

Marko Cepin

Assessment of Power System Reliability

Methods and Applications

 Springer

Assessment Of Power System Reliability Methods And Applications

Wenyuan Li



Assessment Of Power System Reliability Methods And Applications:

Assessment of Power System Reliability Marko Čepin, 2011-07-29 The importance of power system reliability is demonstrated when our electricity supply is disrupted whether it decreases the comfort of our free time at home or causes the shutdown of our companies and results in huge economic deficits The objective of Assessment of Power System Reliability is to contribute to the improvement of power system reliability It consists of six parts divided into twenty chapters The first part introduces the important background issues that affect power system reliability The second part presents the reliability methods that are used for analyses of technical systems and processes The third part discusses power flow analysis methods because the dynamic aspect of a power system is an important part of related reliability assessments The fourth part explores various aspects of the reliability assessment of power systems and their parts The fifth part covers optimization methods The sixth part looks at the application of reliability and optimization methods Assessment of Power System Reliability has been written in straightforward language that continues into the mathematical representation of the methods Power engineers and developers will appreciate the emphasis on practical usage while researchers and advanced students will benefit from the simple examples that can facilitate their understanding of the theory behind power system reliability and that outline the procedure for application of the presented methods

Risk Assessment of Power Systems Wenyan Li, 2014-02-19 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 Wenyan 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

Proceedings of the 5th International Conference on Electrical Engineering and Control Applications-Volume 2 Salim Ziani, Mohammed Chadli, Sofiane Bououden, Ivan Zelinka, 2024-09-02 This book gathers papers presented during the 5th International Conference on Electrical Engineering and Control Applications ICEECA 2022 held on November 15 17 2022 Khenchela Algeria It covers new control system models troubleshooting tips and complex system requirements such as increased speed precision and remote capabilities

Additionally the book discusses not only the engineering aspects of signal processing and various practical issues in the broad field of information transmission but also novel technologies for communication networks and modern antenna design. The later part of the book covers important related topics such as fault diagnosis and fault tolerant control strategies for nonlinear systems and alternative energy sources. This book is intended for researchers, engineers and advanced postgraduate students in the fields of control and electrical engineering, computer science, signal processing as well as mechanical and chemical engineering.

System Reliability Management Adarsh Anand, Mangey Ram, 2018-09-21. This book provides the latest research advances in the field of system reliability assurance and engineering. It contains reference material for applications of reliability in system engineering offering a theoretical sound background with adequate numerical illustrations. Included are concepts pertaining to reliability analysis, assurance techniques and methodologies, tools and practical applications of system reliability modeling and allocation. The collection discusses various soft computing techniques like artificial intelligence and particle swarm optimization approach for reliability assessment. Importance of differentiating between the optimal release time and testing stop time of the software has been explicitly discussed and presented in the book. Features: Creates understanding of the costs associated with complex systems. Covers reliability measurement of engineering systems. Incorporates an efficient effort based expenditure policy incorporating cost and reliability criteria. Provides information for optimal testing stop and release time of software system. Presents software performance and security layout. Addresses reliability prediction and its maintenance through advanced analytics techniques. Overall, *System Reliability Management: Solutions and Techniques* is a collaborative and interdisciplinary approach for better communication of problems and solutions to increase the performance of the system for better utilization and resource management.

Power System Protection in Smart Grid Environment Ramesh Bansal, 2019-01-15. With distributed generation interconnection, power flow becoming bidirectional, culminating in network problems, smart grids aid in electricity generation, transmission, substations, distribution and consumption to achieve a system that is clean, safe, protected, secure, reliable, efficient and sustainable. This book illustrates fault analysis, fuses, circuit breakers, instrument transformers, relay technology, transmission lines protection setting using DIGSILENT Power Factory. Intended audience is senior undergraduate and graduate students and researchers in power systems, transmission and distribution protection system, broadly under electrical engineering.

Statistical Diagnostics of Electric Power Equipment Vitalii Babak, Sergii Babak, Artur Zaporozhets, 2024-11-25. This book considers the issues of constructing mathematical probabilistic models of diagnostic signals, the development of statistical methods of their analysis in order to make diagnostic decisions and finally the technical implementation of the proposed diagnostic methods. Following the concept of primacy of the mathematical model of the diagnostic signal, the authors considered it expedient to consider first of all the questions connected with the theory of random processes possessing infinitely divisible distribution laws: linear and linear periodic random processes. Considerable

attention is paid to the issues of simulation modeling of diagnostic signals and their statistical evaluation Modern element base and new information technologies allowed to develop build and practically test a number of experimental samples of information measuring systems of statistical diagnostics of electric power engineering objects Among these IMS the systems are realized by means of unmanned diagnostic complexes and also IMS of vibrodiagnostics of moving units of electric machines represents an important role A large amount of experimental research has shown the operability and efficiency of the built IMS samples Particular attention is paid to the selection of diagnostic spaces formation of training sets construction of solving rules for diagnosis and classification of EE defects The authors do not pretend to a comprehensive consideration of the issues of EE diagnostics using statistical methods and IMS realized on their basis At the same time the results of researches stated in this monograph were a natural continuation of the subject of application of statistical methods in the field of control monitoring and diagnostics for objects of electric power industry

Smart and Power Grid Systems - Design Challenges and Paradigms Kolla Bhanu Prakash, Sanjeevikumar Padmanaban, Massimo Mitolo, 2023-03-10 The Smart Grid represents an unprecedented opportunity to move the energy industry into a new era of reliability availability and efficiency that will contribute to our economic and environmental health During the transition period it will be critical to carry out testing technology improvements consumer education development of standards and regulations and information sharing between projects to ensure that the benefits we envision from the Smart Grid become a reality Today an electricity disruption such as a blackout can have a domino effect a series of failures that can affect banking communications traffic and security This is a particular threat in the winter when homeowners can be left without heat A smarter grid will add resiliency to our electric power system and make it better prepared to address emergencies such as severe storms earthquakes large solar flares and terrorist attacks Because of its two way interactive capacity the Smart Grid will allow for automatic rerouting when equipment fails or outages occur This will minimize outages and minimize the effects when they do happen When a power outage occurs Smart Grid technologies will detect and isolate the outages containing them before they become large scale blackouts The new technologies will also help ensure that electricity recovery resumes quickly and strategically after an emergency routing electricity to emergency services first for example In addition the Smart Grid will take greater advantage of customer owned power generators to produce power when it is not available from utilities By combining these distributed generation resources a community could keep its health center police department traffic lights phone system and grocery stores operating during emergencies In addition the Smart Grid is a way to address an aging energy infrastructure that needs to be upgraded or replaced This book shows that Smart Grids can address energy efficiency to bring increased awareness to consumers about the connection between electricity use and the environment bring increased national security to our energy system drawing on greater amounts of home grown electricity that is more resistant to natural disasters and attack

Handbook of Smart Energy Systems Michel Fathi, Enrico Zio, Panos M. Pardalos, 2023-08-04 This handbook

analyzes and develops methods and models to optimize solutions for energy access for industry and the general world population alike in terms of reliability and sustainability. With a focus on improving the performance of energy systems, it brings together state-of-the-art research on reliability enhancement, intelligent development, simulation and optimization, as well as sustainable development of energy systems. It helps energy stakeholders and professionals learn the methodologies needed to improve the reliability of energy supply and demand systems, achieve more efficient long-term operations, deal with uncertainties in energy systems and reduce energy emissions. Highlighting novel models and their applications from leading experts in this important area, this book will appeal to researchers, students and engineers in the various domains of smart energy systems and encourage them to pursue research and development in this exciting and highly relevant field.

Proceedings of the 2nd International Symposium on Disaster Resilience and Sustainable Development Indrajit Pal, Sreevalsa Kolathayar, Sheikh Tawhidul Islam, Anirban Mukhopadhyay, Iftekhar Ahmed, 2022-10-12. This conference proceeding book contains invited articles and contributory papers from the 2nd International Symposium on Disaster Resilience and Sustainable Development organized by Asian Institute of Technology, Thailand, on June 24-25, 2021. It includes contributions from researchers and practitioners working in the area of disaster mitigation and risk reduction for sustainable communities. The articles cover topics such as tools and techniques of hazard identification, risk assessment, engineering innovations for hazard mitigation and safe design of structures to vulnerable systems. The content caters to research scholars, students, industry professionals, data analytics companies, reinsurance companies, government bodies and policymakers who work in the field of hazard modeling and disaster management.

Reliability Assessment of Electric Power Systems Using Monte Carlo Methods Billinton, W. Li, 1994-11-30. The application of quantitative reliability evaluation in electric power systems has now evolved to the point at which most utilities use these techniques in one or more areas of their planning, design and operation. Most of the techniques in use are based on analytical models and resulting analytical evaluation procedures. Improvements in and availability of high-speed digital computers have created the opportunity to analyze many of these problems using stochastic simulation methods and over the last decade there has been increased interest in and use made of Monte Carlo simulation in quantitative power system reliability assessment. Monte Carlo simulation is not a new concept and recorded applications have existed for at least 50 yr. However, localized high-speed computers with large capacity storage have made Monte Carlo simulation an available and sometimes preferable option for many power system reliability applications. Monte Carlo simulation is also an integral part of a modern undergraduate or graduate course on reliability evaluation of general engineering systems or specialized areas such as electric power systems. It is hoped that this textbook will help formalize the many existing applications of Monte Carlo simulation and assist in their integration in teaching programs. This book presents the basic concepts associated with Monte Carlo simulation.

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