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Lifts (elevators), escalators and moving walks — Programmable electronic systems in safety-related applications —

Part 1: Lifts (elevators) (PESSRAL)

Ascenseurs, escaliers mécaniques et trottoirs roulants — Systèmes électroniques programmables dans les applications liées à la sécurité —

Partie 1: Ascenseurs (PESSRAL)

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 178, *Lifts, escalators and moving walks*.

This first edition cancels and replaces ISO 22201:2009, which has been technically revised (incorporating ISO 22201:2009/Cor 1:2011) and includes the following changes:

— editorial changes that correct typographical errors and terminology inconsistencies between this document and its reference standards, including between it and the two other standards in the 22201 series.

A list of all parts in the ISO 22201 series can be found on the ISO website.

Introduction

Systems comprised of electrical and/or electronic elements have been used for many years to perform safety functions in most application sectors. Computer-based systems, generically referred to as programmable electronic systems, are being used in many application sectors to perform non-safety functions and, increasingly, to perform safety functions. In order to effectively and safely exploit computer-system technology, it is essential that those responsible for making decisions have sufficient guidance on the safety aspects on which to make these decisions. In most situations, safety is achieved by a number of protective systems that rely on many technologies (for example mechanical, hydraulic, pneumatic, electrical, electronic, programmable electronic). It is necessary that any safety strategy, therefore, considers not only all the components within an individual system (for example sensors, controlling devices and actuators), but also all the safety-related elements making up the total combination of safety-related systems.

This document is based upon the guidelines provided in the generic IEC 61508 series of standards of the International Electrotechnical Commission (IEC) and EN 81 (all parts) of the Comité Européen de Normalization (CEN).

The requirements given in this document recognize the fact that the product family covers a total range of passenger and goods/passenger lifts used in residential buildings, offices, hospitals, hotels, industrial plants, etc. This document is the product family standard for lifts and takes precedence over all aspects of the generic standard.

This document sets out the product specific requirements for systems comprised of programmable electronic components and programmable electronic systems that are used to perform safety functions in lifts. This document has been developed in order that consistent technical and performance requirements and rational be specified for programmable electronic systems in safety-related applications for lifts (PESSRAL).

Risk analysis, terminology and technical solutions have been considered, taking into account the methods of the IEC 61508 series of standards. The risk analysis of each safety function specified in Table 1 resulted in the classification of electric safety functions applied to PESSRAL. Tables 1 and 2 give the safety integrity level and functional requirements, respectively, for each electric safety function.

The safety integrity levels (SIL) specified in this document can also be applied to other technologies used to satisfy the safety functions specified in this document.

Within the context of the harmonization with national standards for lifts, the application of this document is intended to be by reference within a national standard lift such as lift codes, standards, or laws. The reason for this is threefold:

a) to allow selective reference by national standards to specific lift safety functions described in this document (not all lift safety functions identified in this document are called out in every national standard);

b) to allow for future harmonization of national standards with lift safety functions identified in this document:

   — Because there exist some differences in the requirements for fulfilment of the safety objectives of national lift standards and in national practice of lift use and maintenance, there are instances where the requirements for lift safety functions described in this document are based on the consensus work and agreement by the ISO committee responsible for this document. National bodies may choose to selectively harmonize with those lift safety functions that differ in the requirements called for by the existing national standard in future standard revisions.

   — It is important to note that more than 90 % of the safe-state requirements and more than 80 % of the anticipated SIL requirements by the national standards referenced in this document are already harmonized with the requirements of the lift safety functions specified in this document. The remainder is not harmonized for the reasons given above.

c) to allow for the application of this document where lift safety functions are new or deviate from those specified in this document. More and more, national lift legislations are moving to performance-based requirements. For this reason, the development of new or different lift safety functions can be foreseen in product specific applications. For those who require lift safety functions that are new or different from those specified in this document, this document provides a verifiable method to establish the necessary level of safety integrity for those functions.

