Power System Probabilistic And Security Analysis On

Proceedings of the Tenth Power Systems Computation Conference
Probabilistic Power System Expansion Planning with Renewable Energy Resources and Energy Storage Systems
The book offers a snapshot of the theories and applications of soft computing in the area of complex systems modeling and control. It presents the most important findings discussed during the 5th International Conference on Modelling, Identification and Control, held in Cairo, from August 31-September 2, 2013. The book consists of twenty-nine selected contributions, which have been thoroughly reviewed and extended before their inclusion in the volume. The different chapters, written by active researchers in the field, report on both current theories and important applications of soft-computing. Besides providing the readers with soft-computing fundamentals, and soft-computing based inductive methodologies/algorithms, the book also discusses key industrial soft-computing applications, as well as multidisciplinary solutions developed for a variety of purposes, like windup control, waste management, security issues, biomedical applications and many others. It is a perfect reference guide for graduate students, researchers and practitioners in the area of soft computing, systems modeling and control.
This book constitutes revised selected papers from the 9th International Conference on Critical Information Infrastructures Security, CRITIS 2014, held in Limassol, Cyprus, in October 2014. The 20 full and 19 short papers presented in this volume were carefully reviewed and selected from 74 submissions. They are organized in topical sections named: cyber-physical systems and sensor networks; security of water systems; power and energy system security; security and recovery policies, cyber security; and security tools and protocols.
Critical Information Infrastructures Security
Energy Abstracts for Policy Analysis
Probabilistic Power System Expansion Planning with Renewable Energy Resources and Energy Storage Systems
Proceedings of the First International Symposium, Toronto, Canada, 11–13 July 1986
Probabilistic Dynamic Security Assessment for Power System Control
Over the past 30 years, numerous concerns have been raised in the literature regarding the capability of static modeling approaches such as the event-tree (ET)/fault-tree (FT) methodology to adequately account for the impact of process/hardware/software/firmware/human interactions on nuclear power plant safety assessment, and methodologies to augment the ET/FT approach have been proposed. Often referred to as dynamic probabilistic risk/safety assessment (DPRA/DPSA) methodologies, which use a time-dependent phenomenological model of system evolution along with a model of its stochastic behavior to model for possible dependencies among failure events. The book contains a collection of papers that describe at existing plant level applicable DPRA/DPSA tools, as well as techniques that can be used to augment the ET/FT approach when needed. Contents: Shutdown Probabilistic Safety Assessment (Marko Čepin) Dynamic Probabilistic Risk Assessment Model Validation and Application -- Experience with ADS-IDAC, Version 2.0 (Kevin Coyne and Ali Mosleh) MCDET: A Tool for Integrated Deterministic Probabilistic Safety Analyses (Martina Kloos, Nadine Berner, Joerg Peschke and Josef Scheuer) Why Sequence Dynamics Matters in PSA: Checking Consistency of Probabilistic and Deterministic Analyses (J M Izquierdo, J Hortal, M Sánchez and E Meléndez) Level 2 Probabilistic Risk Assessment Using Dynamic Event Tree Analysis (Douglas M Osborn, Tunc Aldemir, Richard S Denning and Diego Mandelli) EDF Experience in Integrated Deterministic Probabilistic Safety Analysis for Risk Assessment (Valentin Rychkov) Offsite Power Reliability Assessment for Nuclear Power Plants: An Application of Dynamic Reliability to Power Systems (Pierre Henneaux and Pierre-Etienne Labeau) Stochastic Differential Equations in Dynamic Reliability (Vytis Kopustinskas, Henrikas Pragarauskas and Juozas Augutis) Dynamic Event Tree Modeling of a Reactor Coolant Pump Seal LOCA (Kyle Metzroth, Richard Denning and Tunc Aldemir) Markov/Cell-to-Cell Mapping Technique for Stochastic Modeling of Dynamic Systems (Tunc Aldemir) Dynamic Flowgraph Methodology (DFM) Modeling of Nuclear and Advanced Technology System Risk and Reliability Scenarios (Sergio Guarro and Michael Yau) Dynamic Behavior of Nuclear Power Plant State Under Severe Accident Conditions: Analysis by the GO-FLOW Methodology and the Consideration of Loop Structures (Takeshi Matsuoka) Dynamic Accident Scenario Generation, Modeling and Post-Processing for the Integrated Deterministic and Probabilistic Safety Analysis of Nuclear Power Plants (Francesco Di Maio and Enrico Zio) Software Behavior Modeling for Dynamic Probabilistic Risk Assessment: Perspectives (C S Smidts) Readership: Graduate students, researchers and professionals in the field of nuclear engineering, risk analysis and reliability engineering. Keywords: Probabilistic Risk Assessment;Nuclear Energy;Nuclear Plant Reliability and SafetyReview: Key Features: Except for PSAM, ESREL and PSA conference proceedings which may contain some relevant papers, the most recent review publication on similar topics is Proceedings of the International Workshop on Dynamic Reliability, C Smidts, T Aldemir (Eds.), The Center for Risk and Reliability, University of Maryland, USA (2007) In addition to capturing more recent developments, the proposed publication differs from 2007 publication by concentrating on nuclear energy and also containing papers on risk management The book is a compilation of papers by almost all prominent researchers active in the field of dynamic probabilistic safety/ris
This highly experienced author sets out to build a bridge between two inter-disciplinary power engineering practices. The book looks into two major fields used in modern power systems: intelligent systems and the signal processing. The intelligent systems section comprises fuzzy logic, neural network and support vector machine. The author looks at relevant theories on the topics without assuming much particular background. Following the theoretical basics, he studies their applications in various problems in power engineering, like, load forecasting, phase balancing, or disturbance analysis.
Power Systems, Third Edition (part of the five-volume set, The Electric Power Engineering Handbook) covers all aspects of power system protection, dynamics, stability, operation, and control. Under the editorial guidance of L.L. Grigsby, a respected and accomplished authority in power engineering, and section editors Andrew Hanson, Pritindra Chowdhuri, Gerry Sheblé, and Mark Nelms, this carefully crafted reference includes substantial new and revised contributions from worldwide leaders in the field. This content provides convenient access to overviews and detailed information on a diverse array of topics. Concepts covered include: Power system analysis and simulation Power system transients Power system planning (reliability) Power electronics Updates to nearly every chapter keep this book at the forefront of developments in modern power systems, reflecting international standards, practices, and technologies. New sections present developments in small-signal stability and power system oscillations, as well as power system stability controls and dynamic modeling of power systems. With five new and 10 fully revised chapters, the book supplies a high level of detail and, more importantly, a tutorial style of writing and use of photographs and graphics to help the reader understand the material. New chapters cover: Symmetrical Components for Power System Analysis Transient Recovery Voltage Engineering Principles of Electricity Pricing Business Essentials Power Electronics for Renewable Energy A volume in the Electric Power Engineering Handbook, Third Edition Other volumes in the set: K12642 Electric Power Generation, Transmission, and Distribution, Third Edition (ISBN: 9781439856284) K13917 Power System Stability and Control, Third Edition (9781439883204) K12650 Electric Power Substations Engineering, Third Edition (9781439856383) K12643 Electric Power Transformer Engineering, Third Edition (9781439856291)
The electric power utility industry is presently undergoing a change towards the deregulated environment. This has resulted in unbundling of generation, transmission and distribution services. The introduction of competition into unbundled electricity services may lead system operation closer to its security boundaries resulting in smaller operating safety margins. The competitive environment is expected to lead to lower price rates for customers and higher efficiency for power suppliers in the long run. Under this deregulated environment, security assessment and pricing of transmission services have become important issues in power systems. This dissertation provides new methods for power system security assessment and transmission pricing. Inpower system security assessment, the following issues are discussed 1) The description of probabilistic methods for power system security assessment 2) The computation time of simulation methods 3) on-line security assessment for operation. A probabilistic method using Monte-Carlo simulation is proposed for power system security assessment. This method takes into account dynamic and static effects corresponding to contingencies. Two different Kohonen networks, Self-Organizing Maps and Learning Vector Quantization, are employed to speed up the probabilistic method. The combination of Kohonen networks and Monte-Carlo simulation can reduce computation time in comparison with straight Monte-Carlo simulation. A technique for security assessment employing Bayes classifier is also proposed. This method can be useful for system operators to make security decisions during on-line power system operation. This dissertation also suggests an approach for allocating transmission transaction costs based on reliability benefits in transmission services. The proposed method shows the transmission transaction cost of reliability benefits when transmission line capacities are considered. The ratio between allocation by transmission line capacity-use and allocation by reliability benefits is computed using the probability of system failure.
Proceedings of the Tenth Power Systems Computation Conference
Transmission Grid Security
A Method for the Probabilistic Security Analysis of Transmission Grids
Probabilistic Security Management for Power System Operations with Large Amounts of Wind Power
Power Systems
A collection of papers presented at the PSAM 7 – ESREL '04 conference in June 2004, reflecting a wide variety of disciplines, such as principles and theory of reliability and risk analysis, systems modelling and simulation, consequence assessment, human and organisational factors, structural reliability methods, software reliability and safety, insights and lessons from risk studies and management/decision making. This volume covers both well-established practices and open issues in these fields, identifying areas where maturity has been reached and those where more development is needed.
This book contains substantially extended and revised versions of the best papers from the 13th International Conference on Enterprise Information Systems (ICEIS 2011), held in Beijing, China, June 8-11, 2011. The 27 papers included (plus one invited paper) in this volume were carefully reviewed and selected from 57 full papers presented at the conference (out of 402 submissions). They reflect state-of-the-art research that is often driven by real-world applications, thus successfully relating the academic with the industrial community. The topics covered are: databases and information systems integration, artificial intelligence and decision support systems, information systems analysis and specification, software agents and Internet computing, and human-computer interaction.
Part of the second edition of The Electric Power Engineering Handbook, Power Systems offers focused and detailed coverage of all aspects concerning power system analysis and simulation, transients, planning, reliability, and power electronics. Contributed by worldwide leaders under the guidance of one of the world's most respected and accomplished
This monograph presents a wider spectrum of researches, developments, and case specific studies in the area of smart power systems and integration of renewable energy systems. The book will be for the benefit of a wider audience including researchers, postgraduate students, practicing engineers, academics, and regulatory policy makers. It covers a wide range of topics from fundamentals, and modelling and simulation aspects of traditional and smart power systems to grid integration of renewables; Micro Grids; challenges in planning and operation of a smart power system; risks, security, and stability in smart operation of a power system; and applied research in energy storage.
For Sustainable Power Systems
Emerging Techniques in Power System Analysis
Comparison Between Deterministic and Probabilistic Approaches in Power System Security Assessment
Evaluation of a Probabilistic Model for Bulk-power System Security
A Methodology to Compute the Probabilistic Incremental Security Costs for Large Power Systems
In response to the growing importance of power system security and reliability, Transmission Grid Security proposes a systematic and probabilistic approach for transmission grid security analysis. The analysis presented uses probabilistic safety assessment (PSA) and takes into account the power system dynamics after severe faults. In the method shown in this book the power system states (stable, not stable, system breakdown, etc.) are connected with the substation reliability model. In this way it is possible to: estimate the system-wide consequences of grid faults; identify a chain of events that might lead to blackout; and rank the importance of different substation components at the system level. Transmission Grid Security also presents the main features and basic mathematics of PSA. It provides the reader with up-to-date knowledge of the regulatory issues affecting the security of transmission grids in Europe. Transmission Grid Security gives a practical method for the security analysis of transmission grids, making it a valuable text for engineers and system operators, as well as postgraduate students. It includes basic information and detailed modules for creating a reliability model that takes into account all the basic operations and components needed after grid faults.
Electrical grids are, in general, among the most reliable systems in the world. These large interconnected systems, however, are subject to a host of challenges - aging infrastructure, transmission expansion to meet growing demand, distributed resources, and congestion management, among others. Innovations in Power Systems Reliability aims to provide a vision for a comprehensive and systematic approach to meet the challenges of modern power systems. Innovations in Power Systems Reliability is focused on the emerging technologies and methodologies for the enhancement of electrical power systems reliability. It addresses many relevant topics in this area, ranging from methods for balancing resources to various reliability and security aspects. Innovations in Power Systems Reliability not only discusses technological breakthroughs and sets out roadmaps in implementing the technology, but it also informs the reader about current best practice. It is a valuable source of information for academic researchers, as well as those working in industrial research and development.
Automatic learning is a complex, multidisciplinary field of research and development, involving theoretical and applied methods from statistics, computer science, artificial intelligence, biology and psychology. Its applications to engineering problems, such as those encountered in electrical power systems, are therefore challenging, while extremely promising. More and more data have become available, collected from the field by systematic archiving, or generated through computer-based simulation. To handle this explosion of data, automatic learning can be used to provide systematic approaches, without which the increasing data amounts and computer power would be of little use. Automatic Learning Techniques in Power Systems is dedicated to the practical application of automatic learning to power systems. Power systems to which automatic learning can be applied are screened and the complementary aspects of automatic learning, with respect to analytical methods and numerical simulation, are investigated. This book presents a representative subset of automatic learning methods - basic and more sophisticated ones - available from statistics (both classical and modern), and from artificial intelligence (both hard and soft computing). The text also discusses appropriate methodologies for combining these methods to make the best use of available data in the context of real-life problems. Automatic Learning Techniques in Power Systems is a useful reference source for professionals and researchers developing automatic learning systems in the electrical power field.
Control and Dynamic Systems: Advances in Theory and Applications, Volume 42: Analysis and Control System Techniques for Electric Power Systems, Part 2 of 4 covers the research studies on the significant advances in areas including economic operation of power systems and voltage and power control techniques. This book is composed of eight chapters and begins with a survey of the application of parallel processing to power system analysis as motivated by the requirement for faster computation. The next chapters deal with the issues of power system protection from a system point of view, the voltage stability phenomenon, and an overview of the techniques used in the reliability evaluation of large electric power systems. These chapters also look into the reliability assessment of bulk power systems, which are the composite of generation and high-voltage transmission, often called composite systems. These topics are followed by investigations of the potential of integer quadratic optimization to improve efficiency in a radial electric distribution system through the coordination of switched capacitors and regulators. Other chapters consider the issues of the optimal operation of a power system that are substantially complicated as a result of the large system scale nature of these issues. The final chapters explore the techniques for achieving requisite speed improvements that are essential to electric power systems and the problems on effective methods in hydro optimization. This book will be of value to electrical engineers, designers, and researchers.
Control of Modern Integrated Power Systems
Control and Dynamic Systems V42: Analysis and Control System Techniques for Electric Power Systems Part 2
Automatic Learning Techniques in Power Systems
Evaluation of Power System Security and Development of Transmission Pricing Method
Complex System Modelling and Control Through Intelligent Soft Computations
In many countries today, the introduction of competitive supply and corresponding organizational separation of supply, transmission, and system operation has resulted in more highly stressed operating conditions, more vulnerable networks, and an increased need to identify the security level of the power system in both operating and planning scheme. There are two approaches used to assess the security level. One of them, the deterministic approach, is widely utilized in industry to perform security evaluation of power system operation by providing a basis for determining tradeoffs between security and economy. The other one, the probabilistic approach, can enhance this decision-making process by quantitatively assessing a number of uncertainties. In the thesis, we compare the deterministic approach to a probabilistic one via an overload and low voltage security assessment study to identify secure regions of operation or a secure facility planning for a local area within the IEEE Reliability Test System. The results of this comparison indicate that the probabilistic approach offers several inherent advantages relative to the deterministic approach.
In this comprehensive and systematically presented text, the various aspects of modern power system operation and control are discussed. Covered in the volume are: computer configurations and control aids, load-frequency control and automatic generation c ontrol, reactive power planning and scheduling procedure, security monitoring, and control under emergency conditions. Also presented are case study reports on power grid failures in different countries, examining how they occurred, how they were handled, and what lessons that they can provide. A "defence" plan against similar major disturbances is detailed, including the overall system architecture adopted and the processing and communication sub-systems.
The world is witnessing a rapid growth in wind and other renewable based electricity generation due to environmental concerns associated with electricity generation from the conventional sources. Wind power behaves quite differently than conventional electric power generating units due to its intermittent and diffuse nature. System planners and operators face the variability and uncertainty of wind power availability, and therefore, encounter considerable challenges in making decisions to maintain the adequacy and security of wind integrated power systems. This volume intends to bring out the original research work of researchers from academia and industry in understanding, quantifying and managing the risks associated with the uncertainty in wind variability in order to plan and operate a modern power system integrated with a significant proportion of wind power generation with an acceptable level of reliability. Accurate modeling of wind power variability and proper incorporation of the models in reliability and risk evaluation is very important for the planning and operation of electric power systems, and will play a crucial role in defining the requirement of various types of resources and services, such as storage and ancillary services in power systems.
Identifying, assessing, and mitigating electric power grid vulnerabilities is a growing focus in short-term operational planning of power systems. Through illustrated application, this important guide surveys state-of-the-art methodologies for the assessment and enhancement of power system security in short term operational planning and real-time operation. The methodologies employ advanced methods from probabilistic theory, data mining, artificial intelligence, and optimization, to provide knowledge-based support for monitoring, control (preventive and corrective), and decision making tasks. Key features: Introduces behavioural recognition in wide-area monitoring and security constrained optimal power flow for intelligent control and protection and optimal grid management. Provides in-depth understanding of risk-based reliability and security assessment, dynamic vulnerability assessment methods, supported by the underpinning mathematics. Develops expertise in mitigation techniques using intelligent protection and control, controlled islanding, model predictive control, multi-agent and distributed control systems Illustrates implementation in smart grid and self-healing applications with examples and real-world experience from the WAMPAC (Wide Area Monitoring Protection and Control) scheme. Dynamic Vulnerability Assessment and Intelligent Control for Power Systems is a valuable reference for postgraduate students and researchers in power system stability as well as practicing engineers working in power system dynamics, control, and network operation and planning.
Stochastic Dynamics of Power Systems
Risk Assessment Of Power Systems
13th International Conference, ICEIS 2011, Beijing, China, June 8-11, 2011, Revised Selected Papers
Risk Assessment of Power Systems
Dynamic Vulnerability Assessment and Intelligent Control
The interstate integration of power grids provides multiple advantages concerning operation security, integration of renewable energy as well as energy trading. Due to these facts grid interconnections, such as ENTSO-E in Continental Europe, expand continually since its establishment. Due to the increasing scale and distance of interconnected power systems as well as an increasing number of countries involved with increasing complexity of operation, comprehensive R&D and innovations are urgently required to assure reliable and efficient operation of power systems. In this book new tools and methods are presented for monitoring, control and protection of large scale power systems. These tools and methods consider Smart Grid technologies based on wide area data exchange in combination with modern measurement devices, such as PMUs and advanced network controllers such as FACTS and HVDC systems. Within this topic the impact and reliability of different communication technologies play a key role. The material of this book is based on final results from the international research project ICOEUR "Intelligent Coordination of Operation and Emergency Control of EU and Russian Power Grids", supported by the European Commission and the Russian Federal Agency of Science and Innovation. This book provides a great value for professional power system engineers as well as for students interested in topics related to large scale power system monitoring, control, protection and operation.
Extended models, methods, and applications in power system risk assessment Risk Assessment of Power Systems: Models, Methods, and Applications, Second Edition fills the gap between risk theory and real-world application. Author Wenyuan Li is a leading authority on power system risk and has more than twenty-five years of experience in risk evaluation. This book offers real-world examples to help readers learn to evaluate power system risk during planning, design, operations, and maintenance activities. Some of the new additions in the Second Edition include: New research and applied achievements in power system risk assessment A discussion of correlation models in risk evaluation How to apply risk assessment to renewable energy sources and smart grids Asset management based on condition monitoring and risk evaluation Voltage instability risk assessment and its application to system planning The book includes theoretical methods and actual industrial applications. It offers an

extensive discussion of component and system models, applied methods, and practical examples, allowing readers to effectively use the basic concepts to conduct risk assessments for power systems in the real world. With every original chapter updated, two new sections added, and five entirely new chapters included to cover new trends, Risk Assessment of Power Systems is an essential reference.

This Special Issue “Power System Simulation, Control and Optimization” offers valuable insights into the most recent research developments in these topics. The analysis, operation, and control of power systems are increasingly complex tasks that require advanced simulation models to analyze and control the effects of transformations concerning electricity grids today: Massive integration of renewable energies, progressive implementation of electric vehicles, development of intelligent networks, and progressive evolution of the applications of artificial intelligence.

"Risk Assessment of Power Systems closes the gap between risk theory and real-world application. As a leading authority in power system risk evaluation for more than fifteen years and the author of a considerable number of papers and more than fifty technical reports on power system risk and reliability evaluation, Wenyuan Li is uniquely qualified to present this material. Following the models and methods developed from the author's hands-on experience, readers learn how to evaluate power system risk in planning, design, operations, and maintenance activities to keep risk at targeted levels."--BOOK JACKET.

Probabilistic Safety Assessment and Management

Power Systems & Power Plant Control

Models, Methods, and Applications

Probabilistic Methods for Security Analysis of Power Systems

Enterprise Information Systems

This textbook provides an introduction to probabilistic reliability analysis of power systems. It discusses a range of probabilistic methods used in reliability modelling of power system components, small systems and large systems. It also presents the benefits of probabilistic methods for modelling renewable energy sources. The textbook describes real-life studies, discussing practical examples and providing interesting problems, teaching students the methods in a thorough and hands-on way. The textbook has chapters dedicated to reliability models for components (reliability functions, component life cycle, two-state Markov model, stress-strength model), small systems (reliability networks, Markov models, fault/event tree analysis) and large systems (generation adequacy, state enumeration, Monte-Carlo simulation). Moreover, it contains chapters about probabilistic optimal power flow, the reliability of underground cables and cyber-physical power systems. After reading this book, engineering students will be able to apply various methods to model the reliability of power system components, smaller and larger systems. The textbook will be accessible to power engineering students, as well as students from mathematics, computer science, physics, mechanical engineering, policy & management, and will allow them to apply reliability analysis methods to their own areas of expertise.

This book discusses stochastic dynamics of power systems and the related analytical methodology. It summarizes and categorizes the stochastic elements of power systems and develops a framework for research on stochastic dynamics of power systems. It also establishes a research model for stochastic dynamics of power systems and theoretically proves stochastic stability in power systems. Further, in addition to demonstrating the stochastic oscillation mechanism in power systems, it also proposes methods for quantitative analysis and stochastic optimum control in the field of stochastic dynamic security in power systems. This book is a valuable resource for researchers, scholars and engineers in the field of electrics.

The book is composed of 12 chapters and three appendices, and can be divided into four parts. The first part includes Chapters 2 to 7, which discuss the concepts, models, methods and data in probabilistic transmission planning. The second part, Chapters 8 to 11, addresses four essential issues in probabilistic transmission planning applications using actual utility systems as examples. Chapter 12, as the third part, focuses on a special issue, i.e. how to deal with uncertainty of data in probabilistic transmission planning. The fourth part consists of three appendices, which provide the basic knowledge in mathematics for probabilistic planning.

Identifying, assessing, and mitigating electric power grid vulnerabilities is a growing focus in short-term operational planning of power systems. Through illustrated application, this important guide surveys state-of-the-art methodologies for the assessment and enhancement of power system security in short term operational planning and real-time operation. The methodologies employ advanced methods from probabilistic theory, data mining, artificial intelligence, and optimization, to provide knowledge-based support for monitoring, control (preventive and corrective), and decision making tasks. Key features: Introduces behavioural recognition in wide-area monitoring and security constrained optimal power flow for intelligent control and protection and optimal grid management. Provides in-depth understanding of risk-based reliability and security assessment, dynamic vulnerability assessment methods, supported by the underpinning mathematics. Develops expertise in mitigation techniques using intelligent protection and control, controlled islanding, model predictive control, multi-agent and distributed control systems Illustrates implementation in smart grid and self-healing applications with examples and real-world experience from the WAMPAC (Wide Area Monitoring Protection and Control) scheme. Supplementary material, including Matlab codes, available through the companion website: www.wiley.com/go/rueda_torres/dynamic Dynamic Vulnerability Assessment and Intelligent Control for Power Systems is a valuable reference for postgraduate students and researchers in power system stability as well as practicing engineers working in power system dynamics, control, and network operation and planning.

Power System Simulation, Control and Optimization

Probabilistic Methods Applied to Electric Power Systems

Probabilistic Security Assessment of Electric Power Systems Using Transient Energy Function Method

9th International Conference, CRITIS 2014, Limassol, Cyprus, October 13-15, 2014, Revised Selected Papers

Reliability and Risk Evaluation of Wind Integrated Power Systems

"Emerging Techniques in Power System Analysis" identifies the new challenges facing the power industry following the deregulation. The book presents emerging techniques including data mining, grid computing, probabilistic methods, phasor measurement unit (PMU) and how to apply those techniques to solving the technical challenges. The book is intended for engineers and managers in the power industry, as well as power engineering researchers and graduate students. Zhaoyang Dong is an associate professor at the Department of Electrical Engineering, The Hong Kong Polytechnic University, China. Pei Zhang is program manager at the Electric Power Research Institute (EPRI), USA.

The control of power systems and power plants is a subject of worldwide interest which continues to sustain a high level of research, development and application in many diverse yet complementary areas. Papers pertaining to 13 areas directly related to power systems and representing state-of-the-art methods are included in this volume. The topics covered include linear and nonlinear optimization, static and dynamic state estimation, security analysis, generation control, excitation and voltage control, power plant modelling and control, stability analysis, emergency and restorative controls, large-scale sparse matrix techniques, data communication, microcomputer systems, power system stabilizers, load forecasting, optimum generation scheduling and power system control centers. The compilation of this information in one volume makes it essential reading for a comprehension of the current knowledge in the field of power control.

Probabilistic Methods Applied to Electric Power Systems contains the proceedings of the First International Symposium held in Toronto, Ontario, Canada, on July 11-13, 1986. The papers explore significant technical advances that have been made in the application of probability methods to the design of electric power systems. This volume is comprised of 65 chapters divided into 10 sections and begins by discussing the probabilistic methodologies used in the assessment of power system reliability and structural design. The following chapters focus on the applications of probabilistic techniques to the analysis and design of transmission systems and structures; evaluation of design and reliability of distribution systems; system planning; and assessment of performance of transmission system components such as insulators, tower joints, and foundations. The probability-based procedures for dealing with data bases such as wind load and ice load are also considered, along with the effects of weather-induced loads on overhead power lines and the use of probability methods in upgrading existing power lines and components. The final section deals with applications of probability methods to power system problems not covered in other chapters. This book will be of value to engineers involved in uprating, designing, analyzing, and assessing reliability of transmission and distribution systems.

The capability of effectively analyzing complex systems is fundamental to the operation, management and planning of power systems. This book offers broad coverage of essential power system concepts and features a complete and in-depth account of all the latest developments, including Power Flow Analysis in Market Environment; Power Flow Calculation of AC/DC Interconnected Systems and Power Flow Control and Calculation for Systems Having FACTS Devices and recent results in system stability.

A Student’s Introduction

Advances in Theory and Applications

Advanced Concepts In Nuclear Energy Risk Assessment And Management

Probabilistic Transmission System Planning

A PSA Approach