INTERNATIONAL TELECOMMUNICATION UNION

CCITT

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

Q.782

(11/1988)

SERIES Q: SWITCHING AND SIGNALLING

Specifications of Signalling System No. 7 –
Test Specification

MTP LEVEL 3 TEST SPECIFICATION

Reedition of CCITT Recommendation Q.782 published
in the Blue Book, Fascicle VI.9 (1988)

NOTES

1   CCITT Recommendation Q.782 was published in Fascicle VI.9 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

2   In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Recommendation Q.782

MTP LEVEL 3 TEST SPECIFICATION

1   Introduction

This Recommendation contains a set of detailed tests of signalling system No. 7 MTP level 3 protocol. These tests intend to validate the protocol specified in Q.704 and Q.707 Recommendations. The level 3 performance aspects specified in Q.706 Recommendation are also partly checked whenever possible. This Recommendation conforms to the Q.780 Recommendation. However, in addition to the objectives and guidelines of the latter Recommendation, other general principles specific to level 3 tests are presented below.

2   General principles of level 3 tests

2.1   *Presentation of test descriptions*

Each test description mentions the type of SP involved in the test. Three cases are possible:

–   test applicable to an SP having no STP function: SP
–   test applicable to an SP having STP function: STP
–   test applicable to all types of SPs: ALL

Each test description includes the environment in which the point under test must be inserted in order to pass the test. Four test configurations are necessary (named A, B, C and D); they are presented in § 3.

Each test is precisely described. Nevertheless, some events not directly concerning the point under test, or without direct link with the test nature, are not explicitly described. This is, for example, the case of TFPs propagation when a point becomes isolated, or of the changeover procedure in a test concerning transfer allowed procedure.

In order to preserve the test description implementation independence, a certain flexibility has been left in the test descriptions. This is particularly the case when it is necessary to deactivate a link (where it is only mentioned "Deactivate" with no more precision). The operator will choose, according to the implementation particularities and the events expected in the test description, the appropriate deactivation means (MML, provoked failure, etc.).

In the test descriptions, the signalling links are identified as follows: "number of linkset" – "number of link in the linkset" (e.g. 1 – 1 means link 1 of the linkset 1). This identification is independent of SLC attributed to these links. When the number of the link is X, that means that the concerned message can use any link of the linkset. When the field "number of link in the linkset" is, for example, "1, 2, . . .", that means that the traffic uses all indicated links. Finally, when the links are identified by the mention ALL, that means that the traffic will use all available links of the point.

The orders "Start traffic", "Wait" and "Stop traffic" apply to the test configuration. They are placed at the beginning of the line.

2.2   *Presentation of the test list*

These tests, as a whole, aim at a complete validation of the level 3 protocol without redundancies.

The test list is presented in § 4. The national options and the various signalling link management "policies" are not included in this Recommendation.

The first set of tests in the list checks that, before some more precise tests, the point under test can perform the basic functions, i.e. can connect itself to the external environment and exchange signalling messages.

The second set basically validates the signalling message handling function of the point under test. A main point of this part concerns the validation of load sharing procedures. If an implementation does not use the load sharing between linksets, some tests would not be applicable, and other should be adapted.

The third and fourth sets check changeover and changeback procedures. They include tests like changeover and changeback to/from two linksets which will be performed only if the point under tests allows this possibility.

Rerouting procedures are checked using the tests in parts 5 and 6.

Part 7 concerns tests to check inhibition and uninhibition procedures. To limit the test numbers, it was not considered that the messages used in these procedures can be transferred via STPs.

Part 8 concerns tests to check transfer controlled procedure and MTP user flow control for the international signalling network.

Part 9 concerns tests to check signalling route management functions in a point having an STP function. To limit the test numbers and to avoid to complicate the test configuration, it was not considered that TFPs and TFAs can be transferred via STPs.

Part 10 concerns tests for the point restart procedure.

Part 11 deals with STP traffic test.

Part 12 checks the signalling link test procedure.

Finally, part 13 contains solely validation tests and aims at checking the actions of the tested system on reception of invalid level 3 messages.

2.3   *Test traffic*

Running the tests described in this Recommendation requires the exchange of traffic between the point under test and its environment. The traffic used is a test traffic especially generated for the test of the system. It uses variable length messages, structured as described below:

T1109980-88
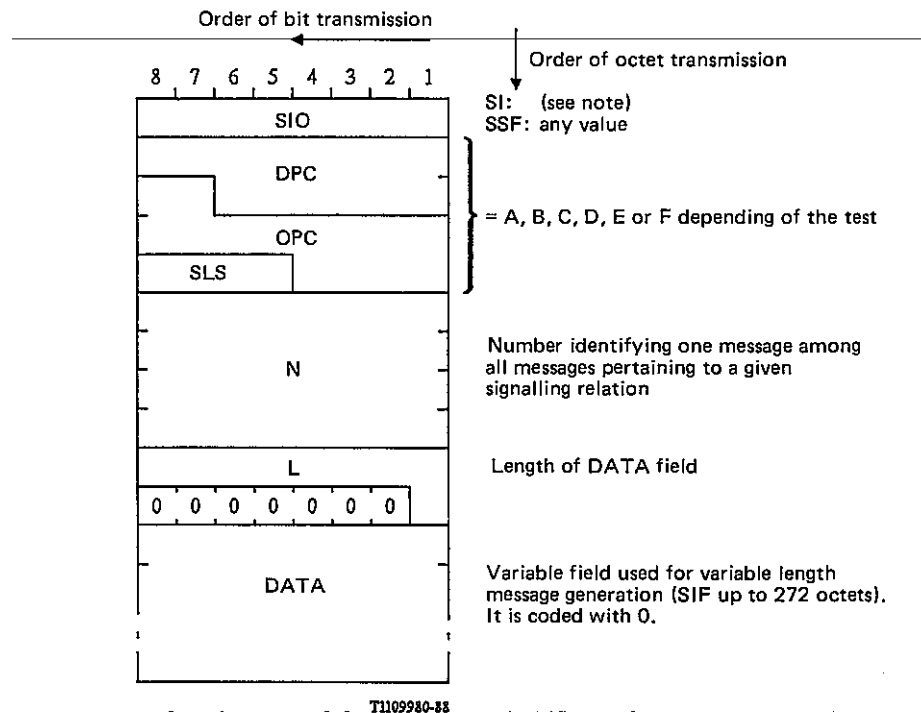
The mechanisms of generation and reception of this test traffic may be internal to the point under test or external (using a simulator for example). The tests presented here do not impose the choice of one of these mechanisms except for the tests of the STP function itself (tests 2.7, 8.2, 10 and 11) where the test traffic is necessarily generated outside the STP. The test traffic should be recorded and analysed subsequently for each described test.

Note – For compatibility testing (CPT), use SI value for MTP testing user part, for validation testing (VAT) value is to be chosen as required.

3   Test configurations

3.1   *Definition*

The set of tests described in this Recommendation assumes that the point under test is inserted in a test environment called "test configuration". A **test configuration** is defined as being:

a)   the set of points, real or simulated, linked between them by signalling linksets, real or simulated, and of which some are connected to the point under test by one or several signalling linksets,

b)   the set of routing rules applied in different points and also in point under test,

c)   the flows of test traffic generated and received by:

d)   a set of generation and reception means (see § 2.3),

e)   the means (program, operator interface, etc.) to run the described tests; notably the possibilities of storage and analysis of test traffic and level 3 messages, and, in the case of validation tests, the possibility to send at any stage of a test, any messages (level 3 or test) valid or not.

3.2   *Presentation of test configurations*

3.2.1   *General*

The set of tests described in this Recommendation requires 4 different configurations named A, B, C and D. For each test, only the three first aspects of the above definition are precisely defined (set of points, set of routing rules and test traffic flows, see § 3.1).

3.2.2   *Configuration A*

This simple configuration is adapted to the validation of all procedures concerning only one or more signalling links belonging to one linkset. It is used for the tests:

–   of activation and deactivation of links;

–   of changeover and changeback procedures;

–   of inhibition and uninhibition of links;

–   invalid messages.

Configuration A is shown in Figure 1/Q.782.
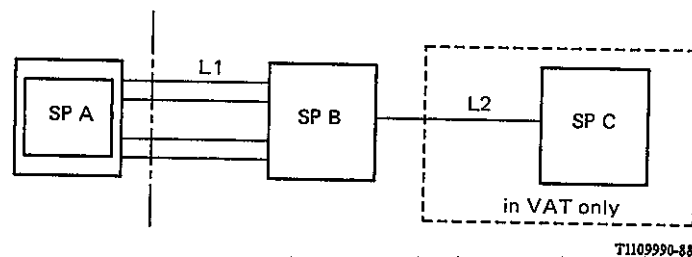
FIGURE 1/Q.782

Configuration A

Configuration A makes use of a point C in all validation tests in order to check the impact of the procedures on various traffic flows. Point C is not used in configuration A in the case of compatibility tests.

Linkset 1 has four signalling links in order to check, for example, changeover procedure to several links within a linkset (test 3.15).

In real networks, the procedures checked with this configuration act on the traffic carried in both directions of a link. Consequently, the flows of test traffic used are, regarding the routing label of messages:

–   OPC = A, DPC = B and OPC = B, DPC = A

–   OPC = A, DPC = C and OPC = C, DPC = A (in validation test only).

Routing rules in configuration A

→	A	B	C
A	–	L1	L1
B	L1	–	L2
C	L2	L2	–

3.2.3 *Configuration B*

Configuration B is adapted to the validation of all procedures concerning several signalling linksets. It is used for the tests:

–   of signalling message handling;

–   of changeover and changeback;

–   of forced and controlled rerouting.

Configuration B is shown in Figure 2/Q.782.
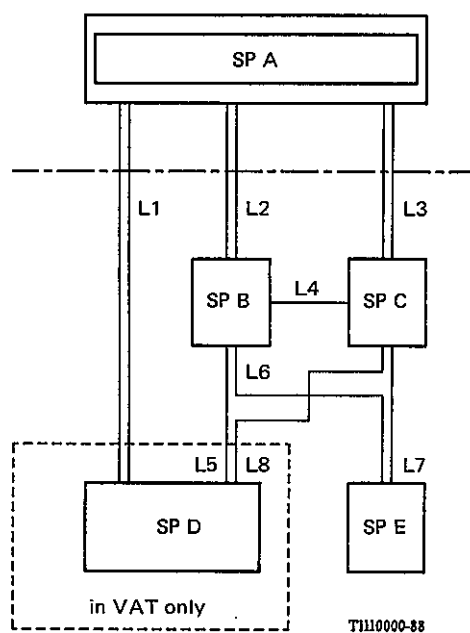
FIGURE 2/Q.782

Configuration B

In configuration B, Table 2/Q.782, the point under test A is linked to the external world with 3 signalling linksets. This is the minimum required number of linksets in order to check:

–   load sharing between three linksets;

–   changeover and changeback from/to two linksets (Recommendation Q.704, § 5.3.1).

When the SP A is an SP having no STP function, this configuration is also the minimum to run the tests in a network situation where associated mode and quasi—associated mode are used (Recommendation Q.701, § 3.1.2).

This configuration comprises point D in all validation tests in order to check the impact of the procedures on various traffic flows (relations A—D and A—E). The point D is not used in configuration B in case of compatibility tests.

In a real network, some procedures (changeover, changeback) checked with this configuration act on the traffic in both directions on the concerned linksets. Consequently, the test traffic flows used are, regarding the routing label of messages:

    –   OPC = A, DPC = E and OPC = E, DPC = A

    –   OPC = A, DPC = D and OPC = D, DPC = A (in validation test only).

TABLE 2/Q.782

Routing rules in configuration B

	A	B	C	D	E
A	–	L2,L3	L3,L2	L1-L2-L3	L2-L3
B	L2,L4	–	L4	L5,L4	L6,L4
C	L3,L4	L4	–	L8,L4	L7,L4
D	L1,L5,L8	L5,L8	L8,L5	–	Any
E	L7,L6	L6,L7	L7,L6	Any	–

Li,Lj: Li normal linkset and Lj alternative linkset

Li-Lj: load sharing between Li and Lj

3.2.4   *Configuration C*

This configuration is adapted to the validation of some functions specific to an STP like:

    –   message transfer function;

    –   sending of TFC;

    –   traffic test.

Configuration C is shown in Figure 3/Q.782.
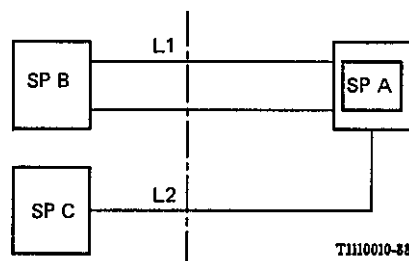
FIGURE 3/Q.782

Configuration C

In configuration C, Table 3/Q.782, the point under test A carries the test traffic from B to C and from C to B. The linkset 1 has two links, this a minimum to create an overload situation to trigger the sending of TFC independently of the implementation of the flow control procedure.

The tests performed with this configuration require that the traffic crosses the STP under test in both directions. Consequently the test traffic flows are, regarding the routing label of messages:

–   OPC = B, DPC = C and OPC = C, DPC = B

TABLE 3/Q.782

Routing rules in configuration C

⎦⎯⎯⎯⎯→	A	B	C
A	–	L1	L2
B	L1	–	L1
C	L2	L2	–

3.2.5   *Configuration D*

This configuration is adapted to the validation of all procedures concerning exclusively the points having an STP function. It is used to check the signalling route management procedures.

Configuration D is shown in Figure 4/Q.782.

TI110020-88
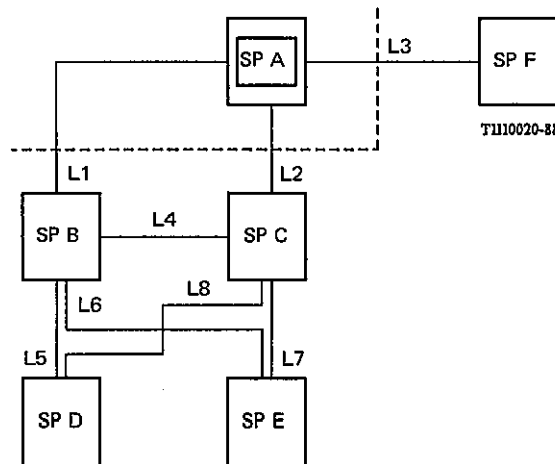
Note — The SPs E, D and F have not STP function.

FIGURE 4/Q.782

Configuration D

Configuration D, Table 4/Q.782, is used only to check the signalling route management: transfer prohibited and transfer allowed procedures. Consequently, all linksets of this configuration have only one signalling link.

The STP under test is linked to the external world with three linksets: one terminal linkset (to an SP without STP function) and two inter STP linksets. This structure is minimal to check the various aspects of the broadcasting of TFPs and TFAs:

– TFPs or TFAs concerning several destinations;

– TFPs or TFAs to several destinations.

This configuration includes points D and E. This is necessary in order to check the sending of TFP on an alternative linkset: in A the routing rules are such that the linksets 1 and 2 are used to reach D using normal/alternative routing and to reach E using load sharing routing (sending of TFP in the first case and not in the second).

The tests performed with this configuration, which check the signalling route procedures, require that the test traffic uses the concerned signalling routes. The test traffic flows used in this Recommendation are, regarding the routing label messages:

– OPC = F, DPC = D   OPC = D, DPC = F

– OPC = F, DPC = E   OPC = E, DPC = F

– OPC = A, DPC = D   OPC = A, DPC = E   OPC = A, DPC = F

TABLE 4/Q.782

Routing rules in configuration D

	A	B	C	D	E	F
A	–	L1,L2	L2,L1	L1,L2	L1,L2	L3
B	L1,L4	–	L4	L5,L4	L6,L4	L1
C	L2,L4	L4	–	L8,L4	L7,L4	L2
D	Any			–	Any	
E	Any				–	Any
F	L3	L3	L3	L3	L3	–

4 Test list

All tests with the indication "*" are validation and compatibility tests. The tests without asterisk are validation test only.

1 *Signalling link management*

*   1.1 First signalling link activation

*   1.2 Signalling linkset deactivation

*   1.3 Signalling linkset activation

2 *Signalling message handling*

    2.1 Message received with an invalid SSF (discrimination function)

    2.2 Message received with an invalid DPC (discrimination function)

    2.3 Message received with an invalid SI (distribution function)

    2.4 Load sharing within a linkset

*   2.4.1 All links available

TEST NUMBER: 1.1	PAGE: 1 of 1

REFERENCE: Q.704 § 3 Fig. 7, Fig. 36, Fig. 37, Fig. 38

TITLE: Signalling link management

SUBTITLE: First signalling link activation

PURPOSE: To put into service a signalling linkset with 1 signalling link

PRE-TEST CONDITIONS: Signalling links deactivated

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP   A                                    SP   B

         Link                                    Link

                                                 1 — 1              :Activate
         1 — 1           :Activate
                                    <---------------   1 — 1       SLTM
         1 — 1       SLTA           --------------->
         1 — 1       SLTM           --------------->
                                    <---------------   1 — 1       SLTA
    :Start traffic

         1 — 1       TRAFFIC        --------------->
                                    <---------------   1 — 1       TRAFFIC
    :Wait

    :Stop traffic
```

TEST DESCRIPTION

1.	Check that the signalling link becomes available.
2.	Check the reception and sending of variable length messages on the activated linkset from/to the SP at the other end of this linkset (and, in case of VAT, from/to other SP crossing the SP at the other end of this linkset).
3.	Check that, after the alignment, the level 2 does not send any message received before or during the deactivation.
4.	Check that all messages are correctly received (no loss of messages, no duplication and no missequencing).
5.	Stop traffic.
6.	Repeat the test with different SLC values.

TEST NUMBER: 1.2	PAGE: 1 of 1

REFERENCE: Q.704 § 3 Fig. 7, Fig. 36, Fig. 37, Fig. 38

TITLE: Signalling link management

SUBTITLE: Signalling linkset deactivation

PURPOSE: To remove from service a signalling linkset with 1 signalling link

PRE-TEST CONDITIONS: One signalling link (1-1) activated

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                              SP    B

   Link                              Link

   1 – 1           :Deactivate
```

TEST DESCRIPTION

1.	Check that the signalling linkset becomes unavailable.

TEST NUMBER: 1.3	PAGE: 1 of 1

REFERENCE: Q.704 § 3, 12.2.4.1 Fig. 7, Fig. 36, Fig. 37, Fig. 38

TITLE: Signalling link management

SUBTITLE: Signalling linkset activation

PURPOSE: To put into service a signalling linkset with 4 signalling links

PRE-TEST CONDITIONS: Signalling links deactivated

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                              SP    B

        Link                              Link

                                          1 — 1              :Activate
        1 — 1         :Activate
                                          1 — 2              :Activate
        1 — 2         :Activate
                                          1 — 3              :Activate
        1 — 3         :Activate
                                          1 — 4              :Activate
        1 — 4         :Activate
:Start traffic

        1 — 1       TRAFFIC     ---------------->
                                <----------------  1 — 1      TRAFFIC
        1 — 2       TRAFFIC     ---------------->
                                <----------------  1 — 2      TRAFFIC
        1 — 3       TRAFFIC     ---------------->
                                <----------------  1 — 3      TRAFFIC
        1 — 4       TRAFFIC     ---------------->
                                <----------------  1 — 4      TRAFFIC
:Wait

:Stop traffic
```

Note — This test describes the activation of a linkset. The signalling link activation order is given simultaneously to all signalling links of the signalling linkset (Q.704 § 12.2.4.1). However, depending on in which order the links are getting aligned, changeback procedures will be performed. This test does not describe the transitory states (changeback procedure is checked in other tests).

TEST DESCRIPTION

1.	Check that the signalling links become available and start traffic between A and B (and A and C in VAT).
2.	Check the reception and sending of variable length messages on the activated linkset from/to the SP at the other end of this linkset (and, in case of VAT, from/to other SP crossing the SP at the other end of this linkset).
3.	Check that, after the alignment, the level 2 does not send any message received before or during the deactivation.
4.	Check that all messages are correctly received (no loss of messages, no duplication and no missequencing).
5.	Stop traffic.

TEST NUMBER: 2.1	PAGE: 1 of 1

REFERENCE: Q.704 § 3 Fig. 24 § 2.4

TITLE: Signalling message handling

SUBTITLE: Message received with an invalid SSF (discrimination function)

PURPOSE: To check the response to a message with an invalid SSF

PRE-TEST CONDITIONS: Signalling linkset activated

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                                    SP    B

        Link                                      Link

                                <---------------    1 - 1      :Invalid SLTM
                                                               (invalid SSF)
```

TEST DESCRIPTION

1.	Send an SLTM with an erroneous SSF.
2.	Check that no response is received.

TEST NUMBER: 2.2	PAGE: 1 of 1

REFERENCE: Q.704 § 2 Fig. 24, Fig. 26

TITLE: Signalling message handling

SUBTITLE: Message received with an invalid DPC

PURPOSE: To check the response to a message with an invalid DPC

PRE-TEST CONDITIONS: Signalling linkset activated

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                              SP    B

        Link                               Link

                          <--------------  1 — 1         :Invalid ECO
                                                         (erronenous DPC)

          1 — 1      TFP   -------------->  (only if the tested point A has an STP function)
```

TEST DESCRIPTION

1.	Send a ECO message with an erroneous DPC.
2.	Check that no response is received if the tested point has not STP function. If the tested point has the STP function, check that a TFP is received.

TEST NUMBER: 2.3	PAGE: 1 of 1

REFERENCE: Q.704 § 2.4 Fig. 24, Fig. 25

TITLE: Signalling message handling

SUBTITLE: Message received with an erroneous SI (distribution function)

PURPOSE: To check the response to a message received with an erroneous SI

PRE-TEST CONDITIONS: Signalling linkset activated

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                SP    A                                     SP    B

        Link                                       Link

                            <--------------    1 ─ 1    :invalid SLTM
                                                        (invalid SI)
```

TEST DESCRIPTION

1.	Send an SLTM message with an invalid SI.
2.	Check that no response is received.

MTP LEVEL 3

TEST NUMBER: 2.4.1	PAGE: 1 of 1

REFERENCE: Q.704 Fig. 26; §2.3   Q.705 § 4.4

TITLE: Signalling message handling

SUBTITLE: Load sharing within a linkset — all links available

PURPOSE: To check the load sharing within a linkset with all the links available

PRE-TEST CONDITIONS: Signalling linkset activated

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                                      SP    B

      Link                                    Link
:Start traffic

      1 — 1      TRAFFIC      --------------->
                             <--------------    1 — 1      TRAFFIC
      1 — 2      TRAFFIC      --------------->
                             <--------------    1 — 2      TRAFFIC
      1 — 3      TRAFFIC      --------------->
                             <--------------    1 — 3      TRAFFIC
      1 — 4      TRAFFIC      --------------->
                             <--------------    1 — 4      TRAFFIC
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B (and C in VAT) for all SLS.
2.	Stop traffic, check that the messages have been transmitted on the correct link in accordance with the SLS field.
3.	Check that there was no loss of messages, no duplication and no missequencing.

TEST NUMBER: 2.4.2	PAGE: 1 of 1

REFERENCE: Q.704 Fig. 26; § 2.3 Q.705 § 4.4

TITLE: Signalling message handling

SUBTITLE: Load sharing within a linkset — one link unavailable

PURPOSE: To check the load sharing within a linkset when one link is unavailable

PRE-TEST CONDITIONS: Signalling link 1 — 3 deactivated

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                  SP     A                                    SP     B

       Link                                        Link
:Start traffic

          1 — 1      TRAFFIC        ---------------->
                                    <---------------     1 — 1      TRAFFIC
          1 — 2      TRAFFIC        ---------------->
                                    <---------------     1 — 2      TRAFFIC
          1 — 4      TRAFFIC        ---------------->
                                    <---------------     1 — 4      TRAFFIC
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start the traffic to B and C for all SLS, wait and stop.
2.	Check that the messages have been transmitted on the correct link in accordance with the SLS field on the remaining links.

TEST NUMBER: 2.5.1	PAGE: 1 of 1

REFERENCE: Q.704 Fig. 26; § 2.3   Q.705 § 4.4

TITLE: Signalling message handling

SUBTITLE: Load sharing between linksets — between two linksets

PURPOSE: To check the load sharing between two linksets under normal conditions

PRE-TEST CONDITIONS: All linksets and routes available

CONFIGURATION: B	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
          SP    A                    SP    B                   SP    C              SP    E

      Link                      Link                  Link                    Link
  :Start traffic

      3 — 1      TRAFFIC    ----------------------->   7 — 1    ------------>
                            <-----------------------   3 — 1    <-----------   7 — 1       TRAFFIC
      3 — 2      TRAFFIC    ----------------------->   7 — 1    ------------>
                            <-----------------------   3 — 2    <-----------   7 — 1       TRAFFIC
      2 — 1      TRAFFIC    -------->   6 — 1    ----------------------------------->
      2 — 2      TRAFFIC    -------->   6 — 1    ----------------------------------->
  :Wait

  :Stop traffic
```

	TEST DESCRIPTION
1.	Start the traffic to E for all SLS.
2.	Stop the traffic and check that the messages have been transmitted on the correct linkset in accordance with the SLS and DPC.
3.	Check that there was no loss of messages, no duplication and no missequencing.

TEST NUMBER: 2.5.2	PAGE: 1 of 1

REFERENCE: Q.704 Fig. 26; § 2.3   Q.705 § 4.4

TITLE: Signalling message handling

SUBTITLE: Load sharing between linksets — between three linksets

PURPOSE: To check the load sharing between three linksets under normal conditions

PRE-TEST CONDITIONS: All linksets and routes available

CONFIGURATION: B	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
        SP    A              SP    B              SP    C              SP    D

     Link                    Link          Link                    Link

   :Start traffic

    1 — 1      TRAFFIC    ------------------------------------------------------->
                         <------------------------------------------------------ 1 — 1      TRAFFIC

    1 — 2      TRAFFIC    ------------------------------------------------------->
                         <------------------------------------------------------ 1 — 2      TRAFFIC

    3 — 1      TRAFFIC    ------------------------------------>  8 — 1  ------------->

    3 — 2      TRAFFIC    ------------------------------------>  8 — 1  ------------->

    2 — 1      TRAFFIC    --------->  5 — 1  ------------------------------------->

    2 — 2      TRAFFIC    --------->  5 — 1  ------------------------------------->

   :Wait

   :Stop traffic
```

TEST DESCRIPTION

1.	Start the traffic to D for all SLS.
2.	Stop the traffic and check that the messages have been transmitted on the correct linkset and on the correct link in accordance with the SLS.
3.	Check that there was no loss of messages, no duplication and no missequencing.

Focus

TEST NUMBER: 2.5.3	PAGE: 1 of 1

REFERENCE: Q.704 Fig. 26; § 2.3   Q.705 § 4.4

TITLE: Signalling message handling

SUBTITLE: Load sharing between linksets — between three linksets and one route unavailable

PURPOSE: To check the load sharing between three linksets when one route is unavailable

PRE-TEST CONDITIONS: Linksets 4 and 8 unavailable (TFP, PC = D from C to A)

CONFIGURATION: B	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
        SP    A                SP    B            SP    C            SP    D

   Link                      Link              Link              Link
:Start traffic

  1 — 1      TRAFFIC    ------------------------------------------------->
                        <-----------------------------------------------    1 — 1       TRAFFIC
  1 — 2      TRAFFIC    ------------------------------------------------->
                        <-----------------------------------------------    1 — 2       TRAFFIC
  2 — 1      TRAFFIC    -------->   5 — 1    ----------------------------->
  2 — 2      TRAFFIC    -------->   5 — 1    ----------------------------->
:Wait
:Stop traffic
```

TEST DESCRIPTION	
1.	Start the traffic for all SLS, wait and stop.
2.	Check that the traffic to D via C has been shared on the remaining linksets.

TEST NUMBER: 2.5.4	PAGE: 1 of 1

REFERENCE: Q.704 Fig. 26; § 2.3   Q.705 § 4.4

TITLE: Signalling message handling

SUBTITLE: Load sharing between linksets – between three linksets and one linkset unavailable

PURPOSE: To check the load sharing between two linksets after the unavailability of the third linkset

PRE-TEST CONDITIONS: Linkset 1 deactivated

CONFIGURATION: B	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
        SP    A              SP    B              SP    C              SP    D

     Link                    Link                Link                Link

  :Start traffic

     3 — 1     TRAFFIC    ----------------------------->  8 — 1   ------------->
     3 — 2     TRAFFIC    ----------------------------->  8 — 1   ------------->
     2 — 1     TRAFFIC    --------->  5 — 1   ----------------------------------->
                          <---------  2 — 1   <----------------------------------  5 — 1    TRAFFIC
     2 — 2     TRAFFIC    --------->  5 — 1   ----------------------------------->
                          <---------  2 — 2   <----------------------------------  5 — 1    TRAFFIC

  :Wait

  :Stop traffic
```

TEST DESCRIPTION

1.	Start the traffic for all SLS to D, wait and stop.
2.	Check that the traffic has been shared on the remaining linksets.

TEST NUMBER: 2.6.1		PAGE: 1 of 1
REFERENCE: Q.704 Fig. 26		
TITLE: Signalling message handling		
SUBTITLE: Inaccessible destination — due to a linkset failure		
PURPOSE: To check the signalling message handling when a destination becomes inaccessible due to a linkset failure		
PRE-TEST CONDITIONS: Signalling linkset with one link available		
CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                 SP    A                                      SP    B

      Link                                   Link
:Start traffic

      1 — 1      TRAFFIC        ---------------->
                               <---------------     1 — 1      TRAFFIC
      1 — 1                :Deactivate
```

TEST DESCRIPTION	
1.	Start the traffic for all SLS to B and C.
2.	Deactivate the last link 1 — 1 and check that the linkset becomes unavailable.
3.	Check that the SPs B and C become inaccessible.
4.	Check that all messages stored or received after the unavailability of the linkset are discarded.

TEST NUMBER: 2.6.2	PAGE: 1 of 1

REFERENCE: Q.704 Fig. 26

TITLE: Signalling message handling

SUBTITLE: Inaccessible destination — due to a route failure

PURPOSE: To check the signalling message handling when a destination becomes inaccessible on reception of a TFP.

PRE-TEST CONDITIONS: All links and routes available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                  SP    A                                    SP    B

        Link                                     Link
:Start traffic

    1 — 1       TRAFFIC        ---------------->
                              <----------------    1 — 1       TRAFFIC
    1 — 2       TRAFFIC        ---------------->
                              <----------------    1 — 2       TRAFFIC
    1 — 3       TRAFFIC        ---------------->
                              <----------------    1 — 3       TRAFFIC
    1 — 4       TRAFFIC        ---------------->
                              <----------------    1 — 4       TRAFFIC
                              <----------------    1 — X       TFP, PC = C
```

TEST DESCRIPTION

1.	Start the traffic to B and C for all SLS.
2.	Provoke the sending of a TFP (PC = C) from SP B to SP A.
3.	Check that the SP C becomes inaccessible.
4.	Stop traffic.
5.	Check that all messages stored or received after the inaccessibility have been discarded.
6.	Check that traffic to B has not been disturbed.

TEST NUMBER: 2.6.3	PAGE: 1 of 1

REFERENCE: Q.704 Fig. 26

TITLE: Signalling message handling

SUBITLE: Inaccessible destination — due to a linkset and a route failure

PURPOSE: To check the signalling message handling when a destination becomes inaccessible due to a linkset and a route failure

PRE-TEST CONDITIONS: Linkset 4 unavailable

CONFIGURATION: B	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                   SP    A                          SP    B          SP    C

        Link                            Link              Link
:Start traffic

    1 — 1, 2      TRAFFIC       <------------------------------------------------>   SP  D
       3 — 1      TRAFFIC       ------------------------------------>  To D and E
                                <----------------------------------  3 — 1  TRAFFIC (from E)
       3 — 2      TRAFFIC       ------------------------------------>  To D and E
                                <----------------------------------  3 — 2  TRAFFIC (from E)
       2 — 1      TRAFFIC       ----------------->      To D and E
       2 — 2      TRAFFIC       ----------------->      To D and E

                                                                      7 — 1          :Deactivate
                                <----------------------------------  3 — X  TFP, PC = E
       2 — 1      TRAFFIC       ----------------->  To D and E
                                <---------------  2 — 1 TRAFFIC
                                                  (from E)
       2 — 2      TRAFFIC       ----------------->  To D and E
                                <---------------  2 — 2 TRAFFIC
                                                  (from E)
       2 — 1                    :Deactivate
       2 — 2                    :Deactivate
    1 — 1, 2      TRAFFIC       <------------------------------------------------>   SP  D
:Wait

:Stop traffic
```

Note — The transitory states (signalling network management procedures) are not described in this test which checks only the signalling message handling.

TEST DESCRIPTION

1.	Start the traffic to the SPs D and E for all SLS.
2.	Initiate the sending of a TFP (DPC = E) from SP C to SP A, check that the traffic to E is routed via B and check that the traffic to D is not disturbed.
3.	Deactivate the linkset 2 and check that the destination E becomes inaccessible. Stop traffic.
4.	Check that all messages stored or received during the inaccessibility have been discarded.

TEST NUMBER: 2.7	PAGE: 1 of 1

REFERENCE: Q.704 § 2 Fig. 26

TITLE: Signalling message handling

SUBTITLE: Message transfer function

PURPOSE: To test the transfer function in an STP

PRE-TEST CONDITIONS: All links available

CONFIGURATION: C	TYPE OF TEST: VAT, CPT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
              SP    B                        SP    A          SP    C

       Link                            Link                 Link
:Start traffic

    1 — 1, 2      TRAFFIC      ----------->   2 — 1   ----------->
                               <-----------   1 — 1, 2  <-----------      TRAFFIC
```
:Wait

:Stop traffic

Note — The traffic used in this test is in conformance with the traffic model presented in Recommendation Q.706.

TEST DESCRIPTION

1.	Start traffic between B and C in both directions via A.
2.	Check that transfer function is correctly performed.
3.	Stop traffic and check that there were no loss of messages, no duplication and no missequencing. Check that the information field of these messages has not been corrupted.

TEST NUMBER: 3.1	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Changeover initiated at one side of a linkset (COO <-> COA)

PURPOSE: To check the normal changeover procedure

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                                SP    B

        Link                                  Link
:Start traffic

        1 - 1      TRAFFIC         --------------->
                                   <--------------    1 - 1    TRAFFIC

        1 - 2      TRAFFIC         --------------->
                                   <--------------    1 - 2    TRAFFIC

        1 - 1      :Deactivate (MML command or failure)
        1 - 2      COO, SLC 1 - 1  --------------->
                                   <--------------    1 - 2    COA, SLC 1 - 1

        1 - 2      TRAFFIC         --------------->
                   (from 1 - 1)
                                   <--------------    1 - 2    TRAFFIC
                                                               (from 1 - 1)
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on all the links.
2.	Deactivate link 1 - 1, check that a COO is sent (from A) for 1 - 1 on 1 - 2 and respond with a COA within T2.
3.	Check that the time between the deactivation and the sending of the COO is inside the specified value (see Q.706).
4.	Check that the traffic from link 1 - 1 is changed over to 1 - 2 and check that the traffic normally carried by 1 - 2 is passed over to 1 - 2.
5.	Stop traffic and check it has been received correctly (no lost messages no duplication and no missequencing).
6.	Repeat the test by sending the COO from B (instead of A). In addition, check that the time between the reception of the COO and the sending of the COA is inside the specified value (see Q.706).

TEST NUMBER: 3.2	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Changeover initiated at both ends at the same time (COO <-> COO)

PURPOSE: To check the changeover procedure when the changeover is initiated at the both ends simultaneously

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                 SP     A                              SP     B


        Link                              Link
:Start traffic

    1 - 1      TRAFFIC        -------------->
                             <--------------     1 - 1      TRAFFIC
    1 - 2      TRAFFIC        -------------->
                             <--------------     1 - 2      TRAFFIC
    1 - 1         :Deactivate (MML command or failure)
    1 - 2      COO (SLC 1 - 1)  -------------->
                             <--------------     1 - 2      COO (SLC 1 - 1)
    1 - 2      COA (SLC 1 - 1)  -------------->
                             <--------------     1 - 2      COA (SLC 1 - 1)
    1 - 2      TRAFFIC        -------------->
               (from 1 - 1)
                             <--------------     1 - 2      TRAFFIC
                                                            (from 1 - 1)
:Wait

:Stop traffic
```

TEST DESCRIPTION	
1.	Start the traffic to B and C on all the links.
2.	Deactivate the link 1 − 1, check that the COOs and COAs for 1 − 1 are received on link 1 − 2.
3.	Check that the traffic from link 1 − 1 changed over to 1 − 2 and stop traffic.
4.	Repeat the test without sending of COA from SP B to SP A

TEST NUMBER: 3.3	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Changeover on expiration of timer T2 (COO or ECO -> -)

PURPOSE: To check the changeover procedure when no COA is received in response of a COO previously sent

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                 SP    A                                    SP    B

        Link                                    Link
:Start traffic

        1 - 1      TRAFFIC          --------------->
                                    <---------------   1 - 1     TRAFFIC
        1 - 2      TRAFFIC          --------------->
                                    <---------------   1 - 2     TRAFFIC

        1 - 1          :Deactivate (MML command or failure)
        1 - 2      COO, SLC 1 - 1   --------------->

                   |
                   | T2
                   |

        1 - 2      TRAFFIC          --------------->
                   (from 1 - 1)
                                    <---------------   1 - 2     TRAFFIC (from 1 - 1)
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on all the links.
2.	Deactivate link 1 - 1, check that a COO is received for 1 - 1 on link 1 - 2.
3.	After the expiration of T2, check that the changeover procedure is performed.
4.	Check that the duration of T2 is inside the specified range.
5.	Stop traffic and check that there was no duplication and no missequencing, some messages may be lost as the system should not perform retreival.
6.	Repeat the test but replacing COO by ECO.

TEST NUMBER: 3.4	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Unreasonable FSN in COO/COA

PURPOSE: To check the changeover procedure on reception of a COO/COA containing an unreasonable FSN

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                                    SP    B


          Link                                      Link
:Start traffic

     1 - 1       TRAFFIC          --------------->
                                  <--------------    ·   1 - 1       TRAFFIC

     1 - 2       TRAFFIC          --------------->
                                  <--------------        1 - 2       TRAFFIC

     1 - 1          :Deactivate (MML command or failure)
     1 - 2       COO, SLC 1 - 1   --------------->
                                  <--------------        1 - 2       COA, SLC 1 - 1
                                                                     (unreasonable FSN)

   ? 1 - 2       TRAFFIC          --------------->
                 (from 1 - 1)
                                  <--------------        1 - 2       TRAFFIC (from 1 - 1)
:Wait

:Stop traffic
```

TEST DESCRIPTION	
1.	Start traffic to B and C on all the links.
2.	Deactivate link 1 - 1, check that a COO is received for 1 - 1 on link 1 - 2 and respond within T2 with a COA containing an unreasonable FSN.
3.	Stop traffic, check that the changeover procedure has been performed.
4.	Check that there was no duplication and no missequencing. Some messages may be lost as the system should not perform retreival.
5.	Check that an indication is given by the system.
6.	Repeat the test with a COO sent from B (instead COA) containing an unreasonable FSN.

TEST NUMBER: 3.5	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: changeover

SUBTITLE: Reception of a changeover acknowledgement without sending a changeover order (- <- COA or ECA)

PURPOSE: To check the changeover procedure on reception of an unexpected changeover acknowledgement

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP     A                                    SP     B

          Link                                       Link
:Start traffic

     1 - 1        TRAFFIC         ---------------->
                                  <---------------   1 - 1        TRAFFIC
     1 - 2        TRAFFIC         ---------------->
                                  <---------------   1 - 2        TRAFFIC
                                  <---------------   1 - 2        COA, SLC 1 - 1
     1 - 1        TRAFFIC         ---------------->
                                  <---------------   1 - 1        TRAFFIC
     1 - 2        TRAFFIC         ---------------->
                                  <---------------   1 - 2        TRAFFIC
:Wait
:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on all the links.
2.	Send a COA for 1 - 1 on link 1 - 2, check that this message is ignored.
3.	Stop traffic and check that it has been received correctly.
4.	Repeat the test with an ECA instead of a COA.

TEST NUMBER: 3.6	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Reception of an additional changeover order (- <- COO or ECO)

PURPOSE: To check the action of the system when a changeover order relating to a particular link is received after completion of changeover

PRE – TEST CONDITIONS: Linkset with the link 1 – 2 available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                 SP    A                                        SP    B


        Link                                       Link

:Start traffic

        1 - 2         TRAFFIC            ---------------->
                                         <---------------   1 - 2      TRAFFIC
                                         <---------------   1 - 2      COO, SLC 1 - 1
        1 - 2      ECA, SLC 1 - 1        ---------------->
        1 - 2         TRAFFIC            ---------------->
                                         <---------------   1 - 2      TRAFFIC
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 – 2.
2.	Send a COO for 1 – 1 on link 1 – 2 and check that an ECA is received in T2.
3.	Stop traffic and check that it has been received correctly.
4.	Check that an indication is given by the system.
5.	Repeat the test with an ECO instead of a COO.

TEST NUMBER: 3.7	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Emergency changeover at one side of a linkset (COO <-> ECA)

PURPOSE: To check the emergency changeover procedure when a COO is acknowledged by an ECA

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                SP     A                                      SP     B


        Link                                      Link
:Start traffic

    1 — 1       TRAFFIC           --------------->
                                  <--------------   1 — 1       TRAFFIC
    1 — 2       TRAFFIC           --------------->
                                  <--------------   1 — 2       TRAFFIC

    1 — 1       :Deactivate (MML command or failure)
    1 — 2       COO, SLC 1 — 1    --------------->
                                  <--------------   1 — 2       ECA, SLC 1 — 1

                                  <--------------   1 — 2       TRAFFIC (from 1 — 1)
    1 — 2       TRAFFIC           --------------->
                (from 1 — 1)
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on all links.
2.	Check the sending of a COO (from A) for 1 — 1 on 1 — 2 and check that an ECA is sent inside T2.
3.	Check that the traffic is changed over from 1 — 1 to 1 — 2.
4.	Stop traffic and check that it has been received correctly; no duplication and no missequencing. Some messages may be lost as the system should not perform retreival.
5.	Repeat the test by sending COO from B (instead of A).

TEST NUMBER: 3.8	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Emergency changeover at one side of a linkset (COO <-> ECO)

PURPOSE: To check the emergency changeover procedure when a COO is acknowledged by an ECO

PRE-TEST CONDITIONS: Linkset with two available links.

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                              SP    B

        Link                              Link
:Start traffic

        1 - 1       TRAFFIC        ---------------->
                                   <---------------   1 - 1   TRAFFIC
        1 - 2       TRAFFIC        ---------------->
                                   <---------------   1 - 2   TRAFFIC
        1 - 1       :Deactivate (MML command or failure)
        1 - 2       COO, SLC 1 - 1 ---------------->
                                   <---------------   1 - 2   ECO, SLC 1 - 1
        1 - 2       COA, SLC 1 - 1 ---------------->
        1 - 2       TRAFFIC        ---------------->
                    (from 1 - 1)
                                   <---------------   1 - 2   TRAFFIC (from 1 - 1)
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on all links.
2.	Check the sending of a COO (from A) for 1 − 1 on 1 − 2 and check that an ECO is sent (before T2 expires) and a COA is received.
3.	Check that the traffic is changed over from 1 − 1 to 1 − 2.
4.	Stop traffic and check that it has been received correctly; no duplication and no missequencing. Some messages may be lost as the system should not perform retreival.
5.	Repeat the test but send COO from B (instead of A).

TEST NUMBER: 3.9	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Emergency changeover at one side of a linkset (ECO <-> COA)

PURPOSE: To check the emergency changeover procedure when an ECO is acknowledged by a COA

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                 SP    A                                    SP    B

        Link                                    Link
:Start traffic

         1 - 1      TRAFFIC          --------------->
                                     <--------------   1 - 1      TRAFFIC
         1 - 2      TRAFFIC          --------------->
                                     <--------------   1 - 2      TRAFFIC
         1 - 1      :Deactivate (failure)
         1 - 2      ECO, SLC 1 - 1   --------------->
                                     <--------------   1 - 2      COA, SLC 1 - 1
                                     <--------------   1 - 2      TRAFFIC (from 1 - 1)
         1 - 2      TRAFFIC          --------------->
                    (from 1 - 1)
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on all links.
2.	Check that an ECO is received for 1 − 1 on 1 − 2 and that a COA is sent before T2 expires.
3.	Check that traffic is changed over from 1 − 1 to 1 − 2.
4.	Stop traffic and check that it has been received correctly; no duplication and no missequencing, some messages may be lost as the system should not perform retreival.
5.	Repeat the test but send ECO from B (instead of A).

TEST NUMBER: 3.10	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Emergency changeover at one side of a linkset (ECO <-> ECA)

PURPOSE: To check the emergency changeover procedure when an ECO is acknowledged by an ECA

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                  SP    A                              SP    B

          Link                              Link
:Start traffic

      1 — 1      TRAFFIC        ---------------->
                               <---------------    1 — 1      TRAFFIC
      1 — 2      TRAFFIC        ---------------->
                               <---------------    1 — 2      TRAFFIC
      1 — 1          :Deactivate (failure)
      1 — 2      ECO, SLC 1 — 1   --------------->
                               <---------------    1 — 2      ECA, SLC 1 — 1
                               <---------------    1 — 2      TRAFFIC (from 1 — 1)
      1 — 2      TRAFFIC        ---------------->
                 (from 1 — 1)
:Wait

:Stop traffic
```

TEST DESCRIPTION	
1.	Start traffic to B and C on all links.
2.	Check that an ECO is received for 1 — 1 on 1 — 2 and that an ECA is sent before T2 expires.
3.	Check that traffic is changed over from 1 — 1 to 1 — 2.
4.	Stop traffic and check that it has been received correctly; no duplication and no missequencing. Some messages may be lost as the system should not perform retreival.
5.	Repeat the test but send ECO from B (instead of A).

TEST NUMBER: 3.11	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Emergency changeover at one side of a linkset (ECO <-> COO)

PURPOSE: To check the emergency changeover procedure when a COO is received in response to an ECO

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                              SP    B

        Link                             Link

:Start traffic

        1 - 1      TRAFFIC       ---------------->
                                 <----------------   1 - 1    TRAFFIC
        1 - 2      TRAFFIC       ---------------->
                                 <----------------   1 - 2    TRAFFIC
        1 - 1          :Deactivate (failure)
        1 - 2      ECO, SLC 1 - 1   ---------------->
                                 <----------------   1 - 2    COO, SLC 1 - 1
        1 - 2      ECA, SLC 1 - 1   ---------------->
        1 - 2      TRAFFIC        ---------------->
                   (from 1 - 1)
                                 <----------------   1 - 2    TRAFFIC (from 1 - 1)
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on all links.
2.	Check that an ECO is received for 1 - 1 on 1 - 2 and that a COO is sent before T2 expires and acknowledged with an ECA.
3.	Check that traffic is changed over from 1 - 1 to 1 - 2.
4.	Stop traffic and check that it has been received correctly; no duplication and no missequencing. Some messages may be lost as the system should not perform retrieval.
5.	Repeat the test but sent ECO from B (instead of A).

TEST NUMBER: 3.12	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Emergency changeover initiated at both ends at the same time (ECO <-> ECO)

PURPOSE: To check the emergency changeover procedure when it is initiated at the both ends simultaneously

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                SP    A                                    SP    B

        Link                                     Link
:Start traffic

     1 - 1      TRAFFIC          --------------->
                                 <--------------   1 - 1      TRAFFIC
     1 - 2      TRAFFIC          --------------->
                                 <--------------   1 - 2      TRAFFIC
     1 - 1        :Deactivate (failure)
     1 - 2      ECO, SLC 1 - 1   --------------->
                                 <--------------   1 - 2      ECO, SLC 1 - 1
     1 - 2      ECA, SLC 1 - 1   --------------->
                                 <--------------   1 - 2      ECA, SLC 1 - 1
     1 - 2      TRAFFIC          --------------->
                (from 1 - 1)
                                 <--------------   1 - 2      TRAFFIC (from 1 - 1)
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on all links.
2.	Check that an ECO is received for 1 — 1 on 1 — 2 and that an ECO is sent before T2 expires and acknowledged with ECA.
3.	Check that traffic is changed over from 1 — 1 to 1 — 2.
4.	Stop traffic and check that it has been received correctly; no duplication and no missequencing. Some messages may be lost as the system should not perform retrieval.
5.	Repeat the test without sending ECA from SP B to SP A.

TEST NUMBER: 3.13	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Reactivation of a link during a changeover procedure

PURPOSE: To check the changeover procedure when the link failure causing the changeover is removed during the procedure.

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                                    SP    B

        Link                                        Link
:Start traffic

       1 — 1        TRAFFIC          -------------->
                                     <--------------   1 — 1        TRAFFIC
       1 — 2        TRAFFIC          -------------->
                                     <--------------   1 — 2        TRAFFIC
       1 — 1            :Deactivate (failure)
       1 — 1            :Activate (end of failure)
:Wait
:Stop traffic
```

Note — This test will be performed if applicable (some systems may terminate the changeover procedure, then perform the changeback).

TEST DESCRIPTION

1.	Start traffic to B and C on all links.
2.	Deactivate the link 1 — 1 and reactivate this link immediately.
3.	Stop traffic and check that the changeover procedure has not been performed. Depending the time between the deactivation and the reactivation, a COO may be sent or not.
4.	Check that the traffic used the links 1 — 1 and 1 — 2 normally.

TEST NUMBER: 3.14	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Simultaneous changeover

PURPOSE: To check that the system can correctly handle simultaneous failures of several links

PRE-TEST CONDITIONS: Linkset with three available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                                      SP    B

         Link                                        Link
:Start traffic

     1 — 1     TRAFFIC          ---------------->
                                <---------------   1 — 1     TRAFFIC
     1 — 2     TRAFFIC          ---------------->
                                <---------------   1 — 2     TRAFFIC
     1 — 3     TRAFFIC          ---------------->
                                <---------------   1 — 3     TRAFFIC
  1 — 1, 1 — 2      :Deactivate (MML command or failure)
     1 — 3     COO, SLC 1 — 1   ---------------->
     1 — 3     COO, SLC 1 — 2   ---------------->
                                <---------------   1 — 3     COA, SLC 1 — 1
                                <---------------   1 — 3     COA, SLC 1 — 2
     1 — 3     TRAFFIC          ---------------->
               (from 1 — 1 and
               1 — 2)
                                <---------------   1 — 3     TRAFFIC
                                                             (from 1 — 1 and
                                                             1 — 2)
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on all links.
2.	Deactivate the links 1 — 1 and 1 — 2 simultaneously.
3.	Check that COOs are received on 1 — 3 for 1 — 1 and 1 — 2, and respond with COAs inside T2s. Check that traffic is changed over from 1 — 1 and 1 — 2 to 1 — 3.
4.	Stop traffic and check that it has been received correctly (no lost messages, no duplication and no missequencing).

TEST NUMBER: 3.15	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Changeover to several alternative links within a linkset

PURPOSE: To check the changeover porcedure when there are several alternative links

PRE-TEST CONDITIONS: Linkset with all links available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                   SP    A                                        SP    B

        Link                                         Link
:Start traffic

     1 - 1       TRAFFIC           --------------->
                                   <--------------    1 - 1       TRAFFIC
     1 - 2       TRAFFIC           --------------->
                                   <--------------    1 - 2       TRAFFIC
     1 - 3       TRAFFIC           --------------->
                                   <--------------    1 - 3       TRAFFIC
     1 - 4       TRAFFIC           --------------->
                                   <--------------    1 - 4       TRAFFIC

     1 - 1          :Deactivate (MML command or failure)
   1 - 2, 3 or 4  COO, SLC 1 - 1   --------------->
                                   <--------------  1 - 2, 3 or 4   COA, SLC 1 - 1
     1 - 2       TRAFFIC           --------------->
                 (from 1 - 1)
                                   <--------------    1 - 2       TRAFFIC (from 1 - 1)
     1 - 3       TRAFFIC           --------------->
                 (from 1 - 1)
                                   <--------------    1 - 3       TRAFFIC (from 1 - 1)
     1 - 4       TRAFFIC           --------------->
                 (from 1 - 1)
                                   <--------------    1 - 4       TRAFFIC (from 1 - 1)
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on all links.
2.	Deactivate the link 1 − 1 and check that the changeover is performed to links 1 − 2, 1 − 3 and 1 − 4.
3.	Stop traffic and check that it has been shared on the alternative links according to the load sharing policy of this linkset.
4.	Check that, for each destination and for each SLS, there was no lost messages, no duplication and no missequencing.

TEST NUMBER: 3.16	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Changeover to another linkset with adjacent SP accessible

PURPOSE: To check that the system performs changeover to an alternative route when the last link of a linkset becomes unavailable

PRE-TEST CONDITIONS: Linkset 1 and link 3 − 1 unavailable

CONFIGURATION: B	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
        SP    A              SP    B              SP    C              SP    ●

     Link                 Link                Link                 Link

:Start traffic

  3 − 2   TRAFFIC    ------------------------->  7 − 1  ------------>            SP   E
                                                 8 − 1  <------------            SP   D

                     <----------------------- 3 − 2  <-----------  7 − 1        SP   E
  2 − 1, 2  TRAFFIC  -------->  6 − 1  ------------------------------->          SP   E
                               5 − 1  ------------------------------->          SP   D
                     <-------- 2 − 1, 2  <-----------------------------  5 − 1   SP   D
  3 − 2    :Deactivate (MML command or failure)

  2 − X    COO, SLC  -------->  4 − 1  -------->
           3 − 2

                     <-------- 2 − X  <--------4 − 1 COA, SLC 3 − 2

  2 − 1, 2  TRAFFIC  -------->  6 − 1  ------------------------------->          SP   E
           (from 3 − 2)        5 − 1  ------------------------------->          SP   D
                     <-------- 2 − 1, 2  <-----------------------------  5 − 1   SP   D
                     <-------- 2 − 1, 2  <-----------------------------  6 − 1   SP   E

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to E (and D in VAT).
2.	Deactivate link 3 − 2 and check that a COO (for 3 − 2) is sent from A to C via B and that a COA (from 3 − 2) is sent from C to A via B within T2.
3.	Stop traffic and check that it has been shared on the alternative links 2 − 1 and 2 − 2 according to the load sharing rules of linkset 2.
4.	Check that, for each SLS, there was no lost messages, no duplication and no missequencing.
5.	Repeat the test but replace COO with ECO (some messages may have been lost).

TEST NUMBER: 3.17	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Changeover to another linkset with adjacent SP inaccessible

PURPOSE: To check that the system responds correctly when there is no path between the ends of an unavailable link.

PRE-TEST CONDITIONS: Linkset 4 unavailable

CONFIGURATION: B	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
        SP    A              SP    B             SP    C           SP    E

     Link                  Link               Link              Link

   :Start traffic

     2 — 1   TRAFFIC    --------->  6 — 1   ------------------------------>
     2 — 2   TRAFFIC    --------->  6 — 1   ------------------------------>
     3 — 1   TRAFFIC    -------------------------->  7 — 1   ------------>
                        <----------------------- 3 — 1   <----------- 7 — 1    TRAFFIC
     3 — 2   TRAFFIC    -----------------------> 7 — 1   ----------->
                        <----------------------- 3 — 2   <----------- 7 — 1    TRAFFIC

     2 — 1   :Deactivate (MML command or failure)
     2 — 2   :Deactivate (MML command or failure)

             |  T1
             |

     3 — 1   TRAFFIC    -----------------------> 7 — 1   ----------->
             (from 2 — 1, 2)
                        <----------------------- 3 — 1   <----------- 7 — 1    TRAFFIC
     3 — 2   TRAFFIC    -----------------------> 7 — 1   ----------->
             (from 2 — 1, 2)
                        <----------------------- 3 — 2   <----------- 7 — 1    TRAFFIC
   :Wait
   :Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to E on linkset 2 and 3.
2.	Deactivate the linkset 2.
3.	Check that traffic continues on linkset 3 at the expiration of T1.
4.	Stop traffic and check that it has been shared on links 3 — 1 and 3 — 2 according to the load sharing rules of the linkset 3.
5.	Check that the traffic has been received correctly. Some messages may have been lost but none should be missequenced or duplicated..
6.	Check that the duration of T1 is inside the specified range.

TEST NUMBER: 3.18	PAGE: 1 of 1

REFERENCE: Q.704 § 5 Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUBTITLE: Changeover to two linksets

PURPOSE: To check the changeover procedure when it is performed to several links pertaining to two linksets

PRE-TEST CONDITIONS: Link 1 − 1 unavailable, all other available

CONFIGURATION: B	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
        SP    A                 SP    B              SP    C              SP    D

    Link                      Link              Link                  Link

 :Start traffic

    1 − 2   TRAFFIC       ---------------------------------------------------->
                          <----------------------------------------------------  1 − 2      TRAFFIC
    1 − 2   :Deactivate (MML command or failure)

    2 − X   COO,          --------->   5 − 1   --------------------------------->
            SLC 1 − 2
    or 3 − X              ------------------------------>   8 − 1   ------------->
                          <---------   2 − X   <-------------------------------  5 − 1   COA,
                                                                                        SLC 1 − 2
    2 − 1   TRAFIC        --------->   5 − 1   --------------------------------->
            (from 1 − 2)
                          <---------   2 − X   <-------------------------------  5 − 1   TRAFIC
                                                                                        (from 1 − 2)
    2 − 2   TRAFIC        --------->   5 − 1   --------------------------------->
            (from 1 − 2)
    3 − 1   TRAFFIC       ----------------------------->   8 − 1   ------------->
            (from 1 − 2)
    3 − 2   TRAFFIC       ----------------------------->   8 − 1   ------------->
            (from 1 − 2)
 :Wait

 :Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to D.
2.	Deactivate the link 1 − 2 and check that a COO for 1 − 2 is sent to D via B or C and that a COA is sent from D to A via B or C inside T2.
3.	Stop traffic and check that it has been shared on the alternative links 2 − 1, 2 − 2, 3 − 1 and 3 − 2 according to the load sharing rules in A.
4.	Check that, for each SLS, there were no lost messages, no duplication and no missequencing.
5.	Repeat the test but replace COO with ECO (some messages may have been lost).

TEST NUMBER: 3.19	PAGE: 1 of 1

REFERENCE: Q.704 § 5 ; 3.2.2

TITLE: Changeover

SUBTITLE: Changeover due to various reasons

PURPOSE: To check the interface L2-L3

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                              SP    B

        Link                              Link

:Start traffic

    1 — 1      TRAFFIC      ---------------->
                           <----------------   1 — 1      TRAFFIC
    1 — 2      TRAFFIC      ---------------->
                           <----------------   1 — 2      TRAFFIC

    1 — 1          :Deactivation due to various reasons (see Note)

               CHANGEOVER

    1 — 2      TRAFFIC      ---------------->
               (from 1 — 1)
                           <----------------   1 — 2      TRAFFIC (from 1 — 1)
:Wait

:Stop traffic
```

Note — The object of this test is to check the interface L2-L3 by invoking a changeover by the different means listed in Q.704 (§ 3.2.2). These reasons are: high error rate, expiration of timer T1, T2, T6 and T7 of L2, equipement failure, erroneous BSN or FIB, reception of SIOS, SIN, SIE, SIO and SIPO of L2, and management request. The goal of this test is not to check the changeover procedure itself, but only that the COO is generated for each of these reasons.

TEST DESCRIPTION	
1.	Start traffic to B and C on all links.
2.	Invoke the deactivation of the link 1 — 1 (see Note above).
3.	Check that traffic is changed over from 1 — 1 to 1 — 2.
4.	Stop traffic and check that it has been received correctly.
5.	Repeat the test for each reason.

TEST NUMBER: 3.20	PAGE: 1 of 1

REFERENCE: Q.704 § 5, Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUB TITLE: Changeover as compatibility test

PURPOSE: To check the changeover procedure as compatibility test

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                SP    A                              SP    B

            Link                              Link

:Start traffic

        1 — 1    TRAFFIC        ----------------------->
                               <----------------------    1 — 1    TRAFFIC
        1 — 2    TRAFFIC        ----------------------->
                               <----------------------    1 — 2    TRAFFIC

        1 — 1    :Deactivate (MML command or failure)

                 CHANGEOVER

        1 — 2    TRAFFIC (from 1 — 1)   ------------------------>
                               <----------------------    1 — 2    TRAFFIC (from 1 — 1)
:Wait

:Stop traffic
```

Note — In a compatibility test it is impossible to describe precisely the exchanges of changeover messages because the description depends of the type of deactivation of the link and of the time necessary to detect the deactivation.

TEST DESCRIPTION

1.	Start traffic to B on links 1 — 1 and 1 — 2.
2.	Deactivate link 1 — 1 and check that the changeover is performed.
3.	Check that the sequence of changeover messages conforms to one of the descriptions 3.1 to 3.12. Stop traffic.
4.	Repeat the test by invoking the different reasons listed in the note in test 3.19.

TEST NUMBER: 3.21	PAGE: 1 of 1

REFERENCE: Q.704 § 5, Fig. 28, Fig. 29, Fig. 30

TITLE: Changeover

SUB TITLE: Reception of a changeover order on an available link

PURPOSE: To check the changeover procedure on reception of a COO or ECO for a link in service

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                                          SP    B

         Link                                             Link

:Start traffic

      1 - 1    TRAFFIC              ----------------------->
                                    <---------------------    1 - 1    TRAFFIC
      1 - 2    TRAFFIC              ----------------------->
                                    <---------------------    1 - 2    TRAFFIC

                                    <---------------------    1 - 2    COO, SLC 1 - 1
                                                                       (FSN corresponding to the last
                                                                       received message)

      1 - 2    COA, SLC 1 - 1       ----------------------->

      1 - 2    TRAFFIC (from 1 - 1) ----------------------->
                                    <---------------------    1 - 2    TRAFFIC (from 1 - 1)
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on all the links.
2.	Send a COO from B to A for 1 - 1 on link 1 - 2 and check that the COA is received.
3.	Check that the link 1 - 1 becomes unavailable.
4.	Stop traffic and check that the changeover procedure has been performed.
5.	Check that there was no loss of messages, no duplication and no missequencing.
6.	Repeat the test but send an ECO (instead of a COO) and check that an ECA is received (instead of a COA). Some messages may be lost.

TEST NUMBER: 4.1	PAGE: 1 of 1

REFERENCE: Q.704 § 6,   Fig. 28, Fig. 29, Fig. 31

TITLE: Changeback

SUB TITLE: Changeback within a linkset

PURPOSE: To check that the changeback procedure is correctly performed on restoration of a link in a linkset

PRE-TEST CONDITIONS: Linkset with one available link (end of test 3.1)

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                                           SP    B

         Link                                             Link

    :Start traffic

         1 − 2    TRAFFIC              ------------------------->
                                       <------------------------   1 − 2    TRAFFIC

         1 − 1    :Activate (depending of the deactivation mean previously used)

         1 − 2    CBD, SLC 1 − 1       ------------------------->
                                       <------------------------   1 − X    CBA, SLC 1 − 1

         1 − 1    TRAFFIC (from 1 − 2) ------------------------->

                                       <------------------------   1 − 2    CBD, SLC 1 − 1
         1 − X    CBA, SLC 1 − 1       ------------------------->

                                       <------------------------   1 − 1    TRAFFIC (from 1 − 2)

         1 − 2    TRAFFIC              ------------------------->
                                       <------------------------   1 − 2    TRAFFIC

    :Wait

    :Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B (and C in VAT) on link 1 − 2.
2.	Activate the link 1 − 1 and check that it enters the correct in service state.
3.	Check that a CBD for SLC 1 − 1 is received and that traffic for link 1 − 1 is switched back after a CBA is sent.
4.	Stop traffic and check that it has been received correctly, no lost messages, no duplication and no missequencing.
5.	Continue the test by activating the link 1 − 3, then 1 − 4.
6.	As a compatibility test, repeat the test for several reasons chosen among those listed in test 4.10.

TEST NUMBER: 4.2	PAGE: 1 of 1

REFERENCE: Q.704   § 6,   Fig. 28, Fig. 29, Fig. 31

TITLE: Changeback

SUB TITLE: Additional CBA

PURPOSE: To check the actions of the system on reception of an additional CBA

PRE-TEST CONDITIONS: Linkset with all links available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                                    SP    B

        Link                                    Link

 :Start traffic

          ALL        TRAFFIC      ---------------------->

                                  <-----------------------   ALL        TRAFFIC

                                  <-----------------------   1 – X      CBA, SLC 1 – X

          ALL        TRAFFIC      ---------------------->

                                  <-----------------------   ALL        TRAFFIC

 :Wait

 :Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on all links.
2.	Send an unexpected CBA to A and check that this message is discarded without action on the traffic.
3.	Stop traffic.

TEST NUMBER: 4.3	PAGE: 1 of 1

REFERENCE: Q.704 § 6, Fig. 28, Fig. 29, Fig. 31

TITLE: Changeback

SUB TITLE: Additional CBD

PURPOSE: To check the action of the system on reception of an additional CBD

PRE-TEST CONDITIONS: Linkset with all links available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                SP     A                           SP     B

        Link                              Link

:Start traffic

        ALL       TRAFFIC        ------------------------->

                                 <------------------------  ALL       TRAFFIC

                                 <------------------------  1 - X     CBD, SLC 1 - X

        1 - X     CBA, SLC 1 - X  ------------------------>

        ALL       TRAFFIC         ------------------------>

                                 <------------------------  ALL       TRAFFIC


:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on all links.
2.	Send an unexpected CBD to A and check that a CBA is send back in response without impact on the traffic.
3.	Stop traffic and check that it has been received correctly.

TEST NUMBER: : 4.4	PAGE: 1 of 1

REFERENCE: Q.704 § 6, Fig. 28, Fig. 29, Fig. 31

TITLE: Changeback

SUB TITLE: No acknowledgement to first CBD

PURPOSE: To check that a second CBD is sent if the first is not acknowledged

PRE-TEST CONDITIONS: Linkset with one available link

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                                    SP    B

        Link                                      Link
:Start traffic

        1 — 2    TRAFFIC              --------------------------->
                                      <--------------------------     1 — 2    TRAFFIC
        1 — 1    :Activate
        1 — 2    CBD, SLC 1 — 1       --------------------------->

                 |
                 | T4
                 |

        1 — 2    CBD, SLC 1 — 1       --------------------------->
                                      <--------------------------     1 — X    CBA, SLC 1 — 1
        1 — 1    TRAFFIC (from 1 — 2)  --------------------------->
                                      <--------------------------     1 — 1    TRAFFIC (from 1 — 2,
                                                                               see note)
        1 — 2    TRAFFIC              --------------------------->
                                      <--------------------------     1 — 2    TRAFFIC
:Wait

:Stop traffic
```

Note — B may perform a changeback or not.

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 — 2.
2.	Activate link 1 — 1 and check that a CBD is received (no CBA in response).
3.	Check that after T4 a second CBD is received and CBA is sent in response before T5 expires.
4.	Check that the traffic is changed back on link 1 — 1.
5.	Stop traffic and check that there were no lost messages, no duplication and no missequencing.
6.	Check that the duration of T4 is inside the specified range.

TEST NUMBER: 4.5	PAGE: 1 of 1

REFERENCE: Q.704   § 6,   Fig. 28, Fig. 29, Fig. 31

TITLE: Changeback

SUB TITLE: No acknowledgement of repeat changeback declaration

PURPOSE: To check that traffic is changed back after a repeat changeback declaration is not acknowledged

PRE-TEST CONDITIONS: Linkset with one available link

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                  SP    A                                    SP    B

            Link                                      Link
   :Start traffic

            1 — 2    TRAFFIC          ------------------------>
                                      <------------------------   1 — 2    TRAFFIC

            1 — 1    :Activate
```
```
            1 — 2    CBD, SLC 1 — 1   ------------------------>

                     | T4

            1 — 2    CBD, SLC 1 — 1   ------------------------>

                     | T5

            1 — 1    TRAFFIC (from 1 — 2)  ------------------>
                                      <------------------------   1 — 1    TRAFFIC (from 1 — 2,
                                                                           see note)
            1 — 2    TRAFFIC          ------------------------>
                                      <------------------------   1 — 2    TRAFFIC
   :Wait

   :Stop traffic

   Note — B may perform a changeback or not.
```

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 — 2.
2.	Check that a CBD is received and not acknowledged.
3.	Check that after T4, a CBD is repeated and not acknowledged by a CBA.
4.	Check that after T5, the traffic is changed back on link 1 — 1.
5.	Stop traffic and check that there were no lost messages, no duplication and no missequencing.
6.	Check that an indication was given by the system (§ 6.2.3, Q. 704).
7.	Check that the duration of T5 is inside the specified range.

TEST NUMBER: 4.6	PAGE: 1 of 1

REFERENCE: Q.704 § 6, Fig. 28, Fig. 29, Fig. 31

TITLE: Changeback

SUB TITLE: Simultaneous changeback

PURPOSE: To check simultaneous changebacks of traffic onto two links

PRE-TEST CONDITIONS: Linkset with one available link (end of test 3.14)

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                 SP    A                                          SP    B

        Link                                          Link
:Start traffic

        1 - 3    TRAFFIC               ------------------------->
                                       <------------------------   1 - 3   TRAFFIC
        1 - 1    :Activate  (depending of the deactivation mean
        1 - 2    :Activate   previously used)

        1 - 3    CBD, SLC 1 - 1        ------------------------->
        1 - 3    CBD, SLC 1 - 2        ------------------------->
                                       <------------------------   1 - X   CBA, SLC 1 - 1
                                       <------------------------   1 - X   CBA, SLC 1 - 2

        1 - 1    TRAFFIC (from 1 - 3)  ------------------------->
                                       <------------------------   1 - 1   TRAFFIC (from 1 - 3,
                                                                           see note)
        1 - 2    TRAFFIC (from 1 - 3)  ------------------------->
                                       <------------------------   1 - 2   TRAFFIC (from 1 - 3,
                                                                           see note)
        1 - 3    TRAFFIC               ------------------------->
                                       <------------------------   1 - 3   TRAFFIC
:Wait

:Stop traffic
```

Note 1 — B may perform changebacks or not.

Note 2 — Changeback procedures may be performed in sequence. The traffic sequence presented here, after the changebacks, is the final situation.

TEST DESCRIPTION	
1.	Start traffic to B and C on link 1 — 3.
2.	Simultaneously activate links 1 — 1 and 1 — 2.
3.	Check that CBDs are received and CBAs are sent (within T4) for 1 — 1 and 1 — 2 and that the traffic is changed back on links 1 — 1 and 1 — 2.
4.	Stop traffic and check that there were no lost messages, no duplication and no missequencing.

TEST NUMBER: 4.7	PAGE: 1 of 1

REFERENCE: Q.704 § 6, Fig. 28, Fig. 29, Fig. 31

TITLE: Changeback

SUB TITLE: Changeback from several alternative links within a linkset

PURPOSE: To check the changeback procedure when it is performed to several links in a same linkset

PRE-TEST CONDITIONS: Linkset with one unavailable link (end of test 3.15)

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                  SP    A                                    SP    B

              Link                                       Link

:Start traffic

   1 - 2, 3, 4   TRAFFIC        ------------------------->
                               <------------------------    1 - 2, 3, 4   TRAFFIC

   1 - 1         :Activate   (depending of the deactivation mean previously used)

   1 - 2         CBD, SLC 1 - 1   ------------------------->
   1 - 3         CBD, SLC 1 - 1   ------------------------->
   1 - 4         CBD, SLC 1 - 1   ------------------------->
                               <------------------------    1 - X    CBA, SLC 1 - 1
                               <------------------------    1 - X    CBA, SLC 1 - 1
                               <------------------------    1 - X    CBA, SLC 1 - 1

   1 - 1         TRAFFIC        ------------------------->
                 (from 1 - 2, 3, 4)
                               <------------------------    1 - 1    TRAFFIC (from 1 - 2, 3, 4,
                                                                      see note)
   1 - 2, 3, 4   TRAFFIC        ------------------------->
                               <------------------------    1 - 2, 3, 4   TRAFFIC

:Wait

:Stop traffic

Note —  B may perform changebacks or not.
```

TEST DESCRIPTION

1.	Start traffic to B and C on links 1 - 2, 1 - 3 and 1 - 4.
2.	Activate link 1 - 1 and check that a CBD is sent on links 1 - 2, 1 - 3 and 1 - 4. Check that each CBD contains a different changeback code.
3.	Check that the traffic is changed back on link 1 - 1.
4.	Stop traffic and check that there were no lost messages, no duplication and no missequencing.

TEST NUMBER: 4.8	PAGE: 1 of 1

REFERENCE: Q.704 § 6, Fig. 28, Fig. 29, Fig. 31

TITLE: Changeback

SUB TITLE: Changeback from another linkset

PURPOSE: To check the changeback procedure when it is performed from another linkset

PRE-TEST CONDITIONS: Linksets 1 and 3 unavailable (end of test 3.16)

CONFIGURATION: B	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                        SP    B      SP    C            SP  ●
          Link                           Link         Link              Link
      :Start traffic

       2 − 1, 2    TRAFFIC        -----------> 5 − 1  -----------------------------> SP   D
                                               6 − 1  -----------------------------> SP   E
                                  <----------- 2 − 1, 2 <----------------------------- 5 − 1 SP   D
                                  <----------- 2 − 1, 2 <----------------------------- 6 − 1 SP   E
       3 − 2      :Activate   (depending of the deactivation mean previously used)
       2 − 1       CBD, SLC 3 − 2   -----------> 4 − 1  ----------->
       2 − 2       CBD, SLC 3 − 2   -----------> 4 − 1  ----------->
                                  <--------------------------------- 3 − 2    CBA, SLC 3 − 2
                                  <--------------------------------- 3 − 2    CBA, SLC 3 − 2
                                                       CHANGEBACK

       2 − 1, 2    TRAFFIC        -----------> 5 − 1  -----------------------------> SP   D
                                               6 − 1  -----------------------------> SP   E
                                  <----------- 2 − 1, 2 <----------------------------- 5 − 1 SP   D
       3 − 2      TRAFFIC        -----------------------------> 8 − 1  ---------> SP   D
                  (from 2 − X)                                 7 − 1  ---------> SP   E
      :Wait
      :Stop traffic
```

Note − After activation of link 3 − 2, CBDs are sent from C to A via B and acknowledged by A. These messages are not presented to simplify the test description.

TEST DESCRIPTION

1.	Start traffic to E (and D in VAT).
2.	Activate link 3 − 2 and check that CBDs are received and that CBAs are sent before T4 expires in A.
3.	Check that the traffic is changed back on linkset 3 in accordance with the load sharing rules in A.
4.	Stop traffic and check that there were no lost messages, no duplication and no missequencing.

TEST NUMBER: 4.9	PAGE: 1 of 1

REFERENCE: Q.704 § 6, Fig. 28, Fig. 29, Fig. 31

TITLE: Changeback

SUB TITLE: Changeback from two linksets

PURPOSE: To check the changeback procedure when it is performed from two linksets

PRE-TEST CONDITIONS: Linkset 1 unavailable (end of test 3.18)

CONFIGURATION: B	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
        SP    A                          SP   B        SP   C           SP   D

   Link                              Link          Link             Link

:Start traffic

   2 − 1   TRAFFIC       ------------>  5 − 1  ----------------------------------->
                         <------------  2 − 1  <---------------------------------- 5 − 1   TRAFFIC
   2 − 2   TRAFFIC       ------------>  5 − 1  ----------------------------------->
                         <------------  2 − 2  <---------------------------------- 5 − 1   TRAFFIC
   3 − 1   TRAFFIC       ------------------------------------>  8 − 1  ------------>
   3 − 2   TRAFFIC       ------------------------------------>  8 − 1  ------------>
   1 − 2   :Activate    (depending of the deactivation mean previously used)
   2 − 1   CBD, SLC 1 − 2  ---------->  5 − 1  ----------------------------------->
   2 − 2   CBD, SLC 1 − 2  ---------->  5 − 1  ----------------------------------->
   3 − 1   CBD, SLC 1 − 2  --------------------------------->  8 − 1  ------------>
   3 − 2   CBD, SLC 1 − 2  --------------------------------->  8 − 1  ------------>         CBAs
                          <------------  2 − X  <---------------------------------- 5 − 1   SLC 1 − 2
                          <------------  2 − X  <---------------------------------- 5 − 1   SLC 1 − 2
                          <------------  2 − X  <---------------------------------- 5 − 1   SLC 1 − 2
                          <------------  2 − X  <---------------------------------- 5 − 1   SLC 1 − 2
   1 − 2   TRAFFIC    (from linksets 2 and 3)  ----------------------------------->
                          <---------------------------------------------------- 1 − 2   TRAFFIC
                                                                                         (from linksets 5,
                                                                                          see note)
   2 − 1, 2  TRAFFIC       ---------->  5 − 1  ----------------------------------->
   3 − 1, 2  TRAFFIC       ------------------------------------>  8 − 1  ---------->
:Wait
:Stop traffic
Note − D may perform changebacks or not.
```

TEST DESCRIPTION

1.	Start traffic on linksets 2 and 3 to D.
2.	Activate the link 1 − 2 and check that CBDs are received and that CBAs are sent before T4 expires in A. Check that each CBD has a different changeback code.
3.	Check that the traffic is changed back to link 1 − 2 in accordance with the load sharing rules in A.
4.	Stop traffic and check that there were no lost messages, no duplication and no missequencing.

TEST NUMBER: 4.10	PAGE: 1 of 1

REFERENCE: Q.704 § 6, Fig. 28, Fig. 29, Fig. 31

TITLE: Changeback

SUB TITLE: Changeback due to various reasons

PURPOSE: To check the interface L2-L3

PRE-TEST CONDITIONS: Linkset with one available link (end of 3.19)

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                                    SP    B

        Link                                        Link

:Start traffic

        1 - 2    TRAFFIC             ------------------------->
                                     <------------------------  1 - 2    TRAFFIC

        1 - 1    :Activation due to various reasons (see Note)

        1 - 2    CBD, SLC 1 - 1      ------------------------->
                                     <------------------------  1 - 2    CBA, SLC 1 - 1

        1 - 1    TRAFFIC (from 1 - 2) ------------------------>
                                     <------------------------  1 - 2    CBD, SLC 1 - 1

        1 - X    CBA, SLC 1 - 1      ------------------------->
                                     <------------------------  1 - 1    TRAFFIC (from 1 - 2)

        1 - 2    TRAFFIC             ------------------------->
                                     <------------------------  1 - 2    TRAFFIC

:Wait

:Stop traffic
```

Note — The object of this test is to check the interface L2-L3 by provoking a changeback by different means listed in § 3 (Q.704). These reasons are: initial alignment procedure completed with success, processor outage condition has ceased at the remote signalling terminal and management request.

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 - 2.
2.	Provoke the activation of the link 1 - 1 (see Note above).
3.	Check that the traffic is changed back to 1 - 1.
4.	Stop traffic and check that it has been received correctly.
5.	Repeat the test for each reason.

TEST NUMBER: 4.11	PAGE: 1 of 1

REFERENCE: Q.704 § 6.4, Fig. 28, Fig. 29, Fig. 31

TITLE: Changeback

SUB TITLE: Time controlled diversion procedure

PURPOSE: To check the correct operation of the time controlled diversion procedure

PRE-TEST CONDITIONS: Linksets 1, 2 and 4 unavailable

CONFIGURATION: B	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                              SP    B              SP    C
      Link                        Link                          Link
:Start traffic
       3 − 1     TRAFFIC          ----------------------------->
                 (to D and E)
                                  <-----------------------------   3 − 1       TRAFFIC
                                                                                (from D and E)
       3 − 2     TRAFFIC          ----------------------------->
                 (to D and E)
                                  <-----------------------------   3 − 2       TRAFFIC
                                                                                (from D and E)
       2 − 1     :Activate (depending of the deactivation mean previously used)

                  │ T21
                  │
                  ┴               <------  2 − 1      TRA (see note 1)
       3 − 1, 2   TRAFFIC STOPPED

                  │ T3
                  │
       2 − 1      TRAFFIC         --------->
                 (from 3 − 1, 2)
                                  <------  2 − 1      TRAFFIC (from D, see note 2)
       3 − 1, 2   TRAFFIC         ----------------------------->
                                  <-----------------------------   3 − 1, 2    TRAFFIC (from E)
:Wait
:Stop traffic
```

Note 1 − If SP A is an STP, a TRA message is also sent from A to B after activation of link 2 − 1.

Note 2 − B performs the point restart procedure and D on reception of a TFA for A reroutes its traffic to A. These procedures are not presented to simplify the test description.

TEST DESCRIPTION

1.	Start traffic to E (and D in VAT) on linkset 3.
2.	Activate link 2 − 1.
3.	Check that T21 is started in A, and is stopped on reception of TRA from SP B (see notes).
4.	Check that traffic on linkset 3 ceased in A and that after expiration T3 traffic diverts to link 2 − 1 in accordance with the load sharing rules in A.
5.	Stop traffic and check that there were no lost messages, no duplication and no missequencing.
6.	Check that the duration of T3 is inside the specified range.
7.	Repeat the test (in VAT) without sending TRA from B to A and check that the time controlled diversion is performed when T21 expires.

TEST NUMBER: 5	PAGE: 1 of 1

REFERENCE: Q.704 § 7, Fig. 29, Fig. 32

TITLE: Forced rerouting

SUB TITLE:

PURPOSE: To check that the system can perform forced rerouting

PRE-TEST CONDITIONS: Linksets 1 and 4 unavailable

CONFIGURATION: B	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                        SP    B                    SP    C

         Link                    Link                          Link

:Start traffic

    2 — 1, 2     TRAFFIC        -----> to D and E
                                <----- 2 — 1, 2      TRAFFIC (from D)
    3 — 1, 2     TRAFFIC        ---------------------------->  to D and E
                                <---------------------------  3 — 1, 2    TRAFFIC (from E)

                                    6 — 1          :Deactivate
                                <----- 2 — X       TFP, PC = E
    3 — 1, 2     TRAFFIC        ---------------------------->
    (to D and from 2 — 1, 2 to E)

                                <---------------------------  3 — 1, 2    TRAFFIC (from E)
    2 — 1, 2     TRAFFIC        -----> to D
                                <----- 2 — 1, 2      TRAFFIC (from D)

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic on linksets 2 and 3 to E (and D in VAT).
2.	Deactivate the linkset 6 and check the sending of a TFP concerning E from B to A.
3.	Stop traffic and check that the forced rerouting has been performed correctly, messages may have been lost but not missequenced or duplicated.
4.	Check that the traffic to D carried by the linksets 2 and 3 has not been disturbed (no lost messages, no duplication and no missequencing).
5.	Check that an indication was given by the system.

TEST NUMBER: 6	PAGE: 1 of 1

REFERENCE: Q.704 § 8, Fig. 29, Fig. 33

TITLE: Controlled rerouting

SUB TITLE:

PURPOSE: To check that the system can perform controlled rerouting

PRE-TEST CONDITIONS: Linksets 1, 4 and 6 unavailable (end of test 5)

CONFIGURATION: B	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                      SP    B                  SP    C

         Link                        Link                     Link

:Start traffic

      3 — 1, 2    TRAFFIC      -------------------------->   to D and E
                              <--------------------------    3 — 1, 2    TRAFFIC (from E)

      2 — 1, 2    TRAFFIC      ----->  to D
                              <-----  2 — 1, 2   TRAFFIC (from D)
                                      6 — 1      :Activate
                              <-----  2 — X      TFA, PC = E


                     |
                     |
                     | T6
                     |
      2 — 1, 2    TRAFFIC      ----->
      (to D and from 3 — 1, 2 to E)

                              <-----  3 — 1, 2   TRAFFIC (from D)
      3 — 1, 2    TRAFFIC      -------------------------->
                              <--------------------------    3 — 1, 2    TRAFFIC (from E)

:Wait

:Stop traffic
```

TEST DESCRIPTION	
1.	Start traffic to E (and D in VAT).
2.	Activate the linkset 6 and check the sending of a TFA concerning E from B to A.
3.	Stop traffic and check that the controlled rerouting has been performed correctly (for all traffic flows, no lost messages, no duplication and no missequencing).
4.	Check that the duration of T6 is inside the specified range.

TEST NUMBER: 7.1.1	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Inhibition of a link — available link

PURPOSE: To check for the correct response when link inhibition is requested for an available link

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                                    SP    B

          Link                                       Link

:Start traffic

          1 — 1   TRAFFIC         ----------------------->
                                  <----------------------    1 — 1   TRAFFIC
          1 — 2   TRAFFIC         ----------------------->
                                  <----------------------    1 — 2   TRAFFIC

          1 — 1   :Request inhibition

          1 — X   LIN, SLC 1 — 1  ----------------------->
                                  <----------------------    1 — X   LIA, SLC 1 — 1

                  TIME—CONTROLLED CHANGEOVER (see note)

          1 — 2   TRAFFIC (from 1 — 1)  ----------------------->
                                  <----------------------    1 — 2   TRAFFIC (from 1 — 1)
:Wait

:Stop traffic
```

Note — A changeover is performed after the inhibition of link 1 — 1 but it is not described in this test which checks only the inhibition procedure.

TEST DESCRIPTION

1.	Start traffic to B (and C in VAT) on links 1 — 1 and 1 — 2.
2.	Initiate inhibition of link 1 — 1 and check that LIN is received and an LIA is received in A within T14.
3.	Check that the traffic normally carried by link 1 — 1 is transferred to link 1 — 2.
4.	Check that the link 1 — 1 enters in the "Local inhibiting" state.
5.	Repeat test in the reverse direction.

TEST NUMBER: 7.1.2	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Inhibition of a link - unavailable link

PURPOSE: To check for the correct response when link inhibition is requested for an unavailable link

PRE-TEST CONDITIONS: Linkset with one available link

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                                    SP    B

        Link                                       Link

:Start traffic

      1 — 1    TRAFFIC         ----------------------->
                              <-----------------------    1 — 1    TRAFFIC

      1 — 2    :Request inhibition

      1 — 1    LIN, SLC 1 — 2   ----------------------->
                              <-----------------------    1 — 1    LIA, SLC 1 — 2

      1 — 2    :Activate (depending of the deactivation mean previously used)

      1 — 1    TRAFFIC         ----------------------->
                              <-----------------------    1 — 1    TRAFFIC

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B (and C in VAT) on link 1 — 1.
2.	Request inhibition of link 1 — 2, check the reception of LIN at B and send LIA in response within T14.
3.	Check that the inhibition was performed.
4.	Activate link 1 — 2 and check that it stays in inhibited state.
5.	Stop traffic and check that it was not disturbed.
6.	Repeat test in reverse direction.

TEST NUMBER: 7.2.1	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Inhibition not permitted − local reject on available link

PURPOSE: To check the inhibition procedure in case of local reject on an available link

PRE-TEST CONDITIONS: Linkset with one available link

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                               SP    B

        Link                               Link

:Start traffic

        1 − 1   TRAFFIC       ------------------------>
                              <------------------------  1 − 1   TRAFFIC

        1 − 1   :Request inhibition

        1 − 1   TRAFFIC       ------------------------>
                              <------------------------  1 − 1   TRAFFIC

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B (and C in VAT) on link 1 − 1.
2.	Request inhibition of link 1 − 1 and check that this request is not permitted.
3.	Stop traffic and check that it has not been disturbed.
4.	Repeat the test but modify pre-test conditions as follows: link 1 − 1 available and link 1 − 2 inhibited by B.

TEST NUMBER: 7.2.2	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Inhibition not permitted — local reject on unavailable link

PURPOSE: To check the inhibition procedure in case of local reject on an unavailable link

PRE-TEST CONDITIONS: All links unavailable

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
          SP    A                                    SP    B


     Link                                       Link


      1 — 1     :Request inhibition
```

TEST DESCRIPTION

1.	Request inhibition of link 1 — 1 and check that it is rejected.

TEST NUMBER: 7.2.3	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Inhibition not permitted — sending of LID

PURPOSE: To check the reject of an inhibition asked on reception of an LIN

PRE-TEST CONDITIONS: Linkset with one available link

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
            SP    A                                    SP    B


       Link                                       Link

:Start traffic

       1 — 1    TRAFFIC          ------------------------->

                                 <------------------------   1 — 1    TRAFFIC

                                 <------------------------   1 — 1    LIN, SLC 1 — 1
       1 — 1    LID, SLC 1 — 1   ------------------------->

       1 — 1    TRAFFIC          ------------------------->
                                 <------------------------   1 — 1    TRAFFIC

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 — 1.
2.	Send an LIN, SLC 1 — 1 from B to A and check the reception of an LID.
3.	Check that the inhibition is not performed.
4.	Stop traffic and check that it has not been disturbed.

TEST NUMBER: 7.2.4	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Inhibition not permitted — reception of LID

PURPOSE: To check the reject of an inhibition asked on sending of an LIN

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                SP    A                                      SP    B

         Link                                         Link

:Start traffic

    1 — 1, 2    TRAFFIC        ------------------------->
                                <------------------------    1 — 1, 2    TRAFFIC

    1 — 1       :Request inhibition

    1 — X       LIN, SLC 1 — 1  ------------------------->
                                <------------------------    1 — X       LID, SLC 1 — 1

    1 — 1, 2    TRAFFIC         ------------------------->
                                <------------------------    1 — 1, 2    TRAFFIC

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on links 1 — 1 and 1 — 2.
2.	Request the inhibition of link 1 — 1 and check the reception of LIN and response with an LID before T14 expires in A.
3.	Check that the inhibition is not performed.
4.	Stop traffic and check that it was not disturbed.

TEST NUMBER: 7.3.1	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Expiration of T14 — available link

PURPOSE: To check that the inhibition procedure asked for an available link is restarted when T14 expires

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                  SP    A                                        SP    B
          Link                                          Link
:Start traffic

          1 — 1    TRAFFIC          ------------------------>
                                    <------------------------   1 — 1    TRAFFIC
          1 — 2    TRAFFIC          ------------------------>
                                    <------------------------   1 — 2    TRAFFIC
          1 — 1    :Request inhibition

          1 — X    LIN, SLC 1 — 1   ------------------------>


                   |
                   |  T14
                   |


          1 — X    LIN, SLC 1 — 1   ------------------------>

                                    <------------------------   1 — 1    LIA, SLC 1 — 1

                   TIME—CONTROLLED CHANGEOVER (see note)

          1 — 2    TRAFFIC (from 1 — 1)  --------------------->
                                    <------------------------   1 — 2    TRAFFIC (from 1 — 1)
:Wait
:Stop traffic
```

Note — A changeover is performed after the inhibition of link 1 — 1 but it is not described in this inhibition test.

TEST DESCRIPTION

1.	Start traffic to B and C on links 1 — 1 and 1 — 2.
2.	Request the inhibition of link 1 — 1, check that an LIN is received without response. Check that a new LIN is received after T14 expires and that an LIA is sent in response.
3.	Check that the inhibition is performed. Stop traffic and check that it was not disturbed.
4.	Repeat the test but without sending of an LIA. Check that after the second expiration of T14 the procedure is stopped.
5.	Check that the duration of T14 is inside the specified range.

TEST NUMBER: 7.3.2	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Expiration of T14 — unavailable link

PURPOSE: To check that the inhibition procedure asked for an unavailable link is restarted when T14 expires

PRE-TEST CONDITIONS: Linkset with one available link

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
               SP    A                                      SP    B

        Link                                        Link

:Start traffic

       1 — 1    TRAFFIC          ------------------------>
                                 <------------------------   1 — 1    TRAFFIC

       1 — 2    :Request inhibition

       1 — 1    LIN, SLC 1 — 2   ------------------------>

                  |
                  | T14
                  |

       1 — 1    LIN, SLC 1 — 2   ------------------------>
                                 <------------------------   1 — 1    LIA, SLC 1 — 2

       1 — 2    :Activate

       1 — 1    TRAFFIC          ------------------------>
                                 <------------------------   1 — 1    TRAFFIC

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 — 1.
2.	Request inhibition of link 1 — 2, check that an LIN is received without response. Check that a new LIN is received after T14 expires and that an LIA is sent in response.
3.	Check that the inhibition is performed.
4.	Activate link 1 — 2 and check that it stays unavailable.
5.	Stop traffic and check that it was not disturbed.
6.	Repeat the test but without sending of an LIA. Check that after the second expiration of T14 the procedure is stopped.

TEST NUMBER: 7.4	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Additionnal inhibition messages (LIA, LID, LIN)

PURPOSE: To check the action of the system on reception of an additionnal LIA, LID or LIN

PRE-TEST CONDITIONS: End of test 7.1.1

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                                    SP    B
        Link                                       Link
:Start traffic

        1 — 2    TRAFFIC        ----------------------->
                                <----------------------     1 — 2    TRAFFIC

                                <----------------------     1 — 2    LIA, SLC 1 — 1

                                <----------------------     1 — 2    LID, SLC 1 — 1
        1 — 2    TRAFFIC        ----------------------->
                                <----------------------     1 — 2    TRAFFIC

                                <----------------------     1 — 2    LIN, SLC 1 — 1
        1 — 1    LIA, SLC 1 — 1 ----------------------->
        1 — 2    TRAFFIC        ----------------------->
                                <----------------------     1 — 2    TRAFFIC

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 — 2.
2.	Send an additionnal LIA and LID on link 1 — 2.
3.	Check that these messages are ignored without impact on the traffic.
4.	Send an additionnal LIN on link 1 — 2.
5.	Check that an LIA is received in response without impact on the traffic and that the link 1 — 1 enters in the "Local and remote inhibiting" state.
6.	Stop traffic.

TEST NUMBER: 7.5	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Inhibition asked by the both ends of a link

PURPOSE: To check the action of the system on reception of an LIN after sending of an LIN

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                SP    A                                    SP    B

        Link                                      Link

:Start traffic

    1 — 1, 2   TRAFFIC          ------------------------>
                                <------------------------   1 — 1, 2   TRAFFIC

    1 — 1      :Request inhibition

    1 — X      LIN, SLC 1 — 1   ------------------------>

                                <------------------------   1 — X     LIN, SLC 1 — 1
    1 — 1      LIA, SLC 1 — 1   ------------------------>

                                <------------------------   1 — X     LIA, SLC 1 — 1

               TIME-CONTROLLED CHANGEOVER (see note)

    1 — 2      TRAFFIC (from 1 — 1)  --------------------->
                                <------------------------   1 — 2     TRAFFIC (from 1 — 1)
:Wait

:Stop traffic
```

Note — A changeover procedure is performed but not described in this inhibition test.

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 — 1 and 1 — 2.
2.	Request inhibition of link 1 — 1. Check the reception of LIN and response with an LIN.
3.	Check the reception of an LIA and send an LIA.
4.	Check that the inhibition is correctly performed and that the link enters in the «Local and remote inhibiting» state.
5.	Stop traffic and check that it was not disturbed.

TEST NUMBER: 7.6.1	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Manual uninhibition of a link — with changeback

PURPOSE: To check for correct restoration when link uninhibition is requested by an operator

PRE-TEST CONDITIONS: End of test 7.1.1

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                SP    A                                    SP    B

          Link                                     Link

:Start traffic

          1 — 2    TRAFFIC          -------------------------->
                                    <---------------------------  1 — 2    TRAFFIC

          1 — 1    :Request uninhibition

          1 — 2    LUN, SLC 1—1     -------------------------->

                                    <---------------------------  1 — 2    LUA, SLC 1 — 1

CHANGEBACK (See note)                         CHANGEBACK (See note)

          1 — 1    TRAFFIC (from 1 — 2)  -------------------------->
                                    <---------------------------  1 — 1    TRAFFIC (from 1 — 2)
          1 — 2    TRAFFIC          -------------------------->
                                    <---------------------------  1 — 2    TRAFFIC

:Wait

:Stop traffic
```

Note — A changeback procedure is performed after uninhibition of link 1 — 1 but it is not described in this test which checks only uninhibition procedure.

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 — 2.
2.	Request uninhibition of link 1 — 1, check the reception of an LUN and response with an LUA inside T12.
3.	Check that the uninhibition is performed and stop traffic.
4.	Check that the traffic was shared on links 1 — 1 and 1 — 2 according to the load sharing rules.
5.	Check that an uninhibition indication was given by the system.
6.	When B has initiated inhibition (point 5, test 7.1.1), repeat test in reverse direction. Check that uninhibition is not possible when it is requested by an operation in A.

TEST NUMBER: 7.6.2	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Manual uninhibition of a link — without changeback

PURPOSE: To check manual uninhibition procedure when the uninhibited link stays unavailable

PRE-TEST CONDITIONS: End of test 7.1.2 without activation of link 1 — 2 (link 1 — 2 deactivated and inhibited)

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                 SP    A                                      SP    B

           Link                                         Link

:Start traffic

        1 — 1   TRAFFIC          ----------------------->
                                 <----------------------    1 — 1   TRAFFIC

        1 — 2   :Request uninhibition

        1 — 1   LUN, SLC 1 — 2   ----------------------->
                                 <----------------------    1 — 1   LUA, SLC 1 — 2

        1 — 1   TRAFFIC          ----------------------->
                                 <----------------------    1 — 1   TRAFFIC

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic B (and C in VAT) on link 1 — 1.
2.	Request uninhibition of link 1 — 2 and check that an LUN is received and that an LUA is sent in response inside T12.
3.	Check that uninhibition is performed correctly and that link 1 — 2 stays unavailable.
4.	Stop traffic and check that it was not disturbed.
5.	When B has initiated inhibition (point 6, test 7.1.2), repeat test in reverse direction. Check that uninhibition is not possible when it is requested by an operator in A.

TEST NUMBER: 7.7	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Expiration of T12

PURPOSE: To check uninhibition procedure on expiration of time T12

PRE-TEST CONDITIONS: End of test 7.1.1 (1 — 1 inhibited by A)

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

SP   A   SP   B

Link   Link

:Start traffic

    1 — 2   TRAFFIC   ---------------------->

                         <----------------------   1 — 2   TRAFFIC

    1 — 1   :Request uninhibition

    1 — 2   LUN, SLC 1 — 1   ---------------------->

            |

            | T12

            |

    1 — 2   LUN, SLC 1 — 1   ---------------------->

                         <----------------------   1 — 2   LUA, SLC 1 — 1

CHANGEBACK (See note)   CHANGEBACK (See note)

    1 — 1   TRAFFIC (from 1 — 2)   ---------------------->

                         <----------------------   1 — 1   TRAFFIC (from 1 — 2)

    1 — 2   TRAFFIC   ---------------------->

                         <----------------------   1 — 2   TRAFFIC

:Wait

:Stop traffic

Note — A changeback procedure is performed but not described in this uninhibition test.

TEST DESCRIPTION

1.	Start traffic B and C on link 1 — 2.
2.	Request uninhibition of link 1 — 1 and check that an LUN is received.
3.	Check that after expiration of T12, a new LUN is received and acknowledged by an LUA.
4.	Check that uninhibition is performed correctly.
5.	Stop traffic and check it was shared on links 1 — 1 and 1 — 2 according with the load sharing rules and that it was not disturbed.
6.	Repeat the test but without sending of an LUA. Check that after the second expiration of T12 the procedure is stopped and an indication is given to the management.
7.	Check that the duration of T12 is inside the specified range.

TEST NUMBER: 7.8	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Not possible uninhibition

PURPOSE: To check the actions of the system when the uninhibition is not possible

PRE-TEST CONDITIONS: Link 1 − 2 unavailable and inhibited and link 1 − 1 available

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
        SP    A                              SP    B


   Link                                 Link


   1 − 1    :Deactivate


   1 − X    :Request uninhibition
```

TEST DESCRIPTION

1.	Deactivate link 1 − 1.
2.	Check that uninhibition is not performed.

TEST NUMBER: 7.9	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Automatic uninhibition of a link

PURPOSE: To check that the system performs uninhibition procedure when a point becomes unaccessible

PRE-TEST CONDITIONS: End of test 7.1.1

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                                  SP    B

        Link                                    Link

:Start traffic

        1 — 2   TRAFFIC         ------------------------->

                                <------------------------    1 — 2   TRAFFIC

        1 — 2   :Deactivate (failure)

        1 — 1   LUN, SLC 1 — 1   ------------------------->

                                <------------------------    1 — 1   LUA, SLC 1 — 1

        POINT RESTART PROCEDURE IS APPLIED IN A AND B (see note)

        1 — 1   TRAFFIC          ------------------------->

                                <------------------------    1 — 1   TRAFFIC
:Wait

:Stop traffic
```

Note — When link 1-1 becomes available, point restart procedure is applied in A and B but it is not described in this inhibition test to simplify the test description.

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 — 2.
2.	Deactivate link 1 — 2 and check that an LUN is received on link 1 — 1 and response with an LUA within T12.
3.	Check that uninhibition is performed and that the traffic is restarted on link 1 — 1 (see note).
4.	Stop traffic, some messages have been lost.
5.	Repeat the test but without sending of an LUA. Check that after the second expiration of T12 the procedure is stopped, an indication is given to the OMAP and the link 1 — 1 does not carry traffic.

TEST NUMBER: 7.10.1	PAGE: 1 of 1

REFERENCE: Q.704   § 10,   Fig. 28

TITLE: Management inhibiting

SUB TITLE: Forced uninhibition of a link — sending of an LFU

PURPOSE: To check forced uninhibition procedure when a point becomes unaccessible

PRE-TEST CONDITIONS: Link 1 — 1 available, link 1 — 2 inhibited by B

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
            SP    A                                SP    B

      Link                                    Link

:Start traffic

      1 — 1    TRAFFIC          ----------------------->

                               <----------------------    1 — 1    TRAFFIC

      1 — 1    :Deactivate (failure)

      1 — 2    LFU, SLC 1 — 2   ----------------------->

                               <----------------------    1 — 2    LUN, SLC 1 — 2

      1 — 2    LUA, SLC 1 — 2   ----------------------->

               POINT RESTART PROCEDURE IS APPLIED IN A AND B (see note)

      1 — 2    TRAFFIC          ----------------------->

                               <----------------------    1 — 2    TRAFFIC

:Wait

:Stop traffic
```

Note — When link 1 — 2 becomes available, point restart procedure is applied in A and B but it is not described in this inhibition test to simplify the test description.

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 — 1.
2.	Deactivate link 1 — 1 and check the reception of an LFU on link 1 — 2. Response by an LUN. Check that T13 is stopped and that an LUA is received.
3.	Check that uninhibition is performed and that the traffic is restarted on link 1 — 2 (see note).
4.	Stop traffic, some messages have been lost.

TEST NUMBER: 7.10.2	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Forced uninhibition of a link — reception of an LFU

PURPOSE: To check uninhibition procedure on reception of an LFU

PRE-TEST CONDITIONS: Link 1 — 1 available, link 1 — 2 inhibited by A

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE::

```
              SP    A                                    SP    B

         Link                                       Link

:Start traffic

     1 — 1    TRAFFIC          -------------------->
                              <-------------------------   1 — 1    TRAFFIC

                              <-------------------------   1 — 2    LFU, SLC 1 — 2

     1 — 1    LUN, SLC 1 — 2   -------------------->
                              <-------------------------   1 — 1    LUA, SLC 1 — 2

              CHANGEBACK (see note)

     1 — 1    TRAFFIC          -------------------->
                              <-------------------------   1 — 1    TRAFFIC

     1 — 1    TRAFFIC          -------------------->
                              <-------------------------   1 — 2    TRAFFIC

:Wait

:Stop traffic
```

Note — A changeback is performed but not described in this uninhibition test.

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 — 1.
2.	Send an LFU to A on link 1 — 2 and check that an LUN is received within T13 and acknowledged by an LUA inside T12.
3.	Check that the uninhibition is performed.
4.	Stop traffic and check that it was carried on 1 — 1 and 1 — 2.

MTP LEVEL 3

TEST NUMBER: 7.11	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Expiration of T13

PURPOSE: To check uninhibition procedure when T13 expires

PRE-TEST CONDITIONS: Link 1 — 1 available and link 1 — 2 inhibited by B

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
              SP    A                              SP    B

         Link                               Link

:Start traffic

      1 — 1    TRAFFIC        ------------------------->
                             <------------------------   1 — 1    TRAFFIC

      1 — 1    :Deactivate (failure)

      1 — 2    LFU, SLC 1 — 2   ------------------------->


              |
              | T13
              |


      1 — 2    LFU, SLC 1 — 2   ------------------------->

                             <------------------------   1 — 2    LUN, SLC 1 — 2
      1 — 2    LUA, SLC 1 — 2   ------------------------->

      POINT RESTART PROCEDURE IS APPLIED IN A AND B (see note in 7.9)

      1 — 2    TRAFFIC        ------------------------->
                             <------------------------   1 — 2    TRAFFIC
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 — 1.
2.	Deactivate link 1 — 1 and check the reception of an LFU. After T13 expires, check the reception of a second LFU and send an LUN. Check the reception of an LUA.
3.	Check that uninhibition is performed correctly.
4.	Stop traffic and check that it has been restarted on link 1 — 2. Some messages have been lost.
5.	Repeat the test but without sending an LUN. Check that after the second expiration of T13 the procedure is stopped, that an indication is given to the OMAP and that the link 1 — 2 carries traffic normally from A.
6.	Check that the duration of T13 is inside the specified range.

TEST NUMBER: 7.12	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Additionnal uninhibition messages (LUA, LUN, LFU)

PURPOSE: To check the actions of the system on reception of an additionnal LUA, LUN or LFU

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                PS     A                                    PS     B

        Link                                        Link

:Start traffic

        1 — 1, 2    TRAFFIC        ----------------------->
                                   <----------------------    1 — 1, 2    TRAFFIC

                                   <----------------------    1 — 2      LUA, SLC 1 — 1
        1 — 1, 2    TRAFFIC        ----------------------->
                                   <----------------------    1 — 1, 2    TRAFFIC

                                   <----------------------    1 — 2      LUN, SLC 1 — 1
        1 — X    LUA, SLC 1 — 1    ----------------------->
        1 — 1, 2    TRAFFIC        ----------------------->
                                   <----------------------    1 — 1, 2    TRAFFIC

                                   <----------------------    1 — 2      LFU, SLC 1 — 1
        1 — X    LUN, SLC 1 — 1    ----------------------->

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 — 1 and 1 — 2.
2.	Send an LUA (SLC 1 — 1) on link 1 — 2.
3.	Check that this message has been ignored without impact on the traffic.
4.	Send an LUN (SLC 1 — 1) on link 1 — 2.
5.	Check that an LUA is received in response without impact on the traffic.
6.	Send an LUA (SLC 1 — 1) on link 1 — 2.
7.	Check that an LUN is received in response without impact on the trafic.
8.	Stop traffic.

TEST NUMBER: 7.13	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Uninhibition at one side after test 7.5

PURPOSE: To check uninhibition procedure when the inhibition has been asked by the two ends of a link

PRE-TEST CONDITIONS: End of test 7.5

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                SP    A                              SP    B

          Link                              Link

:Start traffic

      1 − 2    TRAFFIC          --------------------------->
                               <---------------------------  1 − 2    TRAFFIC

      1 − 1    :Request uninhibition

      1 − 2    LUN, SLC 1 − 1   --------------------------->

                               <---------------------------  1 − 2    LUA, SLC 1 − 1

      1 − 2    TRAFFIC          --------------------------->
                               <-----------------------/---  1 − 2    TRAFFIC

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 − 2.
2.	Request uninhibition of link 1 − 1. Check that an LUN is received and response with an LUA within T12.
3.	Check that the link stays inhibited (by B).
4.	Stop traffic and check that it was not disturbed.
5.	Repeat test in reverse direction.

TEST NUMBER: 7.14	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Automatic uninhibition after test 7.5

PURPOSE: To check automatic uninhibition of a link when the inhibition has been initiated by the both ends

PRE-TEST CONDITIONS: End of test 7.5

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                  SP    A                                      SP    B

          Link                                        Link

:Start traffic

       1 — 2    TRAFFIC           ----------------------->
                                  <-----------------------    1 — 2    TRAFFIC

       1 — 2    :Deactivate (failure)

       1 — 1    LFU, SLC 1 — 1    ----------------------->
                                  <-----------------------    1 — 1    LFU, SLC 1 — 1
                                  <-----------------------    1 — 1    LUN, SLC 1 — 1
       1 — 1    LUN, SLC 1 — 1    ----------------------->
       1 — 1    LUA, SLC 1 — 1    ----------------------->
                                  <-----------------------    1 — 1    LUA, SLC 1 — 1

          POINT RESTART PROCEDURE IS APPLIED IN A AND B (see note in 7.9)

       1 — 1    TRAFFIC           ----------------------->
                                  <-----------------------    1 — 1    TRAFFIC

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 — 2.
2.	Deactivate link 1 — 2 and check that forced uninhibition is requested by the both ends which send LFU.
3.	Check that LUNs are sent by both ends in response and that LUAs are sent for acknowledgement.
4.	Check that the traffic is restarted on link 1 — 1 and stop traffic.

TEST NUMBER: 7.15	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Automatic uninhibition with two links inhibited

PURPOSE: To check the actions of the system when two links are inhibited and when the third (and last) link is deactivated

PRE-TEST CONDITIONS: Links 1 − 1 and 1 − 2 inhibited (by A) and link 1 − 3 available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                SP    A                                    SP    B

            Link                                        Link

:Start traffic

    1 − 3   TRAFFIC          -------------------------->
                            <--------------------------  1 − 3   TRAFFIC

    1 − 3   :Deactivate (failure)

    1 − X   LUN, SLC 1 − 1   -------------------------->
    and/or  LUN, SLC 1 − 2   -------------------------->

            (implementation dependent: at least one link must be uninhibited)

                            <--------------------------  1 − X   LUA, SLC 1 − 1, and/or
                            <--------------------------  1 − X   LUA, SLC 1 − 2

            POINT RESTART PROCEDURE IS APPLIED IN A AND B (see note in 7.9)

    1 − 1   TRAFFIC          -------------------------->
    and/or                  <--------------------------  1 − 1   TRAFFIC
    1 − 2   TRAFFIC          -------------------------->  and/or
                            <--------------------------  1 − 2   TRAFFIC

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Deactivate link 1 − 3.
2.	Check that at least one LUN is received and acknowledged with an LUA.
3.	Check that the traffic is restarted on linkset 1. Some messages have been lost.
4.	Stop traffic.

TEST NUMBER: 7.16	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Reception of traffic on an inhibited link

PURPOSE: To check the actions of the system on reception of traffic on an inhibited link

PRE-TEST CONDITIONS: Link 1 — 1 inhibited by A, link 1 — 2 available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
           SP    A                                      SP    B


      Link                                         Link

:Start traffic

      1 — 2    TRAFFIC        ----------------------->

                             <----------------------    1 — 2    TRAFFIC


                             <----------------------    1 — 1    TRAFFIC


:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic on link 1 — 1.
2.	Send traffic from B to A on the inhibited link 1 — 2. Check that the messages received in A are normally treated.
3.	Stop traffic.

TEST NUMBER: 7.17.1	PAGE: 1 of 3

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Management inhibiting test — Normal procedure

PURPOSE: To check that the system performs correctly the management inhibiting test

PRE-TEST CONDITIONS: Link 1-1 inhibited by A, other links are available

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

SP   A　　　　　　　　　　　　　　　　SP   B

Link　　　　　　　　　　　　　　　　　　Link

1 — X　　　　LLT, SLC 1 — 1　　———————>

　　　　　　　　　　　　　　　<————————　　1 — X　　　LRT, SLC 1 — 1

　　　　　│ T22　　　　　　　　　　　　　　　　　　　│ T23

1 — X　　　LLT, SLC 1 — 1　　———————>

　　　　　　　　　　　　　　　<————————　　1 — X　　　LRT, SLC 1 — 1

TEST DESCRIPTION

1.	Check that an LLT is periodically sent by A and check (in VAT) that the duration of timer T22 is inside the specified range.
2.	Check that on the reception of an LRT, no action is taken in A.
3.	As compatibility test, check that an LRT is periodically sent from B to A.

TEST NUMBER: 7.17.1 Continued	PAGE: 2 of 3

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Inhibit test procedure — Normal procedure

PURPOSE: See page 1

PRE-TEST CONDITIONS: Link 1 — 1 inhibited by B, other links are available

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                SP    A                              SP    B


            Link                            Link


      1 - X        LRT, SLC 1 - 1    ------------->
                  |                  <------------  1 - X      LLT, SLC 1 - 1
                  | T23                                       |
                  |                                           | T22
                  |                                           |

      1 - X        LRT, SLC 1 - 1    ------------->
                  |                  <------------  1 - X      LLT, SLC 1 - 1
                  |                                           |
                  |                                           |
```

TEST DESCRIPTION

1.	Check that an LRT is periodically sent by A and, in VAT, check that the duration of the timer T23 is inside the specified range.
2.	Check that, on the reception of an LLT, no action is taken in A.
3.	As compatibility test, check that an LLT is periodically sent from B to A.

TEST NUMBER: 7.17.1 Continued	PAGE: 3 of 3

REFERENCE: Q.704   § 10,   Fig. 28

TITLE: Management inhibiting

SUB TITLE: Inhibit test procedure – Normal procedure

PURPOSE: See page 1

PRE-TEST CONDITIONS: Link 1 – 1 inhibited by A and B. The other links are available

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

SP   A   SP   B

Link   Link

1 – X   LLT, SLC 1 – 1   ------------>
                                 <------------   1 – X   LRT, SLC 1 – 1
1 – X   LRT,   SLC 1 – 1   ------------>
                 T22   <------------   1 – X   LLT, SLC 1 – 1
         T23   T23
1 – X   LLT, SLC 1 – 1   ------------>   T22
                                 <------------   1 – X   LRT,   SLC 1 – 1
1 – X   LRT,   SLC 1 – 1   ------------>
                 T22   <------------   1 – X   LLT, SLC 1 – 1
         T23   T23
                                                                    T22

TEST DESCRIPTION

1.	Check that the LLT and LRT messages are periodically sent from A to B and from B to A.

TEST NUMBER: 7.17.2	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Inhibit test procedure — Reception of an LLT or LRT on an uninhibited link

PURPOSE: To check the actions of the system on reception of an LLT or LRT on an uninhibited link

PRE-TEST CONDITIONS: Link 1 — 1 available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
           SP    A                                    SP    B

        Link                                       Link

                          <---------------------  1 — 1   LLT, SLC 1 — 1
      1 — 1    LFU, SLC 1 — 1    --------------------->

               T13
                          <---------------------  1 — 1   LUN, SLC 1 — 1

      1 — 1    LUA, SLC 1 — 1    --------------------->

                          <---------------------  1 — 1   LRT, SLC 1 — 1
      1 — 1    LUN, SLC 1 — 1    --------------------->

               T12
                          <---------------------  1 — 1   LUA, SLC 1 — 1
```

TEST DESCRIPTION

1.	Send an LLT from B to A and check that an LFU is received. Then, send an LUN and check that an LUA is received.
2.	Send an LRT from B to A and check that an LUN is received. Answer with an LUA.

TEST NUMBER: 7.17.3	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Inhibit test procedure -- Reception of an LLT on a link locally inhibited

PURPOSE: To check the actions of the system on reception of an LLT on a link locally (not remotely) inhibited

PRE-TEST CONDITIONS: Link 1 — 1 inhibited in A, other links are available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
            SP    A                                    SP    B


        Link                                       Link


                              <----------------------   1 — X   LLT, SLC 1 — 1


    1 — X    LFU, SLC 1 — 1    ----------------------->
             ┐
             │  T13
             │
             ┘                <----------------------   1 — X   LUN, SLC 1 — 1


    1 — X    LUA, SLC 1 — 1    <----------------------
```

TEST DESCRIPTION

1.	Send an LLT from B to A and check that an LFU is received as described above.

TEST NUMBER: 7.17.4	PAGE: 1 of 1

REFERENCE: Q.704 § 10, Fig. 28

TITLE: Management inhibiting

SUB TITLE: Inhibit test procedure — Reception of an LRT on a link remotely inhibited

PURPOSE: To check the actions of the system on reception of an LRT on a link remotely inhibited

PRE-TEST CONDITIONS: Link 1 — 1 inhibited by B, other links are available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
        SP    A                              SP    B


    Link                                 Link


                        <------------      1 - X   LRT, SLC 1 - 1

    1 - X    LUN, SLC 1 - 1   ------------>
             |
             | T12
             |
                        <------------      1 - X   LUA, SLC 1 - 1
```

TEST DESCRIPTION

1.	Send an LRT from B to A and check that an LUN is received as described above.

TEST NUMBER: 8.1	PAGE: 1 of 1

REFERENCE: Q.704   § 11, 12.6,   Fig. 46A

TITLE: Signalling traffic flow control

SUB TITLE: Reception of a TFC

PURPOSE: To check the actions of the system on reception of a TFC

PRE-TEST CONDITIONS: One or more link available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

             SP   A   SP   B

        Link   Link

:Start traffic

        1 − 1   TRAFFIC   -------------->

                                  <------------   1 − 1   TRAFFIC

                                  <------------   1 − 1   TFC, DPC = C

:Wait

:Stop traffic

Note − This test requires further study.

TEST DESCRIPTION

1.	Start traffic to B and C.
2.	Send a TFC concerning C and check that this message is received correctly.

TEST NUMBER: 8.2	PAGE: 1 of 1

REFERENCE: Q.704 § 11, 12.6, Fig. 46A

TITLE: Signalling traffic flow control

SUB TITLE: Sending of TFCs

PURPOSE: To check the detection of a level 3 congestion

PRE-TEST CONDITIONS: All links available

CONFIGURATION: C	TYPE OF TEST: VAT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
                 SP    B                        SP    A                    SP    C
          Link                 Link                             Link

       :Start traffic

          1 — 1      TRAFFIC  (>n/2 E) ------->    2 — 1   ----- (n E) ------->
                              <----------------    1 — 1   <--------------- 2 — 1   TRAFFIC (<n E)
          1 — 2      TRAFFIC  (>n/2 E) ------->    2 — 1   ----- (n E) ------->
                              <----------------    1 — 2   <--------------- 2 — 1   TRAFFIC (<n E)
       :Wait

                              <----------------    1 — X   TFC, DPC = C

                                                      .
                                                      .  One TFC each 8 messages sent to C
                                                      .
                              <----------------    1 — X   TFC, DPC = C
                                                      .
          1 — 1      TRAFFIC  (<n E) ---------->    2 — 1   ------------------->
                              <----------------    1 — 1   <--------------- 2 — 1   TRAFFIC (<n E)
          1 — 2      TRAFFIC  (<n E) ---------->    2 — 1   ------------------->
                              <----------------    1 — 2   <--------------- 2 — 1   TRAFFIC (<n E)
       :Wait

       :Stop traffic
```

Note — n is the maximum load capacity of linkset 2. The traffic model used in this test is described in Table 2/Q.706.

TEST DESCRIPTION

1.	Start traffic to C with a load exceeding $n/2$ erlang on links 1 — 1 and 1 — 2 (n is the maximum load that the link 2 may carry without congestion).
2.	Check that the signalling traffic flow control procedure is started in A. Check that a TFC message concerning C is received for each 8 messages received in B during the congestion.
3.	Reduce the load to 0.1 erlang or less on links 1 — 1 and 1 — 2.
4.	Check that the congestion disappears and that no TFC is received.
5.	Stop traffic.
6.	Check that the traffic from C to B has not been disturbed.

TEST NUMBER: 8.3	PAGE: 1 of 1

REFERENCE: Q.704 § 11.2.7

TITLE: Signalling traffic flow control

SUB TITLE: Reception of a UPU

PURPOSE: To check the actions of the system on reception of a UPU

PRE-TEST CONDITIONS: One link available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: see note

MESSAGE SEQUENCE:

```
                    SP    A                                    SP    B

         Link                                       Link

:Star traffic

      1 - 1           TRAFFIC       ------------->
                      (DPC=B, SI=X)
      1 - 1           TRAFFIC       ------------->
                      (DPC=C, SI=X)

                                    <------------      1 - 1           TRAFFIC
                                                                       (OPC=C, SI=X)

                                    <------------      1 - 1           UPU
                                                                       (OPC=B, SI=X)

      1 - 1           TRAFFIC       ------------->
                      (DPC=C, SI=X)

                                    <------------      1 - 1           TRAFFIC
                                                                       (OPC=C, SI=X)

:Wait

:Stop traffic
```

Note — The impact of the reception of a UPU on the traffic from A to B requires further study. The SPs having user part(s) are concerned.

TEST DESCRIPTION	
1.	Start traffic to B and C with SI=X.
2.	Send a UPU from B to C with SI=X.
3.	Check that the UPU message is received correctly without impact on the traffic from to A to C.
4.	Wait and stop traffic.

TEST NUMBER: 8.4	PAGE: 1 of 1

REFERENCE: Q.704 § 11.2.7

TITLE: Signalling traffic flow control

SUB TITLE: Sending of a UPU

PURPOSE: To check the detection of an unavailability of a user part

PRE-TEST CONDITIONS: One link available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: See note

MESSAGE SEQUENCE:

```
                  SP    A                                      SP    B
         Link                                         Link

:Start traffic

         1 — 1          TRAFFIC       ----------------------->
                     (to B and C, SI=X)
                                     <---------------------    1 — 1         TRAFFIC
                                                                          (from B and C, SI=X)
              :Deactivate user part X (see note)
```

```
                                     <---------------------    1 — 1         MESSAGE
                                                                          (from B to A, SI=X)
         1 — 1          UPU          ----------------------->
                     (DPC = B, SI=X)
                                     <---------------------    1 — 1         MESSAGE
                                                                          (from C to A, SI=X)
         1 — 1          UPU          ----------------------->
                     (DPC = C, SI=X)
                                     <---------------------    1 — 1         MESSAGE
                                                                          (from B to A, SI=X)
         1 — 1          UPU          ----------------------->
                     (DPC = B, SI=X)
                     :Reactivate user part X

                                     <---------------------    1 — 1         TRAFFIC
                                                                          (from B and C to A, SI=X)
         1 — 1          TRAFFIC      ----------------------->
                     (to B and C, SI=X)
:Wait
:Stop traffic
```

Note — The notion of unavailability of a user part is specific to the implementation, consequently, the ability to deactivate a user part is implementation dependent. The SPs having user part(s) are concerned.

TEST DESCRIPTION

1.	Start traffic to B and C with SI = X.
2.	Deactivate the user part X.
3.	Send a message from B to the user part X in A and check that this message is discarded and that a UPU is sent back.
4.	Send a message from C to the user part X in A and check that this message is discarded and that a UPU is sent back.
5.	Repeat point 3 and reactivate the user part.
6.	Check that the messages sent from B and C are received correctly and that no UPU is sent back. Wait and stop traffic.

TEST NUMBER: 9.1.1	PAGE: 1 of 1

REFERENCE: Q.704 § 13, Fig. 29, Fig. 44

TITLE: Signalling route management

SUB TITLE: Sending of a TFP on an alternative route — failure of normal linkset

PURPOSE: To check the sending of a TFP on the alternative route when the normal linkset becomes unavailable

PRE-TEST CONDITIONS: All linksets available

CONFIGURATION: D	TYPE OF TEST: VAT, CPT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
              SP    A                      SP    B        SP    C              SP   ●

         Link                        Link            Link            Link

:Start traffic

     1 — 1      TRAFFIC      ----------->  5 — 1   ----------------------------->    SP    D
                (from A and F)            6 — 1   ----------------------------->    SP    E
     2 — 1      TRAFFIC      ---------------------------------> 7 — 1 --------->    SP    E
                (from A and F)

     1 — 1      :Deactivate    (MML command or failure)

     2 — 1      TFP, PC = B  --------------------------------->

     2 — 1      TFP, PC = D  --------------------------------->

     2 — 1      TRAFFIC      ---------------------------------> 7 — 1 --------->    SP    E
                (from 1 — 1)                                   8 — 1 --------->    SP    D

:Wait

:Stop traffic
```

Note — A changeover procedure is performed after deactivation of link 1 — 1 but it is not described in this transfer prohibited test.

TEST DESCRIPTION

1.	Start traffic to D and E on linkset 1 and 2.
2.	Deactivate link 1 — 1 and check that TFPs concerning B and D are sent from A to C (alternative route to reach B and D). Check that no TFP concerning E is sent from A to C (load sharing between linksets 1 and 2 in A to reach E).
3.	Check that time out T8 is started for each TFP sent.
4.	Check that the traffic to D and E is diverted to C.
5.	Stop traffic and check that it was not disturbed.

TEST NUMBER: 9.1.2	PAGE: 1 of 1

REFERENCE: Q.704 § 13, Fig. 29, Fig. 44

TITLE: Signalling route management

SUB TITLE: Sending of a TFP on an alternative route — on reception of a TFP

PURPOSE: To check the sending of a TFP on the alternative route when the normal route becomes unavailable on reception of a TFP

PRE-TEST CONDITIONS: Linkset 4 unavailable

CONFIGURATION: D	TYPE PF TEST: VAT, CPT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
            SP    A                      SP    B         SP    C            SP   ●
       Link                        Link            Link            Link
:Start traffic

       1 — 1     TRAFFIC        ------------>  5 — 1   ------------------------------->    SP   D
                 (from A and F)                6 — 1   ------------------------------->    SP   E
       2 — 1     TRAFFIC        ------------------------------------>  7 — 1  ---------->  SP   E
                 (from A and F)

                                              5 — 1           :Deactivate
       See note                 <------------  1 — 1      TFP, PC = D

       2 — 1     TFP, PC = D    -------------------------------->

       1 — 1     TRAFFIC        ------------>  6 — 1   ------------------------------>     SP   E
                 (from A and F)
       2 — 1     TRAFFIC        ----------------------------------->  8 — 1  ---------->   SP   D
                 (from A and F, and from 1 — 1 to D)                  7 — 1  ---------->   SP   E
```

:Wait

:Stop traffic

Note — A forced rerouting is performed after the reception of TFP for D in A but it is not described in this transfer prohibited test.

TEST DESCRIPTION

1.	Start traffic to D and E.
2.	Deactivate link 5 — 1 and check that a TFP concerning D is sent to A.
3.	Check that a TFP concerning D is received from A and that traffic to D is diverted via C.
4.	Check that a time out T8 is started.
5.	Stop traffic and check that traffic to E has not been disturbed. Some messages to D may have been lost.

TEST NUMBER: 9.2.1	PAGE: 1 of 1

REFERENCE: Q.704 § 13, Fig. 29, Fig. 44

TITLE: Signalling route management

SUB TITLE: Broadcast of TFPs — on one linkset failure

PURPOSE: To check the broadcast of TFPs when one point is inaccessible

PRE-TEST CONDITIONS: All linksets available

CONFIGURATION: D	TYPE OF TEST: VAT, CPT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
                 SP    A                        SP    B      SP    C           SP    F

        Link                             Link          Link        Link

:Start traffic

        3 — 1      TRAFFIC    ----------------------------------------------------->
                   (from A, D and E)

        3 — 1      :Deactivate   (MML command or failure)

        1 — 1      TFP, PC = F    ------------>

        2 — 1      TFP, PC = F    ------------------------------------>
```

:Wait

:Stop traffic

Note — The propagation of TFPs is not presented to simplify the test description.

TEST DESCRIPTION

1.	Start traffic to F.
2.	Deactivate link 1 — 1 and check that TFPs concerning F are broadcasted.
3.	Check that a timer T8 is started.
4.	Stop traffic.

TEST NUMBER: 9.2.2	PAGE: 1 of 2

REFERENCE: Q.704 § 13 Fig. 29, Fig. 44

TITLE: Signalling route management

SUB TITLE: Broadcast of TFPs — On multiple failures

PURPOSE: To check the broadcast of TFPs when several point are inaccessible (various reasons)

PRE-TEST CONDITIONS: Linkset 1 unavailable

CONFIGURATION: D	TYPE OF TEST: VAT, CPT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
        SP    A              SP    B            SP    C          SP    ●

     Link                 Link              Link             Link
  :Start traffic
     2 — 1    TRAFFIC    -------------------------->  7 — 1   ------------>      SP   E
              (from A and F)                          8 — 1   ------------>      SP   D
     2 — 1    :Deactivate (MML command or failure)

     3 — 1    TFP, PC = B  ----------------------------------------------------->      SP   F
     3 — 1    TFP, PC = C  ----------------------------------------------------->
     3 — 1    TFP, PC = D  ----------------------------------------------------->
     3 — 1    TFP, PC = E  ----------------------------------------------------->
  :Wait

  :Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to D and E.
2.	Deactivate linkset 2 and check that TFPs concerning B, C, D and E are broadcasted (to F).
3.	Check that for each TFP sent a timer T8 is started.
4.	Repeat test but with linkset 2 unavailable as pre-test condition and then deactivate linkset 1.

TEST NUMBER: 9.2.2 Continued	PAGE: 2 of 2

REFERENCE: Q.704 § 13 Fig. 29, Fig. 44

TITLE: Signalling route management

SUB TITLE: Broadcast of TFPs — On multiple failures

PURPOSE: See page 1

PRE-TEST CONDITIONS: Linksets 1 and 4 unavailable

CONFIGURATION: D	TYPE OF TEST: VAT, CPT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
        SP    A              SP    C                 SP    D              SP    ●

    Link                     Link               Link                    Link

:Start traffic

    2 — 1   TRAFFIC    -------->  8 — 1              ------------>
            (from A and F)        7 — 1     ------------------------------------>        SP   E

                                  8 — 1     :Deactivate

                        <--------  2 — 1     TFP, PC = D

    3 — 1   TFP, PC = D   ------------------------------------------------------------>        SP   F
    2 — 1   TRAFFIC    -------->  7 — 1     ------------------------------------>        SP   E
            (from A and F)

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to D and E.
2.	Deactivate linkset 8 and check that a TFP (PC = D) is sent. Check that TFPs are broadcasted (here to F).
3.	Check that a time out T8 started.
4.	Stop traffic and check that traffic to E has not been disturbed.
5.	Repeat the test with linksets 2 and 4 unavailable as pre-test conditions and then deactivate linkset 5. Repeat the test with linksets 4 and 8 unavailable as pre-test conditions and then deactivate linkset 1.
6.	Repeat the test with linksets 4 and 5 unavailable as pre-test conditions and then deactivate linkset 2.

TEST NUMBER: 9.3	PAGE: 1 of 2

REFERENCE: Q.704 § 13 Fig. 29, Fig. 44

TITLE: Signalling route management

SUB TITLE: Reception of a message for an unaccessible destination

PURPOSE: To check that a TFP is sent in response to a message received for an unaccessible destination

PRE-TEST CONDITIONS: Linksets 1, 4 and 8 unavailable

CONFIGURATION: D	TYPE OF TEST: VAT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
                 SP    A                                     SP    F
      Link                                   Link

                                                        :Sent a message
                                                         to D
                             <---------------    3 - 1   MESSAGE TO D
      3 - 1      TFP, PC = D  --------------->

                 |-T8

                             <---------------    3 - 1   MESSAGE TO D
                 |
```

TEST DESCRIPTION

1.	Send from F a message with OPC = D to A.
2.	Check that a TFP PC = D is sent in response. Check that a time out T8 is started.
3.	During T8, send a new message with OPC = D to A and check that no TFP is sent.

TEST NUMBER: 9.3 Continued	PAGE: 2 of 2

REFERENCE: Q.704 § 13 Fig. 29, Fig. 44

TITLE: Signalling route management

SUB TITLE: Reception of a message for an unaccessible destination

PURPOSE: See page 1

PRE-TEST CONDITIONS: Linksets 1 and 8 unavailable

CONFIGURATION: D	TYPE OF TEST: VAT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
        SP    A              SP    B            SP   C              SP    ●

     Link                   Link             Link                Link
  :Start traffic

     3 – 1    TRAFFIC    ------------------------------------------------------->        SP   F
              (from A, D and
              E)

     3 – 1    :Deactivate (MML command or failure)

     2 – 1    TFP, PC = F   -------------------------------->
                          |  --------------------------------
                          |                                  ]  4 – 1
                       T8 |                  <---------------
                          |
                          |  <-------------------------------  2 – 1        MESSAGE TO F
                          |
```

TEST DESCRIPTION

1.   Start traffic to F.

2.   Deactivate linkset 3 and check that TFPs are broadcasted.

3.   Within T8, send one message with DPC = F from C to A and check that no TFP is sent in response.

TEST NUMBER: 9.4.1	PAGE: 1 of 1

REFERENCE: Q.704 § 13 Fig. 29, Fig. 45

TITLE: Signalling route management

SUB TITLE: Sending of a TFA on an alternative route — Recovery of normal linkset

PURPOSE: To check the sending of a TFA on an alternative route when the normal linkset becomes available

PRE-TEST CONDITIONS: Linkset 1 unavailable (end of test 9.1.1)

CONFIGURATION: D	TYPE OF TEST: VAT, CPT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
        SP    A              SP    B              SP    C              SP    ●

     Link                 Link            Link                 Link
  :Start traffic

     2 — 1   TRAFFIC     ---------------------------->  8 — 1   ------------>      SP  D
             (from A and F)                             7 — 1   ------------>      SP  E
     1 — 1   :Activate (depending of the activation mean previously used)
     2 — 1   TFA, PC = B  ------------------------------>
     2 — 1   TFA, PC = D  ------------------------------>
     1 — 1   TFP, PC = D  --------->
     1 — 1   TFP, PC = E  --------->

     1 — 1   TRAFFIC     --------->  5 — 1  ------------------------------------>  SP  D
             (from A and F            6 — 1  ------------------------------------>  SP  E
             and from 2 — 1)

     2 — 1   TRAFFIC     ---------------------------->  7 — 1   ------------>      SP  E
             (from A and F)
  :Wait

  :Stop traffic
```

Note — a changeback procedure is performed after activation of link 1-1 but it is not described in this transfer allowed test.

TEST DESCRIPTION	
1.	Start traffic to D and E.
2.	Activate linkset 1 and check that traffic to D and E is diverted on linkset 1 and that a TFA concerning D is sent from A to C. Check that no TFA is sent concerning E (load sharing in A between linksets 1 and 2).
3.	Stop traffic and check that is was rerouted correctly without loss of messages, duplication and missequencing.

TEST NUMBER: 9.4.2	PAGE: 1 of 1

REFERENCE: Q.704 § 13 Fig. 29, Fig. 45

TITLE: Signalling route management

SUB TITLE: Sending of a TFA on an alternative route — On reception of a TFA

PURPOSE: To check that a TFA is sent on the alternative route when the normal route becomes available on reception of a TFA

PRE-TEST CONDITIONS: Linksets 4 and 5 unavailable (end of test 9.1.2)

CONFIGURATION: D	TYPE OF TEST: VAT, CPT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
        SP    A              SP    B              SP    C              SP    ●

    Link                   Link             Link             Link

:Start traffic

    1 – 1   TRAFFIC     --------->  6 – 1   --------------------------------->      SP  E
            (from A and F)
    2 – 1   TRAFFIC     ------------------------->  7 – 1   ------------->          SP  E
            (from A and F)                          8 – 1   ------------->          SP  D

                                    5 – 1   :Activate

            See note        <---------  1 – 1   TFA, PC = D
    1 – 1   TFP, PC = D  --------->
    2 – 1   TFA, PC = D  ------------------------------->

    1 – 1   TRAFFIC     --------->  5 – 1   --------------------------------->      SP  D
    (from A and F, from 2 – 1 to D)  6 – 1   --------------------------------->     SP  E
    2 – 1   TRAFFIC     ------------------------->  7 – 1   ------------->          SP  E
            (from A and F)

:Wait

:Stop traffic
```

Note — a controlled rerouting is performed after the activation of linkset 5 it is not described in this transfer allowed test.

TEST DESCRIPTION

1.	Start traffic to D and E.
2.	Activate link 5 – 1 and check that a TFA concerning D is sent to A.
3.	Check that the traffic to D is diverted via B and check that a TFA concerning D is sent from A to C.
4.	Stop traffic and check that traffic was not disturbed.

TEST NUMBER: 9.5.1	PAGE: 1 of 1

REFERENCE: Q.704 § 13 Fig. 29, Fig. 45

TITLE: Signalling route management

SUB TITLE: Broadcast of TFAs — On one linkset recovery

PURPOSE: To check the broadcast of TFA when a destination becomes accessible

PRE-TEST CONDITIONS: Linkset 3 unavailable (end of test 9.2.1)

CONFIGURATION: D	TYPE OF TEST: VAT, CPT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
        SP    A                SP    B              SP    C            SP    ●

    Link                    Link            Link               Link

    3 — 1    :Activate (see Note 1)

    1 — 1    TFA, PC = F    --------> (see Note 2)

    2 — 1    TFA, PC = F    ---------------------------> (see Note 2)

    :Start traffic

    3 — 1    TRAFFIC     ---------------------------------------------------->      SP    F
             (from A and F)

    :Wait

    :Stop traffic
```

Note 1 — After activation of the linkset 3, SPs A and F perform a point restart procedure which is not explicitly described in this test.

Note 2 — The propagation of TFAs is not presented to simplify the test description.

TEST DESCRIPTION	
1.	Activate linkset 3.
2.	Check that TFAs concerning F are broadcasted.
3.	Start traffic to F and check that it is routed correctly; stop traffic.

TEST NUMBER: 9.5.2	PAGE: 1 of 2

REFERENCE: Q.704 § 13 Fig. 29, Fig. 45

TITLE: Signalling route management

SUB TITLE: Broadcast of TFAs — Various reasons

PURPOSE: To check the broadcast of TFA when several destinations become accessible in various network situations

PRE-TEST CONDITIONS: Linksets 1 and 2 unavailable (end of test 9.2.2 page 1 of 2)

CONFIGURATION: D	TYPE OF TEST: VAT, CPT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
        SP    A              SP    B            SP    C            SP    ●

    Link                     Link            Link               Link

    2 — 1    :Activate

    3 — 1    TFA, PC = B  --------------------------------------------->     SP   F
    3 — 1    TFA, PC = C  --------------------------------------------->     SP   F
    3 — 1    TFA, PC = D  --------------------------------------------->     SP   F
    3 — 1    TFA, PC = E  --------------------------------------------->     SP   F

    2 — 1    TFP, PC = B  ------------------------->
    2 — 1    TFP, PC = D  ------------------------->
    2 — 1    TFP, PC = E  ------------------------->
    :Start traffic

    2 — 1    TRAFFIC      ------------------------->   7 — 1  ------------>   SP   E
             (from A and F)                            8 — 1  ------------>   SP   D
    :Wait

    :Stop traffic
```

Note — After activation of the linkset 2, SPs A and C perform the point restart procedure which is not described in this test.

TEST DESCRIPTION

1.	Activate linkset 2.
2.	Check that TFAs concerning B, C, D and E are broadcasted.
3.	Start traffic and check that it is routed correctly; stop traffic.
4.	Repeat test but activate linkset 1 instead of linkset 2.

TEST NUMBER: 9.5.2 Continued	PAGE: 2 of 2

REFERENCE: Q.704 § 13 Fig. 29, Fig. 45

TITLE: Signalling route management

SUB TITLE: Broadcast of TFAs — Various reasons

PURPOSE: See page 1 of 2

PRE-TEST CONDITIONS: Linksets 1, 4 and 8 unavailable (end of tests 9.2.2 page 2 of 2)

CONFIGURATION: D	TYPE OF TEST: VAT, CPT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
        SP   A              SP    B            SP    C          SP    ●

    Link                 Link               Link              Link

:Start traffic

   2 - 1    TRAFFIC    ------------------------>   7 - 1    ------------>       SP   E
            (from A and F)
                                                  8 - 1    :Activate

                       <------------------------   2 - 1    TFA, PC = D

   2 - 1    TFP, PC = D  ------------------------>

   3 - 1    TFA, PC = D  ------------------------------------------------------>  SP  F

   2 - 1    TRAFFIC    ------------------------>   7 - 1    ------------>       SP   E
            (from A and F)                        8 - 1    ------------>       SP   D

:Wait

:Start traffic
```

TEST DESCRIPTION	
1.	Start traffic to E.
2.	Activate linkset 8 and check that a TFA concerning D is sent from C to A. Check that A broadcasts TFAs concerning D.
3.	Check that the traffic to D is restarted.
4.	Repeat test with linksets 2, 4 and 5 unavailable as pre-test conditions and activate linkset 5. Repeat test with linksets 1, 4 and 8 unavailable as pre-test conditions and activate linkset 1. Repeat test with linksets 2, 4 and 5 as pre-test conditions and activate linkset 2.

TEST NUMBER: 9.6	PAGE: 1 of 1

REFERENCE: Q.704 § 13 Fig. 29, Fig. 46

TITLE: Signalling route management

SUB TITLE: Periodic sending of Signalling-Route-Set-Test messages (SRST)

PURPOSE: To check the periodic test of a unavailable signalling route is performed correctly

PRE-TEST CONDITIONS: Linkset 2 unavailable

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                                        SP    B

       link                                          link
:Start traffic

       1 — 1        TRAFFIC        ---------------->
                                   <---------------    1 — 1        TRAFFIC
       1 — 1        RST, PC = C    ---------------->
```
```
                              |
                              | T10
                              |

       1 — 1        RST, PC = C    ---------------->
                              |
                              | T10                    2 — 1                   :Activate
                              |
                                   <---------------    1 — 1        TFA, PC = C
       1 — 1        TRAFFIC        ---------------->
                                   <---------------    1 — 1        TRAFFIC
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B.
2.	Check that at each expiration of T10, a signalling-Route-Set-Test message concerning C is received from A without response.
3.	Activate linkset 2 and check that a TFA is received and that T10 is stopped.
4.	Check that traffic to C is restarted and stop traffic.
5.	Repeat the test but without sending of TFA after activation of linkset 2 and check that when a RST is received a TFA is sent in response. Check that T10 and signalling-route-set-test procedure are stopped.
6.	Check that the duration of T10 is inside the specified range.

TEST NUMBER: 9.7	PAGE: 1 of 1

REFERENCE: Q.704 § 13 Fig. 29, Fig. 46

TITLE: Signalling route management

SUB TITLE: Reception of a Signalling-Route-Set-Test-Message

PURPOSE: To check the actions of the system on reception of an SRST

PRE-TEST CONDITIONS: Linksets 2 and 3 unavailable

CONFIGURATION: D	TYPE OF TEST: VAT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
                    SP    A                      SP   B              SP   F

        Link                                    Link              Link
                                 <--------------- 1 - 1 RST, PC = F

        3 - 1       :Activate                                 T10

        1 - 1       TFA, PC = F     --------------->    (ignored)
                                 <--------------- 1 - 1 RST, PC = F

                                                            T 10
        1 - 1       TFA, PC = F     --------------->
        3 - 1       TRAFFIC         --------------------------------------->
                    (from A, D and E)
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Send to A RST message concerning F and check that no response is received.
2.	Activate linkset 3 and check that a TFA is received but ignored in B.
3.	Send a RST message concerning F after activation of linkset 3 and check that a TFA is received in response.
4.	Repeat the test but with linksets 1 and 3 unavailable as pre-test conditions and RST message sent from C.

TEST NUMBER: 10.1.1	PAGE: 1 of 1

REFERENCE: Q.704 § 9

TITLE: Signalling point restart

SUB TITLE: Recovery of a linkset (SP A has not STP function) — With use of point restart procedure

PURPOSE: To check that point restart procedure is performed correctly when the recovery of a linkset restores connexity between two adjacent SPs

PRE-TEST CONDITIONS: Linksets 1, 2, 4 and 6 are unavailable

CONFIGURATION: B	TYPE OF TEST: VAT, CPT	TYPE OF SP: SP

MESSAGE SEQUENCE:

```
        SP    A              SP    B              SP    C              SP    ●
   Link                   Link                Link                 Link
 :Start traffic

 3 — 1, 2  TRAFFIC   ------------------------->  7 — 1   ------------>          SP  E
                                                 8 — 1   ------------>          SP  D
                     <-------------------------  3 — 1, 2  <------------  7 — 1  SP  E
                                                           <------------  8 — 1  SP  D

 2 — 1   :Activate
         |
         | T21         <--------  2 — 1 TFP (PC = C)
         |             <--------  2 — 1 TFP (PC = E)
         |             <--------  2 — 1 TRA
         ⊥
         TIME CONTROLLED DIVERSION IS APPLIED

 2 — 1   TRAFFIC   -------->  5 — 1  --------------------------------------->          SP  D
         (from 3 — 1, 2)
                  <--------  2 — 1  <-----------------------------------  5 — 1  SP  D
 3 — 1, 2  TRAFFIC  ------------------------------->  7 — 1  ------------>          SP  E
                                                      8 — 1  ------------>          SP  D
                  <-------------------------------  3 — 1, 2  <------------  7 — 1  SP  E
 :Wait
 :Stop traffic
```

Note — The time controlled diversion procedure is applied in A and a changeback is performed in D. These procedures are not described in this point restart test.

TEST DESCRIPTION

1.	Start traffic to E (and D in VAT).
2.	Activate link 2 — 1 and check that the timer T21 is started. Check that TFPs sent from B are received in A. Check that the timer T21 is stopped on reception of the TRA message received from B.
3.	Check that the time controlled diversion procedure is performed at the end of T21. Check that the traffic to D is diverted to the link 2 — 1 in accordance with the load sharing rules in A. Check that the traffic to E is not diverted.
4.	Stop traffic and check that there were no lost messages, no duplication and no missequencing.
5.	Repeat the test (in VAT) without sending of TRA and check that the duration of timer T21 is inside the specified range.

TEST NUMBER: 10.1.2	PAGE: 1 of 1

REFERENCE: Q.704 § 9

TITLE: Signalling point restart

SUB TITLE: Recovery of a linkset (SP A has not STP function) — Without use of point restart procedure

PURPOSE: To check the actions of the system in case of restart of a linkset

PRE-TEST CONDITIONS: Linksets 1, 2 and 6 unavailable

CONFIGURATION: B	TYPE OF TEST: VAT	TYPE OF SP: SP

MESSAGE SEQUENCE:

```
        SP    A              SP    B              SP    C              SP    ●

     Link                 Link             Link                   Link

:Start traffic

3 — 1, 2   TRAFFIC    ---------------------------->   7 — 1    ------------>         SP   E
                                                      8 — 1    ------------>         SP   D
```
```
                             ┌4 — 1   <--------------------------------    5 — 1    SP   D
                             └---------------->    3 — 1, 2┐
                          <-------------------------------------┘
                          <------------------------------  3 — 1, 2   <------------   7 — 1    SP   E

   2 — 1     :Activate

           CHANGEBACKS ARE PERFORMED IN A AND B (see note)

   2 — 1     TRAFFIC    --------->    4 — 1    --------->    7 — 1    ------------>         SP   E
   2 — 1     TRAFFIC    --------->    5 — 1    ------------------------------------>         SP   D
   3 — 1, 2  TRAFFIC    ---------------------------->    7 — 1    ------------>         SP   E
                                                         8 — 1    ----------->         SP   D
                        --------->    2 — 1    <-------------------------------   5 — 1    SP   D
                        ---------------------------->    3 — 1, 2   ------------>   7 — 1    SP   E
```

:Wait

:Stop traffic

Note — After activation of link 2 — 1, changebacks are performed in A and B but they are not explicitly described in this point restart test.

TEST DESCRIPTION

1.	Start traffic to E and D.
2.	Activate link 2 — 1. Check that the point restart procedure is not applied and that changebacks are performed.
3.	Check that the traffic from A is diverted to the link 2 — 1 in accordance with the load sharing rules in A.
4.	Check that the signalling route set test procedure is not applied after the activation of the link 2 — 1.
5.	Stop traffic and check that there were no lost messages, no duplication and no missequencing.

TEST NUMBER: 10.2.1	PAGE: 1 of 2

REFERENCE: Q.704 § 9

TITLE: Signalling point restart

SUB TITLE: Recovery of a linkset (SP A has the STP function) — With use of point restart procedure

PURPOSE: To check that restart procedure is performed correctly when the recovery of a linkset restores the connectivity between two adjacent SPs

PRE-TEST CONDITIONS: Linksets 1, 3, 4 and 6 unavailable

CONFIGURATION: D	TYPE OF TEST: VAT, CPT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
        SP    A                 SP    B              SP    C              SP    ●

    Link                        Link            Link                 Link
:Start traffic

    2 — 1    TRAFFIC       ------------------------->   7 — 1   ------------>        SP  E
             (from A)                                   8 — 1   ------------>        SP  D
                           <-------------------------   2 — 1   <------------ 7 — 1  SP  E
                                                                <------------ 8 — 1  SP  D

    1 — 1    :Activate

    1 — 1    TFP (PC = F)  --------->
             T21                            |
                                            |T21
                           <--------  1 — 1  TFPs (PC = E and PC = C)
    1 — 1    TRA           -------->        _|
                                     5 — 1   TFA (PC = A)                            SP  D
                           <--------  1 — 1   TRA
    2 — 1    TFA (PC = B)  ----------------------------->
    1 — 1    TFP (PC = D)  -------->

             TIME CONTROLLED DIVERSION IS APPLIED

    1 — 1    TRAFFIC       --------> 5 — 1   ---------------------------------->       SP  D
                           <-------- 1 — 1  <--------------------------------- 5 — 1   SP  D
                           <---------------------------------- 2 — 1  <------------ 8 — 1  SP  D
    2 — 1    TRAFFIC       ------------------------------->  7 — 1  ------------>       SP  E
                           <------------------------------- 2 — 1  <------------ 7 — 1  SP  E
:Wait
:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to D and E.
2.	Activate link 1 — 1 and check that the timer T21 is started in A (and B in CPT). Check that TFPs are sent from B to A for E and C, and that a TFP is sent from A to B for F.
3.	Check that a TRA is sent from A to B and check that, on reception of TRA (sent from B to A), the timer T21 is stopped. Check that a TFA is sent from A to C for B.
4.	Check that the time controlled diversion is applied in A. Check that the traffic to D is diverted on link 1 — 1.
5.	Stop traffic. Check that there were no lost messages and no missequencing.
6.	In VAT, repeat the test without sending TRA from B to A and check that the duration of T21 is inside the specified range.

TEST NUMBER: 10.2.1 Continued	PAGE: 2 of 2

REFERENCE: Q.704 § 9

TITLE: Signalling point restart

SUB TITLE: Recovery of a linkset (SP A has the STP function) — With use of point restart procedure

PURPOSE: See page 1 of 2

PRE-TEST CONDITIONS: Linksets 3, 4 and 6 unavailable (end of page 1)

CONFIGURATION: D	TYPE OF TEST: VAT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
          SP    A              SP    B              SP    C              SP    ●

      Link                 Link              Link               Link

:Start traffic

  1 — 1    TRAFFIC      -------->   5 — 1    -------------------------------->        SP   D
                        <--------   1 — 1    <--------------------------------  5 — 1  SP   D
                        <-------------------------- 2 — 1    <------------  8 — 1  SP   D
  2 — 1    TRAFFIC      --------------------------------->  7 — 1    ------------>       SP   E
                        <--------------------------------  2 — 1    <------------  7 — 1  SP   E
  3 — 1    :Activate
  3 — 1    TRAFFIC      <--------------------------------------------------->  3 — 1  SP   F

                                                                              |
                                                                              | T21
                                                                              |
  3 — 1    TRA          ---------------------------------------------->        |
  1 — 1    TFA (PC = F) -------->                                              ⊥
  2 — 1    TFA (PC = F) ------------------------------>
  1 — 1    TRAFFIC      -------->   5 — 1    --------------------------------->       SP   D
            (from A and F)
                        <--------   1 — 1    <--------------------------------  5 — 1  SP   D
  2 — 1    TRAFFIC      ----------------------------->  7 — 1    ------------>        SP   E
            (from A and F)
                        <----------------------------  2 — 1    <------------  7 — 1  SP   E
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic.
2.	Activate the link 3 — 1 and check that the traffic from/to A to/from F is immediately restarted.
3.	Check that a TRA is sent from A to F and check that A broadcasts TFA for F.
4.	Stop traffic and check that there were no lost messages, no duplication and no missequencing.

TEST NUMBER: 10.2.2	PAGE: 1 of 1

REFERENCE: Q.704 § 9

TITLE: Signalling point restart

SUB TITLE: Recovery of a linkset (SP A has the STP function) — Without use of point restart procedure

PURPOSE: To check the actions of the system in case of restart of a linkset

PRE-TEST CONDITIONS: Linkset 1 unavailable

CONFIGURATION: D	TYPE OF TEST: VAT	TYPE OF SP: STP

MESSAGES SEQUENCE:

```
        SP    A              SP    B              SP    C              SP    ●

     Link                 Link              Link                 Link

   :Start traffic

    2 — 1   TRAFFIC      ---------------------------->  8 — 1   ------------>         SP  D
            (from A and F)                              7 — 1   ------------>         SP  E
                         <----------------------------  2 — 1   <------------  7 — 1  SP  E
                                                                <------------  8 — 1  SP  D
    1 — 1   :Activate                                          (see Note 1)

            CHANGEBACKS ARE PERFORMED IN A AND B (see Note 2)

    1 — 1   TRAFFIC      --------->   5 — 1  ------------------------------------->   SP  D
            (from A and F, from 2 — 1)   6 — 1  <---------------------------------   SP  E
    2 — 1   TRAFFIC      ---------------------------->  7 — 1  ------------>          SP  E
                         <----------------------------  2 — 1  <------------  7 — 1   SP  E
                                                                <------------  8 — 1   SP  D
                                                                (see Note 1)
   :Wait

   :Stop traffic
```

Note 1 — Depending of the routing rules in D and E, the traffic to A and F may be carried either on linksets 5 or 8, or on linksets 6 or 7.

Note 2 — Changebacks are performed but they are not explicitly described in this point restart test.

TEST DESCRIPTION

1.	Start traffic to D and E.
2.	Activate link 1 — 1. Check that point restart procedure is not applied in this case and that changebacks are performed.
3.	Check that the traffic to D and E is diverted on link 1 — 1 in accordance with the load sharing rules in A.
4.	Check that the signalling route set test procedure is not used.
5.	Stop traffic and check there were no lost messages, no duplication and no missequencing.

TEST NUMBER: 10.3	PAGE: 1 of 1

REFERENCE: Q.704 § 9

TITLE: Signalling point restart

SUB TITLE: An adjacent SP becomes accessible via another SP (SP A has not STP function)

PURPOSE: To check the actions of the system when an adjacent SP becomes accessible via another SP

PRE-TEST CONDITIONS: Linksets 1, 3, 4, 5 and 6 are unavailable

CONFIGURATION: B	TYPE OF TEST: VAT	TYPE OF SP: SP

MESSAGE SEQUENCE:

```
          SP    A              SP    B              SP    C              SP    ●

       Link                 Link              Link                  Link

                          4 — 1:Activate
                                    |
                               <--------   4 — 1   TFP (A)
                      TFPs 4 — 1  -------->
                      (D and E)   T21                T21

                               <--------   4 — 1   TRA
                      TRA 4 — 1  -------->
                  <--------   2 — X    TFAx       7 — 1  TFAs (A,B) ------>         SP  E
                             (PCs = C, D  8 — 1  TFAs (A,B) ------>                 SP  D
          T21    (for D and C)  and E)                      T21 in D for A
  2 — 1, 2                    (Broadcasting
          TRAFFIC  -------->   4 — 1   mode)     7 — 1  --------------->            SP  E
                  <--------   2 — 1, 2  <--------  4 — 1  <--------------   7 — 1   SP  E

  2 — 1, 2  TRAFFIC  -------->  4 — 1   -------->  8 — 1  --------------->          SP  D
                  <--------   2 — 1, 2  <--------  4 — 1  <--------------   8 — 1   SP  D
  :Wait

  :Stop traffic
```

TEST DESCRIPTION	
1.	Activate link 4 — 1.
2.	Check that on the reception of TFAs the traffic is immediately restarted in A to E and that traffic to D is restarted after expiration of T21.
3.	Stop traffic and check that there were no lost messages, no duplication and no missequencing.

TEST NUMBER: 10.4	PAGE: 1 of 1

REFERENCE: Q.704 § 9

TITLE: Signalling point restart

SUB TITLE: An adjacent SP becomes accessible via another SP (SP A has STP function)

PURPOSE: To check the actions of the system when an adjacent SP becomes accessible via another SP on reception of a TFA

PRE-TEST CONDITIONS: Linksets 1, 3 and 4 are unavailable

CONFIGURATION: D	TYPE OF TEST: VAT	TYPE OF SP: STP

MESSAGES SEQUENCE:

```
        SP    A              SP    B              SP    C              SP    ●

    Link                   Link              Link                   Link

:Start traffic

2 - 1  TRAFFIC     ------------------------>  7 - 1   ------------>         SP  E
       (from A)                               8 - 1   -------------->       SP  D
                   <--------------------------  2 - 1   <------------  7 - 1   SP  E
                          4 - 1   :Activate             <------------  8 - 1   SP  D

                                       Point restart
                                   T21 procedure is        T21
                                       applied in B and C
                                       <--------  4 - 1   TRA
                          4 - 1  TRA -------->
                   <--------------------------  2 - 1    TFA (PC = B)
2 - 1  TFP (PC = F)  ------------------------>  4 - 1┐
       (sent to B via C)    <--------------------------┘
2 - 1  TRAFFIC     ------------------------>  7 - 1   ------------>         SP  E
                                              8 - 1   <------------         SP  D
                   <--------------------------  2 - 1   <------------  7 - 1   SP  E
                                                        <------------  8 - 1   SP  D

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic.
2.	Activate link 4 - 1.
3.	Check that, when the TFA is received for B, SP A is aware of that B is an adjacent point which restarts, and consequently A sends a TFP concerning F on link 2 - 1 to B.
4.	Stop traffic and check that it was not disturbed.

TEST NUMBER: 10.5	PAGE: 1 of 2

REFERENCE: Q.704 § 9

TITLE: Signalling point restart

SUB TITLE: Restart of an SP having no STP function

PURPOSE: To check the restart procedure in an SP having no STP function

PRE-TEST CONDITIONS: SP A unavailable

CONFIGURATION: B	TYPE OF TEST: VAT, CPT	TYPE OF SP: SP

MESSAGE SEQUENCE:

```
        SP    A              SP    B              SP    C              SP    ●

    Link                     Link            Link                 Link

        :Activate
X — X   Activation (first link activated)
        |
        |
        : T21
        |
        |
      __|_ <------------            TRA   received from B or C
      FINAL SITUATION (WHEN ALL LINKS ARE AVAILABLE)
1 — 1, 2  TRAFFIC   ----------------------------------------------------->          SP  D
                    <----------------------------------------------- 1 — 1, 2       SP  D
2 — 1, 2  TRAFFIC   --------->    5 — 1   ------------------------------------>      SP  D
                                  6 — 1   ------------------------------------>      SP  E
3 — 1, 2  TRAFFIC   ----------------------------->   8 — 1    ------------>          SP  D
                                                     7 — 1    ------------>          SP  E
                    <---------------------------  3 — 1, 2  <------------  7 — 1      SP  E
```

:Wait

:Stop traffic

TEST DESCRIPTION

1.	Activate SP A.
2.	Check that when the first link is activated, the timer T21 is started.
3.	Check that, on reception of a TRA received from B or C, T21 is stopped.
4.	Check that, when all links are activated, the traffic is carried as described above.
5.	Stop traffic.

TEST NUMBER: 10.5	PAGE: 1 of 2

REFERENCE: Q.704 § 9

TITLE: Signalling point restart

SUB TITLE: Restart of an SP having no STP function

PURPOSE: To check the restart procedure in an SP having no STP function

PRE-TEST CONDITIONS: SP A unavailable

CONFIGURATION: B	TYPE OF TEST: VAT, CPT	TYPE OF SP: SP

MESSAGE SEQUENCE:

```
          SP    A              SP    B              SP   C              SP    ●

       Link                     Link                Link                Link

           :Activate
  X — X   | Activation (first link activated)
          |
          |
          : T21
          |
          |
        ⊥ <------------              TRA   received from B or C
```

FINAL SITUATION (WHEN ALL LINKS ARE AVAILABLE)

```
1 — 1, 2  TRAFFIC   --------------------------------------------------->        SP  D
                    <-------------------------------------------------- 1 — 1, 2   SP  D
2 — 1, 2  TRAFFIC   --------->    5 — 1   -------------------------------->       SP  D
                                 6 — 1   -------------------------------->       SP  E
3 — 1, 2  TRAFFIC   ------------------------------->   8 — 1   ------------->     SP  D
                                              7 — 1   ------------->             SP  E
                    <------------------------------ 3 — 1, 2  <------------  7 — 1   SP  E
```

:Wait

:Stop traffic

TEST DESCRIPTION

1.	Activate SP A.
2.	Check that when the first link is activated, the timer T21 is started.
3.	Check that, on reception of a TRA received from B or C, T21 is stopped.
4.	Check that, when all links are activated, the traffic is carried as described above.
5.	Stop traffic.

TEST NUMBER: 10.6	PAGE: 1 of 2

REFERENCE: Q.704 § 9

TITLE: Signalling point restart

SUB TITLE: Restart of an SP having the STP function

PURPOSE: To check the restart procedure in an SP having STP function

PRE-TEST CONDITIONS: SP A unavailable

CONFIGURATION: D	TYPE OF TEST: VAT, CPT	TYPE OF SP: STP

MESSAGES SEQUENCE:

```
        SP    A              SP    B              SP    C              SP    ●
     Link                 Link              Link                  Link
           :Activate
   X — X    Activation
              <-------- TRA may be received from B or C
             | T18                         | T21              | T21              | T21
             |                             |                  |                  |
             ⌐ all links are aligned       |                  |                  |
             |                             |                  |                  |
             |  <-------- TRA may be received from B or C     |                  |
             |                             |                  |                  |
             ⌐ T19 (see note)              |                  |                  |
   1 — 1     | TFPs (for D and E) -->      |                  |                  |
   2 — 1     | TFPs (for D and E) ----------------->  -------->|                  |
             ⌐ T20                         |                  |                  |
   1 — 1     | TRA        -------->       ⌐ TFAs (A) are sent |                  |
   2 — 1     | TRA        --------------------------------->  ⌐ TFAs (A) are sent|
   3 — 1     | TRA             ------------------------------------------------------->  ⌐         SP   F
   1 — 1     | TRAFFIC    -------->  5 — 1  ------------------------------------>          SP   D
             | (from A and F) <-------     Via B or C to A and F  ----------> 5 — 1 or 8 — 1   SP   D
             |                      6 — 1  ------------------------------------>          SP   E
   2 — 1     | TRAFFIC    --------------------------------->  7 — 1  ---------->          SP   E
             | (from A and F) <-------     Via B or C to A and F  ----------> 6 — 1 or 7 — 1   SP   E
```

:Wait

:Stop traffic

Note — If all TRAs are received during T18, T19 is not started.

TEST DESCRIPTION

1.	Activate signalling point A.
2.	Check that the signalling links become available and check that the received TRAs are correctly handled.
3.	Check that when all TRAs are received in A, TRAs are broadcasted from A.
4.	Check that the traffic is restarted correctly, wait and stop traffic.
5.	Repeat the test (in VAT) but send the traffic from F to D and E via A immediately after alignment of link 3 — 1 and check that this traffic is treated normally in A.

TEST NUMBER: 10.6 Continued	PAGE: 2 of 2

REFERENCE: Q.704 § 9

TITLE: Signalling point restart

SUB TITLE: Restart of an SP having the STP function

PURPOSE: To check the restart procedure in an SP having STP function

PRE-TEST CONDITIONS: SP A, linksets 2 and 4 unavailable

CONFIGURATION: D	TYPE OF TEST: VAT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
        SP    A              SP    B              SP   C              SP   ●

    Link                     Link              Link                 Link

            :Activate
    3 — 1   Activation (traffic from/to F is immediately restarted)
            | T18
    1 — 1   Activation (traffic from/to B is immediately restarted)
            |       <------    1 — 1    TFP (PC = C)
            |          <------ 1 — 1    TRA
            |
            |
            |
            | T19                        T21                          T21
    3 — 1   | TFP (PC = C) --------------------------------------------->   SP   F
    1 — 1   | TFPs          -------->
            | (PC = C, D and E)
            | T20
    1 — 1   TRA             -------->
    3 — 1   TRA             --------------------------------------------->
    1 — 1   TRAFFIC         -------->   5 — 1   ------------------------------->   SP   D
            (from A and F)              6 — 1   ------------------------------->   SP   E
                                to A and F  <---------------------------  5 — 1   SP   D
                                to A and F  <---------------------------  6 — 1   SP   E
    :Wait
    :Stop traffic
```

TEST DESCRIPTION

1.	Activate signalling point A beginning by the activation of 3 — 1. After activation of 3 — 1, activate link 1 — 1.
2.	Check that T19 is started after expiration of T18. Check that the duration of T18 is inside the specified range.
3.	Check that T20 is started after expiration of T19. Check that the duration of T19 is inside the specified range.
4.	Check that TFPs are sent during T20.
5.	Check that when T20 expires TRAs are broadcasted and that the traffic is correctly restarted, wait and stop traffic.
6.	Repeat the test with activation of 2 — 1 during T19 and check that this event is treated outside the procedure.

TEST NUMBER: 10.7.1	PAGE: 1 of 1
REFERENCE: Q.704 § 9	
TITLE: Signalling point restart	
SUB TITLE: Reception of an unexpected TRA — In an SP having no STP function	
PURPOSE: To check the actions of the system in case of reception of an unexpected TRA	
PRE-TEST CONDITIONS: Linkset with one available link	

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: SP

MESSAGES SEQUENCE:

```
                        SP    A                                  SP    B

            Link                                    Link
:Start traffic

        1 — 1        TRAFFIC        ---------------->
                                    <---------------    1 — 1        TRAFFIC
                                    <---------------    1 — 1        TRA

        1 — 1        TRAFFIC        ---------------->
                                    <---------------    1 — 1        TRAFFIC
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 — 1.
2.	Send a TRA from B to A and check that this message is ignored.
3.	Stop traffic and check that it has not been disturbed.

TEST NUMBER: 10.7.2	PAGE: 1 of 1

REFERENCE: Q.704 § 9

TITLE: Signalling point restart

SUB TITLE: Reception of an unexpected TRA — In an SP having STP function

PURPOSE: See test 10.7.1

PRE-TEST CONDITIONS: Linksets 1, 4 and 8 unavailable

CONFIGURATION: D	TYPE OF TEST: VAT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
        SP    A              SP    B              SP    C              SP    ●

    Link                  Link              Link                  Link

:Start traffic

    2 — 1    TRAFFIC    -------------------------->   7 — 1   ------------->          SP   E
             (from A and F)
                        <--------------------------   2 — 1   <-------------  7 — 1   SP   E
                        <--------------------------   2 — 1   TRA

    2 — 1    TFP (PC = B)  -------------------------->
    2 — 1    TFP (PC = D)  -------------------------->
    2 — 1    TRAFFIC    -------------------------->   7 — 1   ------------->          SP   E
             (from A and F)
                        <--------------------------   2 — 1   <-------------  7 — 1   SP   E

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to E.
2.	Send a TRA from C to A and check that TFPs concerning B and D are received, then, check that a TRAs received from A.
3.	Stop traffic and check that it was not disturbed.

TEST NUMBER: 11	PAGE: 1 of 1

REFERENCE: Q.706

TITLE: Traffic test

SUB TITLE:

PURPOSE: To check the behaviour of an STP in various traffic situations

PRE-TEST CONDITIONS: All links available

CONFIGURATION: C	TYPE OF TEST: VAT	TYPE OF SP: STP

MESSAGE SEQUENCE:

```
                 SP    B                          SP    A              SP    C

          Link                              Link              Link
:Start traffic

     1 — 1        TRAFFIC      -----------> 2 — 1  ----------->
     1 — 2        TRAFFIC      -----------> 2 — 1  ----------->

                               <-----------  1 — 1  <------------  2 — 1   TRAFFIC
                               <-----------  1 — 2

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic between B and C in both directions via A using the traffic models presented in Recommendation Q.706.
2.	Check that the time to cross the STP is better than 20 milliseconds.
3.	Stop traffic and check that it was not disturbed.
4.	Repeat test but with a traffic model including 5% of messages with an SIF = 272 octets.

TEST NUMBER: 12.1	PAGE: 1 of 1

REFERENCE: Q.707

TITLE: Signalling link test

SUB TITLE: After activation of a link

PURPOSE: To check the signalling link test procedure after activation of a signalling link

PRE-TEST CONDITIONS: Signalling link 1 — 2 available

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                                        SP    B

        Link                                         Link
:Start traffic

        1 — 2       TRAFFIC       ---------------->
                                  <---------------   1 — 2       TRAFFIC

        1 — 1       :Activate

        1 — 1       SLTM          ---------------->
                                  <---------------   1 — 1       SLTA

                                  <---------------   1 — 1       SLTM
        1 — 1       SLTA          ---------------->
CHANGEBACK

        1 — 1, 2    TRAFFIC       ---------------->
                    TRAFFIC       <---------------   1 — 1, 2    TRAFFIC
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B (and C in VAT).
2.	-Activate link 1 — -1-and check that an SLTM is received from A.
3.	Send an SLTM to A and check that an SLTA is received.
4.	Check that the link 1 — 1 becomes available and that changeback is performed correctly.
5.	Stop traffic.
6.	In VAT, repeat the test with link 1 — 1 unavailable and inhibited (in this case changeback is not performed). Check that the link 1 — 1 becomes available and stays inhibited.

TEST NUMBER: 12.2	PAGE: 1 of 1

REFERENCE: Q.707

TITLE: Signalling link test

SUB TITLE: No acknowledgement to first SLTM

PURPOSE: To check that a second SLTM is sent if the first is not acknowledged

PRE-TEST CONDITIONS: Signalling link 1 — 2 available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                                    SP    B

        Link                                    Link

:Start traffic

        1 — 2          TRAFFIC      ---------------->
                                    <---------------    1 — 2       TRAFFIC

        1 — 1          :Activate

        1 — 1          SLTM         ---------------->

              | T1

        1 — 1          SLTM         ---------------->
                                    <---------------    1 — 1       SLTA
                                    <---------------    1 — 1       SLTM
        1 — 1          SLTA         ---------------->
CHANGEBACK
        1 — 1, 2       TRAFFIC      ---------------->
                                    <---------------    1 — 1, 2    TRAFFIC
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C.
2.	Activate link 1 — 1 and check that an SLTM is received and not acknowledged.
3.	Check that when the time T1 expires a new SLTM is sent. Check that the duration of this time is inside of the specified range.
4.	Check that the link 1 — 1 becomes available and that the changeback is performed correctly.
5.	Stop traffic.
6.	Repeat the test with link 1 — 1 unavailable and inhibited (in this case changeback is not performed). Check that the link becomes available and stays inhibited.

TEST NUMBER: 12.3	PAGE: 1 of 1
REFERENCE: Q.707	
TITLE: Signalling link test	
SUB TITLE: No acknowledgement to second SLTM	
PURPOSE: To check that the link stays unavailable when the second SLTM is not acknowledged	
PRE-TEST CONDITIONS: Signalling link 1 — 2 available	

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                                    SP    B

        Link                                    Link
:Start traffic

        1 — 2         TRAFFIC      --------------->
                                   <--------------     1 — 2         TRAFFIC

        1 — 1         :Activate

        1 — 1         SLTM         --------------->
                       |
                       | T1
                       |

        1 — 1         SLTM         --------------->
                       |
                       | T1
                       |

        1 — 2         TRAFFIC      --------------->
                                   <--------------     1 — 2         TRAFFIC
:Wait
:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C.
2.	Activate link 1 — 1 and check that two SLTMs are received from A.
3.	Check that after the second expiration of T1, link 1 — 1 stays unavailable and that the management system is informed.
4.	Repeat the test with link 1 — 1 unavailable and inhibited.

TEST NUMBER: 12.4	PAGE: 1 of 1

REFERENCE: Q.707

TITLE: Signalling link test

SUB TITLE: Unreasonable field in an SLTA

PURPOSE: To check the actions of the system on reception of an SLTA with an unreasonable field

PRE-TEST CONDITIONS: Signalling link 1 — 2 available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP     A                                    SP     B

        Link                                    Link
:Start traffic

        1 — 2          TRAFFIC      ---------------->
                                    <---------------    1 — 2          TRAFFIC

        1 — 1          :Activate

        1 — 1          SLTM         ---------------->
                                    <---------------    1 — 1          SLTA (erroneous test
                                                                              pattern)
        1 — 1          SLTM         ---------------->
                                    <---------------    1 — 1          SLTA

CHANGEBACK

        1 — 1, 2       TRAFFIC      ---------------->
                                    <---------------    1 — 1, 2       TRAFFIC

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C.
2.	Activate link 1 — 1 and check that an SLTM is received and acknowledged with an SLTA containing an erroneous test pattern.
3.	Check that a second SLTM is sent from A and correctly acknowledged.
4.	Check that link 1 — 1 becomes available and that changeback is performed correctly.
5.	Wait and stop traffic.
6.	Repeat the test with a first SLTA containing an erroneous SLC then OPC.
7.	Repeat the test with the first and second erroneous SLTA and check that link 1 — 1 stays unavailable and that management system is informed.

TEST NUMBER: 12.5	PAGE: 1 of 1

REFERENCE: Q.707

TITLE: Signalling link test

SUB TITLE: Reception of an SLTM in an attempt state

PURPOSE: To check the actions of the system when an SLTM is received in an attempt state

PRE-TEST CONDITIONS: Signalling link 1 — 2 available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                SP    A                                    SP    B

        Link                                    Link
:Start traffic

        1 — 2         TRAFFIC        --------------->
                                     <--------------   1 — 2      TRAFFIC
        1 — 1         :Activate

        1 — 1         SLTM           --------------->
                    │ T1             <--------------   1 — 1      SLTM
        1 — 1       │ SLTA           --------------->

        1 — 1         SLTM           --------------->
                    │ T1             <--------------   1 — 1      SLTM
        1 — 1       │ SLTA           --------------->

                                     <--------------   1 — 1      STLA

CHANGEBACK

        1 — 1, 2      TRAFFIC        --------------->
                                     <--------------   1 — 1, 2   TRAFFIC
:Wait

:Stop traffic
```

TEST DESCRIPTION	
1.	Start traffic to B and C.
2.	Activate link 1 — 1 and check that SLTM is received. Send an SLTM and check that an SLTA is received.
3.	On reception of the second SLTM, send an SLTM and check that an SLTA is received. Send an SLTA to A.
4.	Check that changeback is performed correctly, and stop traffic.

TEST NUMBER: 12.6	PAGE: 1 of 1

REFERENCE: Q.707

TITLE: Signalling link test

SUB TITLE: Additional SLTA and SLTM

PURPOSE: To check the actions of the system on reception of additional SLTA and SLTM

PRE-TEST CONDITIONS: Signalling link 1 — 2 available

CONFIGURATION: A	TYPE OF TEST: VAT, CPT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                                        SP    B

        Link                                          Link .
:Start traffic

        1 — 2       TRAFFIC       ---------------->

                                  <---------------   1 — 2       TRAFFIC

                                  <---------------   1 — 2       SLTA

                                  <---------------   1 — 2       SLTM
        1 — 2       SLTA          ---------------->
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B (and C in VAT).
2.	Check that the reception of an SLTA is ignored.
3.	Send an SLTM to A and check that an SLTA is received.
4.	Stop traffic and check that it was not disturbed.

TEST NUMBER: 13.1	PAGE: 1 of 1

REFERENCE: Q.704 Tab. 1

TITLE: Invalid messages

SUB TITLE: Invalid H0.H1 in a signalling network management message

PURPOSE: To check the actions of the system when a signalling network management message is received with a nonexisting H0.H1

PRE-TEST CONDITIONS: All links available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                                        SP    B

        Link                                         Link
:Start traffic

        ALL         TRAFFIC          -------------->
                                     <--------------    ALL        TRAFFIC

                                     <--------------    1 - X      SIGNALLING NETWORK
                                                                   MANAGEMENT MESSAGE
                                                                   (Invalid H0.H1)

        ALL         TRAFFIC          -------------->
                                     <--------------    ALL        TRAFFIC
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on all links.
2.	Send a signalling network management message with a nonexisting H0.H1.
3.	Check that this message is discarded without impact on the traffic.
4.	Stop traffic.

TEST NUMBER: 13.2	PAGE: 1 of 1

REFERENCE: Q.704 § 15

TITLE: Invalid messages

SUB TITLE: Invalid changeover messages

PURPOSE: To check the actions of the system on reception of changeover messages with an invalid SLC or OPC

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
            SP    A                              SP    B

     Link                          Link
:Start traffic

     1 - 1       TRAFFIC      --------------->
                             <--------------      1 - 1       TRAFFIC
     1 - 2       TRAFFIC      --------------->
                             <--------------      1 - 2       TRAFFIC
                             <--------------      1 - 2       COO, SLC 1 - X
                                                              (nonexisting SLC)
                             <--------------      1 - 2       COO, SLC 1 - 1
                                                              (nonexisting OPC)
                             <--------------      1 - 2       ECO, SLC 1 - X
                                                              (nonexisting SLC)
                             <--------------      1 - 2       ECO, SLC 1 - 1
                                                              (nonexisting OPC)
                             <--------------      1 - 2       COA, SLC 1 - X
                                                              (nonexisting SLC)
                             <--------------      1 - 2       COA, SLC 1 - 1
                                                              (nonexisting OPC)
                             <--------------      1 - 2       ECA, SLC 1 - X
                                                              (nonexisting SLC)
                             <--------------      1 - 2       ECA, SLC 1 - 1
                                                              (nonexisting OPC)
     1 - 1       TRAFFIC      --------------->
                             <--------------      1 - 1, 2    TRAFFIC
:Wait
:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C on all links.
2.	Send the invalid messages as described above and check that they are ignored.
3.	Stop traffic and check that it was not disturbed.

MTP LEVEL 3

TEST NUMBER: 13.3	PAGE: 1 of 1

REFERENCE: Q.704 § 15

TITLE: Invalid messages

SUB TITLE: Invalid changeback messages

PURPOSE: To check the actions of the system on reception of changeback messages with an invalid SLC or OPC

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
            SP    A                              SP    B

     Link                              Link
:Start traffic

     1 - 1      TRAFFIC      ---------------->
                            <---------------   1 - 1      TRAFFIC
     1 - 2      TRAFFIC      ---------------->
                            <---------------   1 - 2      TRAFFIC

                            <---------------   1 - 2      CBD, SLC 1 - X
                                                          (nonexisting SLC)

                            <---------------   1 - 2      CBD, SLC 1 - 1
                                                          (nonexisting OPC)

                            <---------------   1 - 2      CBA, SLC 1 - X
                                                          (nonexisting SLC)

                            <---------------   1 - 2      CBA, SLC 1 - 1
                                                          (nonexisting OPC)

     1 - 1, 2   TRAFFIC      ---------------->
                            <---------------   1 - 1, 2   TRAFFIC
:Wait

:Stop traffic
```

TEST DESCRIPTION	
1.	Start traffic to B and C on all links.
2.	Send the invalid messages described above and check that they are ignored.
3.	Stop traffic and check that it was not disturbed.

TEST NUMBER: 13.4	PAGE: 1 of 1

REFERENCE: Q.704 § 15

TITLE: Invalid messages

SUB TITLE: Invalid changeback code

PURPOSE: To check the actions of the system on reception of an invalid changeback code in a changeback message

PRE-TEST CONDITIONS: Linkset with one link available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                              SP    B

        Link                              Link
:Start traffic

    1 — 2      TRAFFIC            ---------------->
                                 <---------------    1 — 2      TRAFFIC

    1 — 1      :Activate (depending of the deactivation mean previously used)

    1 — 2      CBD, SLC 1 — 1     ---------------->

                  │
                  │ T4
                  │             <---------------    1 — 2      CBA, SLC 1 — 1
                  │                                             (invalid changeback
                  │                                             code ≠ CBD)
    1 — 2      CBD, SLC 1 — 1     ---------------->

                  │
                  │ T5
                  │
    1 — 1      TRAFFIC            ---------------->
               (from 1 — 2)
                                 <---------------    1 — 1      TRAFFIC
                                                                (from 1 — 2 see note)
    1 — 2      TRAFFIC            ---------------->
                               . <---------------    1 — 2      TRAFFIC
:Wait

:Stop traffic

Note — B may perform a changeback or not.
```

TEST DESCRIPTION

1.	Start traffic to B and C on link 1 — 2.
2.	Activate link 1 — 1, check that a CBD is received and acknowledged by a CBA with an invalid changeback code.
3.	Check that a new CBD is received after T4 expires and acknowledged by a correct CBA. Check that changeback is performed.
4.	Stop traffic and check that the invalid message has been discarded without impact on the traffic.

TEST NUMBER: 13.5	PAGE: 1 of 3

REFERENCE: Q.704 § 15

TITLE: Invalid messages

SUB TITLE: Invalid inhibition messages

PURPOSE: To check the actions of the system on reception of an invalid inhibition messages

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                                    SP    B

        Link                                    Link

:Start traffic

        1 — 1      TRAFFIC      ---------------->
                                <----------------    1 — 1      TRAFFIC
        1 — 2      TRAFFIC      ---------------->
                                <----------------    1 — 2      TRAFFIC

                                <----------------    1 — 2      LIN, SLC 1 — X
                                                                (nonexisting SLC)

                                <----------------    1 — 2      LIN, SLC 1 — 2
                                                                (nonexisting OPC)

                                <----------------    1 — 2      LIA, SLC 1 — X
                                                                (nonexisting SLC)

                                <----------------    1 — 2      LIA, SLC 1 — 1
                                                                (nonexisting OPC)

                                <----------------    1 — 2      LID, SLC 1 — X
                                                                (nonexisting SLC)

                                <----------------    1 — 2      LID, SLC 1 — 1
                                                                (nonexisting OPC)
```

TEST DESCRIPTION

1.	Start traffic to B and C.
2.	Send the invalid messages described above and check that these are ignored.
3.	Stop traffic and check that it was not disturbed.

TEST NUMBER: 13.5 Continued	PAGE: 2 of 3

REFERENCE: Q.704 § 15

TITLE: Invalid messages

SUB TITLE: Invalid inhibition messages

PURPOSE: As page 1

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                                        SP    B

        Link                                    Link

                              <--------------   1 - 2    LUN, SLC 1 - X
                                                         (nonexisting SLC)

                              <--------------   1 - 2    LUN, SLC 1 - 1
                                                         (nonexisting OPC)

                              <--------------   1 - 2    LUA, SLC 1 - X
                                                         (nonexisting SLC)

                              <--------------   1 - 2    LUA, SLC 1 - 1
                                                         (nonexisting OPC)

                              <--------------   1 - 2    LFU, SLC 1 - X
                                                         (nonexisting SLC)

                              <--------------   1 - 2    LFU, SLC 1 - 1
                                                         (nonexisting OPC)
```

TEST DESCRIPTION

See page 1.

TEST NUMBER: 13.5 Continued	PAGE: 3 of 3

REFERENCE: Q.704 § 15

TITLE: Invalid messages

SUB TITLE: Invalid inhibition messages

PURPOSE: As page 1

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                SP    A                               SP    B

        Link                           Link
                        <---------------    1 - 2     LLT, SLC 1 - X
                                                      (nonexisting SLC)

                        <---------------    1 - 2     LLT, SLC 1 - 1
                                                      (nonexisting OPC)

                        <---------------    1 - 2     LRT, SLC 1 - X
                                                      (nonexisting SLC)

                        <---------------    1 - 2     LRT, SLC 1 - 1
                                                      (non existing OPC)

        ALL       TRAFFIC    --------------->
                        <---------------     ALL      TRAFFIC
    :Wait
    :Stop traffic
```

TEST DESCRIPTION

	See page 1.

TEST NUMBER: 13.6	PAGE: 1 of 1

REFERENCE: Q.704 § 15

TITLE: Invalid messages

SUB TITLE: Invalid transfer control messages

PURPOSE: To check that there is no problem on reception of a TFC with spare field or SLC not coded 00

PRE-TEST CONDITIONS: Link 1 — 1 available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                 SP    A                                      SP    B

       Link                                       Link
:Start traffic

       1 — 1      TRAFFIC           ---------------->
                                    <---------------    1 — 1      TRAFFIC

                                    <---------------    1 — 1      TFC, PC = C
                                                                   (spare field ≠ 0)

                                    <---------------    1 — 1      TFC, PC = C
                                                                   (SLC ≠ 0000)

                                    <---------------    1 — 1      TFC, PC = X
                                                                   (nonexisting PC)

       1 — 1      TRAFFIC           ---------------->
                                    <---------------    1 — 1      TRAFFIC
:Wait

:Stop traffic
```

TEST DESCRIPTION	
1.	Start traffic to B and C.
2.	Send a TFC with invalid spare field to A, then a TFC with an invalid SLC then a TFC with a nonexisting PC.
3.	Check that these messages are correctly received without disturbances due to these incorrect values.
4.	Stop traffic.

TEST NUMBER: 13.7	PAGE: 1 of 1

REFERENCE: Q.704 § 15

TITLE: Invalid messages

SUB TITLE: Invalid signalling route management messages

PURPOSE: To check the actions of the system on reception of invalid TFA or TFP

PRE-TEST CONDITIONS: Link 1 — 1 available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGES SEQUENCE:

```
                  SP    A                                      SP    B

       Link                                       Link
:Start traffic

       1 — 1       TRAFFIC        ----------------->
                                  <----------------   1 — 1       TRAFFIC
                                  <----------------   1 — 1       TFP, PC = X
                                                                  (nonexisting PC)
                                  <----------------   1 — 1       TFA, PC = X
                                                                  (nonexisting PC)
                                  <----------------   1 — 1       TFP, PC = C
                                                                  (nonexisting OPC)
                                  <----------------   1 — 1       TFP, PC = C
                                                                  (spare bits ≠ 00)
                                  <----------------   1 — 1       TFP, PC = C
                                                                  (SLC ≠ 0000)
                                                      2 — 1       :Deactivate
                                  <----------------   1 — 1       TFP, PC = C
                                  <----------------   1 — 1       TFA, PC = C
                                                                  (nonexisting OPC)
                                  <----------------   1 — 1       TFA, PC = C
                                                                  (spare bits ≠ 00)
                                  <----------------   1 — 1       TFA, PC = C
                                                                  (SLC ≠ 0000)
       1 — 1       TRAFFIC        ----------------->
                                  <----------------   1 — 1       TRAFFIC
:Wait
:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C.
2.	Send TFPs and TFAs with invalid values to A (as described above). Check that these messages are discarded without impact on the traffic.
3.	Deactivate linkset 2 and check that B becomes inaccessible.
4.	Send TFAs concerning C with invalid values to A (as described above) and check that these messages are discarded without impact on the traffic.
5.	Check the indications are given by the system (except for SLC and spare bits ≠ 0).
6.	Stop traffic.

TEST NUMBER: 13.8	PAGE: 1 of 1

REFERENCE: Q.704 § 15

TITLE: Invalid messages

SUB TITLE: Invalid Signalling-Route-Set-Test messages

PURPOSE: To check the actions of the system on reception of invalid SRST messages

PRE-TEST CONDITIONS: Link 1 — 1 available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: STP

MESSAGES SEQUENCE:

```
                    SP   A                                    SP   B

        Link                                    Link
:Start traffic

        1 — 1        TRAFFIC        ----------------->
                                    <----------------   1 — 1        TRAFFIC
                                    <----------------   1 — 1        RST, PC = X
                                                                     (nonexisting PC)
                                    <----------------   1 — 1        RST, PC = C
                                                                     (nonexisting OPC)
                                    <----------------   1 — 1        RST, PC = C
                                                                     (spare bits ≠ 00)
                                    <----------------   1 — 1        RST, PC = C
                                                                     (SLC ≠ 0000)
        1 — 1        TRAFFIC        ----------------->
                                    <----------------   1 — 1        TRAFFIC
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C.
2.	Send to A the invalid messages described above and check that these messages are discarded without impact on the traffic.
3.	Stop traffic.

TEST NUMBER: 13.9	PAGE: 1 of 1

REFERENCE: Q.704 § 15

TITLE: Invalid messages

SUB TITLE: Invalid traffic restart allowed message

PURPOSE: To check the actions of the system on reception of an invalid traffic restart allowed message

PRE-TEST CONDITIONS: Linkset with two available links

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                              SP    B

        Link                                   Link
:Start traffic

    1 — 1, 2      TRAFFIC      --------------->
                               <--------------   1 — 1, 2      TRAFFIC
                               <--------------   1 — 1         TRA (unknown OPC)
    1 — 1, 2      TRAFFIC      --------------->
                               <--------------   1 — 1, 2      TRAFFIC
:Wait
:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C.
2.	Send the invalid message described above and check that this message is ignored.
3.	Stop traffic and check that it was not disturbed.

TEST NUMBER: 13.10	PAGE: 1 of 1

REFERENCE: Q.707

TITLE: Invalid messages

SUB TITLE: Invalid H0-H1 in a signalling network testing and maintenance message

PURPOSE: To check the actions of the system on reception of this invalid message

PRE-TEST CONDITIONS: Link 1 — 1 available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP     A                                    SP     B

        Link                                       Link
:Start traffic

        1 — 1       TRAFFIC        --------------->
                                   <--------------    1 — 1       TRAFFIC

                                   <--------------    1 — 1       SIGNALLING NETWORK
                                                                  TESTING AND
                                                                  MAINTENANCE MESSAGE
                                                                  (Invalid H0-H1)
        1 — 1       TRAFFIC        --------------->
                                   <--------------    1 — 1       TRAFFIC
:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C.
2.	Send a signalling network testing and maintenance message with a nonexisting H0-H1.
3.	Check that this message is discarded without impact on the traffic.
4.	Stop traffic.

TEST NUMBER: 13.11	PAGE: 1 of 1

REFERENCE: Q.707

TITLE: Invalid messages

SUB TITLE: Invalid signalling link test messages

PURPOSE: To check the actions of the system on reception of an invalid signalling link test message

PRE-TEST CONDITIONS: Link 1 — 1 available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                     SP    A                                    SP    B

        Link                                      Link
:Start traffic

        1 — 1        TRAFFIC        --------------->
                                    <---------------    1 — 1        TRAFFIC

                                    <---------------    1 — 1        SLTM (invalid SLC)

                                    <---------------    1 — 1        SLTA (invalid SLC)

        1 — 1        TRAFFIC        --------------->
                                    <---------------    1 — 1        TRAFFIC

:Wait

:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C.
2.	Send the invalid SLTM and SLTA described above and check that they are discarded without impact on the traffic.
3.	Stop traffic.

TEST NUMBER: 13.12	PAGE: 1 of 1

REFERENCE: Q.704 § 15

TITLE: Invalid messages

SUB TITLE: Invalid user part unavailable messages

PURPOSE: To check the actions of the system on reception of an invalid user part unavailable message

PRE-TEST CONDITIONS: Link 1 — 1 available

CONFIGURATION: A	TYPE OF TEST: VAT	TYPE OF SP: ALL

MESSAGE SEQUENCE:

```
                    SP    A                              SP    B

         Link                              Link
:Start traffic

         1 — 1        TRAFFIC        --------------->
                                     <--------------    1 — 1        TRAFFIC
                                     <--------------    1 — 1        UPU (nonexisting OPC)
                                     <--------------    1 — 1        UPU (nonexisting SI)
         1 — 1        TRAFFIC        --------------->
                                     <--------------    1 — 1        TRAFFIC
:Wait
:Stop traffic
```

TEST DESCRIPTION

1.	Start traffic to B and C.
2.	Send the invalid UPUs described above and check that these messages are ignored.
3.	Stop traffic and check that it was not disturbed.

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