INTERNATIONAL TELECOMMUNICATION UNION

ITU-T Q.287

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

SPECIFICATIONS OF SIGNALLING SYSTEM No. 6

SIGNAL TRAFFIC CHARACTERISTICS

SIGNAL TRANSFER TIME REQUIREMENTS

ITU-T Recommendation Q.287

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation Q.287 was published in Fascicle VI.3 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.

7.3 SIGNAL TRANSFER TIME REQUIREMENTS

The cross-office signal transfer should be fast so as not to lose the advantage of the fast signalling capability of the System No. 6. While no firm time requirements in regard to the various components of signal transfer time have been established, Annex A to this Recommendation contains design objectives in terms of average and 95% level time values for T_h and T_c for the answer signal, other one-unit messages and the initial address message at the specified data rates. These figures have to be viewed as reasonable design requirements.

ANNEX A

(to Recommendation Q.287)

Estimates for transfer times

1. *Design objectives*

The design objectives for the handling time T_h and the cross-office transfer time T_c are shown in Table 8/Q.287.

TABLE 8/Q.287

Design-objectives (T_h and T_c)

Type of message		Answer	Other one-signal unit message	IAM of 5 SU
T_h in ms	Average	12	25	25
	95 % level	25	60	60
T_c in ms at 2.4 kbit/s	Average	40	65	120
	95 % level	70	140	200
T_c in ms at 4 kbit/s	Average	30	50	80
	95 % level	55	100	135
T_c in ms at 56 kbit/s	Average	20	35	35
	95 % level	35	70	70

Note - These figures have to be viewed as reasonable design requirements.

2. *Calculation for cross-office transfer time*

Average value:

The average value of the cross-off-ice transfer time, T_{cAV}, is calculated by the following formula:

$$T_{cAV} = T_r + T_{hAV} + T_{sAV}. \quad (1)$$

The average value of the sender transfer time, T_{sAV}, is approximated as follows:

$T_{sAV} = T_{qAV} + T_m + T_e$, for one-unit messages (2a)

$T_{sAV} = T_{qAV} + T_m + (D \times T_e)$, for multi-unit messages (2b)

where T_e = emission time of a signal unit,

T_m = time for encoding and modulation and, where present, parallel to serial conversion,

T_r = receiver transfer time,

D = number of SUs composing a multi-unit message.

The average queueing delay, T_{qAV}, is equivalent to Q_w, Q_o or Q_d which is calculated by the formula in Annex A to Recommendation Q.286.

95% level value:

The 95% level value of the cross-office transfer time, $T_{c\,95\%}$, is approximated by the following formula:

$$T_{c\,95\%} = T_{cAV} \sqrt{(\Delta T_h)^2 + (\Delta T_q)^2}$$

where

$$\Delta T_h = T_{h\,95\%} - T_{hAV} \quad (3)$$

$$\Delta T_q = T_{q\,95\%} - T_{qAV}$$

The 95% level value of the queueing delay, $T_{q\,95\%}$, may be determined by simulation.

Example 1:

Table 9/Q.287 shows a calculated example at 2.4 kbit/s of T_{cAV} and $T_{c\,95\%}$ for a_p = 0.4 erlang with the traffic model of Table 6/Q.286. As a result of simulation for this model, it has been determined that $T_{q\,95\%} = 3.5 \times T_{qAV}$. The values of T_{hAV} and $T_{h\,95\%}$ are those assumed for Table 8/Q.287 and $T_r = T_m$ = 2 ms is assumed.

TABLE 9/Q.287

Calculated example (T_c)

Type of message		Answer	Other one-unit message	IAM of 5 SU
T_c in ms	Average	38	60	111
	95% level	69	121	181

Example 2:

Figure 23/Q.287 and Table 10/Q.287 show a calculated example of the average T_c for traffic of 2000 circuits served by systems of different data transmission rates with 10 calls per speech circuit per hour, with the traffic model of Table 6/Q.286. Answer message average handling time T_h= 10 ms (other message average handling time T_h= 20 ms) and T_r= T_m= 2 ms are assumed. The number of blocks in the error control loop is assumed not to exceed eight.

TABLE 10/Q.287

Average cross-office transfer times for systems of different signal transmission rate

Type of message			Answer	Other one-unit message	IAM of 5 SU
Average handing time T_h (ms)			10	20	20
Average cross-office transfer time T_c (ms)	Bit rate (kbit/s)	2.4	36	54	105
		4	27	38	69
		56	15	25	28
Average cross-office transfer time T_c (ms) (Refer to Figure 23/Q.287)			A	B	C

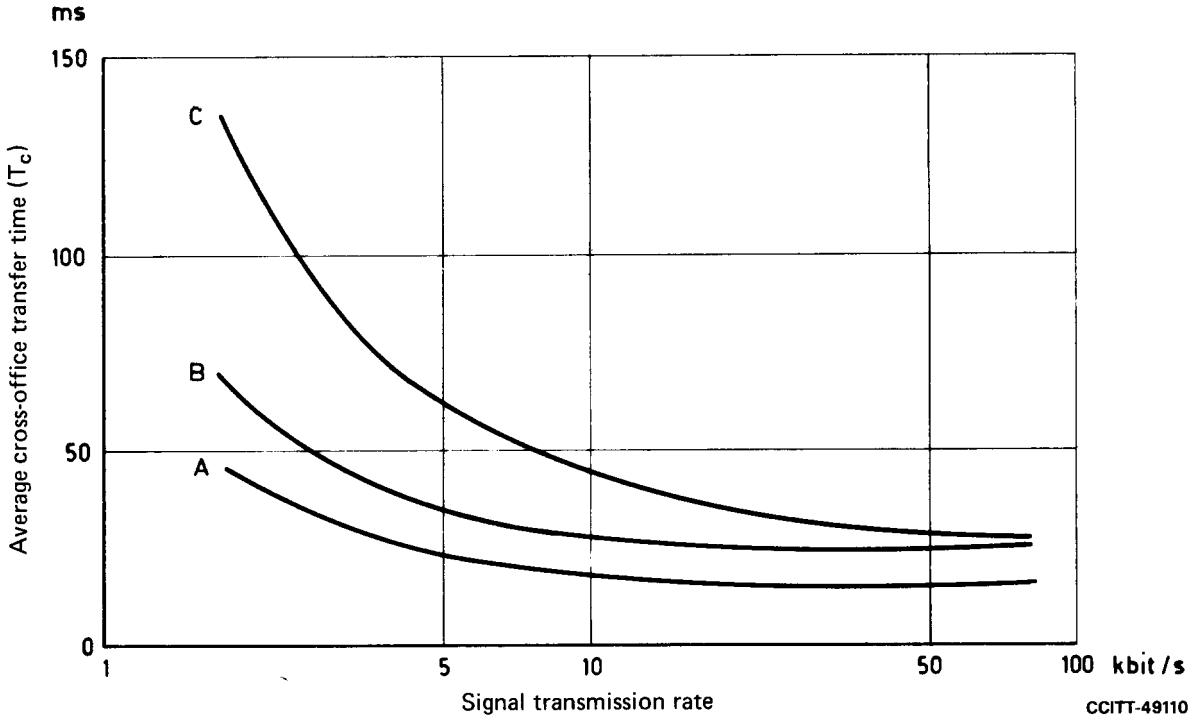

FIGURE 23/Q.287

Average cross-office transfer time for systems of different signal transmission rates