BS 5760-0:2014

BSI Standards Publication

Reliability of systems, equipment and components –

Part 0: Guide to reliability and maintainability

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Publishing and copyright information

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Contents

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 26, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 March 2014. It was prepared by Technical Committee DS/1, *Dependability*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This part of BS 5760 supersedes BS 5760-0:1986, which is withdrawn.

Relationship with other publications

The following parts of BS 5760 have been published or are in preparation:

- Part 0: *Guide to reliability and maintainability*;
- Part 2: *Guide to the assessment of reliability*;
- Part 8: *Guide to assessment of reliability of systems containing software*;
- Part 10: *Guide to reliability testing*;
- Part 12: *Guide to the presentation of reliability, maintainability and availability predictions*;
- Part 13: *Guide to reliability test conditions for consumer equipment*;
- Part 18: *Guide to the demonstration of dependability requirements – The dependability case*;
- Part 24: *Guide to the integration of risk techniques in the inspection and testing of complex systems*.

Information about this document

This is a full revision of BS 5760-0 and its changes reflect current practices. While addressing system and equipment level reliability and maintainability, many of the techniques described in the different parts of BS 5760 can also be applied at the component level.

Use of this document

As a guide, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification or a code of practice and claims of compliance cannot be made to it.

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The guidance in this standard is presented in roman (i.e. upright) type. Any recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Introduction

Reliability and maintainability are vital qualities of any system or product. When assessing how good a system or product is, the end user considers four characteristics: how much did it cost, how well does it perform when it is working, how often does it break down and how easy is it to mend when it has broken down. A successful product or system strikes the correct balance between these considerations. This standard provides guidance on how to assess and control the last two considerations, which are formally named reliability and maintainability, respectively.

When a product fails, it as a minimum inconveniences the user as a result of direct costs involved in undertaking repair and loss of use of the product. In the case of systems with a safety implication, unexpected failure can have far more serious consequences. The outcome of failures can range from loss of reputation through direct and indirect financial penalties to legal action. As reliability and maintainability are inherent design characteristics, it is essential that the required characteristics are identified as early in the design process as possible, when the other performance criteria are also being set. If they are not considered at this stage, it is likely that the product will not be satisfactory.

The activities described within this standard normally form part of an organization's asset management strategy and are therefore aligned to, and consistent with, the organizational objectives.

1 Scope

This part of BS 5760 gives guidance on the basic principles of reliability and maintainability that are applicable to any business model.

It is particularly applicable to reliability and maintainability in the design, manufacturing, management and decommissioning of products, equipment, services, plant or structures, and gives guidance on matters of common interest to any business supplying or purchasing products, services, plant or structures.

This part of BS 5760 provides all managers and engineers involved in the specification, design, development, manufacture, acceptance and use of engineering artefacts with guidance on how to manage reliability and maintainability effectively and develop an auditable record of activities. This standard is also applicable to students and anyone else who needs to understand how to develop, manufacture and support systems and equipment that meet the needs of the user by working when required.

This part of BS 5760 does not give guidance on issues relating to safety. However, much of the guidance could also be applied to the production of safety cases.

NOTE Guidance on component reliability is given in BS CECC 00804.

2 Terms and definitions and abbreviations

For the purposes of this part of BS 5760, the following terms and definitions apply.

2.1 active repair time
part of the active maintenance time during which repairs are performed on an item

NOTE This does not take into account any waiting time for maintenance resources.

2.2 availability
ability to be in a state to perform as required

NOTE Availability depends upon the combined characteristics of the reliability, recoverability, and maintainability of the item, and the maintenance support performance.

2.3 intrinsic availability
availability provided by the design, under ideal conditions of operation and maintenance

NOTE 1 Delays associated with maintenance, such as logistic and administrative delays, are excluded.

NOTE 2 Operational availability is determined considering down time due to failures, outages and associated delays, but excluding external causes.

2.4 corrective maintenance
maintenance carried out after fault detection to effect restoration

NOTE Corrective maintenance of software invariably involves some modification.

2.5 dependability
ability to perform as and when required

NOTE 1 Dependability includes availability, reliability, recoverability, maintainability and maintenance support performance, and, in some cases, other characteristics such as durability, safety and security.