TECHNICAL REPORT

ISO/TR 22201-3

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

Part 3: Life cycle guideline for programmable electronic systems related to PESSRAL and PESSRAE

Ascenseurs, escaliers mécaniques et trottoirs roulants — Conception et mise au point des systèmes électroniques programmables dans les applications liées à la sécurité —

Partie 3: Lignes directrices pour le cycle de vie des systèmes électroniques programmables liés à PESSRAL et PESSRAE

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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).

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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 second edition cancels and replaces the first edition (ISO/TR 22201-3:2013), which has been technically revised.

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

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Introduction

This document addresses phases in the life cycle planning and actions for post-installation activities (e.g. maintenance, repair, and replacement and modification of interface) of PESSRAL and PESSRAE to help ensure the safety integrity level (SIL) over the life cycle of the system.

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

Part 3: Life cycle guideline for programmable electronic systems related to PESSRAL and PESSRAE

1 Scope

This document provides additional information and process for the development of the instruction manual required by ISO 22201-1 (PESSRAL) and ISO 22201-2 (PESSRAE) for programmable electronic systems for use by competent maintenance person(s) that carry out maintenance operations.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22201-1, ISO 22201-2 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
competent maintenance person
designated person, suitably trained, qualified by knowledge and practical experience, provided with necessary instructions and supported within their *maintenance organization* (3.4) to enable the required maintenance operations to be safely carried out

Note 1 to entry: The competence of the maintenance person within the *maintenance organization* (3.4) should be continuously updated.

3.2
design equivalent
original equipment manufacturer, or third party certified product, which fulfils same SIL rated element/subsystem design specifications but has different specifications for the non-SIL rated portion of the PE system

3.3
functional equivalent
product which fulfils same functional requirements with different SIL rated element/subsystem design specifications from that of the original certified product

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3.4
maintenance organization
company or part of a company where *competent maintenance person(s)* (3.1) carry out maintenance operations on behalf of the *owner* (3.7) of the installation

3.5
manufacturer
natural or legal person who takes responsibility for the design, manufacture and placing on the market safety components for lifts or of machinery (escalator, passenger conveyor, service lift and accessible goods only lift)

3.6
maintenance
post-installation life cycle activities, including preventative, replacement, repair, and alteration (modifications)

3.7
owner
natural or legal person who has the power or disposal of the installation and takes the responsibility for its operation and use

3.8
programmable electronic
PE
based on computer technology which may be comprised of hardware, software, and of input and/or output units

Note 1 to entry: This term covers microelectronic devices based on one or more central processing units (CPUs) together with associated memories, etc.

EXAMPLE The following are all programmable electronic devices:

— microprocessors;

— micro-controllers;

— programmable controllers;

— field programmable gate array (FPGA);

— application specific integrated circuits (ASICs);

— programmable logic controllers (PLCs);

— other computer-based devices (for example, smart sensors, transmitters, actuators).

3.9
programmable electronic system
PE system
system for control, protection or monitoring based on one or more programmable electronic devices, including all elements of the system such as power supplies, sensors and other input devices, data highways and other communication paths, and actuators and other output devices

Note 1 to entry: See Figure 1.

Note 2 to entry: A PE system may perform functions that fulfil requirements for SIL rated and non-SIL rated function(s). The SIL rating of a function is only required to consider that portion of the PE system that performs the SIL relevant functional requirements.

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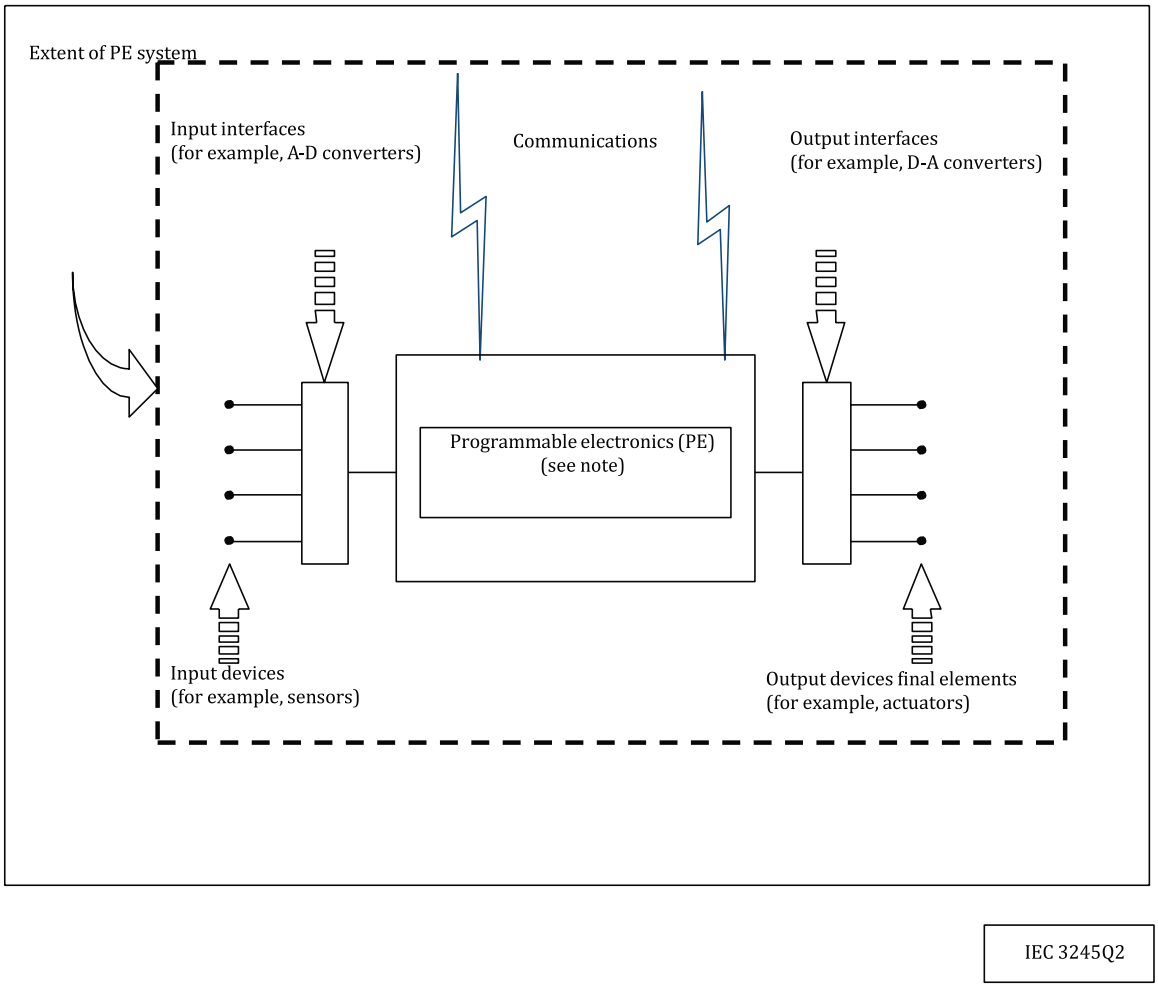

NOTE The programmable electronics are shown centrally located but could exist at several places in the PE system.

Figure 1 — Basic PE system structure

3.10
product equivalent
original equipment manufacturer or third party certified product that is a direct replacement in design, make, model, and version (built to the same production drawings) of the original certified product

4 Instruction manual content

This clause addresses special considerations for process and additional content of instruction manuals applied to PE system as described in ISO 22201-1 and ISO 22201-2.

4.1 Safety precautions

In creating an instruction manual, the developer should carry out a risk assessment to identify and address possible hazards for this phase of the life cycle of PE system. (See ISO 14798 for possible hazard assessment methodology).

4.2 Markings, signs, pictograms and written warnings

Assemblies containing SIL rated devices should be labelled or tagged with identification information, in accordance with national requirements, and indicate that the maintainer should refer to the

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