
Siemens Sn 29500 Standard

Zuverlässigkeit und Verfügbarkeit technischer Systeme
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Application of Risk Assessment and Mitigation Techniques
Methods and Processes
Communications in Reliability, Maintainability, and Supportability
Proceedings of EUROTHERM Seminar 45, 20-22 September 1995, Leuven, Belgium
Wärtsilä Encyclopedia of Ship Technology
Modelle, Standards, Vergleich, Softwaretools
Anwendung der DIN EN ISO 13849
Functional safety of machine controls
Reliability Improvement with Design of Experiment
Thermal Management of Electronic Systems II
Telecommunications Abstracts
Strategies, Tools, Process and Implementation
Solutions for Cyber-Physical Systems Ubiquity
Interconnects, Devices and Systems
The CRC Handbook of Thermal Engineering
Improving Product Reliability and Software Quality
Switching Power Supplies A to Z
Optimum Cooling of Data Centers
GB/T 16855.1-2008 Translated English of Chinese Standard
Reliability Improvement with Design of Experiments

KNOX MILES

Zuverlässigkeit und Verfügbarkeit technischer Systeme diplom.de

This book highlights the current challenges for engineers involved in product development and the associated changes in procedure they make necessary. Methods for systematically analyzing the requirements for safety and security mechanisms are described using examples of how they are implemented in software and hardware, and how their effectiveness can be demonstrated in terms of functional and design safety are discussed. Given today's new E-mobility and automated driving approaches, new challenges are arising and further issues concerning "Road Vehicle Safety" and "Road Traffic Safety" have to be resolved. To address the growing complexity of vehicle functions, as well as the increasing need to accommodate interdisciplinary project teams, previous development approaches now have to be reconsidered, and system engineering approaches and proven management systems need to be supplemented or wholly redefined. The book presents a continuous system development process, starting with the basic requirements of quality management and continuing until the release of a vehicle and its components for road use. Attention is paid to the necessary definition of the respective development item, the threat-, hazard- and risk analysis, safety concepts and their relation to architecture development, while the book also addresses the aspects of product realization in mechanics, electronics and software as well as for subsequent testing, verification, integration and validation phases. In November 2011, requirements for the Functional Safety (FuSa) of road vehicles were first published in ISO 26262. The processes and methods described here are intended to show developers how vehicle systems can be implemented according to ISO 26262, so that their compliance with the relevant standards can be demonstrated as part of a safety case, including audits, reviews and assessments.

Parts Selection and Management IGI Global

Reliability engineering is a rapidly evolving discipline, whose purpose is to develop methods and tools to predict, evaluate, and demonstrate reliability, maintainability, and availability of components, equipment, and systems, as well as to support development and production engineers in building in reliability and maintainability. To be cost and time effective, reliability engineering has to be coordinated with quality assurance activities, in agreement with Total Quality Management (TQM) and Concurrent Engineering efforts. To build in reliability and maintainability into complex equipment or systems, failure rate and failure mode analyses have to be performed early in the development phase and be supported by design guidelines for reliability, maintainability, and software quality as well as by extensive design reviews. Before production, qualification tests on prototypes are necessary to ensure that quality and reliability targets have been met. In the production phase, processes need to be selected and monitored to assure the required quality level. For many systems, availability requirements have also to be satisfied. In these cases, stochastic processes can be used to investigate and optimize availability. including logistical support as well. Software often plays a dominant role, requiring specific quality assurance activities. This book

presents the state-of-the-art of reliability engineering, both in theory and practice. It is based on over 25 years experience of the author in this field, half of which was in industry and half as Professor for reliability engineering at the ETH (Swiss Federal Institute of Technology Zurich).

Theory and Practice Springer

Handbook and reference for industrial statisticians and system reliability engineers System Reliability Theory: Models, Statistical Methods, and Applications, Third Edition presents an updated and revised look at system reliability theory, modeling, and analytical methods. The new edition is based on feedback to the second edition from numerous students, professors, researchers, and industries around the world. New sections and chapters are added together with new real-world industry examples, and standards and problems are revised and updated. System Reliability Theory covers a broad and deep array of system reliability topics, including:

- In depth discussion of failures and failure modes
- The main system reliability assessment methods
- Common-cause failure modeling
- Deterioration modeling
- Maintenance modeling and assessment using Python code
- Bayesian probability and methods
- Life data analysis using R

Perfect for undergraduate and graduate students taking courses in reliability engineering, this book also serves as a reference and resource for practicing statisticians and engineers. Throughout, the book has a practical focus, incorporating industry feedback and real-world industry problems and examples.

IC Component Sockets CRC Press

The CRC Handbook of Thermal Engineering, Second Edition, is a fully updated version of this respected reference work, with chapters written by leading experts. Its first part covers basic concepts, equations and principles of thermodynamics, heat transfer, and fluid dynamics. Following that is detailed coverage of major application areas, such as bioengineering, energy-efficient building systems, traditional and renewable energy sources, food processing, and aerospace heat transfer topics. The latest numerical and computational tools, microscale and nanoscale engineering, and new complex-structured materials are also presented. Designed for easy reference, this new edition is a must-have volume for engineers and researchers around the globe.

Choosing the Best Method and the Best Tool for Quantitative Analysis John Wiley & Sons

This book describes the use of free air cooling to improve the efficiency of, and cooling of, equipment for use in telecom infrastructures. Discussed at length is the cooling of communication installation rooms such as data centers or base stations, and this is intended as a valuable tool for the people designing and manufacturing key parts of communication networks. This book provides an introduction to current cooling methods used for energy reduction, and also compares present cooling methods in use in the field. The qualification methods and standard reliability assessments are reviewed, and their inability to assess the risks of free air cooling is discussed. The method of identifying the risks associated with free air cooling on equipment performance and reliability is introduced. A novel method of assessment for free air cooling is also proposed that utilizes prognostics and health management (PHM). This book also: Describes how the implementation of free air cooling can save energy for cooling within the telecommunications infrastructure. Analyzes the potential risks and failures of mechanisms possible in the implementation of free air cooling,

which benefits manufacturers and equipment designers. Presents prognostics-based assessments to identify and mitigate the risks of telecommunications equipment under free air cooling conditions, which can provide the early warning of equipment failures at operation stage without disturbing the data centers' service. Optimum Cooling for Data Centers is an ideal book for researchers and engineers interested in designing and manufacturing equipment for use in telecom infrastructures.

Podstawy teoretyczne i zastosowania Springer Science & Business Media

A guide to implementing and operating a practical reliability program using carefully designed experiments to provide information quickly, efficiently and cost effectively. It emphasizes real world solutions to daily problems. The second edition contains a special expanded section demonstrating how to combine accelerated testing with design of experiments for immediate improvement.

Zuverlässigkeitsvorhersage für elektronische Komponenten unter mechanischer Belastung DGUV/IFA

Diese Einführung in die Praxis für die Berechnung von Zuverlässigkeit und Verfügbarkeit von technischen Systemen legt besonderen Wert auf den technischen und wirtschaftlichen Nutzen der Ergebnisse. Ein Gerät oder System ist dann zuverlässig, wenn es über einen bestimmten Zeitraum seine definierte Funktion erbringt. Verfügbarkeit ist definiert als die Wahrscheinlichkeit, dass ein System zu einem beliebigen Zeitpunkt funktionsfähig ist bzw. - in anderer Sichtweise - zu z.B. 99,999 % zur Verfügung steht. Beide Größen werden mit Hilfe von statistischen Verfahren ermittelt. Die Verfahren werden ausführlich und, soweit sinnvoll und erforderlich, mit der zugehörigen Mathematik und mit Beispielen nachvollziehbar dargestellt. Die dafür notwendigen Daten werden definiert und die erhaltenen Ergebnisse interpretiert.

CRC Handbook of Thermal Engineering Springer Science & Business Media

W pracy przedstawiono syntezę zagadnień prowadzenia analizy drzewa niezdatności (FTA) w odniesieniu do złożonych systemów technicznych na przykładzie podsystemów siłowni okrętowej statku morskiego. Przedstawiono ryshistoryczny rozwoju metody oraz dokonano przeglądu jej zastosowań. Omówiono szczegółowo etapy prowadzenia analizy drzewa niezdatności. Opisano wybrane problemy związane z modelowaniem uszkodzalności systemów. Dokonano dogłębnej klasyfikacji i scharakteryzowano zdarzenia elementarne, pośrednie i szczytowe; transfery oraz operatory modelujące relacje przyczynowo-skutkowe. Scharakteryzowano i poparto przykładami zastosowanie różnego rodzaju bramek. Opisu dokonano, klasyfikując bramki ze względu na cechy budowanego drzewa niezdatności. W pracy wyszczególniono statyczne koherentne drzewa niezdatności, statyczne niekoherentne drzewa niezdatności, dynamiczne drzewa niezdatności oraz powypadkowe drzewa niezdatności. Zestawiono podstawowe informacje z zakresu teorii niezawodności związane z opisem obiektów nieodnawialnych i odnawialnych oraz modelowaniem struktury niezawodnościowej złożonych systemów technicznych. Relacje przyczynowo-skutkowe występujące w podstawowych strukturach niezawodnościowych zamodelowano drzewami niezdatności. Szczegółowo opisano wraz z przykładami obliczeniowymi zagadnienia jakościowej i ilościowej analizy drzewa niezdatności. Omówiono analityczne i symulacyjne niezawodnościowe miary niezawodności i gotowości systemów oraz ważności elementów. Przedstawiono autorską metodykę analizy złożonych wielostanowych systemów technicznych opartą na metamodelu wykorzystującym wektor zdarzeń zewnętrznych modelujący zmiany w konfiguracji elementów

systemu. Przeprowadzono przykładową analizę ważności elementów oraz wyznaczono gotowości systemu energetyczno-napędowego i technologicznego statku rybackiego dla różnych stanów eksploatacyjnych i różnego wyposażenia statku. Porównano rankingi ważności uzyskane w oparciu o różne miary i stany systemu. Kolejno dokonano charakterystyki wybranych komputerowych programów wspomagających analizę FTA. Dokonano zestawienia najważniejszych cech oprogramowania poszczególnych producentów. Cechy tych programów zestawiono w postaci tabel, które umożliwiają porównanie pakietów i wybór najbardziej odpowiedniego do wymaganego zakresu prowadzonej analizy. Pracę zamyka zakończenie wraz z nakreśleniem wybranych kierunków dalszych badań w przedmiotowej tematyce. Załączniki prezentują aplikację analizy drzewa niezdatności w ocenie działania wybranych instalacji siłowni okrętowych statków morskich.

Influence of Temperature on Microelectronics and System Reliability CRC Press

Functional safety of machine controls Application of EN ISO 13849 DGUV/IFA

Enhancing Defense System Reliability John Wiley & Sons

The EN ISO 13849-1 standard, "Safety of machinery - Safety-related parts of control systems", contains provisions governing the design of such parts. This report is an update of BGIA Report 2/2008e of the same name. It describes the essential subject-matter of the standard in its third, revised 2015 edition, and explains its application with reference to numerous examples from the fields of electromechanics, fluidics, electronics and programmable electronics, including control systems employing mixed technologies. The standard is placed in its context of the essential safety requirements of the Machinery Directive, and possible methods for risk assessment are presented. Based upon this information, the report can be used to select the required Performance Level PLr for safety functions in control systems. The Performance Level PL which is actually attained is explained in detail. The requirements for attainment of the relevant Performance Level and its associated Categories, component reliability, levels of diagnostic coverage, software safety and measures for the prevention of systematic and common-cause failures are all discussed comprehensively. Background information is also provided on implementation of the requirements in real-case control systems. Numerous example circuits show, down to component level, how Performance Levels a to e can be engineered in the selected technologies with Categories B to 4. The examples provide information on the safety principles employed and on components with well-tried safety functionality. Numerous literature references permit closer study of the examples provided. The report shows how the requirements of EN ISO 13849-1 can be implemented in engineering practice, and thus makes a contribution to consistent application and interpretation of the standard at national and international level.

Reliability of Microtechnology John Wiley & Sons

Die Norm DIN EN ISO 13849-1 "Sicherheit von Maschinen - Sicherheitsbezogene Teile von Steuerungen" macht Vorgaben für die Gestaltung von sicherheitsbezogenen Teilen von Steuerungen. Dieser Report ist eine Aktualisierung des gleichnamigen BGIA-Reports 2/2008. Er stellt die wesentlichen Inhalte der Norm in ihrer dritten Ausgabe von 2016 vor und erläutert deren Anwendung an zahlreichen Beispielen aus den Bereichen Elektromechanik, Fluidtechnik, Elektronik und programmierbarer Elektronik, darunter auch Steuerungen gemischter Technologie. Der Zusammenhang der Norm mit den grundlegenden Sicherheitsanforderungen der Maschinenrichtlinie

wird aufgezeigt und mögliche Verfahren zur Risikoabschätzung werden vorgestellt. Auf der Basis dieser Informationen erlaubt der Report die Auswahl des erforderlichen Performance Level PLr für steuerungstechnische Sicherheitsfunktionen. Die Bestimmung des tatsächlich erreichten Performance Level PL wird detailliert erläutert. Auf die Anforderungen zum Erreichen des jeweiligen Performance Level und seine zugehörigen Kategorien, auf die Bauteilzuverlässigkeit, Diagnosedeckungsgrade, Softwaresicherheit und Maßnahmen gegen systematische Ausfälle sowie Fehler gemeinsamer Ursache wird im Detail eingegangen. Hintergrundinformationen zur Umsetzung der Anforderungen in die steuerungstechnische Praxis ergänzen das Angebot. Zahlreiche Schaltungsbeispiele zeigen bis auf die Ebene der Bauteile hinunter, wie die Performance Level a bis e mit den Kategorien B bis 4 in den jeweiligen Technologien technisch umgesetzt werden können. Sie geben dabei Hinweise auf die verwendeten Sicherheitsprinzipien und sicherheitstechnisch bewährte Bauteile. Zahlreiche Literaturhinweise dienen einem tieferen Verständnis der jeweiligen Beispiele. Der Report zeigt, wie die Anforderungen der DIN EN ISO 13849-1 in die technische Praxis umgesetzt werden können, und leistet damit einen Beitrag zur einheitlichen Anwendung und Interpretation der Norm auf nationaler und internationaler Ebene.

Funktionale Sicherheit von Maschinensteuerungen Springer-Verlag

Peter Tröger nimmt eine umfassende Einordnung und Bewertung von Methoden vor, mit denen sich nicht-funktionale Eigenschaften wie Zuverlässigkeit, Verfügbarkeit und Sicherheit modellieren und analysieren lassen. Er diskutiert dabei die Frage, ob und wie die Unvollkommenheit von Ausgangsinformationen berücksichtigt werden kann. Dafür werden die Teilprobleme Unsicherheit und Uneindeutigkeit im Kontext von Informationstechnologien genauer besprochen. Der Autor zeigt, dass die meisten etablierten Ansätze diese beiden Probleme nur teilweise berücksichtigen, wodurch eine frühe Modellbildung aufwendig oder sogar unmöglich wird. Er stellt einige neue Ansätze vor, mit denen die Berücksichtigung von Unvollkommenheit besser gelingen kann.

Fundamentals of Electronic Systems Design National Academy Press

A guide to implementing and operating a practical reliability program using carefully designed experiments to provide information quickly, efficiently and cost effectively. It emphasizes real world solutions to daily problems. The second edition contains a special expanded section demonstrating how to combine accelerated testing with design of experiments for immediate improvement.

Telcom Report Wydawnictwo Naukowe Akademii Morskiej w Szczecinie

Safety, Reliability and Risk Analysis. Theory, Methods and Applications contains the papers presented at the joint ESREL (European Safety and Reliability) and SRA-Europe (Society for Risk Analysis Europe) Conference (Valencia, Spain, 22-25 September 2008). The book covers a wide range of topics, including: Accident and Incident Investigation; Crisis

An Introduction to Reliability and Maintainability Engineering DGVV/IFA

Chapter 1: The Principles of Switching Power Conversion Chapter 2: DC-DC Converter Design and Magnetics Chapter 3: Off-line Converter Design and Magnetics Chapter 4: The Topology FAQ Chapter 5: Optimal Core Selection Chapter 6: Component Ratings, Stresses, Reliability and Life Chapter 7: Optimal Power Components Selection Chapter 8: Conduction and Switching Losses Chapter 9: Discovering New Topologies Chapter 10: Printed Circuit Board Layout Chapter 11: Thermal Management Chapter 12: Feedback Loop Analysis and Stability Chapter 13: Paralleling, Interleaving

and Sharing Chapter 14: The Front-End of AC-DC Power Supplies Chapter 15: DM and CM Noise in Switching Power Supplies Chapter 16: Fixing EMI across the Board Chapter 17: Input Capacitor and Stability Chapter 18: The Math behind the Electromagnetic Puzzle Chapter 19: Solved Examples Appendix A.

Technical Safety, Reliability and Resilience Springer Nature

Offers a holistic approach to guiding product design, manufacturing, and after-sales support as the manufacturing industry transitions from a product-oriented model to service-oriented paradigm This book provides fundamental knowledge and best industry practices in reliability modelling, maintenance optimization, and service parts logistics planning. It aims to develop an integrated product-service system (IPSS) synthesizing design for reliability, performance-based maintenance, and spare parts inventory. It also presents a lifecycle reliability-inventory optimization framework where reliability, redundancy, maintenance, and service parts are jointly coordinated. Additionally, the book aims to report the latest advances in reliability growth planning, maintenance contracting and spares inventory logistics under non-stationary demand condition. Reliability Engineering and Service provides in-depth chapter coverage of topics such as: Reliability Concepts and Models; Mean and Variance of Reliability Estimates; Design for Reliability; Reliability Growth Planning; Accelerated Life Testing and Its Economics; Renewal Theory and Superimposed Renewals; Maintenance and Performance-Based Logistics; Warranty Service Models; Basic Spare Parts Inventory Models; Repairable Inventory Systems; Integrated Product-Service Systems (IPSS), and Resilience Modeling and Planning Guides engineers to design reliable products at a low cost Assists service engineers in providing superior after-sales support Enables managers to respond to the changing market and customer needs Uses end-of-chapter case studies to illustrate industry best practice Lifecycle approach to reliability, maintenance and spares provisioning Reliability Engineering and Service is an important book for graduate engineering students, researchers, and industry-based reliability practitioners and consultants.

Functional Safety for Road Vehicles Springer Science & Business Media

Makes the case for systems thinking in an easily accessible form for a broad interdisciplinary audience, including health system stewards, programme implementers, researchers, evaluators, and funding partners.

Preprints John Wiley & Sons

For the second time, the Eurotherm Committee has chosen Thermal Management of Electronic Systems as the subject for its 45th Seminar, held at IMEC in Leuven, Belgium, from 20 to 22 September 1995. After the successful first edition of this seminar in Delft, June 14-16, 1993, it was decided to repeat this event on a two year basis. This volume constitutes the edited proceedings of the Seminar. Thermal management of electronic systems is gaining importance. Whereas a few years ago papers on this subject were mainly devoted to applications in high end markets, such as mainframes and telecommunication switching equipment, we see a growing importance in the "lower" end applications. This may be understood from the growing impact of electronics on every day life, from car electronics, GSM phones, personal computers to electronic games. These applications add new requirements to the thermal design. The thermal problem and the applicable cooling strategies are quite different from those in high end products. In this seminar the latest

developments in many of the different aspects of the thermal design of electronic systems were discussed. Particular attention was given to thermal modelling, experimental characterisation and the impact of thermal design on the reliability of electronic systems.

CRC Press

This book raises the level of understanding of thermal design criteria. It provides the design team with sufficient knowledge to help them evaluate device architecture trade-offs and the effects of operating temperatures. The author provides readers a sound scientific basis for system operation at realistic steady state temperatures without reliability penalties. Higher temperature performance than is commonly recommended is shown to be cost effective in production for life cycle costs. The microelectronic package considered in the book is assumed to consist of a semiconductor device with first-level interconnects that may be wirebonds, flip-chip, or tape automated bonds; die attach; substrate; substrate attach; case; lid; lid seal; and lead seal. The temperature effects on electrical parameters of both bipolar and MOSFET devices are discussed, and models quantifying the temperature effects on package elements are identified. Temperature-related models have been used to derive derating criteria for determining the maximum and minimum allowable temperature stresses for a given microelectronic package architecture. The first chapter outlines problems with some of the current modeling strategies. The next two chapters present microelectronic device failure mechanisms in terms of their dependence on steady state temperature, temperature cycle, temperature gradient, and rate of change of temperature at the chip and package level. Physics-of-failure based models used to characterize these failure mechanisms are identified and the variabilities in temperature dependence of each of the failure mechanisms are characterized. Chapters 4 and 5 describe the effects of temperature on the performance characteristics of MOS and

bipolar devices. Chapter 6 discusses using high-temperature stress screens, including burn-in, for high-reliability applications. The burn-in conditions used by some manufacturers are examined and a physics-of-failure approach is described. The

Application of Risk Assessment and Mitigation Techniques Wiley

With emphasis on practical aspects of engineering, this bestseller has gained worldwide recognition through progressive editions as the essential reliability textbook. This fifth edition retains the unique balanced mixture of reliability theory and applications, thoroughly updated with the latest industry best practices. Practical Reliability Engineering fulfils the requirements of the Certified Reliability Engineer curriculum of the American Society for Quality (ASQ). Each chapter is supported by practice questions, and a solutions manual is available to course tutors via the companion website. Enhanced coverage of mathematics of reliability, physics of failure, graphical and software methods of failure data analysis, reliability prediction and modelling, design for reliability and safety as well as management and economics of reliability programmes ensures continued relevance to all quality assurance and reliability courses. Notable additions include: New chapters on applications of Monte Carlo simulation methods and reliability demonstration methods. Software applications of statistical methods, including probability plotting and a wider use of common software tools. More detailed descriptions of reliability prediction methods. Comprehensive treatment of accelerated test data analysis and warranty data analysis. Revised and expanded end-of-chapter tutorial sections to advance students' practical knowledge. The fifth edition will appeal to a wide range of readers from college students to seasoned engineering professionals involved in the design, development, manufacture and maintenance of reliable engineering products and systems.

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