

Reliability Availability And Maintainability

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Reliability Engineering Handbook - Dimitri Kececioglu 2002

Designed to be used in engineering education and industrial practice, this book provides a comprehensive presentation of reliability engineering for optimized design engineering of products, parts, components and equipment.

Reliability and Maintainability of In-Service Pipelines - Mojtaba Mahmoodian 2018-06-13

Reliability and Maintainability of In-Service Pipelines helps engineers understand the best structural analysis methods and more accurately predict the life of their pipeline assets. Expanded to cover real case studies from oil and gas, sewer and water pipes, this reference also explains inline inspection and how the practice influences reliability analysis, along with various reliability models beyond the well-known Monte Carlo method. Encompassing both numerical and analytical methods in structural reliability analysis, this book gives engineers a stronger point of reference covering both pipeline maintenance and monitoring techniques in a single resource. Provides tactics on cost-effective pipeline integrity management decisions and strategy for a variety of different pipes Presents readers with rational tools for strengthening and rehabing existing pipelines Teaches how to optimize materials selection and design parameters for designing future pipelines with a longer service life

Reliability - Wallace R. Blischke 2000-03-27

Bringing together business and engineering to reliability analysis With manufactured products exploding in numbers and complexity, reliability studies play an increasingly critical role throughout a product's entire life cycle-from design to post-sale support. Reliability: Modeling, Prediction, and Optimization presents a remarkably broad framework for the analysis of the technical and commercial aspects of product reliability, integrating concepts and methodologies from such diverse areas as engineering, materials science, statistics, probability, operations research, and management. Written in plain language by two highly respected experts in the field, this practical work provides engineers, operations managers, and applied statisticians with both qualitative and quantitative tools for solving a variety of complex, real-world reliability problems. A wealth of examples and case studies accompanies:

- * Comprehensive coverage of assessment, prediction, and improvement at each stage of a product's life cycle
- * Clear explanations of modeling and analysis for hardware ranging from a single part to whole systems
- * Thorough coverage of test design and statistical analysis of reliability data
- * A special chapter on software reliability
- * Coverage of effective management of reliability, product support, testing, pricing, and related topics
- * Lists of sources for technical information, data, and computer programs
- * Hundreds of graphs, charts, and tables, as well as over 500 references

Tutorial on Hardware and Software Reliability, Maintainability and Availability - Norman F. Schneidewind 2008-10-21

Computer systems, whether hardware or software, are subject to failure. Precisely, what is a failure? It is defined as: The inability of a system or system component to perform a required function within specified limits. A failure may be produced when a fault is encountered and a loss of the expected service to the user results [IEEE/AIAA P1633]. This brings us to the question of what is a fault? A fault is defect in the hardware or computer code that can be the cause of one or more failures. Software-based systems have become the dominant player in the computer systems world. Since it is imperative that computer systems operate reliably, considering the criticality of software, particularly in safety critical systems, the IEEE and AIAA commissioned the development of

the Recommended Practice on Software Reliability. This tutorial serves as a companion document with the purpose of elaborating on key software reliability process practices in more detail than can be specified in the Recommended Practice. However, since other subjects like maintainability and availability are also covered, the tutorial can be used as a stand-alone document. While the focus of the Recommended Practice is software reliability, software and hardware do not operate in a vacuum. Therefore, both software and hardware are addressed in this tutorial in an integrated fashion. The narrative of the tutorial is augmented with illustrative solved problems. The recommended practice [IEEE P1633] is a composite of models and tools and describes the "what and how" of software reliability engineering. It is important for an organization to have a disciplined process if it is to produce high reliability software. This process uses a life cycle approach to software reliability that takes into account the risk to reliability due to requirements changes. A requirements change may induce ambiguity and uncertainty in the development process that cause errors in implementing the changes. Subsequently, these errors may propagate through later phases of development and maintenance. In view of the life cycle ramifications of the software reliability process, maintenance is included in this tutorial. Furthermore, because reliability and maintainability determine availability, the latter is also included. Current Trends in Reliability, Availability, Maintainability and Safety - Uday Kumar 2015-12-14

Containing selected papers from the ICRESH-ARMS 2015 conference in Lulea, Sweden, collected by editors with years of experiences in Reliability and maintenance modeling, risk assessment, and asset management, this work maximizes reader insights into the current trends in Reliability, Availability, Maintainability and Safety (RAMS) and Risk Management. Featuring a comprehensive analysis of the significance of the role of RAMS and Risk Management in the decision making process during the various phases of design, operation, maintenance, asset management and productivity in Industrial domains, these proceedings discuss key issues and challenges in the operation, maintenance and risk management of complex engineering systems and will serve as a valuable resource for those in the field.

Reliability, Maintainability, and Supportability - Michael Tortorella 2015-02-25

Focuses on the core systems engineering tasks of writing, managing, and tracking requirements for reliability, maintainability, and supportability that are most likely to satisfy customers and lead to success for suppliers This book helps systems engineers lead the development of systems and services whose reliability, maintainability, and supportability meet and exceed the expectations of their customers and promote success and profit for their suppliers. This book is organized into three major parts: reliability, maintainability, and supportability engineering. Within each part, there is material on requirements development, quantitative modelling, statistical analysis, and best practices in each of these areas. Heavy emphasis is placed on correct use of language. The author discusses the use of various sustainability engineering methods and techniques in crafting requirements that are focused on the customers' needs, unambiguous, easily understood by the requirements' stakeholders, and verifiable. Part of each major division of the book is devoted to statistical analyses needed to determine when requirements are being met by systems operating in customer environments. To further support systems engineers in writing, analyzing, and interpreting sustainability requirements, this book also Contains "Language Tips" to help systems engineers learn the different languages spoken by specialists and non-specialists in the sustainability disciplines Provides exercises in each chapter, allowing the reader to try out some of the ideas and procedures presented in the chapter Delivers end-of-chapter summaries of the current reliability, maintainability, and supportability

engineering best practices for systems engineers Reliability, Maintainability, and Supportability is a reference for systems engineers and graduate students hoping to learn how to effectively determine and develop appropriate requirements so that designers may fulfil the intent of the customer.

Reliability Engineering - Alessandro Birolini 2018-08-15

This book shows how to build in and assess reliability, availability, maintainability, and safety (RAMS) of components, equipment, and systems. It presents the state of the art of reliability (RAMS) engineering, in theory & practice, and is based on over 30 years author's experience in this field, half in industry and half as Professor of Reliability Engineering at the ETH, Zurich. The book structure allows rapid access to practical results. Methods & tools are given in a way that they can be tailored to cover different RAMS requirement levels. Thanks to Appendices A6 - A8 the book is mathematically self-contained, and can be used as a textbook or as a desktop reference with a large number of tables (60), figures (210), and examples / exercises (10,000 per year since 2013) were the motivation for this final edition, the 13th since 1985, including German editions. Extended and carefully reviewed to improve accuracy, it represents the continuous improvement effort to satisfy reader's needs and confidence. New are an introduction to risk management with structurally new models based on semi-Markov processes & to the concept of mean time to accident, reliability & availability of a k-out-of-n redundancy with arbitrary repair rate for $n - k = 2, 10$ new homework problems, and refinements, in particular, on multiple failure mechanisms, approximate expressions, incomplete coverage, data analysis, and comments on \bar{e} , MTBF, MTTF, MTTR, R, PA. *Recent Advances in Life-Testing and Reliability* - N. Balakrishnan 1995-04-27

This unique volume presents chapters written on the areas of life-testing and reliability by many well-known researchers who have contributed significantly to these two areas over the years. Chapters cover a wide range of topics such as inference under censoring and truncation, reliability growth models, designs to improve quality, prediction techniques, Bayesian analysis of reliability, multivariate methods, accelerated testing, and more. The book is written in an easy-to-follow style, first presenting the necessary theoretical details and then illustrating the methods with a numerical examples wherever possible. Many tables and graphs that are essential for the use of some of the new methodologies are presented throughout the volume. Numerous examples provide the reader with a clear understanding of the methods presented as well as with insight into the applications of these results.

Maintainability - Benjamin S. Blanchard 1995-03-10

Gets professionals quickly on-line with all the crucial design concepts and skills they need to dramatically improve the maintainability of their products or systems Maintainability is a practical, step-by-step guide to implementing a comprehensive maintainability program within your organization's design and development function. From program scheduling, organizational interfacing, cost estimating, and supplier activities, to maintainability prediction, task analysis, formal design review, and maintainability tests and demonstrations, it describes all the planning and organizational aspects of maintainability for projects under development and * Schools readers in state-of-the-art maintainability design techniques * Demonstrates methods for quantitatively measuring maintainability at every stage of the development process * Shows how to increase effectiveness while reducing life-cycle costs of already existing systems or products * Features numerous case studies, sample applications, and practice exercises * Functions equally well as a professional reference and a classroom text Independent cost analysis studies indicate that an inordinately large percentage of the overall life-cycle cost of most systems/products is currently taken up by maintenance and support. In fact, for many large-scale systems, maintenance and support have been shown to account for as much as 60% to 75% of overall life-cycle costs. At a time of fierce global competition, long-term cost effectiveness is a major competitive advantage that manufacturers simply cannot afford to underestimate. Clearly then, to remain competitive in today's international marketplace, companies must institute programs for reducing system maintenance and support costs-- comprehensive programs that are an integral part of the design and development process from its earliest conceptual stages. This book shows you how to implement such a program within your organization's design and development function. From program scheduling, organizational interfacing, cost estimating, and supplier activities, to maintainability prediction, task analysis, formal design review, and maintainability tests

and demonstrations, it describes all the planning and organizational aspects of maintainability for projects under development while schooling you in the use of the full range of proven design techniques-- including methods for quantitatively measuring maintainability at every stage of the development process. The authors also clearly explain how the principles and practices outlined in Maintainability can be applied to the evaluation of systems/products now in use both to increase their effectiveness and reduce long-term costs. While theoretical aspects of maintainability are discussed, the authors' main purpose in writing this book is to help get professionals quickly on-line with the essential maintainability concepts and skills. Hence, in addition to clarity of presentation and a rational hierarchical format, Maintainability features many case studies and sample applications that help to clarify the points covered, and numerous practice exercises that help engineers to test their mastery of the concepts and techniques covered. Maintainability is an invaluable professional tool for engineers from all disciplines who are involved with the design, testing, prototyping, manufacturing, and maintenance of products and systems. It also serves as a superior course book for graduate-level programs in those disciplines.

Current Trends in Reliability, Availability, Maintainability and Safety - Uday Kumar 2015-12-15

Containing selected papers from the ICRESH-ARMS 2015 conference in Lulea, Sweden, collected by editors with years of experiences in Reliability and maintenance modeling, risk assessment, and asset management, this work maximizes reader insights into the current trends in Reliability, Availability, Maintainability and Safety (RAMS) and Risk Management. Featuring a comprehensive analysis of the significance of the role of RAMS and Risk Management in the decision making process during the various phases of design, operation, maintenance, asset management and productivity in Industrial domains, these proceedings discuss key issues and challenges in the operation, maintenance and risk management of complex engineering systems and will serve as a valuable resource for those in the field.

Handbook of RAMS in Railway Systems - Qamar Mahboob 2018-03-14

The Handbook of RAMS in Railway Systems: Theory and Practice addresses the complexity in today's railway systems, which use computers and electromechanical components to increase efficiency while ensuring a high level of safety. RAM (Reliability, Availability, Maintainability) addresses the specifications and standards that manufacturers and operators have to meet. Modeling, implementation, and assessment of RAM and safety requires the integration of railway engineering systems; mathematical and statistical methods; standards compliance; and financial/economic factors. This Handbook brings together a group of experts to present RAM and safety in a modern, comprehensive manner.

Reliability, Availability, Maintainability and Safety Assessment - Alain Villemeur 1992

ETARA PC Version 3.3 User's Guide: Reliability, Availability, Maintainability Simulation Model - David J. Hoffman 1991

Reliability, Maintainability and Risk - David J. Smith 2011-06-29
Reliability, Maintainability and Risk: Practical Methods for Engineers, Eighth Edition, discusses tools and techniques for reliable and safe engineering, and for optimizing maintenance strategies. It emphasizes the importance of using reliability techniques to identify and eliminate potential failures early in the design cycle. The focus is on techniques known as RAMS (reliability, availability, maintainability, and safety-integrity). The book is organized into five parts. Part 1 on reliability parameters and costs traces the history of reliability and safety technology and presents a cost-effective approach to quality, reliability, and safety. Part 2 deals with the interpretation of failure rates, while Part 3 focuses on the prediction of reliability and risk. Part 4 discusses design and assurance techniques; review and testing techniques; reliability growth modeling; field data collection and feedback; predicting and demonstrating repair times; quantified reliability maintenance; and systematic failures. Part 5 deals with legal, management and safety issues, such as project management, product liability, and safety legislation. 8th edition of this core reference for engineers who deal with the design or operation of any safety critical systems, processes or operations Answers the question: how can a defect that costs less than \$1000 dollars to identify at the process design stage be prevented from escalating to a \$100,000 field defect, or a \$1m+ catastrophe Revised throughout, with new examples, and standards,

including must have material on the new edition of global functional safety standard IEC 61508, which launches in 2010

Product Reliability, Maintainability, and Supportability Handbook

- Michael Pecht 1995-05-04

This unique publication addresses the role of reliability, maintainability, and supportability in the life-cycle of a product, in the context of product effectiveness and worth. It emphasizes all aspects of producing an effective electrical or mechanical system. This is the only handbook available on this subject and the only book that is this comprehensive and informative. The Product Reliability, Maintainability, and Supportability Handbook examines the logistics, cost, and the physics of failure-topics never before found in a single volume on reliability. It describes the factors that affect product effectiveness and worth: performance, reliability, design effectiveness and margin for error, availability, affordability, use effectiveness, and logistic effectiveness. The handbook contains 13 in-depth chapters, opening with an introduction on product effectiveness and worth and concluding with reliability and maintainability data that can be combined with performance data to assess overall effectiveness of the product. The pages are filled with valuable information that can be easily and quickly put to practical use. Basic principles of the mathematical theory of probability and necessary background are provided. Concepts and basic theory of reliability in terms of probability and statistical inference are also given. Techniques for deriving probabilistic models from observational data as well as reliability models and associated validation techniques are detailed. Software and software reliability, quality, and safety are all covered, including the development life-cycle process and mechanisms by which software errors are introduced. The book presents design guidelines and techniques and the requirements for materials, manufacturing, and assembly. Learn how to analyze the reliability of redundant and fault-tolerant products. Use the methods for modeling and analyzing failures of repairable products that normally exhibit wearout characteristics. The Product Reliability, Maintainability, and Supportability Handbook also provides reliability improvement techniques to improve the competitiveness of existing products. The book includes helpful summaries and numerous problem sections to reinforce and test learned information. This reference source is the guide that professionals and technical managers should turn to when they need a comprehensive and detailed overview of everything that goes into producing systems and products that meet customer needs in an effective and timely manner.

Reliability Engineering - Alessandro Birolini 2013-04-17

Using clear language, this book shows you how to build in, evaluate, and demonstrate reliability and availability of components, equipment, and systems. It presents the state of the art in theory and practice, and is based on the author's 30 years' experience, half in industry and half as professor of reliability engineering at the ETH, Zurich. In this extended edition, new models and considerations have been added for reliability data analysis and fault tolerant reconfigurable repairable systems including reward and frequency / duration aspects. New design rules for imperfect switching, incomplete coverage, items with more than 2 states, and phased-mission systems, as well as a Monte Carlo approach useful for rare events are given. Trends in quality management are outlined. Methods and tools are given in such a way that they can be tailored to cover different reliability requirement levels and be used to investigate safety as well. The book contains a large number of tables, figures, and examples to support the practical aspects.

Guidebook for Reliability, Availability, and Maintainability Analysis of NWS Repository Equipment - 1981

Gas Turbines for Electric Power Generation - S. Can Gülen 2019-02-14

Everything you wanted to know about industrial gas turbines for electric power generation in one source with hard-to-find, hands-on technical information.

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Reliability, Availability, Maintainability & Safety Assessment - Alain Villemeur 1992

Part of a two-volume work which presents the methods and techniques used to assess and measure the dependability of industrial systems, this book concentrates on the specific methods used to solve reliability problems, taking into account human factors, mechanics and software.

Design for Maintainability - Louis J. Gullo 2021-03-26

How to design for optimum maintenance capabilities and minimize the repair time Design for Maintainability offers engineers a wide range of

tools and techniques for incorporating maintainability into the design process for complex systems. With contributions from noted experts on the topic, the book explains how to design for optimum maintenance capabilities while simultaneously minimizing the time to repair equipment. The book contains a wealth of examples and the most up-to-date maintainability design practices that have proven to result in better system readiness, shorter downtimes, and substantial cost savings over the entire system life cycle, thereby, decreasing the Total Cost of Ownership. Design for Maintainability offers a wealth of design practices not covered in typical engineering books, thus allowing readers to think outside the box when developing maintainability design requirements. The book's principles and practices can help engineers to dramatically improve their ability to compete in global markets and gain widespread customer satisfaction. This important book: Offers a complete overview of maintainability engineering as a system engineering discipline Includes contributions from authors who are recognized leaders in the field Contains real-life design examples, both good and bad, from various industries Presents realistic illustrations of good maintainability design principles Provides discussion of the interrelationships between maintainability with other related disciplines Explores trending topics in technologies Written for design and logistics engineers and managers, Design for Maintainability is a comprehensive resource containing the most reliable and innovative techniques for improving maintainability when designing a system or product.

Product Reliability, Maintainability, and Supportability Handbook, Second Edition - Michael Pecht 2009-04-16

To ensure product reliability, an organization must follow specific practices during the product development process that impact reliability. The second edition of the bestselling Product Reliability, Maintainability, and Supportability Handbook helps professionals identify the shortcomings in the reliability practices of their organizations and empowers them to take actions to overcome them. The book begins by discussing product effectiveness and its related functions, presents the mathematical theory for reliability, and introduces statistical inference concepts as ways to analyze probabilistic models from observational data. Later chapters introduce basic types of probability distributions; present the concepts of confidence interval; focus on reliability assessment; and examine software reliability, quality, and safety. Use FMMEA to identify failure mechanisms Reflecting the latest developments in the field, the book introduces a new methodology known as failure modes, mechanisms, and effects analysis (FMMEA) to identify potential failure mechanisms. Shifting to a practical stance, the book delineates steps that must be taken to develop a product that meets reliability objectives. It describes how to combine reliability information from parts and subsystems to compute system level reliability, presents methods for evaluating reliability in fault-tolerant conditions, and describes methods for modeling and analyzing failures of repairable products. The text discusses reliability growth, accelerated testing, and management of a continuous improvement program; analyzes the influence of reliability on logistics support requirements; shows how to assess overall product effectiveness; and introduces the concepts of process capability and statistical process control techniques. New Topics in the Second Edition Include: Failure Modes, Mechanisms, and Effects Analysis Confidence Interval on Reliability Metrics and their Relationships with Measures of Product Quality Process Control and Process Capability and their Relationship with Product Reliability System Reliability, including Redundancy

Predictive Analytics - Vijay Kumar 2021-01-13

Predictive analytics refers to making predictions about the future based on different parameters which are historical data, machine learning, and artificial intelligence. This book provides the most recent advances in the field along with case studies and real-world examples. It discusses predictive modeling and analytics in reliability engineering and introduces current achievements and applications of artificial intelligence, data mining, and other techniques in supply chain management. It covers applications to reliability engineering practice, presents numerous examples to illustrate the theoretical results, and considers and analyses case studies and real-world examples. The book is written for researchers and practitioners in the field of system reliability, quality, supply chain management, and logistics management. Students taking courses in these areas will also find this book of interest.

Reliability, Availability, Maintainability and Safety Assessment, Methods and Techniques - Alain Villemeur 1992-04-08

Presents methods and techniques for assessing the reliability, availability, maintainability or safety of industrial systems. Describes the

history of dependability concepts and methods and also defines the main concepts and principles of predictive analysis used. The second section is a detailed description of principles and methods. The third deals with the specific methods used in the fields of human factors, mechanics, software and safety assessment. The last section lists the main computer programs developed to assess dependability and common cause failures. **Reliability, Availability, Maintainability and Safety Assessment, 2 Volume Set** - Alain Villemeur 1992-02-18

Sampling Procedures and Tables for Life and Reliability Testing (based on Exponential Distribution) - United States. Dept. of Defense 1960

Reliability, Quality, and Safety for Engineers - B.S. Dhillon 2004-11-15
Due to global competition, safety regulations, and other factors, manufacturers are increasingly pressed to create products that are safe, highly reliable, and of high quality. Engineers and quality assurance professionals need a cross-disciplinary understanding of these topics in order to ensure high standards in the design and manufacturing process. **Reliability and Maintainability Guideline for Manufacturing Machinery and Equipment** - 1999-01-01

Second Edition. Co-published by SAE and the National Center for Manufacturing Sciences, Inc. This guideline is intended to provide a description of reliability and maintainability (R&M) fundamentals for manufacturing machinery and equipment users and supplier personnel at all operating levels. It embraces the concept of upfront engineering and continuous improvement in the design process for machinery and equipment. The revision includes information to help implement and clarify the activities necessary to build and employ more reliable machinery and equipment. The guideline consolidates R&M terminology, methodology and procurement language, generally accepted by suppliers and users of equipment employed for the manufacture of discrete components. This will help integrate R&M concepts when equipment is designed, and contribute to the reduction of maintenance, warranty and life cycle costs, while increasing equipment availability. Contents include: Section I: Introduction to R&M and its Implementation
Introduction to Reliability and Maintainability Implementing R&M Through the Life Cycle Process. Section II: R&M and the Life Cycle Process Use and Supplier R&M Activities in the Concept and Proposal Phase User and Supplier R&M Activities in the Design and Development Phase R&M Activities During the Build and Install Phase R&M Activities During the Operation and Support Phase R&M Activities During the Conversion or Decommission Phase. Section III: Life Cycle Phases and Life Cycle Costs Tailored R&M Program Matrices Sample R&M Tools and Techniques Data tracking and Feedback System Failure Mode and Effects Analysis R&M Training Glossary.

Advances in RAMS Engineering - Durga Rao Karanki 2019-12-10
This book surveys reliability, availability, maintainability and safety (RAMS) analyses of various engineering systems. It highlights their role throughout the lifecycle of engineering systems and explains how RAMS activities contribute to their efficient and economic design and operation. The book discusses a variety of examples and applications of RAMS analysis, including: • software products; • electrical and electronic engineering systems; • mechanical engineering systems; • nuclear power plants; • chemical and process plants and • railway systems. The wide-ranging nature of the applications discussed highlights the multidisciplinary nature of complex engineering systems. The book provides a quick reference to the latest advances and terminology in various engineering fields, assisting students and researchers in the areas of reliability, availability, maintainability, and safety engineering.

Handbook of Reliability, Availability, Maintainability and Safety in Engineering Design - Rudolph Frederick Stapelberg 2016-10-22

This handbook studies the combination of various methods of designing for reliability, availability, maintainability and safety, as well as the latest techniques in probability and possibility modeling, mathematical algorithmic modeling, evolutionary algorithmic modeling, symbolic logic modeling, artificial intelligence modeling and object-oriented computer modeling.

The Handbook of Reliability, Maintenance, and System Safety through Mathematical Modeling - Amit Kumar 2021-01-09

The Handbook of Reliability, Maintenance, and System Safety through Mathematical Modeling discusses the many factors affect reliability and performance, including engineering design, materials, manufacturing, operations, maintenance, and many more. Reliability is one of the fundamental criteria in engineering systems design, with maintenance serving as a way to support reliability throughout a system's life.

Addressing these issues requires information, modeling, analysis and testing. Different techniques are proposed and implemented to help readers analyze various behavior measures (in terms of the functioning and performance) of systems. Enables mathematicians to convert any process or system into a model that can be analyzed through a specific technique Examines reliability and mathematical modeling in a variety of disciplines, unlike competitors which typically examine only one Includes a table of contents with simple to complex examples, starting with basic models and then refining modeling approaches step-by-step Reliability, Availability, and Maintainability - Joseph W. Foster 1981

Handbook of Reliability, Availability, Maintainability and Safety in Engineering Design - Rudolph Frederick Stapelberg 2009-02-17

This handbook studies the combination of various methods of designing for reliability, availability, maintainability and safety, as well as the latest techniques in probability and possibility modeling, mathematical algorithmic modeling, evolutionary algorithmic modeling, symbolic logic modeling, artificial intelligence modeling and object-oriented computer modeling.

Designing Data-Intensive Applications - Martin Kleppmann 2017-03-16

Data is at the center of many challenges in system design today. Difficult issues need to be figured out, such as scalability, consistency, reliability, efficiency, and maintainability. In addition, we have an overwhelming variety of tools, including relational databases, NoSQL datastores, stream or batch processors, and message brokers. What are the right choices for your application? How do you make sense of all these buzzwords? In this practical and comprehensive guide, author Martin Kleppmann helps you navigate this diverse landscape by examining the pros and cons of various technologies for processing and storing data. Software keeps changing, but the fundamental principles remain the same. With this book, software engineers and architects will learn how to apply those ideas in practice, and how to make full use of data in modern applications. Peer under the hood of the systems you already use, and learn how to use and operate them more effectively Make informed decisions by identifying the strengths and weaknesses of different tools Navigate the trade-offs around consistency, scalability, fault tolerance, and complexity Understand the distributed systems research upon which modern databases are built Peek behind the scenes of major online services, and learn from their architectures

Developments in Maritime Transport and Logistics in Turkey - Mahmut Celal Barla 2017-07-05

Turkey is one of the largest and most important shipping and logistics centres in the world. This edited collection brings together industrialists actively involved in the shipping trade with an interdisciplinary team of academics from the region to provide a unique, broad perspective on the industry as a whole. Using Turkey as an in-depth case study, the volume examines issues such as port economics and policy, training and education, ship finance, containerisation and maritime policy in general. This is a useful reference for professionals and academics in both shipping and logistics.

Gas and Oil Reliability Engineering - Eduardo Calixto 2016-06-22

Gas and Oil Reliability Engineering: Modeling and Analysis, Second Edition, provides the latest tactics and processes that can be used in oil and gas markets to improve reliability knowledge and reduce costs to stay competitive, especially while oil prices are low. Updated with relevant analysis and case studies covering equipment for both onshore and offshore operations, this reference provides the engineer and manager with more information on lifetime data analysis (LDA), safety integrity levels (SILs), and asset management. New chapters on safety, more coverage on the latest software, and techniques such as ReBi (Reliability-Based Inspection), ReGBI (Reliability Growth-Based Inspection), RCM (Reliability Centered Maintenance), and LDA (Lifetime Data Analysis), and asset integrity management, make the book a critical resource that will arm engineers and managers with the basic reliability principles and standard concepts that are necessary to explain their use for reliability assurance for the oil and gas industry. Provides the latest tactics and processes that can be used in oil and gas markets to improve reliability knowledge and reduce costs Presents practical knowledge with over 20 new internationally-based case studies covering BOPs, offshore platforms, pipelines, valves, and subsea equipment from various locations, such as Australia, the Middle East, and Asia Contains expanded explanations of reliability skills with a new chapter on asset integrity management, relevant software, and techniques training, such as THERP, ASEP, RBI, FMEA, and RAMS

Systems Engineering in the Fourth Industrial Revolution - Ron S. Kenett 2019-12-10

An up-to-date guide for using massive amounts of data and novel technologies to design, build, and maintain better systems engineering. *Systems Engineering in the Fourth Industrial Revolution: Big Data, Novel Technologies, and Modern Systems Engineering* offers a guide to the recent changes in systems engineering prompted by the current challenging and innovative industrial environment called the Fourth Industrial Revolution—INDUSTRY 4.0. This book contains advanced models, innovative practices, and state-of-the-art research findings on systems engineering. The contributors, an international panel of experts on the topic, explore the key elements in systems engineering that have shifted towards data collection and analytics, available and used in the design and development of systems and also in the later life-cycle stages of use and retirement. The contributors address the issues in a system in which the system involves data in its operation, contrasting with earlier approaches in which data, models, and algorithms were less involved in the function of the system. The book covers a wide range of topics including five systems engineering domains: systems engineering and systems thinking; systems software and process engineering; the digital factory; reliability and maintainability modeling and analytics; and organizational aspects of systems engineering. This important resource: Presents new and advanced approaches, methodologies, and tools for designing, testing, deploying, and maintaining advanced complex systems Explores effective evidence-based risk management practices

Describes an integrated approach to safety, reliability, and cyber security based on system theory Discusses entrepreneurship as a multidisciplinary system Emphasizes technical merits of systems engineering concepts by providing technical models Written for systems engineers, *Systems Engineering in the Fourth Industrial Revolution* offers an up-to-date resource that contains the best practices and most recent research on the topic of systems engineering.

An Introduction to Reliability and Maintainability Engineering - Charles E. Ebeling 2019-04-12

Many books on reliability focus on either modeling or statistical analysis and require an extensive background in probability and statistics. Continuing its tradition of excellence as an introductory text for those with limited formal education in the subject, this classroom-tested book introduces the necessary concepts in probability and statistics within the context of their application to reliability. The Third Edition adds brief discussions of the Anderson-Darling test, the Cox proportionate hazards model, the Accelerated Failure Time model, and Monte Carlo simulation. Over 80 new end-of-chapter exercises have been added, as well as solutions to all odd-numbered exercises. Moreover, Excel workbooks, available for download, save students from performing numerous tedious calculations and allow them to focus on reliability concepts. Ebeling has created an exceptional text that enables readers to learn how to analyze failure, repair data, and derive appropriate models for reliability and maintainability as well as apply those models to all levels of design. *Test and Evaluation of System Reliability, Availability, Maintainability* - John C. Conlon 1982