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Electric Power Substations Engineering John Wiley & Sons

Advanced Power Generation Systems examines the full range of advanced multiple output thermodynamic cycles that can enable more sustainable and efficient power production from traditional methods, as well as driving the significant gains available from renewable sources. These advanced cycles can harness the by-products of one power generation effort, such as electricity production, to simultaneously create additional energy outputs, such as heat or refrigeration. Gas turbine-based, and industrial waste heat recovery-based combined, cogeneration, and trigeneration cycles are considered in depth, along with Syngas combustion engines, hybrid SOFC/gas turbine engines, and other thermodynamically efficient and environmentally conscious generation technologies. The uses of solar power, biomass, hydrogen, and fuel cells in advanced power generation are considered, within both hybrid and dedicated systems. The detailed energy and exergy analysis of each type of system provided by globally recognized author Dr. Ibrahim Dincer will inform effective and efficient design choices, while emphasizing the pivotal role of new methodologies and models for performance assessment of existing systems. This unique resource gathers information from thermodynamics, fluid mechanics, heat transfer, and energy system design to provide a single-source guide to solving practical power engineering problems. - The only complete source of info on the whole array of multiple output thermodynamic cycles, covering all the design options for environmentally-conscious combined production of electric power, heat, and refrigeration - Offers crucial instruction on realizing more efficiency in traditional power generation systems, and on implementing renewable technologies, including solar, hydrogen, fuel cells, and biomass - Each cycle description clarified through schematic diagrams, and linked to sustainable development scenarios through detailed energy, exergy, and efficiency analyses - Case studies and examples demonstrate how novel systems and performance assessment methods function in practice

Risk Assessment Of Power Systems Walter de Gruyter GmbH & Co KG

An exploration of how advances in computing technology and research can be combined to extend the capabilities and economics of modern power plants. The contributors, from academia as well as practising engineers, illustrate how the various methodologies can be applied to power plant operation.

Hydropower Engineering Handbook Woodhead Publishing

Thermal Engineering of Nuclear Power Stations: Balance-of-Plant Systems serves as a ready reference to better analyze common engineering challenges in the areas of turbine cycle analysis, thermodynamics, and heat transfer. The scope of the book is broad and comprehensive, encompassing the mechanical aspects of the entire nuclear station balance of plant from the source of the motive steam to the discharge and/or utilization of waste heat and beyond. Written for engineers in the fields of nuclear plant and thermal engineering, the book examines the daily, practical problems encountered by mechanical design, system, and maintenance engineers. It provides clear examples and solutions drawn from numerous case studies in actual, operating nuclear stations.

Solar Photovoltaic Power Generation Springer Science & Business Media

Provides comprehensive coverage of conventional and alternative power generation systems. Uses state-of-the-art methods for design of main power plant components. Contains examples, case studies, and chapter problems. Includes historical sidebars to show the development and evolution of power plant technology. Offers solutions manual, PowerPoint slides, and additional text questions to instructors.

Integration of Distributed Generation in the Power System Elsevier

The analysis of the reliability and availability of power plants is frequently based on simple indexes that do not take into account the criticality of some failures used for availability analysis. This criticality should be evaluated based on concepts of reliability which consider the effect of a component failure on the performance of the entire plant. System reliability analysis tools provide a root-cause analysis leading to the improvement of the plant maintenance plan. Taking in view that the power plant performance can be evaluated not only based on thermodynamic related indexes, such as heat-rate, Thermal Power Plant Performance Analysis focuses on the presentation of reliability-based tools used to define performance of complex systems and introduces the basic concepts of reliability, maintainability and risk analysis aiming at their application as tools for power plant performance improvement, including: · selection of critical equipment and components, · definition of maintenance plans, mainly for auxiliary systems, and · execution of decision analysis based on risk concepts. The comprehensive presentation of each analysis allows future application of the methodology making Thermal Power Plant Performance Analysis a key resource for undergraduate and postgraduate students in mechanical and nuclear engineering.

Steam Power Plant Engineering Notion Press

Wind energy's bestselling textbook- fully revised. This must-have second edition includes up-to-date data, diagrams, illustrations and thorough new material on: the fundamentals of wind turbine aerodynamics; wind turbine testing and modelling; wind turbine design standards; offshore wind energy; special purpose applications, such as energy storage and fuel production. Fifty additional homework problems and a new appendix on data processing make this comprehensive edition perfect for engineering students. This book offers a complete examination of one of the most promising sources of renewable energy and is a great introduction to this cross-disciplinary field for practising engineers. "provides a wealth of information and is an excellent reference book for people interested in the subject of wind energy." (IEEE Power & Energy Magazine, November/December 2003) "deserves a place in the library of every university and college where renewable energy is taught." (The International Journal of Electrical Engineering Education, Vol.41, No.2 April 2004) "a very comprehensive and well-organized treatment of the current status of wind power." (Choice, Vol. 40, No. 4, December 2002)

Power Plant Engineering Springer Science & Business Media

Combining select chapters from Grigsby's standard-setting *The Electric Power Engineering Handbook* with several chapters not found in the original work, *Electric Power Substations Engineering* became widely popular for its comprehensive, tutorial-style treatment of the theory, design, analysis, operation, and protection of power substations. For its

Wind Energy Explained CRC Press

The *Gas Turbine Engineering Handbook* has been the standard for engineers involved in the design, selection, and operation of gas turbines. This revision includes new case histories, the latest techniques, and new designs to comply with recently passed legislation. By keeping the book up to date with new, emerging topics, Boyce ensures that this book will remain the standard and most widely used book in this field. The new Third Edition of the *Gas Turbine Engineering Handbook* updates the book to cover the new generation of Advanced gas Turbines. It examines the benefit and some of the major problems that have been encountered by these new turbines. The book keeps abreast of the environmental changes and the industries answer to these new regulations. A new chapter on case histories has been added to enable the engineer in the field to keep abreast of problems that are being encountered and the solutions that have resulted in solving them. - Comprehensive treatment of Gas Turbines from Design to Operation and Maintenance. In depth treatment of Compressors with emphasis on surge, rotating stall, and choke; Combustors with emphasis on Dry Low NOx Combustors; and Turbines with emphasis on Metallurgy and new cooling

schemes. An excellent introductory book for the student and field engineers - A special maintenance section dealing with the advanced gas turbines, and special diagnostic charts have been provided that will enable the reader to troubleshoot problems he encounters in the field - The third edition consists of many Case Histories of Gas Turbine problems. This should enable the field engineer to avoid some of these same generic problems

Gas Turbine Engineering Handbook PHI Learning Pvt. Ltd.

The integration of new sources of energy like wind power, solar-power, small-scale generation, or combined heat and power in the power grid is something that impacts a lot of stakeholders: network companies (both distribution and transmission), the owners and operators of the DG units, other end-users of the power grid (including normal consumers like you and me) and not in the least policy makers and regulators. There is a lot of misunderstanding about the impact of DG on the power grid, with one side (including mainly some but certainly not all, network companies) claiming that the lights will go out soon, whereas the other side (including some DG operators and large parts of the general public) claiming that there is nothing to worry about and that it's all a conspiracy of the large production companies that want to protect their own interests and keep the electricity price high. The authors are of the strong opinion that this is NOT the way one should approach such an important subject as the integration of new, more environmentally friendly, sources of energy in the power grid. With this book the authors aim to bring some clarity to the debate allowing all stakeholders together to move to a solution. This book will introduce systematic and transparent methods for quantifying the impact of DG on the power grid.

Elements of Electrical Power Station Design McGraw-Hill Companies

Have you ever wondered how a nuclear power station works? This lively book will answer that question. It'll take you on a journey from the science behind nuclear reactors, through their start-up, operation and shutdown. Along the way it covers a bit of the engineering, reactor history, different kinds of reactors and what can go wrong with them. Much of this is seen from the viewpoint of a trainee operator on a Pressurised Water Reactor - the most common type of nuclear reactor in the world. Colin Tucker has spent the last thirty years keeping reactors safe. Join him on a tour that is the next best thing to driving a nuclear reactor yourself!

An Introduction to Thermal Power Plant Engineering and Operation John Wiley & Sons

Handbook of Generation IV Nuclear Reactors, Second Edition is a fully revised and updated comprehensive resource on the latest research and advances in generation IV nuclear reactor concepts. Editor Igor Pioro and his team of expert contributors have updated every chapter to reflect advances in the field since the first edition published in 2016. The book teaches the reader about available technologies, future prospects and the feasibility of each concept presented, equipping them users with a strong skillset which they can apply to their own work and research. - Provides a fully updated, revised and comprehensive handbook dedicated entirely to generation IV nuclear reactors - Includes new trends and developments since the first publication, as well as brand new case studies and appendices - Covers the latest research, developments and design information surrounding generation IV nuclear reactors

Gas Turbines for Electric Power Generation PHI Learning Pvt. Ltd.

This book is about electric energy: its generation, its transmission from the point of generation to where it is required, and its transformation into required forms. To achieve this end, a number of devices are essential-such as generators, transmission lines, transformers, and electric motors. We discuss the design, construction, and operating characteristics of the electric devices used in the transformation to and from electric energy. This text is designed to be used in a one-semester course in electric energy conversion at the second-year level of the Bachelor of Engineering course. It is assumed that the student is familiar with the laws of thermodynamics and has taken a course in basic circuit analysis, including the application of phasors. We begin with a discussion of how humankind has successfully harnessed the energy of wind, water, the sun, biomass, animals, geothermal sources, fossils, and nuclear fission to make its life comfortable. Some of the consequences of this activity on the environment are examined. In Chapter 2, we review the basic physics of energy and its conversion. This may be, to some extent, a repetition of knowledge gained in high-school and first year university courses. However, we believe that such review is necessary to establish a suitable base from which to launch the subject of electric energy conversion.

Handbook of Generation IV Nuclear Reactors American Society of Mechanical Engineers

This book is a compilation of selected papers from the Seventh Symposium on Digital Instrumentation and Control Technology for Nuclear Power Plant, held online on January 11, 2023. The purpose of this symposium is to discuss inspection, test, certification and research for the software and hardware of Instrumentation and Control (I&C) systems in nuclear power plants (NPP), such as sensors, actuators and control system. It provides a platform of technical exchange and experience sharing for those broad masses of experts and scholars and nuclear power practitioners. At the same time, it also provides a platform for the combination of production, teaching and research in universities and enterprises to promote the safe development of nuclear power plant. Readers will encounter new ideas for realizing a more efficient and safer instrumentation and control system.

Power Plant Engineering Vikas Publishing House

This book illustrates operation and maintenance practices/guidelines for economic generation and managing health of a thermal power generator beyond its regulatory life. The book provides knowledge for professionals managing power station operations, through its unique approach to chemical analysis of water, steam, oil etc. to identify malfunctioning/defects in equipment/systems much before the physical manifestation of the problem. The book also contains a detailed procedure for conducting performance evaluation tests on different equipment, and for analyzing test results

for predicting maintenance requirements, which has lent a new dimension to power systems operation and maintenance practices. A number of real life case studies also enrich the book. This book will prove particularly useful to power systems operations professionals in the developing economies, and also to researchers and students involved in studying power systems operations and control.

Advanced Power Generation Systems PennWell Books

This Text-Cum-Reference Book Has Been Written To Meet The Manifold Requirement And Achievement Of The Students And Researchers. The Objective Of This Book Is To Discuss, Analyses And Design The Various Power Plant Systems Serving The Society At Present And Will Serve In Coming Decades India In Particular And The World In General. The Issues Related To Energy With Stress And Environment Up To Some Extent And Finally Find Ways To Implement The Outcome.Salient Features# Utilization Of Non-Conventional Energy Resources# Includes Green House Effect# Gives Latest Information S In Power Plant Engineering# Include Large Number Of Problems Of Both Indian And Foreign Universities# Rich Contents, Lucid Manner

Power Plants in the Industry Springer Nature

Covers preliminary designs and economic loading of diesel-electric stations, steam stations, nuclear power stations and hydro-electric stations. It discusses load forecasting, economic load dispatch, unit commitment problem, methods of scheduling stations, allocation control, system reliability and system security. Trends in power plant instrumentation and control are also presented.

Electric Power Engineering McGraw-Hill Companies

This comprehensive volume provides a complete, authoritative, up-to-date reference for all aspects of power plant engineering. Coverage ranges from engineering economics to coal and limestone handling, from design processes to plant thermal heat balances. Both theory and practical applications are covered, giving engineers the information needed to plan, design, construct, upgrade, and operate power plants. Power Plant Engineering is the culmination of experience of hundreds of engineers from Black & Veatch, a leading firm in the field for more than 80 years. The authors review all major power generating technologies, giving particular emphasis to current approaches. Special features of the book include: * More than 1000 figures and lines drawings that illustrate all aspects of the subject. * Coverage of related components and systems in power plants such as turbine-generators, feedwater heaters, condenser, and cooling towers. * Definitions and analyses of the features of various plant systems. * Discussions of promising future technologies. Power Plant Engineering will be the standard reference in the professional engineer's library as the source of information on steam power plant generation. In addition, the clear presentation of the material will make this book suitable for use by students preparing to enter the field.

Power Plant Engineering BoD - Books on Demand

This textbook has been designed for a one-semester course on Power Plant Engineering studied by both degree and diploma students of mechanical and electrical engineering. It effectively exposes the students to the basics of power generation involved in several energy conversion systems so that they gain comprehensive knowledge of the operation of various types of power plants in use today. After a brief introduction to energy fundamentals including the environmental impacts of power generation, the book acquaints the students with the working principles, design and operation of five conventional power plant systems, namely thermal, nuclear, hydroelectric, diesel and gas turbine. The economic factors of power generation with regard to estimation and prediction of load, plant design, plant operation, tariffs and so on, are discussed and illustrated with the help of several solved numerical problems. The generation of electric power using renewable energy sources such as solar, wind, biomass, geothermal, tidal, fuel cells, magneto hydrodynamic, thermoelectric and thermionic systems, is discussed elaborately. The book is interspersed with solved problems for a sound understanding of the various aspects of power plant engineering. The chapter-end questions are intended to provide the students with a thorough reinforcement of the concepts discussed.

Human Reliability, Error, and Human Factors in Engineering Maintenance CRC Press

Sustainable Power Generation: Current Status, Future Challenges, and Perspectives addresses emerging problems faced by the transition to sustainable electricity generation and combines perspectives of engineering and economics to provide a well-rounded overview. This book features an in-depth discussion of the main aspects of sustainable energy and the infrastructure of existing technologies. It goes on to evaluate natural resources that are sustainable and convenient forms of energy, and finishes with an investigation of the environmental effects of energy systems and power generating systems of the future. Other sections tackle fundamental topics such as thermal power, nuclear energy, bioenergy, hydropower, challenges and risks to sustainable options, and emerging technologies that support global power trends. Sustainable Power Generation explores the future of sustainable electricity generation, highlighting topics such as energy justice, emerging competences, and major transitions that need to be navigated. This is an ideal reference for researchers, engineers, and other technical specialists working in the energy sector, as well as environmental specialists and policy makers.

Thermal Power Plant Simulation and Control Springer Science & Business Media

This book is intended to meet the requirements of the fresh engineers on the field to endow them with indispensable information, technical know-how to work in the power plant industries and its associated plants. The book provides a thorough understanding and the operating principles to solve the elementary and the difficult problems faced by the modern young engineers while working in the industries. This book is written on the basis of 'hands-on' experience, sound and in-depth knowledge gained by the authors during their experiences faced while working in this field. The problem generally occurs in the power plants during operation and maintenance. It has been explained in a lucid language.

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