

## **CENELEC Guide 32**

### **'Guidelines for Safety Related Risk Assessment and Risk Reduction for Low Voltage Equipment' for risk analysis and self-assessment**

#### **Implementation example for TCs on the use of Guide 32 for risk analysis and self-assessment**

CENELEC Guide 32 has been developed in response to EC Standardisation Mandate M/511. The content of the Guide reflects the requirements in the Low Voltage Directive 2014/35/EU.

The Guide provides 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. It is a tool for CENELEC Technical Bodies in charge of preparing standards, notably to help in preparing the relevant Annex ZZ.

The present document contains an implementation example on how CLC/TC 23E 'Circuit breakers and similar devices for household and similar applications' uses CENELEC Guide 32 for its risk analysis and self-assessment. It reflects how TC 23E links the essential safety requirements of legislation with the requirements and the clauses of the standard. Other TCs may benefit from this example by applying a similar approach when drafting the Annex ZZ for the Low Voltage Directive (2014/35/EU).

The principal elements of the safety objectives for electrical equipment designed for use within certain voltage limits extracted out of annex 1 of the LVD are considered in this analysis covering risk analysis (5 first columns) and self-assessment (6<sup>th</sup> column) of WG1 of CLC TC23E.

Elements of safety objectives	Risk/Observation	CLC Guide 32 Annex D	Requirements description	Requirement clause	Test clause
<b>1. General conditions</b>					
(a) the essential characteristics, the recognition and observance of which will ensure that electrical equipment will be used safely and in applications for which it was made, shall be marked on the electrical equipment, or, if this is not possible, on an accompanying document;	Misuse	A.5.g, A.7.2.b and A.9	Scope	1	
			Normative references	2	
			Definitions	3	
			Classification	4	
			Characteristics	5	
			Marking	6	9.4
(b) the electrical equipment, together with its component parts, shall be made in such a way as to ensure that it can be safely and properly assembled and connected;	Bad assembly, bad connection	A.7.2.b, A.6.13 and A.9	Requirements for construction	6.2 and 8.1.1	
			ARD to be assembled on site	6.2 + 8.1.2.2	
			Correct functioning of the associated protective device	8.1.1 and 8.1.2.1	9.5.1
(c) the electrical equipment shall be so designed and manufactured as to ensure that protection against the hazards set out in points 2 and 3 is assured, providing that the equipment is used	Use outside limits (including voltage and temperature limits)	A.4a, A.4.b, A.6.11, A.7.2.a, A.7.2.b, A7.3 and A.7.4.	Standards conditions	7	
			Operating characteristics	8.10	9.13, 9.18.1 and 9.18.2
			Number of consecutive operations	8.1.2.8 ,8.10.5	9.5.4
			Influence of the distributed capacities	8.10.6	9.18.3.1 and 9.18.3.

in applications for which it was made and is adequately maintained.			Assessment means	8.11	9.7.4 + 9.19.1. + 9.19.2.
		A.6.12, A.7.2.d, A.7.3 and A.7.4	Interruption and return of supply	8.10.7	Table 3, 9.5.2, 9.5.4, 9.18.1and 9.18.2.
		.6.4 and A.7.2.a	EMC	8.15	9.22
2. Protection against hazards arising from the electrical equipment Measures of a technical nature shall be laid down in accordance with point 1, in order to ensure that:					
(a) persons and domestic animals are adequately protected against the danger of physical injury or other harm which might be caused by direct or indirect contact	Electric shock	A.4.e	Protection against electric shock	8.2, , 9.3	9.1,
		A.4.a and A.4.b	Current in the FE and during the assessment	8.10.8, 8.11	9.18.4, 9.7.4, 9.19.1 and 9.19.2
	Deterioration of automatic operation capability	A.5.b	Mechanical and electrical endurance	8.5	9.13
		A.7.2.a	Test device	8.13	9.20
		A.5.b and A.7.2.a	Ageing	8.14	9.21
(b) temperatures, arcs or radiation which would cause a danger, are not produced;	Bad assembly, bad connection	A.7.2.b	Screws, current-carrying parts and connections	8.1.5	9.8
			Terminals for external conductors	8.1.6	9.9
	Excess of temperature	A.4.f, A.6.6, and A.6.7	Temperature rise	8.4	9.12

(c) persons, domestic animals and property are adequately protected against non-electrical dangers caused by the electrical equipment which are revealed by experience;	Blocking of the mechanism	A.5.a, A.5.b, A.5.e, A.5.f A.6.13, A.7.2.c and A.7.3	Interlocking of the associated protective device	8.1.2.3	9.5.2	
			Enabling and disabling system	8.1.2.4	9.5.3	
			Manual opening of the associated protective device	8.1.2.5	9.5.2	
(d) the insulation is suitable for foreseeable conditions.	Inappropriate construction Insufficient dielectric protection	A.4.d and A.7.2.a	Clearance and creepage distances	8.1.3		
			A.4.d, A.4.f, A.6.6, A.7.2.a and 8.1.4	Clearance and creepage distances for electronic circuits	8.1.4	9.6 + 9.7
			A.4.d, A.7.2.a and A.6.5	Dielectric properties and isolation capability	8.3	9.11
3. Protection against hazards which may be caused by external influences on the electrical equipment Technical measures shall be laid down in accordance with point 1, in order to ensure that the electrical equipment:						
(a) meets the expected mechanical requirements in such a way that persons, domestic animals and property are not endangered;	Shocks	A.5.a, A.5.b, A.5.e, A.5.f and A.7.2.a	Resistance to mechanical shock and impact	8.7	9.15	
(b) is resistant to non-mechanical influences in expected environmental conditions, in such a way that persons, domestic animals and property are not endangered;	Deterioration due to high ambient temperature Fire propagation	A.4.f, A.6.6,	Resistance to heat	8.8	9.16	
			Resistance to abnormal heat and to fire	8.9	9.17	
	Non functioning with specific loads	A.6.4 and A.7.2.a	Electromagnetic immunity	8.15	9.22	

	Electromagnetic disturbances of function Electromagnetic disturbance of other functions in the neighborhood	A.6.4 and A.7.2.a	Electromagnetic emissions	8.15	9.22
(c) does not endanger persons, domestic animals and property in foreseeable conditions of overload.	Damage of the device due to overcurrents and short circuits	A.4.f, A.5.c and A.6.6	Overcurrents	8.12	9.17
		A.4.d, A.4.f, A.5.c, A.6.6, A.6.10 and A.7.2.a	Performance at short circuit currents	8.6	9.14

Risks that are not applicable: A.4.c, A.5.d, A.6.2, A.6.3, A.6.5, A.6.8, A.6.14, A.6.15, A.6.16 and A.8.