

## Transformer Design By Indrajit Dasgupta

Power Quality Issues: Current Harmonics provides solutions for the mitigation of power quality problems related to harmonics. Focusing on active power filters (APFs) due to their excellent harmonic and reactive power compensation in two-wire (single phase), three-wire (three-phase without neutral), and four-wire (three-phase with neutral) AC power networks with nonlinear loads, the text: Introduces the APF technology, describing various APF configurations and offering guidelines for the selection of APFs for specific application considerations Compares shunt active filter (SHAF) control strategies for extracting three-phase reference currents, evaluating their performance under a number of source voltage conditions using a proportional-integral (PI) controller Presents PI controller-based SHAF instantaneous active and reactive power (p-q) and instantaneous active and reactive current (Id-Iq) control strategies, supplying detailed MATLAB®/Simulink simulation results Proposes SHAF control strategies using type 1 and type 2 fuzzy logic controllers (FLCs) with different fuzzy membership functions (MFs), analyzing their harmonic mitigation and DC link voltage regulation Verifies the proposed type 2 FLC-based SHAF control strategies with trapezoidal, triangular, and Gaussian fuzzy MFs using RT-LAB, a real-time digital simulation software from OPAL-RT Technologies Power Quality Issues: Current Harmonics is a useful resource for those tackling electrical power quality challenges. The compensation techniques described in this book alleviate harmonic issues that can distort voltage waveforms, fry a building's wiring, trigger nuisance tripping, overheat transformer units, and cause random end-user equipment failure.

This Book Presents A Practical-Oriented, Sound, Modularized Coverage Of Fundamental

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Topics Of Basic Electrical Engineering, Network Analysis & Network Theorems, Electromagnetism & Magnetic Circuit, Alternating Current & Voltages, Electrical Measurement & Measuring Instrument And Electric Machines. Salient Features: # Clarification Of Basic Concepts # Several Solved Examples With Detailed Explanation # At The End Of Chapters, There Are Descriptive And Numerical Unsolved Problems # Written In Very Simple Language And Suitable For Self-Study # Step-By-Step Procedures Given For Solving Numerical

In the newest edition, the reader will learn the basics of transformer design, starting from fundamental principles and ending with advanced model simulations. The electrical, mechanical, and thermal considerations that go into the design of a transformer are discussed with useful design formulas, which are used to ensure that the transformer will operate without overheating and survive various stressful events, such as a lightning strike or a short circuit event. This new edition includes a section on how to correct the linear impedance boundary method for non-linear materials and a simpler method to calculate temperatures and flows in windings with directed flow cooling, using graph theory. It also includes a chapter on optimization with practical suggestions on achieving the lowest cost design with constraints. This book is the collective effort of eminent experts from Bharat Heavy Electricals Limited (BHEL), a leading transformer manufacturer in India. An editorial committee perused the complete material, to integrate it into a homogenous book and to ensure complete continuity between the chapters. A list of authors and members of the editorial committee is included in the book.

"Sound earthing & grounding of the electrical installation is the fundamental requirement for safe and reliable operation. There is a lot of misconception among practicing engineers (both

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design and field) on this topic. Study of this application guide will bring clarity to the reader on this topic. Earthing methods for different applications like EHV Switchyard, MV and LV systems and earthing application to special areas like Solar farms, GIS terminations, C&I (Control & Instrumentation) systems in power and industrial plants are covered. Remarks on mis-interpretation of IE rules are made. The reader will understand why different grounding methods are adopted at different voltage levels. Relationship between Grounding and Transformer Ampere Turns Balance theory is clearly brought out which is the cornerstone of grounding exercise. Features of ungrounded and grounded systems are covered in detail including demystification of zig zag connection. Ready to use spread sheets for sizing of NGT/NGR are given. Supported by copious illustrations from field experience, fundamental concepts of grounding are explained by solving problems of gradually increasing complexity. Various practices adopted for Neutral grounding of generator are described. Students will tremendously benefit by studying this guide as it combines theory with lot of practical examples. He/She will acquire the necessary skills upfront needed by industry. The design engineer or consultants will find the guide very useful to perform optimum design. Origin of many nuisance tripping or power quality issues is poor earthing/grounding. The practicing and field engineers will be able to address many of the problems encountered at site due to faulty earthing and grounding

This book gathers selected research papers presented at the Second International Conference on Energy Systems, Drives and Automations (ESDA 2019), held in Kolkata on 28–29 December 2019. It covers a broad range of topics in the fields of renewable energy, power management, drive systems for electrical machines and automation. Also discussing a variety

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of related tools and techniques, the book offers a valuable resource for researchers, professionals and students in electrical and mechanical engineering disciplines.

This book presents high-quality papers from the Fourth International Conference on Microelectronics, Computing & Communication Systems (MCCS 2019). It discusses the latest technological trends and advances in MEMS and nanoelectronics, wireless communication, optical communication, instrumentation, signal processing, image processing, bioengineering, green energy, hybrid vehicles, environmental science, weather forecasting, cloud computing, renewable energy, RFID, CMOS sensors, actuators, transducers, telemetry systems, embedded systems and sensor network applications. It includes papers based on original theoretical, practical and experimental simulations, development, applications, measurements and testing. The applications and solutions discussed here provide excellent reference material for future product development.

Maintaining appropriate power systems and equipment expertise is necessary for a utility to support the reliability, availability, and quality of service goals demanded by energy consumers now and into the future. However, transformer talent is at a premium today, and all aspects of the power industry are suffering a diminishing of the supply of knowledgeable and experienced engineers. Now in print for over 80 years since initial publication in 1925 by Johnson & Phillips Ltd, the J & P Transformer Book continues to withstand the test of time as a key body of reference material for students, teachers, and all whose careers are involved

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in the engineering processes associated with power delivery, and particularly with transformer design, manufacture, testing, procurement, application, operation, maintenance, condition assessment and life extension. Current experience and knowledge have been brought into this thirteenth edition with discussions on moisture equilibrium in the insulation system, vegetable based natural ester insulating fluids, industry concerns with corrosive sulphur in oil, geomagnetic induced current (GIC) impacts, transportation issues, new emphasis on measurement of load related noise, and enhanced treatment of dielectric testing (including Frequency Response Analysis), Dissolved Gas analysis (DGA) techniques and tools, vacuum LTCs, shunt and series reactors, and HVDC converter transformers. These changes in the thirteenth edition together with updates of IEC reference Standards documentation and inclusion for the first time of IEEE reference Standards, provide recognition that the transformer industry and market is truly global in scale. -- From the foreword by Donald J. Fallon Martin Heathcote is a consultant specializing in power transformers, primarily working for utilities. In this context he has established working relationships with transformer manufacturers on several continents. His background with Ferranti and the UK's Central Electricity Generating Board (CEGB) included transformer design and the management and maintenance of

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transformer-based systems. \* The definitive reference for all involved in designing, installing, monitoring and maintaining high-voltage systems using power transformers (electricity generation and distribution sector; large-scale industrial applications) \* The classic reference work on power transformers and their applications: first published in 1925, now brought fully up to date in this thirteenth edition \* A truly practical engineering approach to design, monitoring and maintenance of power transformers – in electricity generation, substations, and industrial applications.

Sound earthing & grounding of the electrical installation is the fundamental requirement for safe and reliable operation. There is a lot of misconception among practicing engineers (both design and field) on this topic. Study of this application guide will bring clarity to the reader on this topic. Earthing methods for different applications like EHV Switchyard, MV and LV systems and earthing application to special areas like Solar farms, GIS terminations, C&I (Control & Instrumentation) systems in power and industrial plants are covered. Remarks on mis-interpretation of IE rules are made. The reader will understand why different grounding methods are adopted at different voltage levels. Relationship between Grounding and Transformer Ampere Turns Balance theory is clearly brought out which is the cornerstone of grounding exercise. Features of ungrounded and

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grounded systems are covered in detail including demystification of zig zag connection. Ready to use spread sheets for sizing of NGT/NGR are given. Supported by copious illustrations from field experience, fundamental concepts of grounding are explained by solving problems of gradually increasing complexity. Various practices adopted for Neutral grounding of generator are described. Students will tremendously benefit by studying this guide as it combines theory with lot of practical examples. He/She will acquire the necessary skills upfront needed by industry. The design engineer or consultants will find the guide very useful to perform optimum design. Origin of many nuisance tripping or power quality issues is poor earthing/grounding. The practicing and field engineers will be able to address many of the problems encountered at site due to faulty earthing and grounding.

Spotlight on Modern Transformer Design introduces a novel approach to transformer design using artificial intelligence (AI) techniques in combination with finite element method (FEM). Today, AI is widely used for modeling nonlinear and large-scale systems, especially when explicit mathematical models are difficult to obtain or completely lacking. Moreover, AI is computationally efficient in solving hard optimization problems. Many numerical examples throughout the book illustrate the application of the techniques discussed to a variety of real-life

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transformer design problems, including: • problems relating to the prediction of no-load losses; • winding material selection; • transformer design optimisation; • and transformer selection. Spotlight on Modern Transformer Design is a valuable learning tool for advanced undergraduate and graduate students, as well as researchers and power engineering professionals working in electric utilities and industries, public authorities, and design offices.

The Handbook of Information Security is a definitive 3-volume handbook that offers coverage of both established and cutting-edge theories and developments on information and computer security. The text contains 180 articles from over 200 leading experts, providing the benchmark resource for information security, network security, information privacy, and information warfare.

Currently, the installed capacity of power generation in India is 104,917 MW and by 2012 another 100,000 MW will be added. With this addition, the requirement of power and distribution transformers will grow enormously, as will the emphasis on quality and performance. The design of a transformer is critical to its quality as are men, machines and materials. This book is a hands-on guide covering design, process control of manufacturing technique, installation, erection, commissioning and maintenance of distribution transformers. It also covers failure analysis and remedial measures for increasing the longevity of transformers. Apart from

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explaining the design aspect of transformers, the book lists the requirements of ISO 9000 in the process of manufacturing technique up to the final stages of product testing, inspection and despatch.

Recent catastrophic blackouts have exposed major vulnerabilities in the existing generation, transmission, and distribution systems of transformers widely used for energy transfer, measurement, protection, and signal coupling. As a result, the reliability of the entire power system is now uncertain, and many blame severe underinvestment, aging technology, and a conservative approach to innovation. Composed of contributions from noted industry experts around the world, *Transformers: Analysis, Design, and Measurement* offers invaluable information to help designers and users overcome these and other challenges associated with the design, construction, application, and analysis of transformers. This book is divided into three sections to address contemporary economic, design, diagnostic, and maintenance aspects associated with power, instrument, and high-frequency transformers. Topics covered include: Design considerations Capability to withstand short circuits Insulation problems Stray losses, screening, and local excessive heating hazard Shell type and superconducting transformers Links between design and maintenance Component-related diagnostics and reliability Economics of life-cycle cost, design

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review, and risk-management methods Parameter measurement and prediction This book is an essential tool for understanding and implementing solutions that will ensure improvements in the development, maintenance, and life-cycle management of optimized transformers. This will lead to enhanced safety and reliability and lower costs for the electrical supply. Illustrating the need for close cooperation between users and manufacturers of transformers, this book outlines ways to achieve many crucial power objectives. Among these, the authors focus on the growing demand for transformer miniaturization, increased transmitted power density, and use of advanced materials to meet the requirements of power materials running under higher operational frequencies. Suggesting ways to redirect resources and exploit new technologies—such as computational modeling software—this book presents relatively inexpensive, simple, ready-to-implement strategies to advance transformers, improve power system integrity, reduce environmental impact, and much more.

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This reference illustrates the interaction and operation of transformer and system

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components and spans more than two decades of technological advancement to provide an updated perspective on the increasing demands and requirements of the modern transformer industry. Guiding engineers through everyday design challenges and difficulties such as stray loss estimation and control, prediction of winding hot spots, and calculation of various stress levels and performance figures, the book propagates the use of advanced computational tools for the optimization and quality enhancement of power system transformers and encompasses every key aspect of transformer function, design, and engineering.

The majority of natural language processing (NLP) is English language processing, and while there is good language technology support for (standard varieties of) English, support for Albanian, Burmese, or Cebuano—and most other languages—remains limited. Being able to bridge this digital divide is important for scientific and democratic reasons but also represents an enormous growth potential. A key challenge for this to happen is learning to align basic meaning-bearing units of different languages. In this book, the authors survey and discuss recent and historical work on supervised and unsupervised learning of such alignments. Specifically, the book focuses on so-called cross-lingual word embeddings. The survey is intended to be systematic, using consistent notation and putting the available methods on comparable form, making it easy to compare wildly different approaches. In so doing, the authors establish previously unreported relations between these methods and are able to present a fast-

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growing literature in a very compact way. Furthermore, the authors discuss how best to evaluate cross-lingual word embedding methods and survey the resources available for students and researchers interested in this topic.

Since the discovery of the giant magnetoresistance (GMR) effect in magnetic multilayers in 1988, a new branch of physics and technology, called spin-electronics or spintronics, has emerged, where the flow of electrical charge as well as the flow of electron spin, the so-called "spin current", are manipulated and controlled together. Recent progress in the physics of magnetism and the application of spin current has progressed in tandem with the nanofabrication technology of magnets and the engineering of interfaces and thin films. This book is intended to provide an introduction and guide to the new physics and applications of spin current. The emphasis is placed on the interaction between spin and charge currents in magnetic nanostructures. This textbook provides a concise, systematic treatment of essential theories and practical aspects of refrigeration and air-conditioning systems. It is designed for students pursuing courses in mechanical engineering both at diploma and degree level with a view to equipping them with a fundamental background necessary to understand the latest methodologies used for the design of refrigeration and air-conditioning systems. After reviewing the physical principles, the text focuses on the refrigeration cycles commonly used in air-conditioning applications in tropical climates. The subject of psychrometry for analysing the various thermodynamic processes in air conditioning

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is particularly dealt with in considerable detail. The practical design problems require comprehensive use of tables and charts prepared by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). This text incorporates such tables and charts so that the students are exposed to solving real-life design problems with the help of ASHRAE Tables. Finally, the book highlights the features, characteristics and selection criteria of hardware including the control equipment. It also provides the readers with the big picture in respect of the latest developments such as thermal storage air conditioning, desiccant cooling, chilled ceiling cooling, Indoor Air Quality (IAQ) and thermal comfort. Besides the students, the book would be immensely useful to practising engineers as a ready reference.

This book gathers high-quality research papers presented at the Global AI Congress 2019, which was organized by the Institute of Engineering and Management, Kolkata, India, on 12–14 September 2019. Sharing contributions prepared by researchers, practitioners, developers and experts in the areas of artificial intelligence, the book covers the areas of AI for E-commerce and web applications, AI and sensors, augmented reality, big data, brain computing interfaces, computer vision, cognitive radio networks, data mining, deep learning, expert systems, fuzzy sets and systems, image processing, knowledge representation, nature-inspired computing, quantum machine learning, reasoning, robotics and autonomous systems, robotics and the IoT, social network analysis, speech processing, video processing, and virtual reality.

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The basic theory, principle of operation and characteristics of transformers, three-phase induction motors, single-phase induction motors, synchronous machines and dc machines are dealt with in Appendices to provide the background for the design of these machines.

This book features selected papers presented at Third International Conference on Nanoelectronics, Circuits and Communication Systems (NCCS 2017). Covering topics such as MEMS and nanoelectronics, wireless communications, optical communication, instrumentation, signal processing, Internet of Things, image processing, bioengineering, green energy, hybrid vehicles, environmental science, weather forecasting, cloud computing, renewable energy, RFID, CMOS sensors, actuators, transducers, telemetry systems, embedded systems, and sensor network applications in mines, it is a valuable resource for young scholars, researchers, and academics. Transformer Engineering: Design, Technology, and Diagnostics, Second Edition helps you design better transformers, apply advanced numerical field computations more effectively, and tackle operational and maintenance issues. Building on the bestselling Transformer Engineering: Design and Practice, this greatly expanded second edition also emphasizes diagnostic aspects and transformer-system interactions. What's New in This Edition Three new chapters on electromagnetic fields in transformers, transformer-system interactions and

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modeling, and monitoring and diagnostics An extensively revised chapter on recent trends in transformer technology An extensively updated chapter on short-circuit strength, including failure mechanisms and safety factors A step-by-step procedure for designing a transformer Updates throughout, reflecting advances in the field A blend of theory and practice, this comprehensive book examines aspects of transformer engineering, from design to diagnostics. It thoroughly explains electromagnetic fields and the finite element method to help you solve practical problems related to transformers. Coverage includes important design challenges, such as eddy and stray loss evaluation and control, transient response, short-circuit withstand and strength, and insulation design. The authors also give pointers for further research. Students and engineers starting their careers will appreciate the sample design of a typical power transformer. Presenting in-depth explanations, modern computational techniques, and emerging trends, this is a valuable reference for those working in the transformer industry, as well as for students and researchers. It offers guidance in optimizing and enhancing transformer design, manufacturing, and condition monitoring to meet the challenges of a highly competitive market. Sentiment analysis and opinion mining is the field of study that analyzes people's opinions, sentiments, evaluations, attitudes, and emotions from written language.

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It is one of the most active research areas in natural language processing and is also widely studied in data mining, Web mining, and text mining. In fact, this research has spread outside of computer science to the management sciences and social sciences due to its importance to business and society as a whole. The growing importance of sentiment analysis coincides with the growth of social media such as reviews, forum discussions, blogs, micro-blogs, Twitter, and social networks. For the first time in human history, we now have a huge volume of opinionated data recorded in digital form for analysis. Sentiment analysis systems are being applied in almost every business and social domain because opinions are central to almost all human activities and are key influencers of our behaviors. Our beliefs and perceptions of reality, and the choices we make, are largely conditioned on how others see and evaluate the world. For this reason, when we need to make a decision we often seek out the opinions of others. This is true not only for individuals but also for organizations. This book is a comprehensive introductory and survey text. It covers all important topics and the latest developments in the field with over 400 references. It is suitable for students, researchers and practitioners who are interested in social media analysis in general and sentiment analysis in particular. Lecturers can readily use it in class for courses on natural language processing, social media analysis, text

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mining, and data mining. Lecture slides are also available online. Table of Contents: Preface / Sentiment Analysis: A Fascinating Problem / The Problem of Sentiment Analysis / Document Sentiment Classification / Sentence Subjectivity and Sentiment Classification / Aspect-Based Sentiment Analysis / Sentiment Lexicon Generation / Opinion Summarization / Analysis of Comparative Opinions / Opinion Search and Retrieval / Opinion Spam Detection / Quality of Reviews / Concluding Remarks / Bibliography / Author Biography

The international conference will provide an opportunity to the practicing engineers, academicians, researchers, and students to meet in a forum to discuss various issues in Power Electronics, Intelligent Control and Energy Systems. In view of the changing scenario, the conference aims to put together the experts from these areas to disseminate their knowledge and experience for working towards soft computing techniques, electronics and energy sustainability in the years to come. The conference will spark innovative ideas, foster research relations or partnerships between the various institutions and build strong research and development community.

This book presents practical development experiences in different areas of data analysis and pattern recognition, focusing on soft computing technologies, clustering and classification algorithms, rough set and fuzzy set theory,

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evolutionary computations, neural science and neural network systems, image processing, combinatorial pattern matching, social network analysis, audio and video data analysis, data mining in dynamic environments, bioinformatics, hybrid computing, big data analytics and deep learning. It also provides innovative solutions to the challenges in these areas and discusses recent developments. This book is based on the author's 50+ years experience in the power and distribution transformer industry. The first few chapters of the book provide a step-by-step procedures of transformer design. Engineers without prior knowledge or exposure to design can follow the procedures and calculation methods to acquire reasonable proficiency necessary to designing a transformer. Although the transformer is a mature product, engineers working in the industry need to understand its fundamentals and design to enable them to offer products to meet the challenging demands of the power system and the customer. This book can function as a useful guide for practicing engineers to undertake new designs, cost optimization, design automation etc., without the need for external help or consultancy. The book extensively covers the design processes with necessary data and calculations from a wide variety of transformers, including dry-type cast resin transformers, amorphous core transformers, earthing transformers, rectifier transformers, auto transformers, transformers for explosive atmospheres, and

solid-state transformers. The other subjects covered include, carbon footprint calculation of transformers, condition monitoring of transformers and design optimization techniques. In addition to being useful for the transformer industry, this book can serve as a reference for power utility engineers, consultants, research scholars, and teaching faculty at universities.

Complete with equations, illustrations, and tables, this book covers the basic theory of electric power transformers, its application to transformer designs, and their application in utility and industrial power systems. The author presents the principles of the two-winding transformer and its connection to polyphase systems, the origins of transformer losses, autotransformers, and three-winding transformers and compares different types of transformer coil and coil construction. He describes the effects of short circuits on transformers, the design and maintenance of ancillary equipment, and preventative and predictive maintenance practices for extending transformer life.

A field-changing history explains how the subcontinent lost its political identity as the home of all religions and emerged as India, the land of the Hindus. Did South Asia have a shared regional identity prior to the arrival of Europeans in the late fifteenth century? This is a subject of heated debate in scholarly circles and contemporary political discourse. Manan Ahmed Asif argues that Pakistan,

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Bangladesh, and the Republic of India share a common political ancestry: they are all part of a region whose people understand themselves as Hindustani. Asif describes the idea of Hindustan, as reflected in the work of native historians from roughly 1000 CE to 1900 CE, and how that idea went missing. This makes for a radical interpretation of how India came to its contemporary political identity. Asif argues that a European understanding of India as Hindu has replaced an earlier, native understanding of India as Hindustan, a home for all faiths. Turning to the subcontinent's medieval past, Asif uncovers a rich network of historians of Hindustan who imagined, studied, and shaped their kings, cities, and societies. Asif closely examines the most complete idea of Hindustan, elaborated by the early seventeenth century Deccan historian Firishta. His monumental work, *Tarikh-i Firishta*, became a major source for European philosophers and historians, such as Voltaire, Kant, Hegel, and Gibbon during the eighteenth and nineteenth centuries. Yet Firishta's notions of Hindustan were lost and replaced by a different idea of India that we inhabit today. *The Loss of Hindustan* reveals the intellectual pathways that dispensed with multicultural Hindustan and created a religiously partitioned world of today.

Design of Transformers Tata McGraw-Hill Education

A moral dilemma gripped Professor Gupta when he was invited by the

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Bangladeshi government to help restructure their agricultural sector in 1985. He noticed how the marginalized farmers were being paid poorly for their otherwise unmatched knowledge. The gross injustice of this constant imbalance led Professor Gupta to found what would turn into a resounding social and ethical movement—the Honey Bee Network—bringing together and elevating thousands of grassroots innovators. For over two decades, Professor Gupta has travelled through rural lands unearthing innovations by the ranks—from the famed Mitti Cool refrigerator to the footbridge of Meghalaya. He insists that to fight the largest and most persistent problems of the world we must eschew expensive research labs and instead, look towards ordinary folk. Innovation—that oft-flung around word—is stripped to its core in this book. Poignant and personal, *Grassroots Innovation* is an important treatise from a social crusader of our time. This Scientific and Technical Report (STR) presents the findings of the IWA Task Group on River Water Quality Modelling (RWQM). The task group was formed to create a scientific and technical base from which to formulate standardized, consistent river water quality models and guidelines for their implementation. This STR presents the first outcome in this effort: River Water Quality Model No. 1 (RWQM1). As background to the development of River Water Quality Model No.1, the Task Group completed a critical evaluation of the current state of the

practice in water quality modelling. A major limitation in model formulation is the continued reliance on BOD as the primary state variable, despite the fact BOD does not include all biodegradable matter. A related difficulty is the poor representation of benthic flux terms. As a result of these limitations, it is impossible to close mass balances completely in most existing models. These various limitations in current river water quality models impair their predictive ability in situations of marked changes in a river's pollutant load, streamflow, morphometry, or other basic characteristics. RWQM 1 is intended to serve as a framework for river water quality models that overcome these deficiencies in traditional water quality models and most particularly the failure to close mass balances between the water column and sediment. To these ends, the model incorporates fundamental water quality components and processes to characterise carbon, oxygen, nitrogen, and phosphorus (C, O, N, and P) cycling instead of biochemical oxygen demand as used in traditional models. The model is presented in terms of process and components represented via a 'Petersen stoichiometry matrix', the same approach used for the IWA Activated Sludge Models. The full RWQM1 includes 24 components and 30 processes. The report provides detailed examples on reducing the numbers of components and processes to fit specific water quality problems. Thus, the model provides a

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framework for both complicated and simplified models. Detailed explanations of the model components, process equations, stoichiometric parameters, and kinetic parameters are provided, as are example parameter values and two case studies. The STR is intended to launch a participatory process of model development, application, and refinement. RWQM1 provides a framework for this process, but the goal of the Task Group is to involve water quality professionals worldwide in the continued work developing a new water quality modelling approach. This text will be an invaluable reference for researchers and graduate students specializing in water resources, hydrology, water quality, or environmental modelling in departments of environmental engineering, natural resources, civil engineering, chemical engineering, environmental sciences, and ecology. Water resources engineers, water quality engineers and technical specialists in environmental consultancy, government agencies or regulated industries will also value this critical assessment of the state of practice in water quality modelling. Key Features presents a unique new technical approach to river water quality modelling provides a detailed technical presentation of the RWQM1 water quality process model gives an informative critical evaluation of the state of the practice in water quality modelling, and problems with those practices provides a step by step procedure to develop a water quality model

### Scientific & Technical Report No. 12

Exchange of information and innovative ideas are necessary to accelerate the development of technology. With advent of technology, intelligent and soft computing techniques came into existence with a wide scope of implementation in engineering sciences. Keeping this ideology in preference, this book includes the insights that reflect the 'Advances in Computer and Computational Sciences' from upcoming researchers and leading academicians across the globe. It contains high-quality peer-reviewed papers of 'International Conference on Computer, Communication and Computational Sciences (ICCCCS 2016), held during 12-13 August, 2016 in Ajmer, India'. These papers are arranged in the form of chapters. The content of the book is divided into two volumes that cover variety of topics such as intelligent hardware and software design, advanced communications, power and energy optimization, intelligent techniques used in internet of things, intelligent image processing, advanced software engineering, evolutionary and soft computing, security and many more. This book helps the perspective readers' from computer industry and academia to derive the advances of next generation computer and communication technology and shape them into real life applications.

The goal of SmartTechCon 2017 is to provide an outstanding forum for

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researchers, practitioners, policy makers, and users to exchange ideas, techniques and tools, raise awareness, and share experience related to all practical and theoretical aspects of Smart Technologies SmartTechCon 2017 will feature a comprehensive technical program including several special sessions symposiums and a number of short courses

The Doing Business series provides research, data, and analysis on regulation in 181 economies across 10 areas of the business life cycle. Doing Business 2009 identifies top reformers in business regulation and highlights best practices and global reform trends. This year's report builds upon the five previous editions, adding new economies and updating all indicators. This year's report covers 3 additional economies, bringing the total number of economies covered to 181. Now included are the Bahamas, Bahrain, and Qatar. The report also adds a preface on Doing Business methodology, as well as in-depth analysis throughout the report on the main trends and findings of the past six years of Doing Business. Doing Business is an invaluable resource for entrepreneurs, investors, advisors, academics, professionals, and policymakers. The indicators benchmark regulation across 10 areas of a typical business lifecycle, and are used to analyze economic and social outcomes that matter such as equal opportunity, unemployment, poverty, and growth. This annually-published report gives

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policymakers the ability to measure regulatory performance in comparison to other economies, and learn from best practices.

Due to a huge concentration of electromagnetic fields and eddy currents, large power equipment and systems are prone to crushing forces, overheating, and overloading. Luckily, power failures due to disturbances like these can be predicted and/or prevented. Based on the success of internationally acclaimed computer programs, such as the authors' own RNM-3D, *Engineering Electrodynamics: Electric Machine, Transformer, and Power Equipment Design* explains how to implement industry-proven modeling and design techniques to solve complex electromagnetic phenomena. Considering recent progress in magnetic and superconducting materials as well as modern methods of mechatronics and computer science, this theory- and application-driven book: Analyzes materials structure and 3D fields, taking into account magnetic and thermal nonlinearities Supplies necessary physical insight for the creation of electromagnetic and electromechanical high power equipment models Describes parameters for electromagnetic calculation of the structural parts of transformers, electric machines, apparatuses, and other electrical equipment Covers power frequency 50-60 Hz (worldwide and US) equipment applications Includes examples, case studies, and homework problems *Engineering Electrodynamics:*

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Electric Machine, Transformer, and Power Equipment Design provides engineers, students, and academia with a thorough understanding of the physics, principles, modeling, and design of contemporary industrial devices.

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