AS IEC 60300.3.1—2003 IEC 60300-3-1:2003

Australian Standard[™]

Dependability management Part 3.1: Application guide— Analysis techniques for dependability— Guide on methodology



This Australian Standard was prepared by Committee QR-005, Reliability and Maintainability. It was approved on behalf of the Council of Standards Australia on 28 May 2003 and published on 25 July 2003.

The following are represented on Committee QR-005: AirServices Australia Australian Organisation for Quality Certification Bodies (Australia) Department of Defence (Australia) Institution of Engineers Australia University of New South Wales

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about Standards can be found by visiting the Standards Australia web site at www.standards.com.au and looking up the relevant Standard in the on-line catalogue.

Alternatively, the printed Catalogue provides information current at 1 January each year, and the monthly magazine, *The Global Standard*, has a full listing of revisions and amendments published each month.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at mail@standards.com.au, or write to the Chief Executive, Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001.

This Standard was issued in draft form for comment as DR 03255.

Australian Standard[™]

Dependability management Part 3.1: Application guide— Analysis techniques for dependability— Guide on methodology

First published as AS IEC 60300.3.1-2003.

COPYRIGHT

© Standards Australia International

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Published by Standards Australia International Ltd GPO Box 5420, Sydney, NSW 2001, Australia ISBN 0 7337 5435 X ii

PREFACE

This Standard was prepared by the Standards Australia Committee QR-005, Reliability and Maintainability.

This Standard is identical with, and has been reproduced, from IEC 60300-3-1:2003, *Dependability* management Part 3-1: Application guide—Analysis techniques for dependability—Guide on methodology.

The objective of this Standard is to provide a general overview of commonly used dependability analysis techniques. It describes the usual methodologies, their advantages and disadvantages, data input.

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

- (a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.
- (b) A full point should be substituted 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/New Zealand Standard	
ISO		AS/NZS ISO	
9000	Quality management systems – Fundamentals and vocabulary	9000	Quality management systems – Fundamentals and vocabulary

Only International Standard referenced documents identical to Australian Standards have been listed.

iii

CONTENTS

INT	RODL	JCTION	i v	
1	Scop	e	1	
2	Norm	ative references	1	
3	Defin	itions	2	
4 Basic dependability analysis procedure			3	
	4.1	General procedure	3	
	4.2	Dependability analysis methods	4	
	4.3	Dependability allocations		
	4.4	Dependability analysis		
_	4.5	Maintenance and repair analysis and considerations		
5		ting the appropriate analysis method		
	Annex A (informative) Brief description of analysis techniques			
Bibl	liograp	bhy	54	
Fig	ıro 1 _	- General dependability analysis procedure	З	
-		1 – Temperature dependence of the failure rate		
-				
-		2 – Fault tree for an audio amplifier		
-		3 – Sub-tree from FTA in Figure A.2		
Ŭ		4 – Event tree		
-		5 – Elementary models		
-		6 – Example of unit		
-		7 – State-transition diagram		
		8 – Block diagram of a multiprocessor system		
		9 – Petri net of a multiprocessor system		
-		10 – The HAZOP study procedure		
Ŭ		11 – Human errors shown as an event tree		
-		12 – Example – Application of stress-strength criteria		
Figu	ure A.	13 – Truth table for simple systems4	40	
Figu	ure A.	14 – Example	40	
Figu	ure A.	15 – Cause and effect diagram	52	
Tab	le 1 –	Use of methods for general dependability analysis tasks	5	
Tab	le 2 –	Characteristics of selected dependability analysis methods	11	
Tab	le A.1	- Symbols used in the representation of the fault treee	18	
Tab	le A.2	e – States of the unit	24	
Tab	le A.3	- Effects of failures in functional and diagnostic parts	25	
Tab	le A.4	– Transition rates	26	
Tab	le A.5	– Example of FMEA	31	
Tab	le A.6	- Basic guide words and their generic meanings	32	
Tab	le A.7	Additional guide words relating to clock time and order or sequence	32	
		- Credible human errors		
Tab	le A.9	– Truth table example	41	



This is a free preview. Purchase the entire publication at the link below:

Product Page

S Looking for additional Standards? Visit Intertek Inform Infostore

> Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation