EUROPEAN
TELECOMMUNICATION
STANDARD

ETS 300 008-1

January 1997

Second Edition

Integrated Services Digital Network (ISDN); Signalling System No.7; Message Transfer Part (MTP) to support international interconnection; Part 1: Protocol specification

[ITU-T Recommendations Q.701 (1993), Q.702 (1988), Q.703 to Q.706 (1993), Q.707 (1988) and Q.708 (1993), modified]

ETSI

Foreword

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

The second edition of ETS 300 008 covering the Signalling System No.7 Message Transfer Part (MTP) signalling protocol to support international interconnection is structured as a multi-part standard (of which this ETS forms part 1) as described below:

Part 1: **"Protocol specification [ITU-T Recommendations Q.701 (1993), Q.702 (1988), Q.703 to Q.706 (1993), Q.707 (1988) and Q.708 (1993), modified]";**

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

Part 3: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification".

Transposition dates	
Date of adoption	20 December 1996
Date of latest announcement of this ETS (doa):	30 April 1997
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	31 October 1997
Date of withdrawal of any conflicting National Standard (dow):	31 October 1997

Endorsement notice

The text of ITU-T Recommendations Q.701 (1993), Q.702 (1988), Q.703 to Q706 (1993), Q.707 (1988) and Q.708 (1993), was approved by ETSI as an ETS with agreed modifications as given below.

NOTE: New or modified text is indicated using sidebars. In addition, underlining and/or strike-out are used to highlight detailed modifications where necessary.

Whilst every care has been taken in the preparation and publication of this document, errors in content, typographical or otherwise, may occur. If you have comments concerning its accuracy, please write to "ETSI Editing and Committee Support Dept." at the address shown on the title page.

Global modifications to ITU-T Recommendations Q.701 to Q.708

Insert the following two clauses (scope and abbreviations):

Scope

This first part of ETS 300 008 defines the Message Transfer Part (MTP) protocol of Signalling System No.7 for application in the international network and, optionally, in public networks

This ETS is applicable to the international network and is not meant to restrict national networks.

Abbreviations

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

DPC   Destination Point Code
ISDN   Integrated Services Digital Network
LSSU   Link Status Signal Unit
MSU   Message Signal Unit
MTP   Message Transfer Part
PSTN   Public Switched Telecommunications Network
SIF   Signalling Information Field
SIO   Service Information Octet
SP   Signalling Point
STP   Signalling Transfer Point
TFP   Transfer Prohibited message
TRA   Traffic Restart Allowed message
UPU   User Part Unavailable message

The following exceptions to ITU-T Recommendations Q.701 to Q.708 shall apply:

National options

No national options, or remarks with regard to national options, shall apply to this ETS.

Signalling data links

A standard bit rate of 64 kbit/s on signalling data links shall apply.

If signalling data links are to be provided over an analogue transmission path, any necessary digital to analogue or analogue to digital conversion shall be on the multiplexed transmission link after interface point C, as defined in figure 2/Q.702.

Network Indicator

Only the value 00 shall be used for the Network Indicator.

Modifications to ITU-T Recommendation Q.701

Page 20, subclause 8.5

Modify the text as follows:

When the MTP restart procedure is terminated (i.e. when the TRA messages have been broadcast), the MTP indicates the end of MTP restart to all local MTP Users showing each signalling point's accessibility or inaccessibility. The means of doing this is implementation dependent (see 9/Q.704).

Modifications to ITU-T Recommendation Q.703

Timer values

The timer values included in ITU-T Recommendations Q.703 shall apply with the following exceptions:

T1 (4,8 kbit/s), T2 low, T2 high, T4n (4,8 kbit/s), T4e (4,8 kbit/s), T6 (4,8 kbit/s) and T7 (4,8 kbit/s) shall not apply for this ETS.

Modifications to ITU-T Recommendation Q.704

Timer values

The timer values included in ITU-T Recommendations Q.704 shall apply with the following exceptions:

T7, T11, T15, T16 and T24 shall not apply for this ETS.

Signalling link management

Of the requirements in ITU-T Recommendation Q.704, only the basic signalling link management functions of subclause 12.2 shall apply, while subclauses 12.3 to 12.6 shall not apply.

Page 6, subclause 2.3.2, fourth line

Modify the fourth line as follows:

A load sharing collection of two or more link sets is called a combined link set.

Page 25, subclause 4.2.1, third paragraph, second sentence

Modify the second sentence as follows:

An alternative combined linkset may consist of two or more (or all) of the remaining available link sets, which may carry signalling traffic towards the concerned destination.

Page 31, subclause 5.6.2, fifth paragraph, first sentence

Modify the first sentence as follows:

If time-controlled changeover has been initiated according to case ii) above and if a changeover order is received from the remote end and during the Time T1, it is advantageous to switch to the normal changeover procedure including retrieval because unnecessary message loss or sending of old messages is avoided in a simple way.

Page 32, subclause 5.6.2, sixth paragraph, fourth sentence

Modify the fourth sentence as follows:

The decision whether processor outage is of long-term is a local one.

Page 33, subclause 6.2.5, first paragraph, second sentence

Modify the second sentence as follows:

This is done also when the concerned signalling point is accessible, but there is no signalling route to it using the same outgoing signalling link(s) (or one of the same signalling links) from which traffic will be diverted.
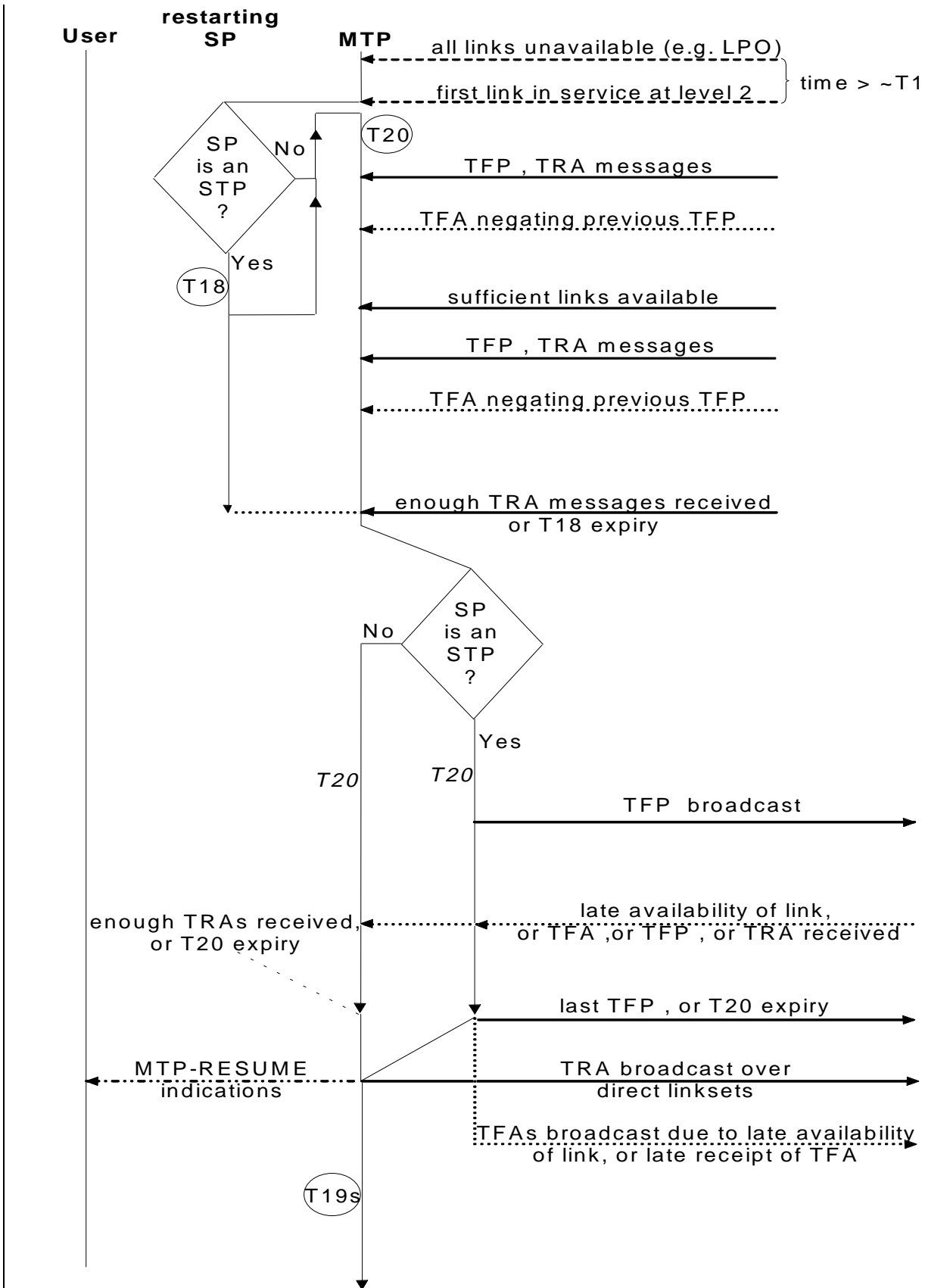
Page 34, subclause 6.3

Add the following note at the end of subclause 6.3:

> NOTE: The sequence control procedure during changeback can only guarantee correct sequencing of MSUs in all cases if the alternative link terminates in the same signalling point (i.e. the destination of the changeback declaration) as the newly available one.
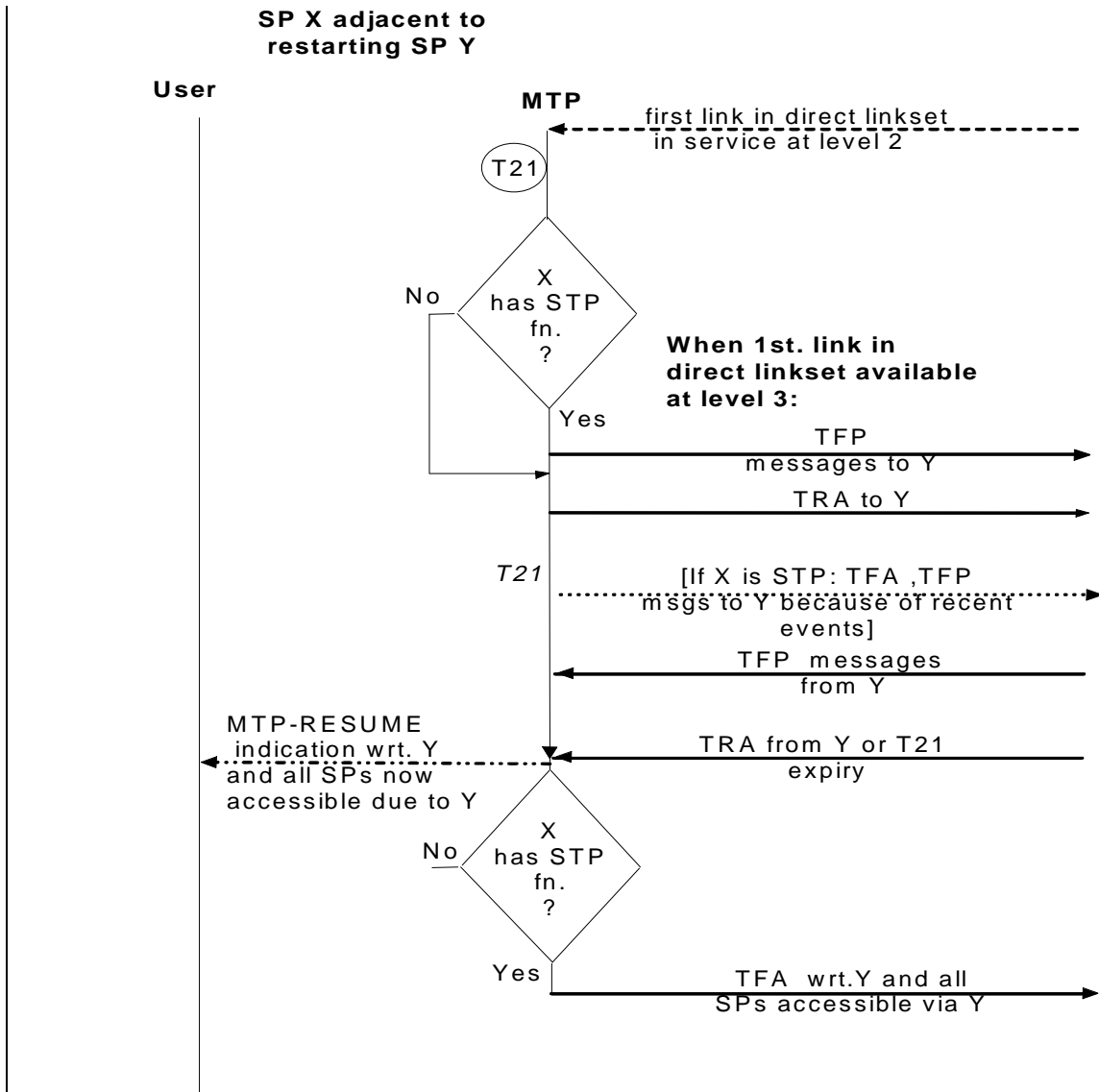
Page 42, subclause 9.7.1

Replace the sequence diagram by:

Page 43, subclause 9.7.2

Replace the sequence diagram by:

**SP X adjacent to
restarting SP Y**

User

MTP

first link in direct linkset
in service at level 2

T21

X
has STP
fn.
?

No

**When 1st. link in
direct linkset available
at level 3:**

Yes

TFP
messages to Y

TRA to Y

T21

[If X is STP: TFA ,TFP
msgs to Y because of recent
events]

TFP messages
from Y

MTP-RESUME
indication wrt. Y
and all SPs now
accessible due to Y

TRA from Y or T21
expiry

X
has STP
fn.
?

No

Yes

TFA wrt.Y and all
SPs accessible via Y

Page 48, subclause 11.2.3.1, item ii) b)

Modify item ii) b) as follows:

> b)   A transfer controlled message is sent to the originating point for the initial message, or alternatively the first octet, and for every n messages (n = 8), or alternatively N octets[19] (N = 279 to 300 provisional value), received from any originating point for the congested route set, <u>or for any link of the congested route set,</u> or for any linkset of the congested route set, or for any congested link of the congested route set.

Page 49, subclause 11.2.7.3

Modify subclause 11.2.7.3 as follows:

11.2.7.3   The user should then take appropriate action in order to stop generation of <u>normal</u> signalling information for the unavailable User Part.

Page 49, subclause 11.2.7.5

Modify subclause 11.2.7.5 as follows:

11.2.7.5   The UPU message contains:
- the label, indicating the destination and originating points;
- the UPU signal;
- the identity of the unavailable User Part;
- <u>the cause of the unavailability.</u>

The format and coding of this message appear in clause 15.

Page 62, subclause 13.5.4, first bullet item

Modify the first bullet item as follows:

- a transferred allowed message, referring to the destination the accessibility of which is tested, if the signalling transfer point can reach the indicated destination via a signalling link not connected to the signalling point from which the signalling-route-set-test message was <u>received</u>.

Page 66, subclause 14.2.1

Modify the service indicator codes for the international signalling network as follows:

bits	D C B A	
	0 0 0 0	Signalling network management messages
	0 0 0 1	Signalling network testing and maintenance messages
	0 0 1 0	Spare
	0 0 1 1	SCCP
	0 1 0 0	Telephone User Part
	0 1 0 1	ISDN User Part
	0 1 1 0	Data User Part (call and circuit related messages)
	0 1 1 1	Data User Part (facility registration and cancellation messages)
	1 0 0 0	Reserved for MTP Testing User Part
	<u>1 0 0 1</u>	<u>Broadband ISDN User Part</u>
	<u>1 0 1 0</u>	<u>Satellite ISDN User Part</u>
	1 0 1 1	⎤
	to	⎬ spare
	1 1 1 1	⎦

Page 68, table 1/Q.704

H1 Codes 0011 and 0100 for message group CHM (H0 = 0001) are reserved for use according to ITU-T Recommendation Q.2210 (MTP-3b).

Page 78, subclause 15.17.4

Modify the User Part identity codes for the international signalling network as follows:

```
bits    D C B A
        0 0 0 0     Spare
        0 0 0 1     Spare
        0 0 1 0     Spare
        0 0 1 1     SCCP
        0 1 0 0     TUP
        0 1 0 1     ISUP
        0 1 1 0     DUP
        0 1 1 1     Spare
        1 0 0 0     MTP Testing User Part
        1 0 0 1     Broadband ISDN User Part
        1 0 1 0     Satellite ISDN User Part
        1 0 1 1     ⎤
                    ⎥
          to        ⎬    spare
                    ⎥
        1 1 1 1     ⎦
```

Annex ZA (normative): Specific requirements

ZA.1 Signalling link loading

Subclauses ZA.1.1 to ZA.1.5 detail the requirements for signalling link loading that shall apply.

ZA.1.1 Basic definition

signalling link load: The signalling link load is defined as the ratio of the number of MSU bits transferred per second on one link at level 2, measured in one direction, including the necessary level 2 fields but excluding retransmitted MSUs as well as FISUs and Link Status Signal Units (LSSUs), to the bit rate at level 2.

The signalling link load is a value for the occupancy of a signalling link, during the period of observation.

ZA.1.2 Maximum signalling link load during normal operation

The maximum signalling link load is a value of the signalling link load during normal operation of the signalling link, which is specified for the purpose of signalling network dimensioning and planning.

Normal operation of the signalling link means that there is no changeover or rerouteing in the signalling network which has any impact on the signalling link under consideration.

The maximum signalling link load is the maximum value of the signalling link load which is transferred via a signalling link at normal operation as an average value over a long period of time during the period of maximum signalling traffic (e.g. busy hour) and for which the signalling link should be able to transfer complying with the transfer time requirements.

The maximum signalling load should not exceed 0,2 Erlang in the European signalling network for interconnections, but the actual signalling link load can be much higher or much lower during short periods of time and may, in general, be lower outside the period of maximum signalling traffic.

ZA.1.3 Minimum signalling link load handling capability

The minimum signalling link load handling capability shall be specified as a minimum requirement in order to support the design of equipment and the planning of the signalling routeing during periods of abnormal conditions in the signalling network.

The minimum signalling link load handling capability shall be that value of the signalling link load which the equipment shall be able to handle as a minimum during abnormal conditions in the signalling network. This load shall be seen during network dimensioning as the maximum value of signalling link load to be carried by one signalling link during periods of abnormal conditions, with the guarantee of not being in conflict with the appropriate transfer time requirements (see ITU-T Recommendation Q.706) and not triggering any congestion control measures in this section of the signalling network.

For this ETS the value of 0,4 Erlang is agreed in the European signalling network for the minimum signalling link load handling capacity. As a long term objective the value of 0,6 Erlang for the minimum signalling load handling capacity is anticipated.

This value of minimum signalling load handling capability is specified with respect to abnormal conditions in the signalling network and therefore to be seen as a medium term average. For short periods of time (in the order of one second) when large queues of signal units are contained in the buffers (e.g. immediately after a changeover), the signalling link load can be higher.

ZA.1.4 Message length influence

The definition of the signalling link load does not refer intentionally to any particular value of the mean message length. In fact the network planning and the specification of equipment shall be based on stable concepts, whereas it is likely that with the introduction of new or modified MTP Users the mean message length in the signalling network may change. So the definitions of the maximum load and of the minimum handling capability are considered as valid for any value of mean message length between the minimum and maximum values.

ZA.1.5 Graphic representation

In figure ZA.1 of this ETS the number of messages per second transferred in one direction at the interface between level 2 and level 3, for one signalling link is represented horizontally. The Signalling Information Field (SIF) + Service Information Field (SIO) load, in number of kbit transferred per second, in the same direction at the same interface is represented vertically. In figure ZA.1, the limits of the message length are two straight lines starting from point O. The line "OGACE" is the minimum value of 6 octets per message. The line "OHBDF" is the maximum value of 273 octets per message.

The different values of the signalling link load, as defined in subclause ZA.1.1, are represented by parallel lines: line GH for 0,1 Erlang, line AB for 0,2 Erlang, line CD for 0,4 Erlang, line EF for 0,6 Erlang.
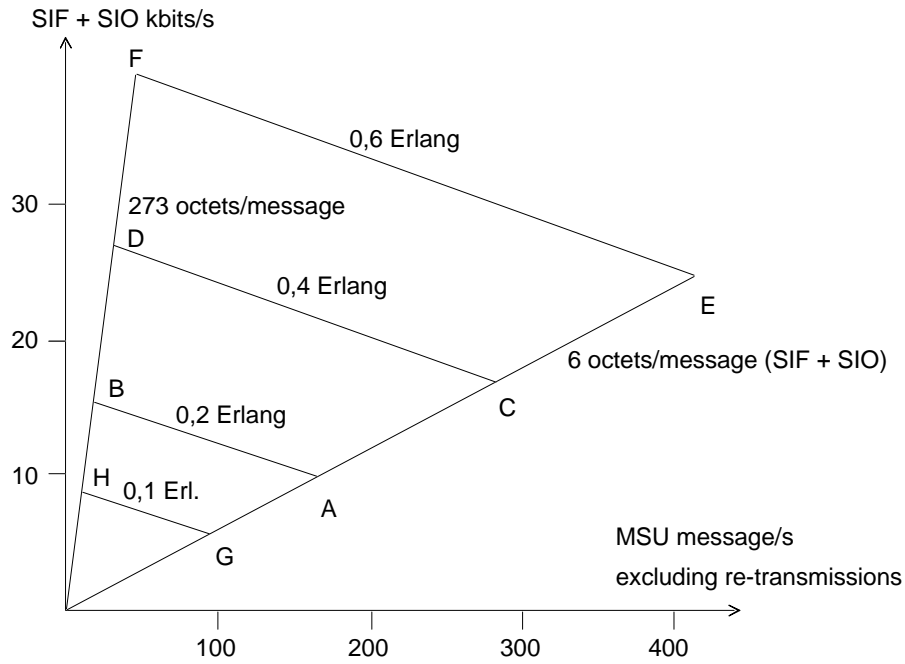

Figure ZA.1: Signalling link loading

Annex ZB (informative): Bibliography

- ITU-T Recommendation Q.709 (1993): "Signalling System No. 7 - Hypothetical signalling reference connection".

History

Document history			
December 1991	First Edition		
April 1996	Public Enquiry	PE 105:	1996-04-08 to 1996-08-30
October 1996	Vote	V 113:	1996-10-21 to 1996-12-13
January 1997	Second Edition		