# **Practical Reliability Engineering**

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this book is intended for the engineer or engineering student with little or no prior background in reliability its purpose is to provide the background material and guidance necessary to comprehend and carry out all the tasks associated with a reliability program from specification generation to final demonstration of reliability achieved most available texts on reliability concentrate on the mathematics and statistics used for reliability analysis evaluation and demonstration they are more often suited more for the professional with a heavier mathematical background that most engineers have and more often than not ignore or pay short shrift to basic engineering design and organizational efforts associated with a reliability program a reliability engineer must be familiar with both the mathematics and engineering aspects of a reliability program this text 1 describes the mathematics needed for reliability analysis evaluation and demonstration commensurate with an engineer s background 2 provides background material guidance and references necessary to the structure and implementation of a reliability program including identification of the reliability standards in most common use how to generate and respond to a reliability specification how reliability can be increased the tasks which make up a reliability program and how to judge the need and scope of each how each is commonly performed caution and comments about their application

this 5th edition differs from the 4th one for some refinements and extensions mainly on investigation and test of complex repairable systems for phased mission systems a new approach is given for both reliability and availability section 6 8 6 2 effects of common cause failures ccf are carefully investigated for a 1 out of 2 redundancy 6 8 7 petri nets and dynamic fta are introduced as alternative investigation methods for repairable systems 6 9 approximate expressions are further developed an unified approach for availability estimation und demonstration is given for exponentially and erlangian distributed failure free and repair times 7

2 2 a8 2 2 4 a8 3 1 4 con dence limits at system level are given for the case of constant failure rates 7 2 3 1 investigation of nonhomogeneous poisson processes is refined and more general point processes superimposed cumulative are discussed a7 8 with application to data analysis 7 6 2 cost optimization 4 7 trend tests to detect early failures or wearozdi are introduced 7 6 3 a simple demonstration for mean variance in a cumulative process is given a7 8 4 expansion of a redundancy 2 out of 3 to a redundancy 1 out of 3 is discussed 2 2 6 5 some present production related reliability problems in vlsi ics are shown 3 3 4 maintenance strategies are reviewed 4 6 as in the previous editions of this book reliability figures at system level have indices si e g

for over 30 years reliability maintainability and risk has been recognised as a leading text for reliability and maintenance professionals now in its seventh edition the book has been updated to remain the first choice for professional engineers and students the seventh edition incorporates new material on important topics including software failure the latest safety legislation and standards product liability integrity of safety related systems as well as delivering an up to date review of the latest approaches to reliability modelling including cutsec ranking it is also supported by new detailed case studies on reliability and risk in practice the leading reliability reference for over 30 years covers all key aspects of reliability and maintenance management in an accessible way with minimal mathematics ideal for hands on applications four new chapters covering software failure safety legislation safety systems and new case studies on reliability and risk in practice

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