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**Earth-moving machinery - Collision warning and avoidance -
Part 1: General requirements
(English Translation)**

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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 for standardization documents" Drafting.

This document is Part 1 of GB/T 45864 Collision warning and avoidance for earth-moving machinery. GB/T 45864 has been published for the following part.

- Part 1: General requirements;
- Part 2: Vehicle J1939 communication interface;
- Part 3: Forward/backward risk areas and risk levels.

This document is equivalent to ISO 21815-1:2022 "Earth-moving machinery - Collision warning and avoidance - Part 1: General requirements".

Introduction

This document belongs to the Class C standard defined in GB/T 15706-2012.

This document is particularly intended for the following stakeholder groups representing machinery safety market participants.

- Machinery manufacturers (small, medium and large enterprises);
 - Health and safety agencies (regulatory agencies, accident prevention organizations, market surveillance, etc.).
- Others may be influenced by the level of machinery safety achieved through this document by the above stakeholder groups.
- Machine users/employers (small, medium and large enterprises);
 - Machine users/employees (e.g. trade unions, organizations of people with special needs);
 - Service providers, such as maintenance service providers (small, medium and large enterprises);
 - Consumers (where the machine is used by consumers).

The above stakeholder groups may be involved in the drafting process of this document.

Furthermore, this document is intended for use by standardization bodies developing Type

C standards.

The requirements of this document can be supplemented or modified by Type C standards.

For machines within the scope of Category C standards and machines designed and manufactured in accordance with the requirements of this document, the requirements of the Category C standards shall apply.

shall prevail.

The scope of this document describes the machinery involved and the hazards, hazardous situations or dangerous events covered.

When the requirements of this C-type standard differ from those specified in the A-type or B-type standards, for machines manufactured for this purpose, the requirements of this Category C standard take precedence over those of other standards.

Detection systems and avoidance technologies are increasingly being used in earthmoving machinery to support operators in safely operating in mining and construction.

At the same time, there are calls for the establishment of detection, warning and intervention standards for machines and systems to reduce the risk of collisions.

Currently, there are two current standards in this field, ISO 16001 and ISO 17757, which are for object detection systems and their visual aids.

There are currently no standards describing collision risk awareness, warning signals, and human intervention.

The machine's collision avoidance behavior when there is a risk of collision.

Collision warning and avoidance systems are a developing technology and the algorithms are not mature or well understood.

The performance requirements of this document are technology neutral and do not specify the requirements that must be met.

technology.

The system described in this document is intended to assist machine operators, as current technology cannot achieve a complete collision avoidance in every situation.

Warning and avoidance, so the safe operation of the machine remains the responsibility of the machine operator.

GB/T 45864 "Collision Warning and Avoidance for Earth-moving Machinery" is a series of standards, consisting of five parts.

--- Part 1: General requirements. The purpose is to provide object detection, operator warning, collision avoidance, automatic intervention control and test General requirements