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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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**Safety of machinery -- Relationship of type-B and type-C
standards to GB/T 15706**

机械安全 B类标准和C类标准与GB/T 15706的关系

(English Translation)

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1 Scope

This standard specifies how the designers/manufacturers of machinery and its associated components apply the Class A, Class B and Guidance for Type C standards so that an acceptable level of risk can be achieved through adequate risk reduction measures during the design of the machine.

This standard gives the general principles of GB/T 15706 and how to comprehensively use GB/T 15706 and Class B standards in practice. Type C standard.

This standard also gives the relevant standardization technical committee's understanding of how GB/T 15706 relates to Type B and Type C standards.

Guidelines, and explain the role of these B standards and C standards when performing risk assessment and risk reduction in accordance with GB/T 15706.

This standard also gives a general overview of the different types of Type B standards available to assist standard users and standard drafters in finding these some standards.

2 Normative references

The following documents are essential for the application of this document. For dated references, only the dated version applies to this article pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 15706-2012 General Principles of Mechanical Safety Design Risk Assessment and Risk Reduction (ISO 12100:2010, IDT)

3 Terms and Definitions

The terms and definitions defined in GB/T 15706-2012 and the following terms and definitions apply to this document.

3.1 Adequate risk reduction

At least as required by laws and regulations, and taking into account the risk reduction of the current state of the art.

Note: Rewrite GB/T 15706-2012, definition 3.18.

3.2 Acceptable risk tolerablerisk

The level of risk that is acceptable under given conditions, based on current societal values.

NOTE: "Acceptable risk" and "Tolerable risk" are considered synonymous.

Note: Rewrite GB/T 20002.4-2015, definition 3.15.

4 General structure of machinery safety standard system

The machinery safety standard is structured as follows.

--- Type A standard (basic safety standard) gives the basic concepts, design principles and general characteristics that can be applied to all machinery safety. standard;

--- Class B standard (general safety standard) specifies a safety feature of machinery or a class of safety devices that can be used in a wide range of applications. standard;

--- Class C standard (machine product safety standard) is a standard that specifies detailed safety requirements for a specific machine or group of machines.

As shown in Figure 1, GB/T 15706 is a Class A standard that specifies the general principles of machinery safety and applies to all machinery.

5.1 Class A Standard (GB/T 15706)

Class A standard GB/T 15706 specifies the principles of machinery safety strategy. Risk assessment and adequate risk assessment through an iterative three-step approach Risk reduction is a necessary measure to bring the designed machine to an acceptable level of risk.

For risk assessment and risk reduction, the designer should take actions in the following order (see Figure 2).

- a) determine the limitations of the machinery, including intended use and any reasonably foreseeable misuse;
- b) identification of hazards and their associated hazardous states;
- c) estimate the risk for each identified hazard and hazardous state;
- d) evaluate the risks and decide whether they need to be mitigated;
- e) Eliminate the hazard or reduce the risk associated with the hazard through protective measures/risk reduction measures.

Note 1: In this standard, "protective measures" (see GB/T 15706-2012, 3.19) and "risk reduction measures" are synonymous, referring to any and/or measures or methods to reduce risk.

The measures a) to d) are related to risk assessment, and the measures e) are related to risk reduction.

Risk assessment is a series of logical steps to identify, estimate and evaluate machinery-related risks in a systematic way.

The results of the risk assessment identify hazards that require risk reduction. In order to achieve an acceptable level of risk, the risk assessment is repeated The process is important for eliminating new hazards arising from the use of protective measures/risk reduction measures, and for taking practicable or sufficient measures to reduce Associated risks are necessary.

A protective measure/risk reduction measure is a combination of measures taken by the designer and user according to Figure 3. Actions that can be taken during the design phase Actions take precedence over actions taken by users and are generally more effective.

The ultimate goal is to minimize risk. The strategies specified in this chapter are presented in Figure 2. The process itself is iterative, and for To take full advantage of the available technology to reduce risk, it is necessary to perform this procedure several times in succession. When doing this process, it is necessary to follow the following sequence Consider four factors.

--- the safety of the machine at all stages of its life cycle;

- the ability of the machine to perform its function;
- the ease of use of the machine;
- The cost of manufacturing, running and dismantling the machine.

5.2.1 Overview

According to GB/T 15706, Type B standard involves a safety feature of machinery (Type B1 standard) or a type of safety device with a wider scope of application set (B2 standard). Class B standards are intended to support the principles in GB/T 15706 to.

- Help to determine whether there is a danger, such as GB/T 23821 "Mechanical safety to prevent the upper and lower limbs from touching the safety distance of the danger zone";
- Provide specific information/measures for risk reduction, such as GB/T 8196 "Fixed and movable mechanical safety guards" General requirements for the design and manufacture of protective devices.

5.2.2 Type B1 standard

Category B1 standards address specific safety aspects (e.g. safety distances, surface temperature, noise) and specify through data and/or methods how to deal with these security aspects. The designer/manufacture can use the Type B1 standard directly, or by using the Type C standard, including the relevant verification methods citations to use the B1 category standard.

5.2.3 Type B2 standard

Class B2 standards specify the design and manufacture of specific safety guards (e.g. two-hand controls, interlocks, pressure-sensitive guards, guards setting) performance requirements. The designer/manufacture may use the Type B2 standard either directly or through a reference to the Type C standard. In addition to performance requirements In addition, the B2 standard may also stipulate corresponding verification measures.

5.3.1 Overview

According to GB/T 15706, Class C standards detail the safety requirements for a specific machine or group of machines.

Note: The term "machine group" refers to the intended use, danger, hazardous state or hazardous events are similar machinery.

Class C standards are machine-specific and their scope defines the limits of the machine and the significant hazards covered.

Class C standards are defined by the availability of machine design (intended use), actual