INTERNATIONAL TELECOMMUNICATION UNION

ITU-T G.214

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

INTERNATIONAL ANALOGUE CARRIER SYSTEMS

GENERAL CHARACTERISTICS COMMON TO ALL ANALOGUE CARRIER-TRANSMISSION SYSTEMS

LINE STABILITY OF CABLE SYSTEMS

ITU-T Recommendation G.214

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation G.214 was published in Fascicle III.2 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 G.214

LINE STABILITY OF CABLE SYSTEMS[1)]

(Mar del Plata, 1968)

Line regulation has a threefold purpose:

1) to keep actual line relative levels within such limits that thermal or intermodulation noise never exceeds acceptable values;

2) to keep levels at the ends of regulated-line sections within such limits that regulators of the following multiplex equipment are able to function;

3) to ensure that regulation is precise enough to make it generally unnecessary to provide an automatic group regulator and/or supergroup regulator for the group, supergroup, etc., links set up on a single regulated-line section.

It appears that all three objectives will be secured if levels at the end of the longest regulated section envisaged are stabilized to ± 1 dB at any frequency in the band transmitted.

The CCITT therefore *unanimously recommends that:*

Designers of line-regulating systems take account of the daily and seasonal variations in temperature to which the cables and repeaters are likely to be subjected, the predictable ageing of components, and also the nominal range of variation of power supplies, assuming that appropriate precautions are taken in the placing of the cable, in the design of buildings and in regulation of power supplies.

As a design objective for the residual effects of sustained power and temperature variations, and the predictable ageing of components, over the ranges expected in any period between two successive manual adjustments, the change in insertion gain of a regulated-line section at any frequency in the transmitted band should not exceed 1 dB.

For the purposes of this Recommendation, it is assumed that a regulated-line section will not be longer than a homogeneous section of the hypothetical reference circuit applicable to the type of system considered and that the interval between two successive manual adjustments will be not less than a fortnight.

The variations in gain of a regulated-line section in service is also affected by maintenance operations and adjustments. The design objective excludes these effects.

Moreover, the dynamic stability of the regulating system should be such that any swinging of the gain is damped and at a suitable rate as a result of an abrupt change in pilot level. If, for example, the pilot level is suddenly increased by 2 dB at the origin of the regulated-line section, the pilot level must not increase or diminish by more than 2 dB at the end of the regulated-line section. The resulting fluctuations in pilot level must fall off progressively.

Note - It may be desirable to specify immunity of the regulating system to interference from components of television signals when transmitted.

Reference

[1] CCITT Recommendation *Stability of transmission,* Vol. IV, Rec. M.160.

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1) Stability of transmission is also the subject of Recommendation M.160 of Volume IV [1].