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Australian Standard®

Dependability management

Part 3.11: Application guide—Reliability centred maintenance

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- The University of New South Wales
- University of Wollongong

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Part 3.11: Application guide—Reliability centred maintenance

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PREFACE

This Standard was prepared by the Standards Australia Committee QR-005, Dependability, to supersede AS IEC 60300.3.11—2004, *Dependability management*, Part 3.11: *Application guide—Reliability centred maintenance*.

The objective of this Standard is to provide guidelines for development of failure management policies for equipment and structures using reliability centred maintenance techniques. It is an application guide and an extension of AS IEC 60300.10, Part 10: *Application guide—Maintainability*, AS IEC 60300.14, Part 14: *Application guide—Maintenance and maintenance support* and AS IEC 60300.12, Part 12: *Application guide—Integrated logistic support*.

This Standard is identical with, and has been reproduced from IEC 60300.3.11, Ed.2.0 (2009), *Dependability management*—Part 3-11: *Application guide—Reliability centred maintenance*.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number appears on the cover and title page while the International Standard number appears only on the cover.

(b) In the source text ‘this part of IEC 60300’ should read ‘this Australian Standard’.

(c) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian Standard*	
IEC		AS IEC	
60300	Dependability management	60300	Dependability management
60300-3-10	Part 3-10: Application guide—Maintainability	60300.3.10	Part 3.10: Application guide—Maintainability
60300-3-12	Part 3-12: Application guide—Integrated logistic support	60300.3.12	Part 3.12: Application guide—Integrated logistic support
60300-3-14	Part 3-14: Application guide—Maintenance and maintenance support	60300.3.14	Part 3.14: Application guide—Maintenance and maintenance support
60812	Analysis techniques for system reliability—Procedure for failure mode and effects analysis (FMEA)	60812	Analysis techniques for system reliability—Procedure for failure mode and effects analysis (FMEA)

Only international references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

The term ‘informative’ has been used in this Standard to define the application of the annex to which it applies. An ‘informative’ annex is only for information and guidance.

CONTENTS

INTRODUCTION

Reliability centred maintenance (RCM) is a method to identify and select failure management policies to efficiently and effectively achieve the required safety, availability and economy of operation. Failure management policies can include maintenance activities, operational changes, design modifications or other actions in order to mitigate the consequences of failure.

RCM was initially developed for the commercial aviation industry in the late 1960s, resulting in the publication of ATA-MGS-3 [1][2]. RCM is now a proven and accepted methodology used in a wide range of industries.

RCM provides a decision process to identify applicable and effective preventive maintenance requirements, or management actions, for equipment in accordance with the safety, operational and economic consequences of identifiable failures, and the degradation mechanism responsible for those failures. The end result of working through the process is a judgement as to the necessity of performing a maintenance task, design change or other alternatives to effect improvements.

The basic steps of an RCM programme are as follows:

a) initiation and planning;

b) functional failure analysis;

c) task selection;

d) implementation;

e) continuous improvement.

All tasks are based on safety in respect of personnel and environment, and on operational or economic concerns. However, it should be noted that the criteria considered will depend on the nature of the product and its application. For example, a production process will be required to be economically viable, and may be sensitive to strict environmental considerations, whereas an item of defence equipment should be operationally successful, but may have less stringent safety, economic and environmental criteria.

Maximum benefit can be obtained from an RCM analysis if it is conducted at the design stage, so that feedback from the analysis can influence design. However, RCM is also worthwhile during the operation and maintenance phase to improve existing maintenance tasks, make necessary modifications or other alternatives.

Successful application of RCM requires a good understanding of the equipment and structure, as well as the operational environment, operating context and the associated systems, together with the possible failures and their consequences. Greatest benefit can be achieved through targeting of the analysis to where failures would have serious safety, environmental, economic or operational effects.

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2 Figures in square brackets refer to the bibliography.

AUSTRALIAN STANDARD

Dependability management

Part 3.11:
Application guide—Reliability centred maintenance

1 Scope

This part of IEC 60300 provides guidelines for the development of failure management policies for equipment and structures using reliability centred maintenance (RCM) analysis techniques.

This part serves as an application guide and is an extension of IEC 60300-3-10, IEC 60300-3-12 and IEC 60300-3-14. Maintenance activities recommended in all three standards, which relate to preventive maintenance, may be implemented using this standard.

The RCM method can be applied to items such as ground vehicles, ships, power plants, aircraft, and other systems which are made up of equipment and structure, e.g. a building, airframe or ship's hull. Typically, equipment comprises a number of electrical, mechanical, instrumentation or control systems and subsystems which can be further broken down into progressively smaller groupings, as required.

This standard is restricted to the application of RCM techniques and does not include aspects of maintenance support, which are covered by the above-mentioned standards or other dependability and safety standards.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-191:1990, *International Electrotechnical Vocabulary – Chapter 191: Dependability and quality of service*

IEC 60300-3-2, *Dependability management – Part 3-2: Application guide – Collection of dependability data from the field*

IEC 60300-3-10, *Dependability management – Part 3-10: Application guide – Maintainability*

IEC 60300-3-12, *Dependability management – Part 3-12: Application guide – Integrated logistic support*

IEC 60300-3-14, *Dependability management – Part 3-14: Application guide – Maintenance and maintenance support*

IEC 60812, *Analysis techniques for system reliability – Procedure for failure mode and effects analysis (FMEA)*

3 Terms, definitions and abbreviations

For the purposes of this document, the terms and definitions of IEC 60050-191 apply, together with the following.

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