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

GB/T 37079-2018

Equipment reliability -- Reliability assessment methods

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Foreword

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

This standard uses the translation method equivalent to IEC 62308.2006 "equipment reliability reliability assessment method".

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

---GB/T 7826-2012 System Reliability Analysis Technology Failure Mode and Impact Analysis (FMEA) program (IEC 60812.

2006, IDT)

---GB/T 20438 (all parts) Functional safety of electrical/electronic/programmable electronic safety related systems [IEC 61508 (all

section)]

This standard has the following editorial changes compared to IEC 62308.2006.

---Modify the error in the international standard, the equation (1) in "6.2.2" " $R(t)=\exp$

$-\int_0^t \lambda(t)dt$]" is changed to " $R(t)=$

$\exp[-\int_0^t \lambda(t)dt]$ "

"

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

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

This standard was drafted. The Fifth Institute of Electronics, Ministry of Industry and Information Technology.

Introduction

This standard describes the reliability assessment procedures primarily used in the early stages of the product, which are based primarily on products or components of the same type on the market.

Use data and test data provided by the module supplier. The results of this type of assessment are inputs to the early design decisions of the equipment, including

Choose system architecture and business decisions (such as estimated warranty and maintenance cost deposits). In addition, such results can also be used as a safety score.

Analyze the initial estimate of the input (such as FTA). Modern electronic components and products are so reliable that they are estimated and verified by experimentation

Reliability is very difficult, so field use data for similar products is often the only way to get an initial estimate of reliability. yuan

Manufacturers have used the similarity analysis method for many years, compared to the classic but outdated data sheet prediction method, which emphasizes the use of the city.

It is a better choice to have data on similar products on the field. This method requires documentation to record similarities.

Reliability assessment results are early in the probability that the selected system architecture, modules, components, and maintenance strategies will meet product reliability goals and objectives.

Estimated value. It has the following uses, such as authorizing the improvement of the next product development process, approving the cost of improvement, or promoting product distribution and

Delivery. Reliability assessment results cannot be directly used to support the purpose, goal or expectation of reliability, and the indicators that meet the reliability requirements can only be used.

From use/live performance. This standard describes the use of reliability assessment results and also provides the phase that requires such results as input.

Close the list of standards.

The reliability assessment methods provided by this standard can be used to.

--- Encourage equipment manufacturers to consider all information related to equipment reliability. Consider component reliability as an influence in the traditional method

The most important factors in reliability are different, and this information may include design and manufacturing processes as well as component screening issues.

---Encourage equipment manufacturers to define and use the most efficient process for the manufacturer's own equipment.

--- Describes the continuous process of continuously updating reliability assessments as more information is available over the life of the equipment. This information is also available

Used to improve equipment reliability and the effectiveness of the evaluation process.

This standard describes the application of three reliability assessment methods, including similarity analysis, durability analysis, and data sheet prediction.

This standard does not provide information to assess the reliability of a software system, but can be used to evaluate the reliability of hardware systems with embedded software.

Equipment reliability reliability assessment method

1 Scope

This standard describes the reliability assessment method implemented in the early stages of the product, mainly based on the on-site use and number of components and modules.

According to the conduct. Suitable for products that require mission-critical tasks, high security requirements, high business value, integration and complexity. This standard package

Includes the following information. Reasons for the early reliability assessment, implementation procedures, and applications. Finally, the standard details the reliability assessment

Estimated methods and necessary data for reliability assessment, and a method based on failure physics to evaluate product durability (lifetime

Or wearout).

This standard discusses three methods of reliability assessment in detail.

---similarity analysis method;

--- Durability analysis method;

---Databook prediction method.

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.

GB/T 2900.13-2008 Electrotechnical terminology credibility and service quality [IEC 60050 (191)..1990, IDT]

GB/T 5080.1-2012 Reliability test Part 1. Test conditions and statistical test principles [IEC 60300-3-5.2001, IDT]

IEC 60300-1 Credibility Management Part 1. Trustworthiness Management System (Dependabilitymanagement-Part 1. De-

Pendabilitymanagementsystems)

IEC 60300-3-1.2003 Credibility Management Part 3-1. Application Guide Reliability Analysis Technical Methodology Guide (De-

pendabilitymanagement-Part 3-1. Applicationguide-Analysistechniquesfordependability-Guide

Onmethodology)

IEC 60300-3-2 Credibility Management Part 3-2. Application Guide Site Dependability Data Collection (Dependabilityman-

agement-Part 3-2. Applicationguide-Colectionofdependabilitydatafromthefield)

IEC 60300-3-3 Credibility Management Part 3-3. Application Guide Life Cycle Costs (Dependability)

management-Part 3-3. Applicationguide-Lifecyclecosting)

IEC 60300-3-4.1996 Credibility Management Part 3-4. Application Guide Credibility Requirements Guide (Dependability)

management-Part 3. Applicationguide-Section4. Guidetothespecificationofdependabilityre-Requirements()

IEC 60300-3-9 Credibility Management Part 3-9. Application Guide Technical System Risk Analysis (Dependabilitymanage-

ment-Part 3. Applicationguide-Section9. Riskanalysisoftechnologicalsystems)

IEC 60300-3-11 Credibility Management Part 3-11. Application Guide Reliability-centered maintenance (Dependability)

management-Part 3-11. Applicationguide-Reliabilitycentredmaintenance)

IEC 60300-3-12 Credibility Management Part 3-12. Application Guide Integrated Logistics Support (Dependability)

management-Part 3-12. Applicationguide-Integratedlogisticsupport)