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TECHNICAL SPECIFICATION

colour inside

Lighting systems – General requirements

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC TS 63116 edition 1.1 contains the first edition (2021-10) [documents 34/808/DTS and 34/843/RVDTS] and its amendment 1 (2023-07) [documents 34/1010/DTS and 34/1050/RVDTS].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

IEC TS 63116 has been prepared by IEC technical committee 34: Lighting. It is a Technical Specification.

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

The committee has decided that the contents of this document and its amendment will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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LIGHTING SYSTEMS – GENERAL REQUIREMENTS

1 Scope

This document specifies general requirements for design, installation and maintenance of a lighting system.

A lighting system comprises a set of products. Requirements of the products are specified in product standards. For the general requirements of lighting systems, this document prevails.

Construction of lighting systems can vary in applications. This document is not intended to provide detailed technical specifications for the construction of lighting systems but to specify requirements in general that are necessary for lighting systems.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62504, *General lighting – Light emitting diode (LED) products and related equipment – Terms and definitions*

IEC TS 63105, *Lighting systems and related equipment – Vocabulary*

IEC TS 63117, *General requirements for lighting systems – Safety*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC TS 63105 and IEC 62504 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
lighting system
system designed to provide lighting

Note 1 to entry: The lighting system can be dedicated to

a) the support of one or more specified visual tasks under specified conditions considering other requirements such as human comfort, safety, the appearance of the surrounding environment and energy consumption;

b) the support of other than human tasks.

Note 2 to entry: The lighting system can include a set of light sources, other physical components, communication protocols, user interfaces, software and networks to provide control and monitoring functions.

Note 3 to entry: The light source(s) and the related equipment can be integrated in a single item, e. g. an LED module, a lamp or a luminaire.

Note 4 to entry: A lighting system can be networked to provide central or remote control and monitoring functions.

Note 5 to entry: A lighting system can be connected to or integrated with other systems or devices.

[SOURCE: IEC 60050-845:2020, 845-27-010]

3.2
functional safety
part of the overall safety that depends on functional and physical units operating correctly in response to their inputs

[SOURCE: IEC 60050-351:2013, 351-57-06, modified – The Note 1 to entry has been deleted.]

3.3
information security
protection of information against unauthorized disclosure, transfer, modification, or destruction, whether accidental or intentional

Note 1 to entry: The term covers cyber-security.

[SOURCE: IEC 60050-721:1991, 721-08-57, modified – The Note 1 to entry has been added.]

3.4
communication protocol
set of rules for data transmission in a system interlinking several system components

Note 1 to entry: A communication protocol can define the conditions for establishing a connection to a transmission medium, the rules governing access to the medium, the procedures for error protection, the functional and procedural means of data exchange, the transport mechanisms, the communication control, the representation of data and the exchange of application data.

Communication protocols define, for example:

- data units transferred between system components,
- the meaning of data units (semantics),
- the format of data units (syntax) and
- the logic time sequence of data exchange.

Note 2 to entry: The communication protocols used in a system can be organized in accordance with industry-wide accepted reference models, e.g. the ISO-OSI seven-layer reference model.

[SOURCE: IEC 60050-351:2013, 351-56-14, modified – "protocol" has been replaced by "communication protocol", "participants" has been replaced by "system components", and the Note 2 to entry has been modified.]

3.5
adaptive characteristic
characteristic that responds to circumstances or predefined conditions

Note 1 to entry: The adaptive characteristic of a lighting system and its components is to provide adaptive lighting.

Note 2 to entry: See IEV 845-29-027 for the definition of "adaptive lighting".

4 General

The lighting systems shall be designed using products that:

- comply with product standards, such as, but not limited to safety requirements, performance requirements and interface requirements;
- are suitable for the environmental conditions to which the system is likely to be subjected, such as, but not limited to temperature range, humidity range, altitude and vibration;

- provide appropriate electrical insulation towards system integration for electrical safety assurance;
- provide appropriate protection measures towards system integration for functional safety and information security;
- provide appropriate interfaces, such as communication interfaces, towards system integration for the expected system performance and functionality.

Compliance is checked by inspection of the documentation and by carrying out the tests of Clause 5 to Clause ~~10~~ 11.

5 Electrical safety

Lighting systems require additional safety requirements at the system level. These requirements apply in addition to the product safety requirements that can be found in the product specific standards.

The electrical safety requirements of lighting systems at the system level shall follow IEC TS 63117.

6 Functional safety

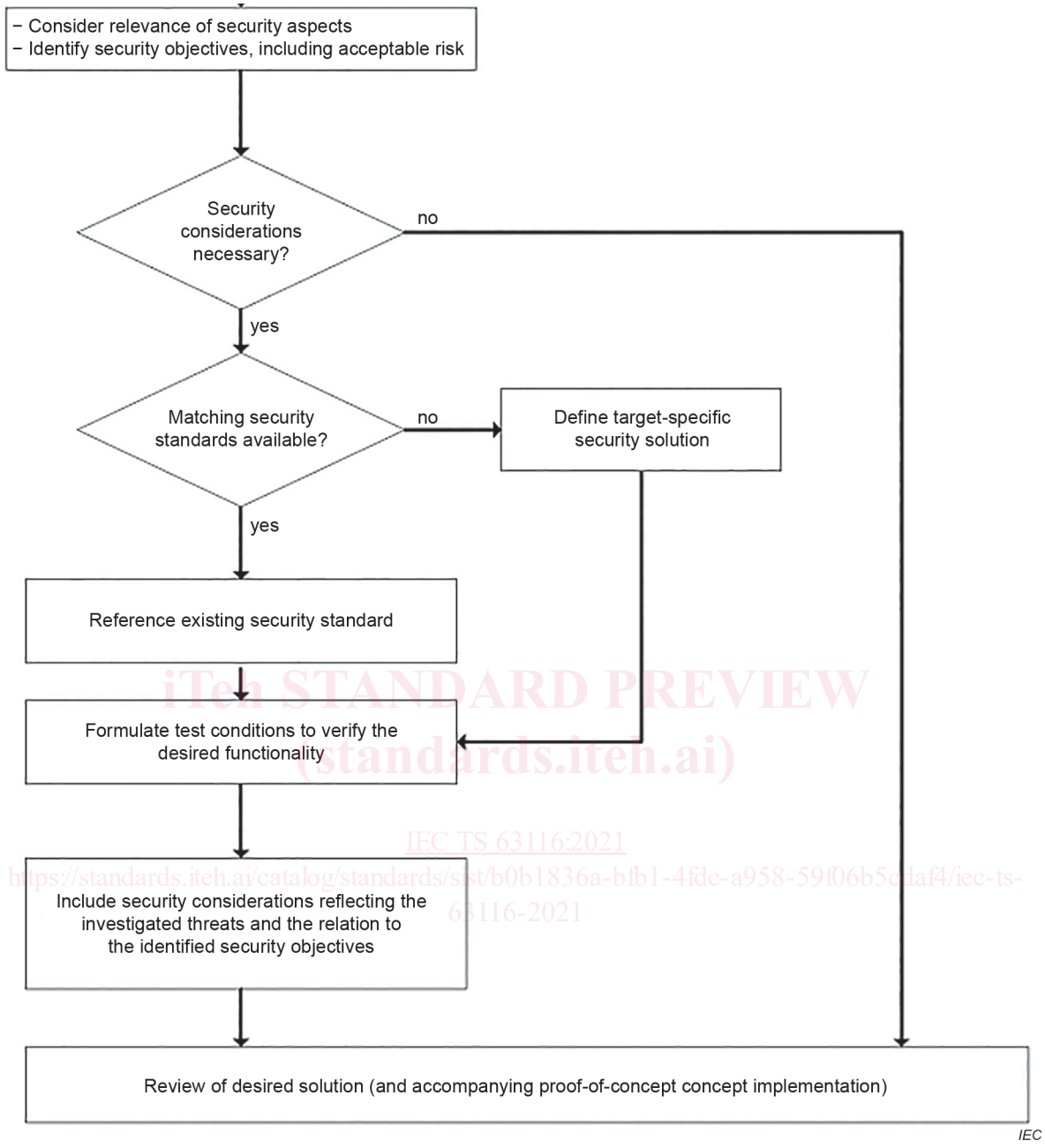
Lighting systems often comprise many different products (luminaire, sensor, controllers, touch panels and other human interfaces, etc.) which are connected through communication cabling or wirelessly, where the light output can be varied based on the input from sensors or users. Malfunction of the interaction of system components can create unsafe lighting conditions. When operating, they should incur no unacceptable risks.

Functional safety requirements of lighting systems shall follow IEC TS 63117.

7 Information security

Lighting systems often utilize communication, data transfer and data storage functions. The data and information can be sensitive and/or private. Lighting systems can also be applied within an environment demanding (a) higher security level(s). These lighting systems shall be applied with an appropriate level of information security.

Information security aspects shall be considered from the start of the design of a lighting system, throughout its service life, and at end-of-life-stage. Whether measures to provide information security are to be included should be checked against regulatory and application requirements, see Figure 1.



SOURCE: IEC Guide 120:2018

Figure 1 – Flow chart for decision of information security measures

A risk assessment process described in IEC 31010 can be used to perform this evaluation.

8 Installation, commissioning and maintenance

Lighting systems shall be installed in accordance with

- the instructions for use (see Clause 10), provided by the manufacturer or responsible vendor of the lighting system and the design details provided by the lighting system designer, and
- the installation instructions specified in the appropriate standards.

NOTE Local installation regulations provide relevant information that can also be consulted when preparing installation instructions.