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H2U6DU - NICHOLSON CARNEY

This book presents a unique collection of contributions from some of the foremost scholars in the field of risk and reliability analysis. Combining the most advanced analysis techniques with practical applications, it is one of the most comprehensive and up-to-date books available on risk-based engineering. All the fundamental concepts needed to conduct risk and reliability assessments are covered in detail,

providing readers with a sound understanding of the field and making the book a powerful tool for students and researchers alike. This book was prepared in honor of Professor Armen Der Kiureghian, one of the fathers of modern risk and reliability analysis.

Fault diagnosis is useful for technicians to detect, isolate, identify faults, and troubleshoot. Bayesian network (BN) is a probabilistic graphical model that effectively

deals with various uncertainty problems. This model is increasingly utilized in fault diagnosis. This unique compendium presents bibliographical review on the use of BNs in fault diagnosis in the last decades with focus on engineering systems. Subsequently, eleven important issues in BN-based fault diagnosis methodology, such as BN structure modeling, BN parameter modeling, BN inference, fault identification, validation, and verification are dis-

cussed in various cases. Researchers, professionals, academics and graduate students will better understand the theory and application, and benefit those who are keen to develop real BN-based fault diagnosis system.

Presented in easy-to-use, step-by-step order, Pipeline Rules of Thumb Handbook is a quick reference for day-to-day pipeline operations. For more than 35 years, the Pipeline Rules of Thumb Handbook has served as the "go-to" reference for solving even the most day-to-day vexing pipeline workflow problems. Now in its eighth edition, this handbook continues to set the standard by which all other piping books are judged. Along with over 30% new or updated material regarding codes, construction processes, and equipment, this book continues to offer hundreds of "how-to" methods and handy formulas for pipeline construction, design, and engineering and features a multitude of calculations to assist in problem solving, directly applying the rules and equations for specific design and operating conditions to illustrate correct application, all in one convenient reference. For the first time in this new edition, we are taking the content and data off the

page and adding a new dimension of practical value for you with online interactive features to accompany some of the handiest and most useful material from the book: Interactive tables that takes data from the book and turns them into a sortable spreadsheet format that gives you the ability to perform your own basic filtering functions, show/hide columns of just the data that is important to you, and download the table into an Excel spreadsheet for additional use A graph digitizer which pulls a graph from the book and gives you the power to plot your own lines on the existing graph, see all the relative x/y coordinates of the graph, and name and color code your lines for clarity A converter calculator performing basic conversions from the book such as metric conversions, time, temperature, length, power and more Please feel free to visit the site: <http://booksite.elsevier.com/9780123876935/index.php>, and we hope you will find our features as another useful and efficient tool for you in your day-to-day activity. Identify the very latest pipeline management tools and technologies required to extend the life of mature assets Understand the obstacles and solutions associat-

ed with pipeline operations in challenging conditions Analyze the key issues relating to flow assurance methodologies and how they can impact pipeline integrity Evaluate effective ways to manage cost and project down-time

This book examines the theoretical and practical aspects of tribological process using synergy, fractal and multifractal methods, and the fractal and multifractal models of self-similar tribosystems developed on their basis. It provides a comprehensive analysis of their effectiveness, and also considers the method of flicker noise spectroscopy with detailed parameterization of surface roughness friction. All models, problems and solutions are taken and tested on the set of real-life examples of oil-gas industry. The book is intended for researchers, graduate students and engineers specialising in the field of tribology, and also for senior students of technical colleges.

This 2-volume work represents the proceedings of the First European Workshop on Fault Diagnostics, Reliability and Related Knowledge-Based Approaches held in the Island of Rhodes, Greece (August 31-

September 3, 1986). This Workshop was organized in the framework of a joint research project sponsored by the Commission of the European Communities under the Stimulation Action Programme. The principal aim of the Workshop was to bring together people working on the numeric and symbolic (knowledge-based) treatment of reliability and fault diagnosis problems, in order to promote the interaction and exchange of ideas, experiences and results in this area. The workshop was a real success, with 55 papers presented and 70 participants. A second Workshop of the same nature has been decided to be held in Manchester (UMIST), England, in April 1987. . The two volumes contain sufficient amount of information which reflects very well the state-of-the-art of the field, and shows the current tendency towards knowledge-based (expert systems) and fault-tolerant approaches. Volume 1 contains the contributions on fault diagnostics and reliability issues (numeric treatment), and Volume 2 the contributions on knowledge-based and fault-tolerant techniques. We are grateful to the Commission of the European Communities for having sponsored the Workshop, and to all au

thors for their high quality contributions and presentations.

Springer has here produced a major debut in English-language publications. It's the first book to describe very recent methods for pipe defect assessment such as notch fracture mechanics and critical gross strain. Pipelines remain the least expensive transcontinental mean of transport compared to the rail-bound or terrestrial transport. It has become increasingly paramount to ensure the safe utilization of such plant in order to prevent economical, social and ecological losses. This book adds much to the body of knowledge in this area.

In this collection of essays and articles, key members of Google's Site Reliability Team explain how and why their commitment to the entire lifecycle has enabled the company to successfully build, deploy, monitor, and maintain some of the largest software systems in the world.

This book reports on innovative research and developments in automation. Spanning a wide range of disciplines, including communication engineering, power engineering, control engineering, instrumenta-

tion, signal processing and cybersecurity, it focuses on methods and findings aimed at improving the control and monitoring of industrial and manufacturing processes as well as safety. Based on the International Russian Automation Conference, held on September 5-11, 2021, in Sochi, Russia, the book provides academics and professionals with a timely overview of and extensive information on the state of the art in the field of automation and control systems, and fosters new ideas and collaborations between groups in different countries.

Researchers in the engineering industry and academia are making important advances on reliability-based design and modeling of uncertainty when data is limited. Non deterministic approaches have enabled industries to save billions by reducing design and warranty costs and by improving quality. Considering the lack of comprehensive and defini

Provides an up-to-date review of the latest developments in system reliability maintenance, fault detection and fault-tolerant design techniques. Topics covered include reliability analysis and optimization, mainte-

nance control policies, fault detection techniques, fault-tolerant systems, reliable controllers and robustness, knowledge based approaches and decision support systems. There are further applications papers on process control, robotics, manufacturing systems, communications and power systems. Contains 36 papers.

Engineering Reliability and Risk Assessment explains how to improve the performance of a system using the latest risk and reliability models. Against a backdrop of increasing availability of industrial data, and ever-increasing global commercial competition, the standards for optimal efficiency with minimum hazards keep improving. Topics explained include Effective strategies for the maintenance of the mechanical components of a system, How to schedule necessary interventions throughout the product life cycle, How to understand the structure and cost of complex systems, Planning a schedule to improve the reliability and life of the system, software, system safety and risk informed asset management, and more. Uses case studies from industry practice to explain innovative solutions to real world risk assessment problems Addresses the full interdiscipli-

nary range of topics that influence this complex field Provides brief introductions to important concepts, including risk and reliability analysis and fuzzy reliability Russia Mineral & Mining Sector Investment and Business Guide - Strategic and Practical Information

Here's the ideal tool if you're looking for a flexible, straightforward analysis system for your everyday design and operations decisions. This new third edition includes sections on stations, geographical information systems, "absolute" versus "relative" risks, and the latest regulatory developments. From design to day-to-day operations and maintenance, this unique volume covers every facet of pipeline risk management, arguably the most important, definitely the most hotly debated, aspect of pipelining today. Now expanded and updated, this widely accepted standard reference guides you in managing the risks involved in pipeline operations. You'll also find ways to create a resource allocation model by linking risk with cost and customize the risk assessment technique to your specific requirements. The clear step-by-step instructions and more than 50 ex-

amples make it easy. This edition has been expanded to include offshore pipelines and distribution system pipelines as well as cross-country liquid and gas transmission pipelines. The only comprehensive manual for pipeline risk management Updated material on stations, geographical information systems, "absolute" versus "relative" risks, and the latest regulatory developments Set the standards for global pipeline risk management

The book contains solutions to fundamental problems which arise due to the logic of development of specific branches of science, which are related to pipeline safety, but mainly are subordinate to the needs of pipeline transportation. The book deploys important but not yet solved aspects of reliability and safety assurance of pipeline systems, which are vital aspects not only for the oil and gas industry and, in general, fuel and energy industries, but also to virtually all contemporary industries and technologies. The volume will be useful to specialists and experts in the field of diagnostics/ inspection, monitoring, reliability and safety of critical infrastructures. First and foremost, it will be useful to the decision making persons —operators of differ-

ent types of pipelines, pipeline diagnostics/inspection vendors, and designers of in-line -inspection (ILI) tools, industrial and ecological safety specialists, as well as to researchers and graduate students.

Safety and Reliability of Complex Engineered Systems contains the Proceedings of the 25th European Safety and Reliability Conference, ESREL 2015, held 7-10 September 2015 in Zurich, Switzerland. It includes about 570 papers accepted for presentation at the conference. These contributions focus on theories and methods in the area of risk, safety and

These proceedings contain 270 papers outlining ideas and contributions to the new scientific, technical and political discipline of Greenhouse Gas (GHG) Control. The contributions were presented at the 4th International Conference on Greenhouse Gas Control Technologies (GHGT-4). It was the largest gathering of experts active in this new and fast-developing field. GHGT-4 was different from its predecessors in that it included all greenhouse gases, not only CO₂, and all issues which could contribute to the mitigation of the greenhouse problem - technical, economic and politi-

cal. The main focus was on practical solutions and real demonstrations of mitigation technology being planned and implemented today. It also addressed ways to increase the efficiency of power production and utilisation, and looked at proposals to encourage the development of renewable energy sources. During the Opening Session, 10 keynote addresses were heard from prominent personalities in government, industry and academia. To tackle this very inter-disciplinary problem and to achieve acceptable solutions, it is essential for industry and government to initiate intense dialogue and cooperation. Conferences like this can provide the opportunity for a meeting of minds between engineers and politicians in the face of global challenge. The primary attributes of this global challenge are manifold: the problem is global and international; it is inter-disciplinary, both in substance and approach; it covers technical, political and economic issues and involves government, science, industry and academia; it is complex and non-linear; and it will take the efforts of all parties involved to solve the problem. These proceedings contain ideas for starting demonstration projects and for making bet-

ter use of the power and flexibility of market measures. They also show it is a problem we can influence and that there is a wealth of ideas. The challenge now is to find the right partners to put these ideas into action.

This book gathers the latest advances, innovations, and applications in the field of building design and construction, by focusing on new design solutions for buildings and new technologies creation for construction, as presented by researchers and engineers at the 2nd International Conference Building Innovations (ICBI), held in Poltava - Baku, Ukraine - Azerbaijan, on May 23-24, 2019. It covers highly diverse topics, including structures operation, repairing and thermal modernization in existing buildings and urban planning features, machines and mechanisms for construction, as well as efficient economy and energy conservation issues in construction. The contributions, which were selected by means of a rigorous international peer-review process, highlight numerous exciting ideas that will spur novel research directions and foster multidisciplinary collaborations.

This book provides a detailed introduction

to maintenance policies and the current and future research in these fields, highlighting mathematical formulation and optimization techniques. It comprehensively describes the state of art in maintenance modelling and optimization for single- and multi-unit technical systems, and also investigates the problem of the estimation process of delay-time parameters and how this affects system performance. The book discusses delay-time modelling for multi-unit technical systems in various reliability structures, examining the optimum maintenance policies both analytically and practically, focusing on a delay-time modelling technique that has been employed by researchers in the field of maintenance engineering to model inspection intervals. It organizes the existing work into several fields, based mainly on the classification of single- and multi-unit models and assesses the applicability of the reviewed works and maintenance models. Lastly, it identifies potential future research directions and suggests research agendas. This book is a valuable resource for maintenance engineers, reliability specialists, and researchers, as it demonstrates the latest developments in maintenance, inspection and de-

lay-time-based maintenance modelling issues. It is also of interest to graduate and senior undergraduate students, as it introduces current theory and practice in maintenance modelling issues, especially in the field of delay-time modelling.

This book presents concepts, methods and techniques to examine symptoms of faults and failures of structures, systems and components and to monitor functional performance and structural integrity. The book is organized in five parts. Part A introduces the scope and application of technical diagnostics and gives a comprehensive overview of the physics of failure. Part B presents all relevant methods and techniques for diagnostics and monitoring: from stress, strain, vibration analysis, non-destructive evaluation, thermography and industrial radiology to computed tomography and subsurface microstructural analysis. Part C covers the principles and concepts of technical failure analysis, illustrates case studies, and outlines machinery diagnostics with an emphasis on tribological systems. Part D describes the application of structural health monitoring and performance control to plants and the tech-

nical infrastructure, including buildings, bridges, pipelines, electric power stations, offshore wind structures, and railway systems. And finally, Part E is an excursion on diagnostics in arts and culture. The book integrates knowledge of basic sciences and engineering disciplines with contributions from research institutions, academe, and industry, written by internationally known experts from various parts of the world, including Europe, Canada, India, Japan, and USA.

Pipeline Rules of Thumb Handbook: A Manual of Quick, Accurate Solutions to Everyday Pipeline Engineering Problems, Ninth Edition, the latest release in the series, serves as the "go-to" source for all pipeline engineering answers. Updated with new data, graphs and chapters devoted to economics and the environment, this new edition delivers on new topics, including emissions, decommissioning, cost curves, and more while still maintaining the quick answer standard display of content and data that engineers have utilized throughout their careers. Glossaries are added per chapter for better learning tactics, along with additional storage tank and LNG fundamentals. This book continues to be the

high-quality, classic reference to help pipeline engineers solve their day-to-day problems. Contains new chapters that highlight costs, safety and environmental topics, including discussions on emissions. Helps readers learn terminology, with updated glossaries in every chapter. Includes renovated graphs and data tables throughout.

Following on from the International Conference on Structural Engineering, Mechanics and Computation, held in Cape Town in April 2001, this book contains the Proceedings, in two volumes. There are over 170 papers written by Authors from around 40 countries worldwide. The contributions include 6 Keynote Papers and 12 Special Invited Papers. In line with the aims of the SEMC 2001 International Conference, and as may be seen from the List of Contents, the papers cover a wide range of topics under a variety of themes. There is a healthy balance between papers of a theoretical nature, concerned with various aspects of structural mechanics and computational issues, and those of a more practical nature, addressing issues of design, safety and construction. As the contributions in these Proceedings show, new and more efficient

methods of structural analysis and numerical computation are being explored all the time, while exciting structural materials such as glass have recently come onto the scene. Research interest in the repair and rehabilitation of existing infrastructure continues to grow, particularly in Europe and North America, while the challenges to protect human life and property against the effects of fire, earthquakes and other hazards are being addressed through the development of more appropriate design methods for buildings, bridges and other engineering structures.

This book presents the results of the research project G5055 'Development of novel methods for the prevention of pipeline failures with security implications,' carried out in the framework of the NATO Science for Peace and Security program, and explores the lifecycle assessment of gas infrastructures. Throughout their service lives, pipelines transporting hydrocarbons are exposed to demanding working conditions and aggressive media. In long-term service, material aging increases the risk of damage and failure, which can be accompanied by significant economic losses

and severe environmental consequences. This book presents a selection of complementary contributions written by experts operating in the wider fields of pipeline integrity; taken together, they offer a comprehensive portrait of the latest developments in this technological area.

This book highlights recent findings in industrial, manufacturing and mechanical engineering, and provides an overview of the state of the art in these fields, mainly in Russia and Eastern Europe. A broad range of topics and issues in modern engineering are discussed, including the dynamics of machines and working processes, friction, wear and lubrication in machines, surface transport and technological machines, manufacturing engineering of industrial facilities, materials engineering, metallurgy, control systems and their industrial applications, industrial mechatronics, automation and robotics. The book gathers selected papers presented at the 5th International Conference on Industrial Engineering (I-CIE), held in Sochi, Russia in March 2019. The authors are experts in various fields of engineering, and all papers have been carefully reviewed. Given its scope, the book will be of interest to a wide reader-

ship, including mechanical and production engineers, lecturers in engineering disciplines, and engineering graduates.

This book constitutes the joint refereed proceedings of Calculemus 2014, Digital Mathematics Libraries, DML 2014, Mathematical Knowledge Management, MKM 2014 and Systems and Projects, S&P 2014, held in Coimbra, Portugal, during July 7-11, 2014 as four tracks of CICM 2014, the Conferences on Intelligent Computer Mathematics. The 26 full papers and 9 Systems and Projects descriptions presented together with 5 invited talks were carefully reviewed and selected from a total of 55 submissions. The Calculemus track of CICM examines the integration of symbolic computation and mechanized reasoning. The Digital Mathematics Libraries track - evolved from the DML workshop series - features math-aware technologies, standards, algorithms and processes towards the fulfillment of the dream of a global DML. The Mathematical Knowledge Management track of CICM is concerned with all aspects of managing mathematical knowledge in the informal, semi-formal and formal settings. The Systems and Projects track presents short descriptions of

existing systems or on-going projects in the areas of all the other tracks of the conference.

This book is intended for systems analysts, designers, developers, users, experts, as well as those involved in quality, risk, safety and security management, and, of course, scientists and students. The various sets of original and traditional probabilistic models and interesting results of their applications to the research of different systems are presented. The models are understandable and applicable for solving system engineering problems: to optimize system requirements, compare different processes, rationale technical decisions, carry out tests, adjust technological parameters, and predict and analyze quality and risks. The engineering decisions, scientifically proven by the proposed models and software tools, can provide purposeful, essential improvement of quality and mitigation of risks, and reduce the expense of operating systems. Models, methods, and software tools can also be used in education for system analysis and mathematical modeling on specializations, for example "systems engineering," "operations

research," "enterprise management," "project management," "risk management," "quality of systems," "safety and security," "smart systems," "system of systems," etc.

This book presents the proceedings of the 10th Conference on Theory and Applications of Soft Computing, Computing with Words and Perceptions, ICSCCW 2019, held in Prague, Czech Republic, on August 27-28, 2019. It includes contributions from diverse areas of soft computing and computing with words, such as uncertain computation, decision-making under imperfect information, neuro-fuzzy approaches, deep learning, natural language processing, and others. The topics of the papers include theory and applications of soft computing, information granulation, computing with words, computing with perceptions, image processing with soft computing, probabilistic reasoning, intelligent control, machine learning, fuzzy logic in data analytics and data mining, evolutionary computing, chaotic systems, soft computing in business, economics and finance, fuzzy logic and soft computing in earth sciences, fuzzy logic and soft computing in engineering, fuzzy logic and soft computing in mate-

rial sciences, soft computing in medicine, biomedical engineering, and pharmaceutical sciences. Showcasing new ideas in the field of theories of soft computing and computing with words and their applications in economics, business, industry, education, medicine, earth sciences, and other fields, it promotes the development and implementation of these paradigms in various real-world contexts. This book is a useful guide for academics, practitioners and graduates.

Proceedings of the June, 1998 conference. Seventy contributions discuss Monte Carlo and signal processing methods, random vibrations, safety and reliability, control/optimization and modeling of nonlinearity, earthquake engineering, random processes and fields, damage/fatigue materials, applied prob

This book provides novel approach to the diagnosis of complex technical systems that are widely used in various kinds of transportation, energy, metallurgy, metalworking, fuels, mining, chemical, paper industries, etc. Effective diagnostic systems are necessary for the early detection of errors in mechatronic systems, for the or-

ganization of maintenance and for the assessment of the performed service quality. Unfortunately, the practical use of AI in the diagnosis of mechatronic systems is still quite limited and the inability to build effective mechatronic systems leads to significant economic losses and dangers. The main aim of this book is to contribute to knowledge within the topic of diagnostics of mechatronic systems by the analysis of the elements reliability characteristics, using methods, models and algorithms for diagnostics and by studying examples of model diagnostic systems using AI methods based on neural networks, fuzzy inference systems and genetic algorithms.

The introduction of the microprocessor in computer and system engineering has motivated the development of many new concepts and has simplified the design of many modern industrial systems. During the first decade of their life, microprocessors have shown a tremendous evolution in all possible directions (technology, power, functionality, I/O handling, etc). Of course putting the microprocessors and their environmental devices into properly operating systems is a complex and difficult task requiring high skills for meld-

ing and integrating hardware. and systemic components. software This book was motivated by the editors' feeling that a cohesive reference is needed providing a good coverage of modern industrial applications of microprocessor-based real time control, together with latest advanced methodological issues. Unavoidably a single volume cannot be exhaustive. but the present book contains a sufficient number of important real-time applications. The book is divided in two sections. Section I deals with general hardware, software and systemic topics. and involves six chapters. Chapter 1. by Gupta and Toong. presents an overview of the development of microprocessors during their first twelve years of existence. Chapter 2. by Dasgupta. deals with a number of system software concepts for real time microprocessor-based systems (task scheduling, memory management, input-output aspects, programming language requirements. Fault diagnosis has always been a concern for industry. In general, diagnosis in complex systems requires the acquisition of information from sensors and the processing and extracting of required features for the classification or identification of faults.

Therefore, fault diagnosis of sensors is clearly important as faulty information from a sensor may lead to misleading conclusions about the whole system. As engi-

neering systems grow in size and complexity, it becomes more and more important to diagnose faulty behavior before it can

lead to total failure. In the light of above issues, this book is dedicated to trends and applications in modern-sensor fault diagnosis.