This is a free page sample. Access the full version online.

NSAI Standards

Irish Standard
S.R. CLC/Guide 32:2014

Guidelines for Safety Related Risk Assessment and Risk Reduction for Low Voltage Equipment

© CENELEC 2014 No copying without NSAI permission except as permitted by copyright law.

This is a free page sample. Access the full version online.

S.R. CLC/Guide 32:2014

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on:	*Published:*
CLC/Guide 32:2014	2014-07-18

This document was published under the authority of the NSAI and comes into effect on:	ICS number:
2014-08-06	NOTE: If blank see CEN/CENELEC cover page

NSAI	T +353 1 807 3800	Sales:
1 Swift Square,	F +353 1 807 3838	T +353 1 857 6730
Northwood, Santry	E standards@nsai.ie	F +353 1 857 6729
Dublin 9	W NSAI.ie	W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

This is a free page sample. Access the full version online.

CENELEC GUIDE 32

Guidelines for Safety Related Risk Assessment and Risk Reduction for Low Voltage Equipment

Edition 1, 2014-07

CENELEC decided to adopt this new CENELEC Guide 32 through CLC Decision D147/C137.

This is a free page sample. Access the full version online.

European Committee for Electrotechnical Standardization

Avenue Marnix, 17

B – 1000 Brussels

Tel: +32 2 519 68 71

Fax: +32 2 519 69 19

www.cenelec.eu

This is a free page sample. Access the full version online.

Contents

Page

Foreword 5
Introduction 6
1 Scope 7
2 General 7
3 Normative references 8
4 Terms and definitions 8
5 Basic principles 11
5.1 Principle of safety integration 11
5.2 Basic concepts 12
Information for risk assessment 15
5.3.1 General 15
5.3.2 Information related to LV equipment description 15
5.3.3 Related standards and other applicable documents 15
5.3.4 Information related to application experience 15
5.3.5 Relevant ergonomic principles 16
6 Determination of the limits of the LV equipment 16
7 Hazard identification 16
8 Risk estimation 18
8.1 General 18
8.2 Elements of risk 18
8.2.1 Combination of elements of risk 18
8.2.2 Severity of harm 19
8.2.3 Probability of occurrence of harm 20
8.2.4 *Risk index* 21
8.3 Aspects to be considered during risk estimation 21
8.3.1 Exposure of persons and domestic animals 21
8.3.2 Type, frequency and duration of exposure 21
8.3.3 Accumulation and synergy of effects 22
9 Risk evaluation 22
9.1 General 22
9.2 Aspects to be considered during risk evaluation 22
9.2.1 Human factors 22
9.2.2 Reliability of protective measures 23
9.2.3 Ability to defeat or circumvent protective measures 23
9.2.4 Ability to maintain protective measures 23
9.2.5 Information for use 24
9.2.6 Current values of society 24
9.3 Elimination of hazards or reduction of risk by protective measures 24
9.4 Comparison of risks 25
10 Risk reduction 25
11 Documentation 28

This is a free page sample. Access the full version online.

CENELEC Guide 32:2014

Annex A (normative) Safety aspects relating to low voltage equipment 29
Annex B (informative) Supporting standards 35
Annex C (informative) Examples of hazards, hazardous situations and hazardous events 36
Annex D (informative) Tool for the application of this CENELEC Guide 37
Bibliography 40

Figures

Figure 1 – Principle of safety integration 12
Figure 2 – Iterative process of risk assessment and risk reduction 14
Figure 3 – Elements of risk for risk estimation 18
Figure 4 – Graph for risk estimation 19
Figure 5 – Risk reduction process 27

This is a free page sample. Access the full version online.

Foreword

This Guide was prepared by CENELEC BTTF 143-1 “Alignment of the Low Voltage Directive under the New Legislative Framework”.

The text of the draft was approved by the CENELEC Technical Board as CENELEC Guide 32 on 2014-04-29.

This guidance document is a tool for Technical Committees and has been developed in response to EC Standardisation Mandate M/511. The content of this Guide reflects the requirements in the Low Voltage Directive 2014/35/EU.

This Guide has been prepared for the use of CENELEC Technical Bodies in charge of preparing standards, notably to help in preparing the relevant Annex ZZ. It is not intended to be imposed by regulatory authorities as a reference to demonstrate that a standard complies with the principal elements of the safety objectives for electrical equipment designed for use within certain voltage limits (Annex I of the LVD). However, regulatory authorities can take this Guide into account when evaluating standards in the context of Annex I of the LVD.

This Guide provides guidance to those developing and revising standards, specifications and similar publications. However, it contains important information that can be useful as background information for, amongst others, designers, architects, manufacturers, service providers, educators, communicators and policy makers.

While auditors and safety inspectors should always use a specific standard when it exists, this Guide provides useful information in the absence of a specific standard.

This is a free page sample. Access the full version online.

Introduction

This CENELEC Guide reflects ISO/IEC Guide 51, gives additional guidance to ISO/IEC Guide 71 and CEN/CENELEC Guide 14, in more detail with practical information for carrying out risk assessment and on basics to implement risk reduction. This is to help assess risks commonly considered during all relevant lifecycle phases of low voltage equipment.

This CENELEC Guide is intended to be applicable for TCs and SCs when they elaborate their own safety standards for the related products. This Guide can also be used when new features of a product are not covered by existing standards.

The use of this Guide implies that safety-related standards are also taken into account when available (see also Annex B) and using them automatically reflects the state of the art as defined in EN 45020, Definition 1.4.

This is a free page sample. Access the full version online.

1 Scope

This CENELEC Guide complements ISO/IEC Guide 51 and establishes useful guidelines for achieving safety in low voltage (LV) equipment. These guidelines include risk assessment, in which the knowledge and experience of the design, use, incidents, accidents and harm related to low voltage equipment are brought together in order to assess the risks during the relevant phases of the life of the equipment, as specified in Clause 6, and to implement the basics for risk reduction measures. This CENELEC guide should be used by Technical Committees as far as appropriate and to the extent they decide to apply it.

This CENELEC Guide gives additional guidance to ISO/IEC Guide 51 and 71 and CEN/CENELEC Guide 14 on performing a risk assessment in more detail with practical information. Procedures are described for identifying hazards, estimating and evaluating risk (including comparison of risks) and risk reduction where necessary. Risks considered in this document include possible damage to persons, property and domestic animals. It is not intended that the structure of this guide be adopted by Technical Committees.

The purpose of this CENELEC Guide is to provide guidance for Technical Committees for decisions to be made on the safety of low voltage equipment and the type of documentation required to verify the risk assessment carried out.

This CENELEC Guide applies to all electrical equipment designed for use with a voltage rating of between 50 V and 1 000 V for alternating current and between 75 V and 1 500 V for direct current. Voltage ratings refer to the voltage of the electrical input or output, not to voltages that may appear inside the equipment (see EU Guidance document “Guidelines on the application of Directive 2006/95/EC”).

Product standards shall require that the equipment documentation include adequate information for the safe use of equipment.

2 General

This Guide includes both electrical equipment intended for incorporation into other equipment and equipment intended to be used directly without being incorporated.

This Guide does not cover basic components whose risk assessment depends to a very large extent on how they are used and incorporated into a machine, electrical system or installation.

NOTE 1 Moreover, the scope of the exclusion of basic components should not be misunderstood and extended to items like lamps, starters, fuses, switches for household use, elements of electrical installations, etc., which, even if they are often used in conjunction with other electrical equipment and have to be properly installed in order to deliver their useful function, are themselves to be considered electrical equipment in the sense of this Guide.

NOTE 2 Protective measures to be taken by the user of a product are subject to legal requirements in many countries, especially in the occupational health and safety framework.

This CENELEC Guide itself is not intended to be used for the purpose of certification. Product committees are encouraged to include a clause in product safety standards pertaining to risk assessment, to be used when the requirements of the standard do not fully encompass all possible hazards with equipment within the standard’s scope, especially for emerging technologies, where new hazards may arise.

An informative annex shall be added as an integral part of each standard that provides presumption of conformity to essential requirements of New Legislative Framework Directives.

This annex shall show how the requirements of the standard cover the essential requirements of the directive.

Annex A of this Guide identifies basic health and safety requirements, typically for Low-Voltage Equipment.

Annex D can be used as a tool for documenting a self-assessment by a Technical Committee.

This is a free page sample. Access the full version online.

CENELEC Guide 32:2014

If the risk assessment identifies aspects not directly related to health and safety, such as environment protection, energy consumption, climate change, etc., the risk reduction for health and safety related risks, in particular with respect to persons, overrules the priority of those other aspects. However, regulations related to such aspects shall be taken into account.

3 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 61508 series, *Functional safety of electrical/electronic/programmable electronic safety – related systems*CEN-CENELEC Guide 14, *Child Safety – Guidance for its Inclusion in Standards*[1)]

CENELEC Guide 29, *Temperatures of hot surfaces likely to be touched*

ISO/IEC Guide 51, *Safety aspects – Guidelines for their inclusion in standards (currently under revision)*

ISO/IEC Guide 71, *Guidelines for standards developers to address the needs of older persons and persons with disabilities*

IEC Guide 104, *The preparation of safety publications and the use of basic safety publications and group safety publications*

IEC 62443 series, *Industrial communication networks – Network and system security*

4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

4.1
low voltage equipment
set of electrical devices or electrical apparatus necessary to perform a specific task such as generation, transmission, distribution, utilization of electrical energy and with a supply or output voltage not exceeding 1 000 V for alternating current and 1 500 V for direct current

Note 1 to entry: Examples of equipment are electric power generator, electrical switchgear and controlgear assemblies, electrical wiring systems, air conditioning units.

4.2
harm
physical injury or damage to persons, property, and domestic animals

Note 1 to entry: Physical injury or damage to persons also includes health aspects.

[SOURCE: ISO/IEC Guide 51, definition 3.3, modified]

4.3
hazard
potential source of harm

Note 1 to entry: The term hazard can be qualified in order to define its origin (e.g. electrical hazard, mechanical hazard) or the nature of the potential harm (e.g. electric shock hazard, cutting hazard, toxic hazard, fire hazard).

[SOURCE: ISO/IEC Guide 51, definition 3.5]

1) Guide 14 applies in conjunction with ISO/IEC Guide 51.

This is a free page sample. Access the full version online.

4.4
hazard zone
any space within and/or around LV equipment in which persons, or domestic animals can be exposed to a hazard

4.5
hazardous event
event that can cause harm

Note 1 to entry: A hazardous event can occur over a short period of time or over an extended period of time.

4.6
hazardous situation
circumstances in which persons, property and domestic animals or the environment are exposed to at least one hazard

Note 1 to entry: The exposure can immediately or over a period of time result in harm.

[SOURCE: ISO/IEC Guide 51, definition 3.6, modified]

4.7
incident
past hazardous event

Note 1 to entry: An incident that has occurred and resulted in harm can be referred to as an accident. Whereas an incident that has occurred and that did not result in harm can be referred to as a near miss occurrence.

4.8
intended use
use of LV equipment in accordance with the information for use provided by the supplier

[SOURCE: ISO/IEC Guide 51, definition 3.13, modified]

4.9
malfunction
situation for which the electrical equipment does not perform the intended function due to a variety of reasons, including:

– variation of a property or of a dimension of the processed material or of the work piece;
– failure of one (or more) of its component parts or services;
– external disturbances (e.g. shocks, vibration, electromagnetic interference);
– design error or deficiency (e.g. software errors);
– disturbance of its power supply;
– surrounding conditions (e.g. condensation due to temperature change)

4.10
protective measure
measure intended to achieve adequate risk reduction, implemented:

– by the designer (inherent design, safeguarding and complementary protective measures, information for use); and
– by the user (organization: safe working procedures, supervision, training; permit-to-work systems; provision and use of additional safeguards; use of personal protective equipment)

4.11
reasonably foreseeable misuse
use of LV equipment in a way not intended by the designer, but which may result from readily predictable human behaviour

[SOURCE: ISO/IEC Guide 51, definition 3.14, modified]

SAI GLOBAL

This is a free preview. Purchase the entire publication at the link below:

Product Page

Looking for additional Standards? Visit Intertek Inform Infostore

Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation