



sector, drawing from the latest research and from the experience of device testing. The book has a twofold objective: to provide an overview of wave and tidal energy suitable for newcomers to the field and to serve as a reference text for advanced study and practice. Including detail on key issues such as resource characterisation, wave and tidal technology, power systems, numerical and physical modelling, environmental impact and policy. The book also includes an up-to-date review of developments worldwide and case studies of selected projects. Key features: A comprehensive and self-contained text covering all aspects of the multidisciplinary fields of wave and tidal energy. Draws upon the latest research in wave and tidal energy and the experience of leading practitioners in numerical and laboratory modelling. Regional developments worldwide are reviewed and representative projects are presented as case studies. Wave and Tidal Energy is an invaluable resource to a wide range of readers, from engineering students to technical managers and policymakers to postgraduate students and researchers.

Falcon medicine exists for centuries, but in the past 10-15 years tremendous progress and new development of diseases and treatment methods have been made. It has always been a challenge to treat these beautiful birds of prey and the challenge continues until now. Falcons, falconry and falcon medicine are important in Abu Dhabi and the United Arab Emirates which can be regarded as the cradle of modern falcon medicine in the 21st century. Having treated more than 30,000 falcons over the past years, the author feels that the time has come to share his outstanding experience with the veterinarians' and falconers' community for the sake of these incredible birds of prey -- to enhance their living conditions and to improve medical falcon health care world-wide. This book is based on his experience of a large variety of different cases and is therefore very practical-oriented. It is intended to be a useful handbook for all interested people working with falcons such as veterinarians, veterinary students, falconers and raptor rehabilitation workers. The aim of this book is not to include all research that has ever been done on falcons, but to highlight those issues that are really working out in practice. It includes 17 chapters ranging from history of falcon medicine to different diseases up to first aid and intensive care medicine.

The book supplements Guidelines for Chemical Process Quantitative Risk Analysis by providing the failure rate data needed to perform a chemical process quantitative risk analysis.

The Safety Critical Systems Handbook: A Straightforward Guide to Functional Safety: IEC 61508 (2010 Edition), IEC 61511 (2015 Edition) and Related Guidance, Fifth Edition presents the latest guidance on safety-related systems that guard workers and the public against injury and death, also discussing environmental risks. This comprehensive resource has been fully revised, with additional material on risk assessment, cybersecurity, COMAH and HAZID, published guidance documents/standards, quantified risk assessment and new worked examples. The book provides a comprehensive guide to the revised IEC 61508 standard as well as the 2016 IEC 61511. This book will have a wide readership, not only in the chemical and process industries, but in oil and gas, power generation, avionics, automotive, manufacturing and other sectors. It is aimed at most engineers, including those in project, control and instrumentation, design and maintenance disciplines. Provides the only comprehensive guide to IEC 61508 and 61511 (updated for 2016) that ensures engineers are compliant with the latest process safety systems design and operation standards Presents a real-world approach that helps users interpret the standard, with new case studies and best practice design examples using revised standards Covers applications of the standard to device design

Presents the theory and methodology for reliability assessments of safety-critical functions through examples from a wide range of applications Reliability of Safety-Critical Systems: Theory and Applications provides a comprehensive introduction to reliability assessments of safety-related systems based on electrical, electronic, and programmable electronic (E/E/PE) technology. With a focus on the design and development phases of safety-critical systems, the book presents theory and methods required to document compliance with IEC 61508 and the associated sector-specific standards. Combining theory and practical applications, Reliability of Safety-Critical Systems: Theory and Applications implements key safety-related strategies and methods to meet quantitative safety integrity requirements. In addition, the book details a variety of reliability analysis methods that are needed during all stages of a safety-critical system, beginning with specification and design and advancing to operations, maintenance, and modification control. The key categories of safety life-cycle phases are featured, including strategies for the allocation of reliability performance requirements; assessment methods in relation to design; and reliability quantification in relation to operation and maintenance. Issues and benefits that arise from complex modern technology developments are featured, as well as: Real-world examples from large industry facilities with major accident potential and products owned by the general public such as cars and tools Plentiful worked examples throughout that provide readers with a deeper understanding of the core concepts and aid in the analysis and solution of common issues when assessing all facets of safety-critical systems Approaches that work on a wide scope of applications and can be applied to the analysis of any safety-critical system A brief appendix of probability theory for reference With an emphasis on how safety-critical functions are introduced into systems and facilities to prevent or mitigate the impact of an accident, this book is an excellent guide for professionals, consultants, and operators of safety-critical systems who carry out practical, risk, and reliability assessments of safety-critical systems. Reliability of Safety-Critical Systems: Theory and Applications is also a useful textbook for courses in reliability assessment of safety-critical systems and reliability engineering at the graduate-level, as well as for consulting companies offering short courses in reliability assessment of safety-critical systems.

Safety Critical Systems Handbook: A Straightforward Guide to Functional Safety, IEC 61508 (2010 Edition) and Related Standards, Including Process IEC 61511 and Machinery IEC 62061 AND ISO 13849, Third Edition, offers a practical guide to the functional safety standard IEC 61508. The book is organized into three parts. Part A discusses the concept of functional safety and the need to express targets by means of safety integrity levels. It places functional safety in context, along with risk assessment, likelihood of fatality, and the cost of conformance. It also explains the life-cycle approach, together with the basic outline of IEC 61508 (known as BS EN 61508 in the UK). Part B discusses

functional safety standards for the process, oil, and gas industries; the machinery sector; and other industries such as rail, automotive, avionics, and medical electrical equipment. Part C presents case studies in the form of exercises and examples. These studies cover SIL targeting for a pressure let-down system, burner control system assessment, SIL targeting, a hypothetical proposal for a rail-train braking system, and hydroelectric dam and tidal gates. The only comprehensive guide to IEC 61508, updated to cover the 2010 amendments, that will ensure engineers are compliant with the latest process safety systems design and operation standards. Helps readers understand the process required to apply safety critical systems standards. Real-world approach helps users to interpret the standard, with case studies and best practice design examples throughout. Dependability and cost effectiveness are primarily seen as instruments for conducting international trade in the free market environment. These factors cannot be considered in isolation of each other. This handbook considers all aspects of performability engineering. The book provides a holistic view of the entire life cycle of activities of the product, along with the associated cost of environmental preservation at each stage, while maximizing the performance.

**Safety and Reliability – Safe Societies in a Changing World** collects the papers presented at the 28th European Safety and Reliability Conference, ESREL 2018 in Trondheim, Norway, June 17-21, 2018. The contributions cover a wide range of methodologies and application areas for safety and reliability that contribute to safe societies in a changing world. These methodologies and applications include: - foundations of risk and reliability assessment and management - mathematical methods in reliability and safety - risk assessment - risk management - system reliability - uncertainty analysis - digitalization and big data - prognostics and system health management - occupational safety - accident and incident modeling - maintenance modeling and applications - simulation for safety and reliability analysis - dynamic risk and barrier management - organizational factors and safety culture - human factors and human reliability - resilience engineering - structural reliability - natural hazards - security - economic analysis in risk management. **Safety and Reliability – Safe Societies in a Changing World** will be invaluable to academics and professionals working in a wide range of industrial and governmental sectors: offshore oil and gas, nuclear engineering, aeronautics and aerospace, marine transport and engineering, railways, road transport, automotive engineering, civil engineering, critical infrastructures, electrical and electronic engineering, energy production and distribution, environmental engineering, information technology and telecommunications, insurance and finance, manufacturing, marine transport, mechanical engineering, security and protection, and policy making.

Completely reorganised and comprehensively rewritten for its second edition, this guide to reliability-centred maintenance develops techniques which are practised by over 250 affiliated organisations worldwide.

A comprehensive introduction to reliability analysis. The first section provides a thorough but elementary prologue to reliability theory. The latter half comprises more advanced analytical tools including Markov processes, renewal theory, life data analysis, accelerated life testing and Bayesian reliability analysis. Features numerous worked examples. Each chapter concludes with a selection of problems plus additional material on applications.

**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 reliability. The objective of the book is to provide all the elements to evaluate the performance of production availability and reliability of a system, to integrate them and to manage them in its life cycle. By the examples provided (case studies) the main target audience is that of the petroleum industries (where I spent most of my professional years). Although the greatest rigor is applied in the presentation, and justification, concepts, methods and data this book is geared towards the user.

**Safety and Reliability – Theory and Applications** contains the contributions presented at the 27th European Safety and Reliability Conference (ESREL 2017, Portorož, Slovenia, June 18-22, 2017). The book covers a wide range of topics, including: • Accident and Incident modelling • Economic Analysis in Risk Management • Foundational Issues in Risk Assessment and Management • Human Factors and Human Reliability • Maintenance Modeling and Applications • Mathematical Methods in Reliability and Safety • Prognostics and System Health Management • Resilience Engineering • Risk Assessment • Risk Management • Simulation for Safety and Reliability Analysis • Structural Reliability • System Reliability, and • Uncertainty Analysis. Selected special sessions include contributions on: the Marie Skłodowska-Curie innovative training network in structural safety; risk approaches in insurance and finance sectors; dynamic reliability and probabilistic safety assessment; Bayesian and statistical methods, reliability data and testing; organizational factors and safety culture; software reliability and safety; probabilistic methods applied to power systems; socio-technical-economic systems; advanced safety assessment methodologies: extended Probabilistic Safety Assessment; reliability; availability; maintainability and safety in railways: theory & practice; big data risk analysis and management, and model-based reliability and safety engineering. **Safety and Reliability – Theory and Applications** will be of interest to professionals and academics working in a wide range of industrial and governmental sectors including: Aeronautics and Aerospace, Automotive Engineering, Civil Engineering, Electrical and Electronic Engineering, Energy Production and Distribution, Environmental Engineering, Information Technology and Telecommunications, Critical Infrastructures, Insurance and Finance, Manufacturing, Marine Industry, Mechanical Engineering, Natural Hazards, Nuclear Engineering, Offshore Oil and Gas, Security and Protection, Transportation, and Policy Making.

Subsea production systems, overview of subsea engineering, subsea field development, subsea distribution system. Flow assurance and system engineering. Subsea structure and equipment. Subsea umbilical, risers and flowlines.

A must-have compendium for the axe-wielding adventurer by one of the industry's leading tastemakers. Buchanan-Smith's *Axe Handbook* is a trusted resource for anyone looking to reconnect with handcraft and the outdoors. Beautifully designed and lavishly illustrated, this handbook will inspire readers to rediscover the great outdoors. Peter Buchanan-Smith founded Best Made Co. in 2009 because he loved making things with his hands and wanted to start a company that would not only celebrate the inherent beauty of timeless, utilitarian tools, but would

also inspire people to get out from behind their screens and experience the natural world. From the basics and fundamentals of handling and owning an axe to the details on how to find the right axe to everything a reader must know about use and maintenance, this stylish, informative axe guide is ideal for anyone interested in the outdoors. .

This book promotes and describes the application of objective and effective decision making in asset management based on mathematical models and practical techniques that can be easily implemented in organizations. This comprehensive and timely publication will be an essential reference source, building on available literature in the field of asset management while laying the groundwork for further research breakthroughs in this field. The text provides the resources necessary for managers, technology developers, scientists and engineers to adopt and implement better decision making based on models and techniques that contribute to recognizing risks and uncertainties and, in general terms, to the important role of asset management to increase competitiveness in organizations.

Microgrids are poised to play a big role in the electricity ecosystem of the future—with decarbonization, digitalization, decentralization, and non-wires solutions being key attributes. This handbook serves as a guide to evaluate the feasibility of microgrid systems in enhancing power supply quality and connectivity. It includes information about on-grid microgrids for urban and industrial applications, prevailing business models, and emerging trends that could shape the future of this sector.

This comprehensive handbook on submarine pipeline systems covers a broad spectrum of topics from planning and site investigations, procurement and design, to installation and commissioning. It considers guidelines for the choice of design parameters, calculation methods and construction procedures. It is based on limit state design with partial safety coefficients.

Amid a plethora of challenges, technological advances in science and engineering are inadvertently affecting an increased spectrum of today's modern life. Yet for all supplied products and services provided, robustness of processes, methods, and techniques is regarded as a major player in promoting safety. This book on systems reliability, which equally includes maintenance-related policies, presents fundamental reliability concepts that are applied in a number of industrial cases. Furthermore, to alleviate potential cost and time-specific bottlenecks, software engineering and systems engineering incorporate approximation models, also referred to as meta-processes, or surrogate models to reproduce a predefined set of problems aimed at enhancing safety, while minimizing detrimental outcomes to society and the environment.

Oil and gas industries apply several techniques for assessing and mitigating the risks that are inherent in its operations. In this context, the application of Bayesian Networks (BNs) to risk assessment offers a different probabilistic version of causal reasoning. Introducing probabilistic nature of hazards, conditional probability and Bayesian thinking, it discusses how cause and effect of process hazards can be modelled using BNs and development of large BNs from basic building blocks. Focus is on development of BNs for typical equipment in industry including accident case studies and its usage along with other conventional risk assessment methods. Aimed at professionals in oil and gas industry, safety engineering, risk assessment, this book Brings together basics of Bayesian theory, Bayesian Networks and applications of the same to process safety hazards and risk assessment in the oil and gas industry Presents sequence of steps for setting up the model, populating the model with data and simulating the model for practical cases in a systematic manner Includes a comprehensive list on sources of failure data and tips on modelling and simulation of large and complex networks Presents modelling and simulation of loss of containment of actual equipment in oil and gas industry such as Separator, Storage tanks, Pipeline, Compressor and risk assessments Discusses case studies to demonstrate the practicability of use of Bayesian Network in routine risk assessments

Instrument Engineers' Handbook – Volume 3: Process Software and Digital Networks, Fourth Edition is the latest addition to an enduring collection that industrial automation (AT) professionals often refer to as the "bible." First published in 1970, the entire handbook is approximately 5,000 pages, designed as standalone volumes that cover the measurement (Volume 1), control (Volume 2), and software (Volume 3) aspects of automation. This fourth edition of the third volume provides an in-depth, state-of-the-art review of control software packages used in plant optimization, control, maintenance, and safety. Each updated volume of this renowned reference requires about ten years to prepare, so revised installments have been issued every decade, taking into account the numerous developments that occur from one publication to the next. Assessing the rapid evolution of automation and optimization in control systems used in all types of industrial plants, this book details the wired/wireless communications and software used. This includes the ever-increasing number of applications for intelligent instruments, enhanced networks, Internet use, virtual private networks, and integration of control systems with the main networks used by management, all of which operate in a linked global environment. Topics covered include: Advances in new displays, which help operators to more quickly assess and respond to plant conditions Software and networks that help monitor, control, and optimize industrial processes, to determine the efficiency, energy consumption, and profitability of operations Strategies to counteract changes in market conditions and energy and raw material costs Techniques to fortify the safety of plant operations and the security of digital communications systems This volume explores why the holistic approach to integrating process and enterprise networks is convenient and efficient, despite associated problems involving cyber and local network security, energy conservation, and other issues. It shows how firewalls must separate the business (IT) and the operation (automation technology, or AT) domains to guarantee the safe function of all industrial plants. This book illustrates how these concerns must be addressed using effective technical solutions and proper management policies and practices. Reinforcing the fact that all industrial control systems are, in general, critically interdependent, this handbook provides a wide range of software application examples from industries including: automotive, mining, renewable energy, steel, dairy, pharmaceutical, mineral processing, oil, gas, electric power, utility, and nuclear power.

