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**NATIONAL STANDARD OF THE
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**Electrical safety of machinery - Functional safety of
safety-related electrical, electronic and programmable
electronic control systems**

机械电气安全 安全相关电气、电子和可编程电子控制系统的功能安全

(English Translation)

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Foreword

5,6.4,6.6.3,6.10,6.12 this standard are mandatory, the rest are recommended.

This standard was drafted in accordance with GB/T 1.1-2009 given rules.

This standard uses the translation method identical with IEC 62061.2005 "Safety of machinery safety-related electrical, electronic and programmable electronic control

System security features. "

The editorial changes made the following standard.

--- Standard name changed to "Electrical safety of machinery safety-related electrical, electronic and programmable electronic control systems safety function";

--- Delete international standards foreword.

The standard proposed by China Machinery Industry Federation.

The standard mechanical and electrical systems by the National Standardization Technical Committee (SAC/TC231) centralized.

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introduction

Since the result of automation required to increase production and reduce operating staff strength, machinery safety-related electrical control system (hereinafter referred to as

SRECS) play an increasingly important role in achieving the overall machine safety. In addition, it SRECS themselves increasingly using sophisticated electronic technology.

In the absence of standards before, people are less reluctant to accept SRECS safety-related functions to deal with major machine dangerous, because such technologies Performance uncertainty.

This standard mechanical designers, and other personnel control system manufacturers and integrators and norms involved, SRECS design and validation

Personnel. It is required to achieve the stated performance methods and requirements.

This standard describes the specific application within the frame of the machine in the field of IEC 61508. It is mainly the major danger in order to improve the machine in the event (see

Specifications for safety-related electrical control system under ISO 12100-1 section 3.8) conditions.

This standard provides the mechanical part of the machine-specific features SRECS security framework. It includes only security lifecycle from the safety requirements with

Set to confirm the safety related aspects of processes. Requirements to provide information about the safe use of SRECS of machines, it

After phase SRECS life related.

SRECS when used as part of the safety assessment, in many cases, the machine may lead to lower risk. Typical case

Using interlocking guards, when it is open, meaning that the danger zone is accessed, then the initiative to send a signal to the electrical control system, stop

Dangerous machine operation. Similarly, in automation, the electrical control system generally used to achieve proper machining operations can often

Failure by reducing the risk of a direct result of the control system in order to achieve security. This standard provides the following methods and requirements.

- Specify each safety-related control functions performed by the SRECS required safety integrity levels;
- Make SRECS designed for specific safety-related control functions;
- Designed integrated security related subsystems comply with ISO 13849;
- Confirmation SRECS.

The standard is expected to reduce systemic risk within the framework for ISO 12100-1 described and in accordance with ISO 14121 (EN1050) description

Principles referred to, in conjunction with the risk assessment. Safety Integrity Level (SIL) assignment method recommended in information provided in Appendix A.

Taking into account the internal control system of random electrical failure or system failure probability and results, the performance and coordination SRECS expected risk

Reducing measures.

Figure 1 shows the relationship between this standard and other relevant standards.

Table 1 summarizes the application of this standard and ISO 13849-1 revision proposals.

IEC 62061 and ISO 13849-1 (under revision) provides mechanical safety-related control system design and implementation requirements. In the standard range

Inside, use any of them, it can be presumed to meet the relevant basic safety requirements.

Table 1 summarizes the IEC 62061 and ISO 13849-1 (Amendment

In) range.

NOTE: ISO 13849-1 is currently being developed by ISO TC199 and CEN.TC114 making.

Diagram 1 IEC 62061 and other relevant standards

Table 1 IEC 62061 and ISO 13849-1 Recommended for (revision)

Perform safety-related control techniques ISO 13849-1 (under revision) IEC 62061

A non-electrical, such as hydraulic X are not included

B electromechanical, such as relays or limit specified complex electronic structure (see Note 1) and reach PL = e all structures and achieve SIL3

C Complex electronics, such as a programmable limit specified structure (see Note 1) and reach PL = d All structure and achieve SIL3

DA and limit the assigned structure B combination (see Note 1) and reach PL = e X See Note 3

EC limits specified structure and composition B (see Note 1) and reach PL = d All structure and achieve SIL3

FC in combination with A, B or C with A and X combination See Note See Note 2 X 3

"X" indicates that the item is processed by the column headings shown in this standard.

Note 1: The specified structure ENISO 13849-1 (Rev.) specified in appendix B, provides a simplified method to quantify performance levels.

Note 2: For complex electronics. According ENISO 13849-1 (revision) using the assigned structure, to PL = d or in accordance with any IEC 62061

structure.

Note 3: For non-electrical technology, in accordance ENISO 13849-1 (revision) as specified in part subsystem.

Electrical safety of machinery safety-related electrical, electronic and
Functional safety of programmable electronic control systems

1 Scope

This standard machinery safety-related electrical and electronic and programmable electronic control systems (SRECS) design, integration and validation requirements

And give advice (see Notes 1 and 2).

This standard applies to individual or combined way to use a control system to enable non-portable working machine to perform safety-related

Control functions, including a group of machines working together in a coordinated manner, does not apply to portable working machine.

Note 1: In this standard, the "electrical control system," the term means "electrical, electronic and programmable electronic (E/E/PE) control system", "SRECS" represents

"Safety related electrical, electronic and programmable electronic control systems."

Note 2: In this standard, the design assumptions complex programmable electronic subsystems or subsystem elements related to IEC 61508 requirements. This standard provides consumers

Law, not of such elements as SRECS subsystem and subsystem components development.

This standard is applicable standards do not restrict or impede technological progress. It does not include the desired or required by other standards or regulations for the protection of personal

From danger all the requirements (for example protection, non-electrical or non-electrical interlock control). Each type of machine has unique requirements to meet the needs,

To provide adequate security.

This standard.

--- Relates only expected to reduce the risk of personal injury or health hazards of direct access to the machine or use the machine directly caused by safety features

Wide requirements;

--- Limited risk of the machine itself or dangerous machine groups to work together in a coordinated manner arising directly;

Note 3: reduce the risk caused by other hazards require related fields in the standard. For example, the machine is part of the processing activities, the mechanical and electrical

Control system functional safety requirements should meet other requirements (such as