



INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

K.6

PROTECTION AGAINST INTERFERENCE

PRECAUTIONS AT CROSSINGS

ITU-T Recommendation K.6

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation K.6 was published in Volume IX 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 K.6

PRECAUTIONS AT CROSSINGS

(Geneva, 1964)

Introduction

Crossings between overhead telecommunication lines and electricity lines present dangers for persons and for equipment.

A number of arrangements have been made by the responsible authorities in various countries, resulting in national regulations. These regulations are sometimes rather inconsistent and the effectiveness of the arrangements made varies somewhat.

Bearing in mind the stage now reached in technique and the experience gained in the various countries, it now seems possible for the CCITT to issue a Recommendation advocating the arrangements which seem to be the most effective, on the basis of which countries might draw up or revise their national regulations.

It is therefore recommended that, when an overhead telecommunication line has to cross an electricity line, either of two methods may be used: namely, to route the overhead telecommunication line in an underground cable at the crossing, or to leave it overhead.

1 Line routed underground

This method is not always to be recommended because if a conductor of the electricity line breaks, the underground cable may be in a region where the ground potential is high. This situation is dangerous if the cable has a bare metallic sheath; the higher the voltage of the power line, the shorter the length of the cable section, and the higher the resistivity of the soil, the greater is the danger. This dangerous situation also arises whenever an earth fault occurs on a pylon near the cable.

If circumstances require the overhead line to be routed in a cable, special precautions will have to be taken at the crossing, for example:

- the use of an insulating covering around the metal sheath of the cable;
- the use of a cable with an all-plastic sheath.

2 Line left overhead

The method whereby the power line is separated from the telecommunication line by a guard-wire or a cradle cannot generally be recommended.

In any case, regardless of the circumstances, a minimum vertical distance has to be kept between telecommunication conductors, in conformity with national regulations.

There are, moreover a number of arrangements that could be introduced to reduce the danger:

- 2.1 *Use of a common support* at the crossing-point, provided the insulators used for the telecommunication line have, if necessary, a high breakdown voltage.
- 2.2 *Insulation of the conductors*, preferably the telecommunication conductors, provided that such insulation is properly adapted to the conditions existing.
- 2.3 *Reinforcement of the construction* of the power line where the crossing takes place, so as to minimize the risk of a break.

3 Circumstances in which the various arrangements in §§ 2.1, 2.2 and 2.3 above are applicable

The application of these methods depends primarily on the voltage of the power line. The voltage ranges to be taken into account are not related to the International Electrotechnical Commission (IEC) standardization, because of the special features of the problem raised.

- 3.1 *Systems using voltages of 600 V or less*
Arrangements to be as in § 2.1 and/or § 2.2.

3.2 *Systems using voltages of 60 kV or more*

(In particular the “high reliability” system referred to in [1].)

Arrangements to be as in § 2.3, if necessary.

3.3 *Intermediate voltage systems*

For the 600-V to 60-kV range, because of the variety of voltages, the mechanical characteristics of lines and the operating methods encountered, it is impossible to issue precise recommendations.

However, one or more of the arrangements described above might be applicable, although certain special cases call for thorough examination in close collaboration with the services concerned.

Reference

- [1] CCITT manual *Directives concerning the protection of telecommunication lines against harmful effects from electric power and electrified railway lines*, Vol. VI, ITU, Geneva, 1988.