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Earth-moving machinery — Machinecontrol systems (MCS) using electronic components — Performance criteria and tests for functional safety

Engins de terrassement — Systèmes de contrôle-commande utilisant des composants électroniques — Critères et essais de performances de sécurité fonctionnelle



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Foreword

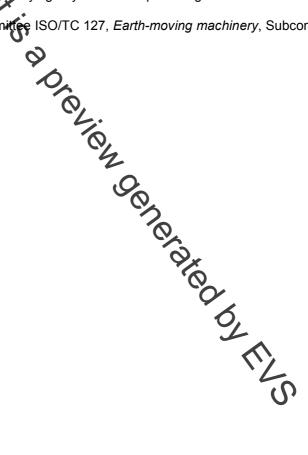
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Introduction

Systems consisting of electrical and/or electronic components have been used for many years to perform safety functions in most application sectors. Computer-based systems, generically referred to as programmable electronic systems (PES), are at present being used in all application sectors to perform nonsafety-related and increasingly, safety-related functions. If computer system technology is to be effectively and safely explorted, it is essential that those responsible for making decisions have sufficient guidance on the safety aspects on which to base these decisions.

This International Standard addresses systems comprising electrical and/or electronic and/or programmable electronic components Rectrical/electronic/programmable electronic systems (E/E/PES)] used for functional safety in earth-moving machinery.

In most situations, safety is achieved by a number of protective systems which rely on many technologies (e.g. mechanical, hydraulic, pneumato, electrical, electronic, programmable electronic). Any safety strategy must therefore consider not only all the lements within an individual system, such as sensors, controlling devices and actuators, but also all the safety-related systems. Therefore, while this International Standard is concerned with safety-related E/E/PES, it could also provide guidance for safety-related systems based on other technologies.

This International Standard

- has been conceived with a rapidly developing technology in mind, with a framework sufficiently robust
- ernation. is been conceived which ind comprehensive to meet thich provides a method for the development of required functional safety for E/E/PES, and presents a methodology for specifying the target level of sale. implemented by the E/E/PES, using a risk-based approximation. The target level of sale. The tar provides a method for the development of safety requirement specifications necessary to define the
- presents a methodology for specifying the target level of safety integrity for the safety functions to be

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Earth-moving machinery — Machine-control systems (MCS) using electronic components — Performance criteria and tests for functional safety

1 Scope

This International Standard specifies performance criteria and tests for functional safety of safety-related machine-control systems (MCS) using electronic components in earth-moving machinery and its equipment, as defined in ISO 6165. The procedures of ECE R79, Annex 6, ISO 13849-1 or IEC 62061 can be used as an alternative, provided verification and testing is carried out by the manufacturer using Clause 7 of this International Standard.

2 Normative references

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

ISO 6165:2006, Earth-moving machinery — Basic types — Identification and terms and definitions

ISO 13766, Earth-moving machinery — Electromagnetic compatibility

IEC 60529, Degrees of protection provided by enclosures (# Code)

IEC 61508-4:1998, Functional safety of electrical/electronic/programmable electronic safety-related systems — Part 4: Definitions and abbreviations

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms, definitions and abbreviations given in IEC 61508-4 and the following apply.

3.1 Terms and definitions

3.1.1

earth-moving machinery

self-propelled or towed machine on wheels, crawlers or legs, having equipment or attachment (working tool), or both, primarily designed to perform excavation, loading, transportation, drilling, spreading, compacting or trenching of earth, rock and other materials

[ISO 6165:2006]