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Integrated Services Digital Network (ISDN); Signalling System No.7; Protocol specification

[ITU-T Recommendations Q.701, Q.702, Q.703, Q.704, Q.705, Q.706, Q.707 and Q.708, modified]



Reference

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

The present document is part 1 of a multi-part EN covering the Integrated Services Digital Network (ISDN); Signalling System No.7; Message Transfer Part (MTP) to support international interconnection, as identified:

Part 1: "Protocol specification [ITU-T Recommendations Q.701, Q.702, Q.703, Q.704, Q.705, Q.706, Q.707 and Q.708 modified]";

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

The present document also incorporates agreements made at ITU-T since the last formal issue of the Q.70x Recommendations.

National transposition dates	
Date of adoption of this EN:	21 July 2000
Date of latest announcement of this EN (doa):	31 October 2000
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 April 2001
Date of withdrawal of any conflicting National Standard (dow):	30 April 2001

Endorsement notice

The elements of ITU-T Recommendations Q.701 [1] , Q.702 [2] , Q.703 [3] , Q.704 [4] , Q.705 [5] , Q.706 [6] , Q.707 [7] and Q.708 [8] apply, with the following modifications:

Insert the following clauses 1, 2 and 3:

1 Scope

The present document defines the Message Transfer Part (MTP) protocol of Signalling System No.7 for application in the international network and, optionally, in public networks.

The present document is applicable to the international network and is not meant to restrict national networks.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.
- [1] ITU-T Recommendation Q.701 (1993): "Functional description of the message transfer part (MTP) of Signalling System No. 7".
- [2] ITU-T Recommendation Q.702 (1998): "Signalling data link".
- [3] ITU-T Recommendation Q.703 (1996): "Signalling link".
- [4] ITU-T Recommendation Q.704 (1996): "Signalling network functions and messages".
- [5] ITU-T Recommendation Q.705 (1993): "Signalling network structure".
- [6] ITU-T Recommendation Q.706 (1993): "Message transfer part signalling performance".
- [7] ITU-T Recommendation Q.707 (1998): "Testing and maintenance".
- [8] ITU-T Recommendation Q.708 (1998): "Assignment procedures for international signalling point codes".
- [9] ITU-T Recommendation E.733: "Methods for dimensioning resources in Signalling System No. 7 networks".
- [10] ITU-T Recommendation Q.2210: "Message transfer Part level 3 Functions and Messages".
- [11] ETSI EG 201 693: "Integrated Services Digital Network (ISDN); Integrated Services Digital Network (ISDN); Master list of codepoints".

3 Abbreviations

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

ISDN	Integrated Services Digital Network
LSSU	Link Status Signal Unit
MSU	Message Signal Unit
MTP	Message Transfer Part
SIF	Signalling Information Field
SIO	Service Information Octet
SP	Signalling Point
TRA	Traffic Restart Allowed message

4 Modifications to ITU-T Recommendations Q.701 to Q.708

The elements of ITU-T Recommendations Q.701 [1] to Q.708 [8] apply with the following exceptions and modifications.

4.1 National options

No national options, or remarks with regard to national options, shall apply to the present document.

4.2 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 of ITU-T Recommendation Q.702 [2] .

4.3 Network Indicator

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

5 Modifications to ITU-T Recommendation Q.701

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 [4]).

6 Modifications to ITU-T Recommendation Q.703

i) Timer values

The timer values included in ITU-T Recommendation Q.703 [3] 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 the present document.

ii) subclause 1.4.1 - changes to error correction method selection criteria, and reference to E.733 [9], as follows:

"a) the Basic method applies for signalling links for which the one way propagation delay is up to 30ms (loop propagation delay up to 60 ms);

b) the PCR method applies for signalling links for which the one way propagation delay is greater than or equal to 125ms and for all signalling links established via satellite;

c) for one way propagation delays between 30 ms and 125 ms additional criteria need to be considered.

NOTE: Additional information and guidelines are provided in ITU-T Recommendation E.733 [9] (§7.1.3- "Choosing between basic and PCR error correction").

iii) SDL - changes that were previously agreed but were not published in Q.703 [3] (07/96). The affected SDL's are figure 8 (sheet 6), figure 13 (sheet 3), figure 13 (sheet 5), figure 16 (sheet 3), all previously agreed changes. Also figure 15 (sheet 6) to be changed with respect to decision FSNF<=Z<=FSNL from FSNF<Z<FSNL and check for empty retransmission buffer. For details refer to Implementor's guide Q.703 (1999) (available at <http://www.itu.int/itudoc/itu-com11/implgd/index.html>) for ITU-T Recommendation Q.703 [3].

7 Modifications to ITU-T Recommendation Q.704

Timer values

The timer values included in ITU-T Recommendation Q.704 [4] shall apply with the following exceptions:

T7, T11, T15, T16 and T24 shall not apply for the present document.

7.1 Signalling link management

Of the requirements in ITU-T Recommendation Q.704 [4], only the basic signalling link management functions of subclause 12.2 shall apply, while subclauses 12.3 to 12.6 shall not apply.

7.2 Subclause 14.2.1

The SI values recorded in the Master list of codepoints [11] apply.

7.3 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 [10] (MTP-3b).

7.4 Subclause 15.17.4

The user part identity field values within the user part unavailable message recorded in the Master list of codepoints [11] applies.

7.5 SDL changes

Editorial errors in ITU-T Recommendation Q.704 [4] published versions of sheets 11 and 16 of figure 29 and a publication error which duplicated fig.30 sheets 5 and 6 (i.e. the correct sheet 6 was omitted). For details refer to Implementor's guide Q.704 (1999) (available at <http://www.itu.int/itudoc/itu-t/com11/implgd/index.html>) for ITU-T Recommendation Q.704 [4].

8 Modifications to ITU-T Recommendation Q.705

The screening method given in §8.2 ii) of ITU-T Recommendation Q.705 [5] shall not apply. For more information on this the Implementor's Guide Q.705 (1997) (available at <http://www.itu.int/itudoc/itu-t/com11/implgd/index.html>) for ITU-T Recommendation Q.705 [5] should be consulted.

9 Modifications to ITU-T Recommendation Q.706

There are no changes to Q.706 [6] normative material. However it should be noted that changes to informative material on queuing delay calculations are currently being developed within ITU-T SG11. For more information on this the Implementor's Guide Q.706 (1999) (available at <http://www.itu.int/itudoc/itu-t/com11/implgd/index.html>) for ITU-T Recommendation Q.706 [6] should be consulted.

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 re-routing 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 this load in compliance 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 routing 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 [6]) and not triggering any congestion control measures in this section of the signalling network.

For the present document 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 the present document 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.

Point	x coordinate (MSUs/sec)	y coordinate (SIF+SIO kbits/sec)	Point	x coordinate (MSUs/sec)	y coordinate (SIF+SIO kbits/sec)
A	133,3	6,4	B	5,73	12,52
C	266,7	12,8	D	11,47	25,05
E	400,0	19,2	F	17,2	37,57
G	66,7	3,2	H	2,87	6,26

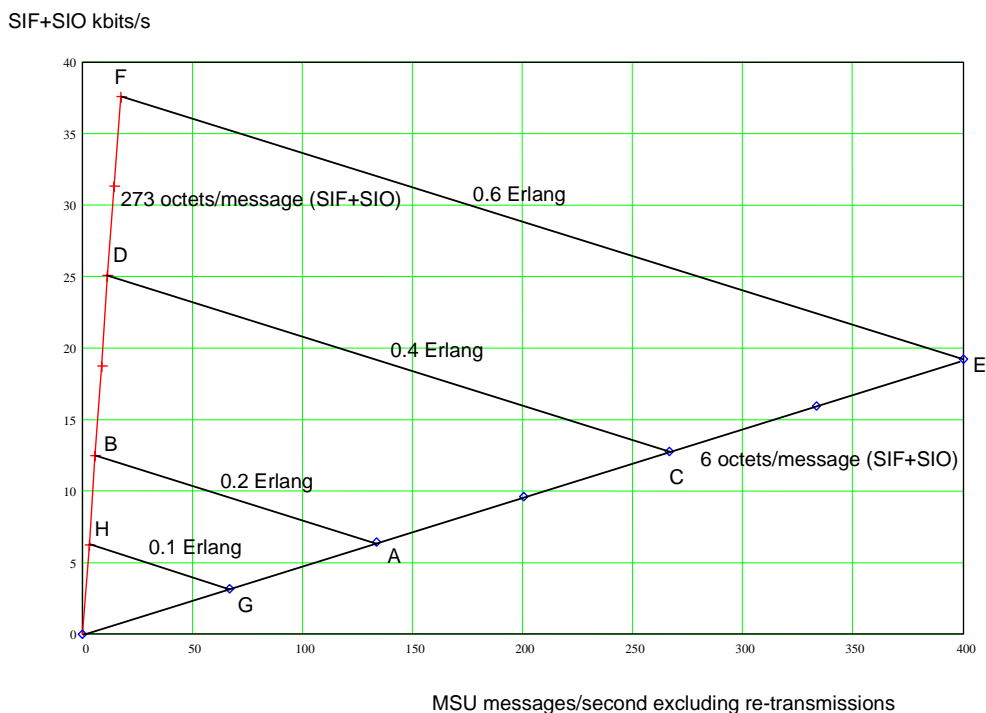


Figure ZA.1: Signalling link loading

Bibliography

The following material, though not specifically referenced in the body of the present document (or not publicly available), gives supporting information.

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

History

Document history			
V1.3.1	December 1999	Public Enquiry	PE 200014: 1999-12-08 to 2000-04-07
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