the response to the receipt of SIOS instead of FISUs
in the aligned ready state
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	FISU
	: | top			
1 — 0	SIOS	---------->		
		<----------	1 — 0	SIOS

TEST DESCRIPTION	
1. Check link enters out of service state when SIOS is received at A instead of FISUs in the aligned ready state. }	{

Tableau [T34.781], p.

H.T. [T35.781]
MTP, LEVEL 2

TEST NUMBER: 1.35	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 8
STD: Fig. 8
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: SIPO received instead of FISUs
}	

{
PURPOSE: To check the response to the receipt of SIPO instead of FISUs in the aligned ready state
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B		
Link			L
		<----------	1
1 — 0	SIOS	---------->	
		<----------	1
1 — 0	SIO	---------->	
		<----------	1
1 — 0	SIN	---------->	
		<----------	1
	: | et LPO		
1 — 0	SIPO	---------->	
		<----------	1

TEST DESCRIPTION	
1. Check link enters processor outage state when SIPO received at A instead of FISUs in the aligned ready state. }	{

Tableau [T35.781], p.

H.T. [T36.781]
MTP, LEVEL 2

TEST NUMBER: 2.1	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 11
STD: Fig. 8
}	

{
TITLE: Link State Control — Unexpected signal units/orders
}	

{
SUB TITLE: Unexpected signal units/orders in ‘‘Out of service’’ state
}	

{
PURPOSE: To check that the unexpected signal units/orders are ignored
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
	xxx	---------->		
				yyy
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	FISU
1 — 0	FISU	---------->		

TEST DESCRIPTION	
1. Check that the unexpected signal units xxx received from B are ignored without impact on the system. xxx are successively SIO, SIN, SIE, SIPO, SIB, aberrant LSSU (non-existing status, one and two octects), FISU and MSU. }	{

H.T. [T37.781]
MTP, LEVEL 2

TEST NUMBER: 2.2	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 11
STD: Fig. 9
}	

{
TITLE: Link State Control — Unexpected signal units/orders
}	

{
SUB TITLE: Unexpected signal units/orders in ‘‘Not aligned’’ state
}	

{
PURPOSE: To check that unexpected signal units/orders are
ignored
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
	xxx	---------->		
				yyy
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	FISU
1 — 0	FISU	---------->		
TEST DESCRIPTION				
1. Check that the unexpected signal unit xxx received from B are ignored without impact on the system. xxx are successively SIOS, SIPO, SIB, aberrant LSSU, FISU and MSU. }	{			
2. Check that the unexpected orders yyy received from Level 3 are ignored without impact on the system. yyy are successively clear EM and start (if applicable). }	{			

Tableau [T37.781], p.

H.T. [T38.781]
MTP, LEVEL 2

TEST NUMBER: 2.3	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 11
STD: Fig. 9
}	

{
TITLE: Link State Control — Expected signal units/orders
}	

{
SUB TITLE: Unexpected signal units/orders in ‘‘Aligned’’ state
}	

{
PURPOSE: To check that unexpected signal units/orders are ignored
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
	xxx	---------->		
				yyy
1 — 0	SIN	---------->		
		<----------	1 — 0	FISU
1 — 0	FISU	---------->		

TEST DESCRIPTION	
1. Check that the unexpected signal units xxx received from B are ignored without impact on the system. xxx are successively SIO, SIPO, SIB, aberrant LSSU, FISU and MSU. }	{
2. Check that the unexpected orders yyy received from Level 3 are ignored without impact on the system. yyy are successively clear EM and start (if applicable). }	{

Tableau [T38.781], p.

H.T. [T39.781]
MTP, LEVEL 2

TEST NUMBER: 2.4	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 11
STD: Fig. 9
}	

{
TITLE: Link State Control — Unexpected signal units/orders
}	

{
SUB TITLE: Unexpected signal units/orders in ‘‘Proving’’ state
}	

{
PURPOSE: To check that unexpected signal units/orders are ignored
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
	xxx	---------->		
				yyy
		<----------	1 — 0	FISU
1 — 0	FISU	---------->		

TEST DESCRIPTION	
1. Check that the unexpected signal units xxx received from B are ignored without impact on the system. xxx are successively SIPO, SIB, aberrant LSSU, FISU and MSU. }	{
2. Check that the unexpected orders yyy received from Level 3 are ignored without impact on the system. yyy are successively clear EM and start (if applicable). *Note* — The reception of SIB in ‘‘Initial alignment’’ state may possibly cause link failure after transferring to ‘‘In service’’ state because of the T6 expiration. }	{

Tableau [T39.781], p.

H.T. [T40.781]
MTP, LEVEL 2

TEST NUMBER: 2.5	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 11
STD: Fig. 8
}	

{
TITLE: Link State Control — Unexpected signal units/orders
}	

{
SUB TITLE: Unexpected signal units/orders in ‘‘Aligned ready’’ state
}	

{
PURPOSE: To check that unexpected signal units/orders are ignored
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	FISU
	xxx	---------->		
				yyy
1 — 0	FISU	---------->		

TEST DESCRIPTION	
1. Check that the unexpected signal units xxx received from B are ignored without impact on the system. xxx are successively SIB and aberrant LSSU. }	{
2. Check that the unexpected orders yyy received from level 3 are ignored without impact on the system. yyy are successively set EM, clear EM, clear LPO and Start (if applicable). *Note* — The reception of SIB in ‘‘Aligned ready’’ state may possibly cause link failure after transferring to ‘‘In service’’ state because of the T6 expiration. }	{

Tableau [T40.781], p.

H.T. [T41.781]
MTP, LEVEL 2

TEST NUMBER: 2.6	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 11
STD: Fig. 8
}	

{
TITLE: Link State Control — Unexpected signal units/orders
}	

{
SUB TITLE: Unexpected signal units/orders in ‘‘Aligned not ready’’ state
}	

{
PURPOSE: To check that unexpected signal units/orders are ignored
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | et LPO
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	SIPO
	xxx	---------->		
				yyy
1 — 0	FISU	---------->		
		<----------	1 — 0	SIPO

TEST DESCRIPTION	
1. Check that the unexpected signal units xxx received from B are ignored without impact on the system. xxx are successively SIB and aberrant LSSU. }	{
2. Check that the unexpected orders yyy received from level 3 are ignored without impact on the system. yyy are successively set EM, clear EM, clear LPO and Start (if applicable). }	{

Tableau [T41.781], p.

H.T. [T42.781]
MTP, LEVEL 2

TEST NUMBER: 2.7	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 11
STD: Fig. 8
}	

{
TITLE: Link State Control — Unexpected signal units/orders
}	

{
SUB TITLE: Unexpected signal units/orders in ‘‘In service’’ state
}	

{
PURPOSE: To check unexpected signal units/orders are ignored
}	

{
PRE-TEST CONDITIONS: Link in service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	FISU
1 — 0	FISU	---------->		
	aberrant LSSU	---------->		
				yyy
		<----------	1 — 0	FISU
1 — 0	FISU	---------->		

TEST DESCRIPTION	
1. Check that an aberrant LSSU received from B is ignored without impact on the system. }	{
2. Check that the unexpected orders yyy received from level 3 are ignored without impact on the system. yyy are successively set EM, clear EM, clear LPO and Start (if applicable). }	{

Tableau [T42.781], p.

H.T. [T43.781]
MTP, LEVEL 2

TEST NUMBER: 2.8	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 7, 11
STD: Fig. 8
}	

{
TITLE: Link State Control — Unexpected signal units/orders
}	

{
SUB TITLE: Unexpected signal units/orders in ‘‘Processor outage’’ state
}	

{
PURPOSE: To check that the unexpected signal units/orders are
ignored
}	

{
PRE-TEST CONDITIONS: Link in service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

Link 1 — 0	SP B xxx FISU	<---------- ----------> ---------->	Link 1 — 0	SP A : | et LPO SIPO yyy
TEST DESCRIPTION				
1. Check that the unexpected signal units xxx received from A are ignored without impact on the system. xxx are successively SIB and aberrant LSSU. } 2. Check that the unexpected orders yyy received from level 3 are ignored without impact on the system. yyy are successively set EM, clear EM and Start (if applicable). }	{ {			

Tableau [T43.781], p.

H.T. [T44.781]
MTP, LEVEL 2

TEST NUMBER: 3.1	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 4, 10.2
STD: Fig. 8
}	

TITLE: Transmission failure	

{
SUB TITLE: Link aligned ready (Break Tx path)
}	

{
PURPOSE: To test the response to a transmission failure — detected by SUERM — when in ‘‘Aligned ready’’ state
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	FISU
	: | reak Tx			
		<----------	1 — 0	SIOS

TEST DESCRIPTION	
1. Break Tx path at B when in ‘‘Aligned ready’’ state, check that the SUERM detects the failure and the link is taken out of service. }	{
2.	Repeat test, break Tx at A.

Tableau [T44.781], p.

H.T. [T45.781]
MTP, LEVEL 2

TEST NUMBER: 3.2	PAGE: 1 OF 1

{
REFERENCE: Q.703 § 5.3
STD: Fig. 8
}	

TITLE: Transmission failure	

{
SUB TITLE: Link aligned ready (Corrupt FIBs — Basic)
}	

{
PURPOSE:
To check the response to a link failure after corruption
of two FIBs — detected by reception control — while in Aligned ready
State.
}	

{
PRE-TEST CONDITIONS: Aligned ready
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B		Link	SP A
Link				
		<----------	1 — 0	FISU
1 — 0	FISU corrupt FIB (FIB+FSN=7F)	---------->		
1 — 0	FISU corrupt FIB (FIB+FSN=7F)	---------->		
		<----------	1 — 0	SIOS

TEST DESCRIPTION	
1. Check that receipt of two FISUs at A with corrupt FIB's at link aligned ready state causes the link to be taken out of service. }	{

Tableau [T45.781], p.

H.T. [T46.781]
MTP, LEVEL 2

TEST NUMBER: 3.3	PAGE: 1 OF 1

{
REFERENCE: Q.703 §§ 8, 10.3
STD: Fig. 8
}	

TITLE: Transmission failure	

{
SUB TITLE: Link aligned not ready (Break Tx path)
}	

{
PURPOSE:
To test the response to a break in the transmission path —
detected by SUERM — in ‘‘Aligned not ready’’ state
}	

{
PRE-TEST CONDITIONS: Link out of service
}	

CONFIGURATION: 1	TYPE OF TEST: VAT

{
EXPECTED SIGNAL UNIT SEQUENCE:
}	

	SP B			SP A
Link			Link	
		<----------	1 — 0	SIOS
1 — 0	SIOS	---------->		
				: | et LPO
				: | tart
		<----------	1 — 0	SIO
1 — 0	SIO	---------->		
		<----------	1 — 0	SIN
1 — 0	SIN	---------->		
		<----------	1 — 0	SIPO
	: | reak Tx			
		<----------	1 — 0	SIOS

TEST DESCRIPTION	
1. 2. 3. In link aligned not ready state break Tx at B and check link is taken out of service. } 4. Repeat test for B with break in Tx at A, check link is taken out of service. } 5. The Tx path must be broken before Timer T1 expires. }	Set LPO at A. Start link alignment at A. { { {

Tableau [T46.781], p.