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

GB/T 9414.5-2018

Maintainability -- Part 5: Testability and diagnostic testing

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Foreword

GB/T 9414 "Maintenance" is divided into the following parts.

--- Part 1. Application Guide;

--- Part 2. Maintainability requirements and research in the design and development phases;

--- Part 3. Verification and data collection, analysis and representation;

--- Part 5. Test and diagnostic tests;

--- Part 9. Maintenance and repair support.

This part is the fifth part of GB/T 9414.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part replaces GB/T 9414.7-2000 "Device Maintenance Guideline Part IV. Diagnostic Test", and GB/T 9414.7-2000

The main changes are as follows.

--- A reference to the IEC standard has been added to the normative reference document;

--- Chapter 4 was revised to "testability description and diagnostic test";

--- Chapter 5 was revised to "testability specification";

--- Chapter 6 was revised to "testability in the development process";

--- Added Chapter 7 "Testability Assessment" and Chapter 8 "Testing Documents".

This section uses the translation method equivalent to IEC 60706-5.2007 "equipment maintainability Part 5. Testability and diagnostic tests."

The documents of our country that have a consistent correspondence with the international documents referenced in this part are as follows.

---GB/T 2900.13-2008 Electrotechnical terminology reliability and service quality (IEC 60050-191.1990, IDT)

---GB/T 9414.1-2008 Maintainability Part 1. Application Guide (IEC 60300-3-10.2001, IDT)

---GB/T 9414.2-2012 Maintainability Part 2. Design and development phase maintainability requirements and research (IEC 60706-2. 2006, IDT)

---GB/T 9414.3-2012 Maintainability Part 3. Verification and data collection, analysis and presentation (IEC 60706-3. 2006, IDT)

This section has made the following editorial changes.

--- Modified the standard name.

This part was proposed by the Ministry of Industry and Information Technology of the People's Republic of China.

This part is under the jurisdiction of the National Technical Committee for Reliability and Maintainability of Electronic and Electrical Products (SAC/TC24).

This section is mainly drafted by. Ministry of Industry and Information Technology, Post and Telecommunications Industry Standardization Institute, Beijing University of Posts and Telecommunications.

Introduction

Testability is an important feature in the use and maintenance of systems or equipment, and is critical to the availability and maintainability of systems or equipment.

Heavy effect. Diagnostic tests can be performed manually or with test equipment of varying degrees of automation. Test-optimized design

Requires close collaboration between design, use, and maintenance organizations. This section is intended to highlight the various requirements of test and diagnostic testing and to help

Timely coordination with each other.

In this section, contract objects, systems, devices, or functional components, collectively referred to as "products", need to consider test design. Every product needs

Perform the necessary functions that are calibrated during the development and production phases and maintained throughout the life cycle. To maintain production

The functionality of the product, knowing the functional status of each sub-function at any time during the operation of the product. If a failure occurs, measures should be taken

Ensure that the fault is identified and locate the unit that caused the fault. Product testability requirements may seem simple, but if at the beginning of product development

The segment does not consider it, and subsequent implementations will result in increased workload and significant cost increases. If all requirements are at the beginning of development

Can be achieved, R & D engineers can specify the functional characteristics "testability" without a lot of extra work, which can significantly save

Cost, for example, by reducing the number of test steps to verify development results. Experience shows that the extra cost and work of the development phase can

Compensation is obtained, for example, existing test equipment can be used in the production phase. Reliable fault identification and low maintenance costs during operation, large

Greatly increased the market value of measurable products.

Since the products to which this section applies cover a wide range of technologies, this section uses a common approach to writing about the process and technical content.

Therefore, this section only provides a basis for evaluating the product estimates and the basic methods for achieving the necessary product testing. Product fault identification and

The technical realization of fault location is the task of product development engineers, and the implementation of this technology depends on the technical level of product development. Therefore,

It is not important that the required test tasks are implemented in hardware or software. It is important that all functions can be checked through the test path.

Check that the determined test characteristic value matches the given target value. If there is a deviation from the target value, measures should be taken to ensure that the target value is obtained.

Satisfy. These measures should be implemented in the early stages of development prior to freezing the design.

Maintainability Part 5. Test and diagnostic tests

1 Scope

The purpose of this part of GB/T 9414 is to.

--- Provide guidance for early consideration of testability issues in design and development;

--- Helps identify valid test procedures as part of operation and maintenance.

This section applies to all types of products, including commercial off-the-shelf, whether mechanical, hydraulic, electrical or other. In addition, this

Partially applicable to the development of any product, making the product characteristics verifiable (measurable).

The goal of this section is to ensure that the prerequisites related to product testability are defined at the beginning of development, so that the conditions established by the customer

Implement, document, and verify during development.

This section also provides a test implementation and evaluation method as an integral part of product design and suggests a product life cycle.

Product testing documents should be continuously updated.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

IEC 60050-191 Electrotechnical terminology reliability and quality of service (International electrotechnical vocabulary-

Chapter 191. Dependability and quality of service)

IEC 60300-3-10 Reliability Management Part 3-10. Application Guide
Dependability management-

Part 3-10. Application guide-Maintainability)

IEC 60706-2 Maintainability Part 2. Design and development phase requirements and research (Maintainability of equipment-

Part 2. Maintainability requirements and studies during the design and development phase)

IEC 60706-3 Maintainability Part 3. Verification and data collection, analysis and presentation (Maintainability of

equipment-Part 3. Verification and collection, analysis and presentation of data)