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Low-voltage switchgear and controlgear - Fire risk analysis and risk reduction measures

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1.Structure and Drafting Rules of Standardization Documents"

Drafting.

The translation method used in this document is equivalent to the adoption of IEC TR63054.2017 (version 1.0) "Low-voltage switchgear and control equipment fire risk analysis"

Analysis and Risk Reduction Measures."

The Chinese documents that have consistent correspondence with the normatively cited international documents in this document are as follows.

---GB/T 5169.2-2013 Fire hazard test of electric and electronic products Part 2.General rules for fire hazard assessment guidelines

(IEC 60695-1-10.2009, IDT);

---GB/T 14048.1-2012 Low-voltage switchgear and control equipment Part 1.General (IEC 60947-1.2011,

MOD);

---GB/T 14048.2-2020 Low-voltage switchgear and control equipment Part 2.Circuit breakers (IEC 60947-2..2019,

MOD);

---GB/T 14048.3-2017 Low-voltage switchgear and control equipment Part 3.Switches, isolators, isolating switches and fuses

Combination appliance (IEC 60947-3.2015, IDT);

---GB/T 14048.5-2017 Low-voltage switchgear and control equipment Part 5-1.Control circuit appliances and switch components

Electromechanical control circuit appliances (IEC 60947-5-1.2016, MOD);

---GB/T 14048.7-2016 Low-voltage switchgear and control equipment Part 7-1.Auxiliary device copper conductor terminals

Sub-row (IEC 60947-7-1.2009, MOD);

---GB/T 14048.9-2008 Low-voltage switchgear and control equipment Part 6-2.Multifunctional electrical (equipment) control and protection

Protective switching appliances (equipment) (CPS) (IEC 60947-6-2.2007, IDT);

---GB/T 14048.11-2016 Low-voltage switchgear and control equipment Part 6-1.Multifunctional electrical switchgear

(IEC 60947-6-1.2013,MOD);

---GB/T 17464-2012 The safety requirements for the threaded and non-threaded clamping parts of the electrical copper wire of the connecting device are applicable

General requirements and special requirements for clamping parts of wires from 0.2mm2 to 35mm2 (including) (IEC 60999-1.1999,

IDT);

---GB/T 20636-2006 The safety requirements for threaded and non-threaded clamping parts of electrical copper conductors for connecting devices are applicable

Special requirements for wires above 35mm2 to 300mm2 (IEC 60999-2.2003, IDT).

The following editorial changes have been made to this document.

---Chapter 2, IEC 60947-4 (all parts) and IEC 60947-6-2 are added to the normative references in Chapter 2.

Introduction

The hazard caused by fire is essentially an electrical hazard. The installation procedures and product standards of electrical equipment are also designed to not affect product safety.

On the basis of full and function, provide measures to reduce risks and reduce residual risks as much as possible.

When selected, installed and used in accordance with the manufacturer's instructions and installation procedures, the IEC 60947 series standard low-voltage switchgear and

The residual risk of control equipment is relatively low, and it will not cause fire during normal operation or foreseeable failure conditions.

This document is consistent with ISO /IEC Guide 51 and IEC Guide 116.

Risk analysis and risk reduction measures, although they are applicable to the requirements of low-voltage switchgear and control equipment, other product committees can also make

For reference.

This document studies the fire hazards (i.e. fire mechanism) related to low-voltage switchgear and control equipment. The IEC 60947 series standard

Measures to reduce risks in the standards will be specified in this document.

These measures are based on a systematic approach and are not limited to material requirements, but also include design rules and type tests to ensure that the equipment is in normal operation or

It will not cause fire under reasonably foreseeable failure conditions.

Low-voltage switchgear and control equipment

Fire risk analysis and risk reduction measures

1 Scope

This document presents the fire mode analysis of four electrical fires of low-voltage switchgear and control equipment (referred to as "equipment") and the corresponding wind

Risk reduction measures.

This document is applicable to the fire risk analysis of low-voltage switchgear and control equipment (referred to as "equipment") in the IEC 60947 series of standards.

The following applies.

---Only consider the situation of the fire source inside the equipment (especially in the case of failure and misuse);

---Only consider the installation of the equipment in a normal environment, without considering the hazardous environment, such as the presence of combustible materials;

--- Only consider the selection, installation and use of the product in accordance with the

manufacturer's instructions and installation procedures.

In addition, this document does not consider the following situations.

---Failure conditions mentioned in IEC TR61641;

---The risk of smoke emission;

---Double failure, such as a combination of potential multiple phenomena.

2 Normative references

The content of the following documents constitutes an indispensable clause of this document through normative references in the text. Among them, dated quotations

Only the version corresponding to that date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to

This document.

IEC Guide 116 Low Voltage Equipment Safety Related Risk Assessment and Risk Reduction Guidelines (Guidelines forsafetyrelatedriskas-

sessmentandriskreductionforlowvoltageequipment)

IEC 60695-1-10.2016 Fire hazard test Part 1-10.General guidelines for fire hazard assessment of electrical and electronic products

(Firehazardtesting-Part 1-10.Guidanceforassessingthefirehazardofelectrotechnicalproducts-

Generalguidelines)

IEC 60947-1.2007 Low-voltage switchgear and control equipment Part 1.General (Low-voltageswitchgearandcon-

trolgear-Part 1.Generalrules)

IEC 60947-1.2007/AMD1.2010

IEC 60947-1.2007/AMD2.2014

IEC 60947-2 Low-voltage switchgear and control equipment Part 2.Circuit breaker (Low-voltage switchgearandcon-

trolgear-Part 2.Circuit-breakers)

IEC 60947-3 Low-Voltage Switchgear and Control Equipment Part 3.Switches, Isolators, Isolating Switches and Fuse Combinations

(Low-voltageswitchgearandcontrolgear-Part 3.Switches, disconnectors, switch-disconnectorsand