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PEOPLE'S REPUBLIC OF CHINA**

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**Functional safety of electrical/electronic/programmable
electronic safety-related systems -- Functional safety and GB/T
20438**

(English Translation)

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Foreword

GB/T 20438 "Functional safety of electrical/electronic/programmable electronic safety-related systems" consists of the following seven sections.

--- Part 1. General requirements;

--- Part 2. Requirements for electrical/electronic/programmable electronic safety-related systems;

--- Part 3. Software Requirements;

--- Part 4. Definitions and abbreviations;

--- Part 5. Examples of methods for determining safety integrity levels;

--- Part 6. GB/T 20438.2 and GB/T 20438.3 application guide;

--- Part 7. Overview of technologies and measures.

This guidance document is a supplement to the GB/T 20438 standard. It mainly introduces the concept of functional safety and GB/T 20438 Series of standard overview, the guidance of technical documents with the GB/T 20438 series of standards supporting the use of.

This instructional document has been drafted in accordance with the rules given in GB/T 1.1-2009.

Our national document, which corresponds in a consistent manner to the international documents that are normative references in this document, is as follows.

--- GB/T 16499-2008 Preparation of safety publications and the application of basic safety and multi-disciplinary safety publications Guidelines (IEC Guide 104.1997, NEQ)

--- GB/T 20000.4-2003 Guide to standardization work Part 4. Standards related to safety (ISO/IEC Guide 51.1999, MOD) this guideline is equivalent to IEC/T R61508-0.2005 "Functionality of electrical/electronic/programmable electronic safety-related systems Safety Part 0. Functional Safety Concepts and IEC 61508 Series Profiles ".

The technical contents of this technical document are the same as IEC/T R61508-0.2005, and for the sake of convenience, the following editorial modify.

--- Remove the foreword of the international standard, according to GB/T 1.1-2009 rewritten the foreword of this document;

--- Body, where appear "IEC 61508" are changed to "GB/T 20438";

--- Where there is "Technical Report" are replaced by "this document";

--- According to GB/T 1.1-2009 format editorial changes.

This guidance document is proposed by China Machinery Industry Federation.

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Automation Trade (on Sea) Co., Ltd., Huazhong University of Science and Technology control, Siemens (China) Co., Ltd.

Introduction

The purpose of this guidance document is to introduce the concept of functional safety and provide an overview of the GB/T 20438 series of standards.

Read this instructor's guide when you have the following requirements.

- Judge GB/T 20438 is suitable for you;
- Participate in the development of electrical/electronic/programmable electronic systems that may involve safety;
- Drafting any other standards related to functional safety.

Chapter 3 of this guidance document gives an informal definition of functional safety that describes safety functions, safety integrity and safety related System, gives examples of how to derive functional safety requirements, and lists some of the electrical/electronic/programmable electronic systems Functional safety will encounter the challenge. Chapter 4 introduces the specific content of GB/T 20438 provides a way to achieve functional safety and describes the purpose of GB/T 20438, technical methods and framework. It states that GB/T 20438 can be widely used in different industries and can be used as a promise Many other standard foundation.

Electrical/Electronic/Programmable Electronic Safety-Related Systems Functional safety
Functional safety concepts and GB/T 20438 series overview

1 Scope

This guidance document introduces the concept of functional safety and an overview of the GB/T 20438 series.

2 Normative references

The following documents for the application of this document is essential. 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 20438.1-2006 Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 1. General requirements (IEC 61508-1:1998, IDT) Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 2. Electrical/electronic /Requirements for programmable electronic safety-related systems (IEC 61508-2:2000, IDT) GB/T 20438.3-2006 Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 3. Software

requirements (IEC 61508-3:1998, IDT) GB/T 20438.4-2006 Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 4. Definitions and abbreviations Language (IEC 61508-4:1998, IDT) GB/T 20438.5-2006 Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 5. Determination of safety Examples of methods for the level of integrity (IEC 61508-5:1998, IDT) Functional safety of electrical/electronic/programmable electronic safety - related systems - Part 6.

Application Guidelines for GB/T 20438.2 and GB/T 20438.3 (IEC 61508-6:2000, IDT) GB/T 20438.7-2006 Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 7. Techniques and measures Overview (IEC 61508-7:2000, IDT) IEC Guide 104 Safety Publications Compilation and Application of Basic Safety Publications and Multi-Professional Safety Publications (The preparation of safety publications and the use of basic safety publications and group safety publications) ISO/IEC Guide 51 Safety Guidelines for the introduction of safety provisions in standards (Safety aspects - Guidelines for their inclusion in standards)

3.1 Functional safety is what

Safety refers to the unacceptable risk of avoiding human health damage or personal injury, which is caused by any loss of property or the environment the destruction caused directly or indirectly.

Functional safety is a part of overall safety and relies on the correct response of a system or device to its inputs.

For example, an overheat protection device with a thermal sensor on the motor windings that can be de-energized before the motor overheats is functionally safe an example. However, the use of special insulation materials to withstand high temperatures is not an example of functional safety (though this is an example of safety and