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Mitigation methods against electromagnetic security threats

Recommendation ITU-T K.115

ITU-T

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Mitigation methods against electromagnetic security threats

Summary

Recommendation ITU-T K.115 specifies mitigation methods against electromagnetic (EM) security threats such as high-altitude electromagnetic pulse (HEMP), high-power electromagnetic (HPEM), information leakage and lightning for telecommunication equipment and facilities. This Recommendation applies to all types of telecommunication equipment and facilities such as switching equipment, modems and buildings where equipment is installed.

History

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Keywords

Electromagnetic security, EM security, high-altitude electromagnetic pulse, HEMP, high-power electromagnetic, HPEM, information leakage, lightning.

* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

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Recommendation ITU-T K.115

Mitigation methods against electromagnetic security threats

1 Scope

This Recommendation specifies mitigation methods against electromagnetic (EM) security threats for telecommunication equipment and facilities. This Recommendation applies to all types of telecommunication equipment and facilities such as switching equipment, modems and buildings where equipment is installed.

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.11] | Recommendation ITU-T K.11 (2009), <i>Principles of protection against overvoltages and overcurrents</i> . |
| [ITU-T K.12] | Recommendation ITU-T K.12 (2010), <i>Characteristics of gas discharge tubes for the protection of telecommunications installations</i> . |
| [ITU-T K.20] | Recommendation ITU-T K.20 (2015), <i>Resistibility of telecommunication equipment installed in a telecommunication centre to overvoltages and overcurrents</i> . |
| [ITU-T K.21] | Recommendation ITU-T K.21 (2015), <i>Resistibility of telecommunication equipment installed in customer premises to overvoltages and overcurrents</i> . |
| [ITU-T K.27] | Recommendation ITU-T K.27 (2015), <i>Bonding configurations and earthing inside a telecommunication building</i> . |
| [ITU-T K.28] | Recommendation ITU-T K.28 (2012), <i>Parameters of thyristor-based surge protective devices for the protection of telecommunication installations</i> . |
| [ITU-T K.36] | Recommendation ITU-T K.36 (1996), <i>Selection of protective devices</i> . |
| [ITU-T K.44] | Recommendation ITU-T K.44 (2012), <i>Resistibility tests for telecommunication equipment exposed to overvoltages and overcurrents – Basic Recommendation</i> . |
| [ITU-T K.45] | Recommendation ITU-T K.45 (2015), <i>Resistibility of telecommunication equipment installed in the access and trunk networks to overvoltages and overcurrents</i> . |
| [ITU-T K.46] | Recommendation ITU-T K.46 (2012), <i>Protection of telecommunication lines using metallic symmetric conductors against lightning-induced surges</i> . |
| [ITU-T K.47] | Recommendation ITU-T K.47 (2012), <i>Protection of telecommunication lines against direct lightning flashes</i> . |
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3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 antenna port [IEC 61000-6-6]: A port that is connected to an antenna, either directly or by a cable. The antenna may be external or internal to the building.

NOTE – Antenna ports connected to antennas internal to the building are covered by signal ports.

3.1.2 availability [ISO/IEC 27001], [ISO/IEC 27002]: Ensuring that authorized users have access to information and associated assets when required.

3.1.3 cable port [IEC 61000-6-6]: A port at which a conductor or cable is connected to the apparatus.

3.1.4 confidentiality [ISO/IEC 27001]: Ensuring that information is accessible only to those authorized to have access.

3.1.5 electrical fast transient/burst (EFT/B) [IEC 61000-4-4]: The 5/50 ns pulse defined in [IEC 61000-4-4].

3.1.6 emanation [b-IETF RFC 2828]: A signal (electromagnetic, acoustic, or other medium) that is emitted by a system (through radiation or conductance) as a consequence (i.e., byproduct) of its operation, and that may contain information. (See: TEMPEST.)

3.1.7 emanations security (EMSEC) [b-IETF RFC 2828]: Physical constraints to prevent information compromise through signals emanated by a system, particularly by the application of TEMPEST technology to block electromagnetic radiation.

In this Recommendation, the term EMSEC is used only for information leakage due to unintentional electromagnetic emission.

3.1.8 enclosure port [IEC 61000-6-6]: A physical boundary of the apparatus which electromagnetic fields may radiate through or impinge upon. The equipment case is normally considered the enclosure port.

3.1.9 functional earth port [IEC 61000-6-6]: A cable port other than a signal, control or power port, intended for connection to earth for purposes other than safety.

3.1.10 HEMP immunity test [IEC 61000-4-25]: The HEMP immunity test is made up of four types of tests. The radiated test is defined in section 5 of [IEC 61000-4-25], and is used with a large HEMP simulator and a small radiated test facility. The other three types are the conducted tests along the HEMP waveforms; early-, intermediate- and late-HEMP. These are also defined in section 5 of [IEC 61000 4-25].

3.1.11 high voltage (HV) transmission line [IEC 61000-4-25]: Power line with a nominal a.c. system voltage equal to or greater than 100 kV.

3.1.12 immunity (to a disturbance) [b-IEC 60050-161]: The ability of a device, equipment or system to perform without degradation in the presence of an electromagnetic disturbance.

3.1.13 integrity [ISO/IEC 27001], [ISO/IEC 27002]: Safeguarding the accuracy and completeness of information and processing methods.

3.1.14 large HEMP simulator [IEC 61000-6-6] [IEC 61000-4-25]: Transient electromagnetic pulse test facility with a test volume sufficiently large to test objects with cubical dimensions equal to or greater than 1 m × 1 m × 1 m.

3.1.15 low voltage (LV) power circuit [IEC 61000-6-6]: Power circuit with a nominal a.c voltage equal to or less than 1.

3.1.16 medium voltage (MV) [b-IEC 60050-601]: Power circuit with a nominal a.c voltage equal to or less than 1.

NOTE – The boundaries between medium and high voltage levels overlap and depend on local circumstances and history or common usage. Nevertheless, the band 30 kV to 100 kV frequently contains the accepted boundary.