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SERIES K: PROTECTION AGAINST INTERFERENCE

Maintenance of protective measures

ITU-T Recommendation K.69



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ITU-T Recommendation K.69

Maintenance of protective measures

Summary

This Recommendation gives guidance on the maintenance of protective measures (protective devices and assemblies and their earthing) in telecommunication installations. It deals with the maintenance of the protection of telecommunication equipment, installations and cable plants exposed to the results of external sources of interference such as overvoltages and overcurrents due to lightning discharges or power induction.

The maintenance activity is achieved with visual and complete inspections during periodical controls defined by this Recommendation. The complete inspection includes the visual inspection and additional measurements or investigations.

The purpose of the maintenance activity is to control the effectiveness of the protective measures against overvoltages and overcurrents – to avoid or reduce hazard to people, damage to installations and disturbances to systems – taking into account the corrosion effects. The effectiveness of the protective measures against corrosion is also considered.

Source

ITU-T Recommendation K.69 was approved on 29 October 2006 by ITU-T Study Group 5 (2005-2008) under the ITU-T Recommendation A.8 procedure.

Keywords

Examining period, inspection, maintenance, protective measures.

FOREWORD

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In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Maintenance of protective measures

1 Scope

Telecommunication networks can be endangered by atmospheric discharge, power induction, power line crossover and corrosion. The application of protective measures becomes necessary to:

- reduce the risk of injury for the user and the personnel;
- optimize the reliability of the network controlling:
 - the risk of damages of the telecommunications network;
 - the loss of function or the reduced performances of the telecommunications service.

This Recommendation gives an overview of the maintenance of these protective measures.

Maintenance of the protection measures and precautions against electrostatic phenomena are not subject of this Recommendation because they are set in general. Appendix III gives an overview how electrostatic protected areas or telecommunications systems have to be labelled.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

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| [ITU-T K.5] | ITU-T Recommendation K.5 (1988), <i>Joint use of poles for electricity distribution and for telecommunications.</i> |
| [ITU-T K.6] | ITU-T Recommendation K.6 (1988), <i>Precautions at crossings.</i> |
| [ITU-T K.12] | ITU-T Recommendation K.12 (2006), <i>Characteristics of gas discharge tubes for the protection of telecommunications installations.</i> |
| [ITU-T K.27] | ITU-T Recommendation K.27 (1996), <i>Bonding configurations and earthing inside a telecommunication building.</i> |
| [ITU-T K.31] | ITU-T Recommendation K.31 (1993), <i>Bonding configurations and earthing of telecommunication installations inside a subscriber's building.</i> |
| [ITU-T K.33] | ITU-T Recommendation K.33 (1996), <i>Limits for people safety related to coupling into telecommunications systems from a.c. electric power and a.c. electrified railway installations in fault conditions.</i> |
| [ITU-T K.35] | ITU-T Recommendation K.35 (1996), <i>Bonding configurations and earthing at remote electronic sites.</i> |
| [ITU-T K.50] | ITU-T Recommendation K.50 (2000), <i>Safe limits of operating voltages and currents for telecommunication systems powered over the network.</i> |
| [ITU-T K.53] | ITU-T Recommendation K.53 (2000), <i>Values of induced voltages on telecommunication installations to establish telecom and a.c. power and railway operators responsibilities.</i> |

[ITU-T K.66]	ITU-T Recommendation K.66 (2004), <i>Protection of customer premises from overvoltages</i> .
[ITU-T K.68]	ITU-T Recommendation K.68 (2006), <i>Management of electromagnetic interference on telecommunication systems due to power systems</i> .
[ITU-T Earthing]	ITU-T Handbook (2003), <i>Earthing and Bonding</i> .
[ITU-T Directives VII]	ITU-T Directives, volume VII (1989), <i>Protective measures and safety precautions</i> .
[IEC 62305-1]	IEC 62305-1 (2006), <i>Protection against lightning – Part 1: General principles</i> .
[IEC 62305-3]	IEC 62305-3 (2006), <i>Protection against lightning – Part 3: Physical damage to structures and life hazard</i> .
[IEC 62305-4]	IEC 62305-4 (2006), <i>Protection against lightning – Part 4: Electrical and electronic systems within structures</i> .

3 Definitions

3.1 Terms defined elsewhere

None.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 maintenance: Combination of all technical and administrative actions, including supervision actions, intended to retain an item in, or restore it to, a state in which it can perform a required function.

3.2.2 visual inspection: Action comprising careful scrutiny of an item carried out either without dismantling, or with the addition of partial dismantling as required.

3.2.3 complete inspection: Visual inspection, supplemented by means such as measurement, in order to arrive at a reliable conclusion as to the condition of an item.

3.2.4 repair: That part of a corrective maintenance in which manual actions are performed on the item to re-establish a required function.

3.2.5 examining period: Time period in years between the implementation of a protective measure and its first inspection or time period between two inspections.

3.2.6 active reduction system (ARS): An active reduction system uses a transformer to compensate for induced voltages in the telecommunication cable system. It operates on the basis that, via a transformer, a voltage with a phase shift by 180° but of the same amplitude, is coupled into the telecommunication cable to be protected. It consists of a coupling element (iron core with a primary winding, a control winding connected to a pilot conductor, a corresponding number of secondary windings) and an amplifier with a power supply.

3.2.7 passive reduction system (PRS): A passive reduction system uses a step-down transformer to compensate for induced voltages in the telecommunication cable system. It consists of an iron core with a primary winding (the grounded cable sheath or a pilot conductor) and a corresponding number of secondary windings. In general, the secondary windings are shielded telecommunication cables.

3.2.8 pilot conductor: Grounded wire, grounded on both sides of the influenced path to generate the steering voltage for the control winding of the ARS or PRS.