

31. Recommendation G.955

Note 1 - For single-mode systems operating in the 1300 nm range, the lower wavelength limit is determined from consideration of dispersion and cut-off wavelength effects, while the upper wavelength limit is due to consideration of dispersion and attenuation. In particular it should be noted that the range quoted in this Recommendation is restricted compared to the dispersion range of 1270 - 1340 nm quoted in Recommendation G.652 because of the possibility of OH peak related excess losses. To ensure satisfactory system operation the cut-off wavelength of the shortest length of cabled fibre in a single-mode elementary cable section must not exceed the operating wavelength. The second order ( $LP_{11}$ ) mode should be sufficiently attenuated along the fibre such that at the detector modal noise and bimodal dispersion effects are negligible.

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4.9

TABLE

5.

A.3 Concerning the bandwidth, in order to obtain such a regenerator section length and to respect the overall limit of 17 MHz, fibres with a bandwidth of 106 MHz should be used if the bandwidth addition factor is 0.75. For additional information on the calculation of bandwidth for elementary cable sections, refer to Recommendation G.651.

ANNEX B

(3201)

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AP IX-60-E

(to Recommendation G.955)

Example of calculation of regenerator section length for a  
3 x 45 Mbit/s laser-based system operating at 1300 nm  
on single-mode fibre

B.1 The regenerator section length can be calculated considering that at the end of the optical path between points S and R (see Figure 2/G.955 in the text of the Recommendation) the overall attenuation should not exceed 28 dB for systems in the wavelength range of 1270 - 1330 nm.

B.2 Concerning the attenuation, the regenerator section length can be obtained as an example and without reference to any particular situation, as follows:

-	attenuation of the optical fibres at 1300 nm	0.40 dB/km
-	attenuation of the splices	0.15 dB/km
-	cable margin (M <sub>c</sub> )	0.15 dB/km
	Total	0.70 dB/km

Regenerator section length 28 dB/0.7 dB/km = 40 km

Note 1 - The above assumes that no connectors are provided between the points S and R.

Note 2 - A suitable adjustment should be made to the fibre attenuation in the above budget for systems operating at wavelengths other than 1300 nm to account for the fibre spectral attenuation variation.

B.3 For systems operating at higher bitrates, the regenerator section lengths may be dispersion-limited. A specific illustration is dependent upon several factors (as in section 4.1) and requires further study.