

Power Plant Engineering Third Edition

One of the most critical requirements for safe and reliable nuclear power plant operations is the availability of competent maintenance personnel. However, just as the nuclear power industry is experiencing a renaissance, it is also experiencing an exodus of seasoned maintenance professionals due to retirement. The perfect guide for engineers just entering the field or experienced maintenance supervisors who need to keep abreast of the latest industry best practices, Nuclear Power Plant Maintenance: Mechanical Systems, Equipment and Safety covers the most common issues faced in day-

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to-day operations and provides practical, technically proven solutions. The book also explains how to navigate the various maintenance codes, standards and regulations for the nuclear power industry. Discusses 50 common issues faced by engineers in the nuclear power plant field Provides advice for complying with international codes and standards (including ASME) Describes safety classification for systems and components Includes case studies to clearly explain the lessons learned over decades in the nuclear power industry This book offers professionals working at power plants guidelines and best practices for vibration problems, in order to help them identify the respective problem, grasp it, and successfully solve it. The book

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provides very little theoretical information (which is readily available in the existing literature) and doesn't assume that readers have an extensive mathematical background; rather, it presents a range of well-documented, real-world case studies and examples drawn from the authors' 50 years of experience at jobsites. Vibration problems don't crop up very often, thanks to good maintenance and support, but if and when they do, most power plants have very little experience in assessing and solving them. Accordingly, the case studies discussed here will equip power plant engineers to quickly evaluate the vibration problem at hand (by deciding whether the machine is at risk or can continue operating) and find a practical solution.

This title provides a reference on

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technical and economic factors of combined-cycle applications within the utility and cogeneration markets.

Kehlhofer - and his co-authors give the reader tips on system layout, details on controls and automation, and operating instructions.

Thermal Power Plant: Design and Operation deals with various aspects of a thermal power plant, providing a new dimension to the subject, with focus on operating practices and troubleshooting, as well as technology and design. Its author has a 40-long association with thermal power plants in design as well as field engineering, sharing his experience with professional engineers under various training capacities, such as training programs for graduate engineers and operating personnel. Thermal Power Plant presents practical content on

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coal-, gas-, oil-, peat- and biomass-fueled thermal power plants, with chapters in steam power plant systems, start up and shut down, and interlock and protection. Its practical approach is ideal for engineering professionals. Focuses exclusively on thermal power, addressing some new frontiers specific to thermal plants Presents both technology and design aspects of thermal power plants, with special treatment on plant operating practices and troubleshooting Features a practical approach ideal for professionals, but can also be used to complement undergraduate and graduate studies

Coal Power Plant Materials and Life Assessment

**PRACTICAL BOILER OPERATION
ENGINEERING AND POWER PLANT,
FOURTH EDITION**

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*Scheduling and Operation of Virtual
Power Plants*

*Design and Operability of Mechanical
Systems, Equipment and Supporting
Structures*

*Nuclear Corrosion Science and
Engineering*

*This book provides a history of
emergency planning with respect to
nuclear power plant accidents from the
1950's to the 2000's. It gives an overview
of essential concepts that a working
emergency planner should know,
including brief overviews of the health
physics and plant engineering that
applies to emergency planning. Each
chapter covers topics unique to
radiological planning that distinguish it
from planning for natural disasters.
Some of the topics include processes that
damage fuel, reactor source terms, basic*

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dispersion theory, protective measures for the public and emergency worker, environmental surveys, and the essential elements of a drill and exercise program. Emergency Planning for Nuclear Power Plants is not intended as a guide to meeting regulatory requirements but provides an understanding of the essential concepts and language of radiological planning, so the planner can apply those concepts to their particular situation.

Practical Power Plant Engineering offers engineers, new to the profession, a guide to the methods of practical design, equipment selection and operation of power and heavy industrial plants as practiced by experienced engineers. The author—a noted expert on the topic—draws on decades of

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practical experience working in a number of industries with ever-changing technologies. This comprehensive book, written in 26 chapters, covers the electrical activities from plant design, development to commissioning. It is filled with descriptive examples, brief equipment data sheets, relay protection, engineering calculations, illustrations, and common-sense engineering approaches. The book explores the most relevant topics and reviews the industry standards and established engineering practices. For example, the author leads the reader through the application of MV switchgear, MV controllers, MCCs and distribution lines in building plant power distribution systems, including calculations of interrupting duty for breakers and contactors. The text also

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contains useful information on the various types of concentrated and photovoltaic solar plants as well as wind farms with DFIG turbines. This important book:

- *Explains why and how to select the proper ratings for electrical equipment for specific applications*
- *Includes information on the critical requirements for designing power systems to meet the performance requirements*
- *Presents tests of the electrical equipment that prove it is built to the required standards and will meet plant-specific operating requirements*

Written for both professional engineers early in their career and experienced engineers, Practical Power Plant Engineering is a must-have resource that offers the information needed to apply the concepts of power plant engineering

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in the real world.

Nuclear Power Plant Design and Analysis Codes: Development, Validation, and Application presents the latest research on the most widely used nuclear codes and the wealth of successful accomplishments which have been achieved over the past decades by experts in the field. Editors Wang, Li, Allison, and Hohorst and their team of authors provide readers with a comprehensive understanding of nuclear code development and how to apply it to their work and research to make their energy production more flexible, economical, reliable and safe. Written in an accessible and practical way, each chapter considers strengths and limitations, data availability needs, verification and validation

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methodologies and quality assurance guidelines to develop thorough and robust models and simulation tools both inside and outside a nuclear setting. This book benefits those working in nuclear reactor physics and thermal-hydraulics, as well as those involved in nuclear reactor licensing. It also provides early career researchers with a solid understanding of fundamental knowledge of mainstream nuclear modelling codes, as well as the more experienced engineers seeking advanced information on the best solutions to suit their needs. Captures important research conducted over last few decades by experts and allows new researchers and professionals to learn from the work of their predecessors Presents the most recent updates and developments,

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including the capabilities, limitations, and future development needs of all codes Includes applications for each code to ensure readers have complete knowledge to apply to their own setting.

Thermodynamic Analysis and Optimization of Geothermal Power Plants guides researchers and engineers on the analysis and optimization of geothermal power plants through conventional and innovative methods.

Coverage encompasses the fundamentals, thermodynamic analysis, and optimization of geothermal power plants. Advanced thermodynamic analysis tools such as exergy analysis, thermoeconomic analysis, and several thermodynamic optimization methods are covered in-depth for different configurations of geothermal power

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plants through case studies.

Interdisciplinary research with relevant economic and environmental dimensions are addressed in many of the studies, along with optimization studies aimed at better efficiency, lower cost and lower environmental impact. Addresses the complexities of thermodynamic assessment in almost all operational plant configurations, including solar-geothermal and multi-generation power plants Includes an exemplary range of case studies, from basic to integrated Provides modern optimization methods, including entropy-based, exergoeconomic, artificial neural networks and multi-objective particle swarm Covers environmental impact considerations and integration with renewable energy systems

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*Standard Handbook of Plant
Engineering*

*Best Practices, Tools, and Case Studies
Powerplant Technology*

Practical Power Plant Engineering

Advanced Power Plant Materials,

Design and Technology

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

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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

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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

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Analysis a key resource for undergraduate and postgraduate students in mechanical and nuclear engineering.

Our lives and the functioning of modern societies are intimately intertwined with electricity consumption. We owe our quality of life to electricity. However, the electricity generation industry is partly responsible for some of the most pressing challenges we currently face, including climate change and the pollution of natural environments,

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energy inequality, and energy insecurity.

Maintaining our standard of living while addressing these problems is the ultimate challenge for the future of humanity. The objective of this book is to equip engineering and science students and professionals to tackle this task. Written by an expert with over 25 years of combined academic and industrial experience in the field, this comprehensive textbook covers both fossil fuels and renewable power generation technologies.

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For each topic, fundamental principles, historical backgrounds, and state-of-the-art technologies are covered. Conventional power production technologies, steam power plants, gas turbines, and combined cycle power plants are presented. For steam power plants, the historical background, thermodynamic principles, steam generators, combustion systems, emission reduction technologies, steam turbines, condensate-feedwater systems, and cooling systems are

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covered in separate chapters. Similarly, the historical background and thermodynamic principles of gas turbines, along with comprehensive discussions on compressors, combustors, and turbines, are presented and then followed with combined cycle power plants. The second half of the book deals with renewable energy sources, including solar photovoltaic systems, solar thermal power plants, wind turbines, ocean energy systems, and geothermal

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power plants. For each energy source, the available energy and its variations, historical background, operational principles, basic calculations, current and future technologies, and environmental impacts are presented. Finally, energy storage systems as required technologies to address the intermittent nature of renewable energy sources are covered. While the book has been written with the needs of undergraduate and graduate college students in mind, professionals interested

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in widening their understanding of the field can also benefit from it. This book describes the history and development of marine power plant. Problems of arrangement, general construction and parameters of marine power plants of all types are considered. It also introduces different characteristics of each type of marine power plant, matching characteristic for diesel propulsion. The book gives a clear idea about different marine power engines, including working

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principle, structure and application. Readers will understand easily the power system for ships since there are a lot of illustrations and instructions for each of the equipment. This book is useful for students majoring in "marine engineering", "energy and power engineering" and other related majors. It is also useful for operators of marine institution for learning main design and operation of ship plants.

"Modular High-temperature Gas-cooled Reactor Power

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Plant" introduces the power plants driven by modular high temperature gas-cooled reactors (HTR), which are characterized by their inherent safety features and high output temperatures. HTRs have the potential to be adopted near demand side to supply both electricity and process heat, directly replacing conventional fossil fuels. The world is confronted with two dilemmas in the energy sector, namely climate change and energy supply security. HTRs have the potential to significantly

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alleviate these concerns. This book will provide readers with a thorough understanding of HTRs, their history, principles, and fields of application. The book is intended for researchers and engineers involved with nuclear engineering and energy technology.

Thermodynamic Analysis and
Optimization of Geothermal
Power Plants
Developments and
Applications
Combined-cycle Gas & Steam
Turbine Power Plants
Thermal Power Plant
Performance Analysis

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Emergency Planning for
Nuclear Power Plants

Ron DiPippo, Professor Emeritus at the University of Massachusetts Dartmouth, is a world-regarded geothermal expert. This single resource covers all aspects of the utilization of geothermal energy for power generation from fundamental scientific and engineering principles. The thermodynamic basis for the design of geothermal power plants is at the heart of the book and readers are clearly guided on the process of designing and analysing the key types of geothermal energy conversion systems. Its practical emphasis is enhanced by the use of case studies from real plants that increase the reader's understanding of geothermal energy conversion and provide a unique compilation of hard-to-obtain data and experience. An important new chapter covers Environmental Impact and

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*Abatement Technologies, including gaseous and solid emissions; water, noise and thermal pollutions; land usage; disturbance of natural hydrothermal manifestations, habitats and vegetation; minimisation of CO₂ emissions and environmental impact assessment. The book is illustrated with over 240 photographs and drawings. Nine chapters include practice problems, with solutions, which enable the book to be used as a course text. Also includes a definitive worldwide compilation of every geothermal power plant that has operated, unit by unit, plus a concise primer on the applicable thermodynamics. * Engineering principles are at the heart of the book, with complete coverage of the thermodynamic basis for the design of geothermal power systems * Practical applications are backed up by an*

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*extensive selection of case studies that show how geothermal energy conversion systems have been designed, applied and exploited in practice * World renowned geothermal expert DiPippo has including a new chapter on Environmental Impact and Abatement Technology in this new edition*

This book provides a reference to analysis techniques of common cooling water system problems and a historical perspective on solutions to chronic cooling water system problems, such as corrosion and biofouling. It covers best design practices for cooling water systems that are required to support the operation of all electric power plants. Plant engineers will gain better understanding of the practical issues associated with their cooling water systems and new designs or modifications of their systems should consider the

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actual challenges to the systems. The book is intended for graduate students and practicing engineers working in both nuclear and fossil power plants and industrial facilities that use large amounts of cooling water.

The fourth edition of the book is richer in contents presenting updated information on the fundamental aspects of various processes related to thermal power plants. The major thrust in the book is given on the hands-on procedure to deal with the normal and emergency situations during plant operation. Beginning from the fundamentals, the book, explores the vast concepts of boilers, steam turbines and other auxiliary systems. Following a simple text format and easy-to-grasp language, the book explicates various real-life situation-related topics involving operation, commissioning, maintenance, electrical and instrumentation of a power

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plant. NEW TO THE FOURTH EDITION • The text now incorporates a new chapter on Environmental and Safety Aspects of Thermal Power Plants. • New sections on Softener, Water Treatment of Supercritical Boiler, Wet Mode and Dry Mode Operation of Supercritical Boiler, Electromatic Pressure Relief Valve, Pressure Reducing and Desuperheating (PRDS) System, Orsat Apparatus, and Safety Interlocks and Auto Control Logics in Boiler have been added in related chapters. • Several sections have been updated to provide the reader with the latest information. • A new appendix on Important Information on Power Generation has been incorporated into the text. Dealing with all the latest coverage, the book is written to address the requirements of the undergraduate students of power plant engineering. Besides this, the text would

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also cater to the needs of those candidates who are preparing for Boiler Operation Engineers (BOE) Examination and the undergraduate/postgraduate students who are pursuing courses in various power training institutes. The book will also be of immense use to the students of postgraduate diploma course in thermal power plant engineering. KEY FEATURES

- *Covers almost all the functional areas of thermal power plants in its systematically arranged topics.*
- *Incorporates more than 500 self-test questions in chapter-end exercises to test the student's grasp of the fundamental concepts and BOE Examination preparation.*
- *Involves numerous well-labelled diagrams throughout the book leading to easy learning.*
- *Provides several solved numerical problems that generally arise during the functioning of*

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thermal power plants.

Nuclear Power Plant Development covers the intricacies of developing a nuclear power plant project from a construction and legal standpoint. It deals with structuring, drafting, and negotiating a wide range of standard and specialised contracts relating to the development of nuclear power-generation projects and also covers the other forms of power-generating facilities. It covers the forms of contract, the law involved internationally, and potential areas of pitfalls and how to avoid them in a systematic format covering various forms of projects. It is suitable for solicitors and barristers involved in the contracting for such facilities and the handling of litigation related to them, government officials involved in the commissioning and development of nuclear facilities for regional governments, and engineers and

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contractors involved in the actual work of design and contract administration and dispute resolution.

Combined Cycle Systems for Near-Zero Emission Power Generation

Nuclear Power Plant Development

Modular High-temperature Gas-cooled Reactor Power Plant

A Text Book of Power Plant Engineering

Nuclear Power Plant Safety and Mechanical Integrity

In the Standard Handbook of Plant Engineering, Second Edition, Robert C. Rosaler and 70 other industry experts take you on an exhaustive tour of the basic plant facility, plant operation equipment and the all-important maintenance function-giving you the hands-on skill and essential technical data you need to keep your plant running smoothly. You get

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complete, up-to-the-minute details on: In-plant prime power generation and cogeneration; Heating, ventilating and air conditioning; Water sources, use and disposition; Mechanical power transmission; Instrumentation and automatic control; Pollution control and waste disposal; Plant safety and sanitation; Energy conservation; Lubricants and lubrication systems. Fossil-fuel power plants account for the majority of worldwide power generation. Increasing global energy demands, coupled with issues of ageing and inefficient power plants, have led to new power plant construction programmes. As cheaper fossil fuel resources are exhausted and emissions criteria are tightened, utilities are turning to power plants

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designed with performance in mind to satisfy requirements for improved capacity, efficiency, and environmental characteristics. Advanced power plant materials, design and technology provides a comprehensive reference on the state of the art of gas-fired and coal-fired power plants, their major components and performance improvement options. Part one critically reviews advanced power plant designs which target both higher efficiency and flexible operation, including reviews of combined cycle technology and materials performance issues. Part two reviews major plant components for improved operation, including advanced membrane technology for both hydrogen (H₂) and carbon dioxide

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(CO₂) separation, as well as flue gas handling technologies for improved emissions control of sulphur oxides (SO_x), nitrogen oxides (NO_x), mercury, ash and particulates. The section concludes with coverage of high-temperature sensors, and monitoring and control technology that are essential to power plant operation and performance optimisation. Part three begins with coverage of low-rank coal upgrading and biomass resource utilisation for improved power plant fuel flexibility. Routes to improve the environmental impact are also reviewed, with chapters detailing the integration of underground coal gasification and the application of carbon dioxide (CO₂) capture and storage. Finally, improved generation performance

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is reviewed with coverage of syngas and hydrogen (H₂) production from fossil-fuel feedstocks. With its distinguished international team of contributors, *Advanced power plant materials, design and technology* is a standard reference for all power plant engineers and operators, as well as to academics and researchers in this field. Provides a comprehensive reference on the state-of-the-art gas-fired and coal-fired power plants, their major components and performance improvement options Examines major plant components for improved operation as well as flue gas handling technologies for improved emissions control Routes to improve environmental impact are discussed with chapters

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detailing the integration of underground coal gasification Scheduling and Operation of Virtual Power Plants: Technical Challenges and Electricity Markets provides a multidisciplinary perspective on recent advances in VPPs, ranging from required infrastructures and planning to operation and control. The work details the required components in a virtual power plant, including smartness of power system, instrument and information and communication technologies (ICTs), measurement units, and distributed energy sources. Contributors assess the proposed benefits of virtual power plant in solving problems of distributed energy sources in integrating the small, distributed and intermittent output of these units. In addition,

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they investigate the likely technical challenges regarding control and interaction with other entities.

Finally, the work considers the role of VPPs in electricity markets, showing how distributed energy resources and demand response providers can integrate their resources through virtual power plant concepts to effectively participate in electricity markets to solve the issues of small capacity and intermittency. The work is suitable for experienced engineers, researchers, managers and policymakers interested in using VPPs in future smart grids.

Explores key enabling technologies and infrastructures for virtual power plants in future smart energy systems Reviews technical challenges and introduces

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solutions to the operation and control of VPPs, particularly focusing on control and interaction with other power system entities. Introduces the key integrating role of VPPs in enabling DER powered participative electricity markets. 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

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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

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various aspects of power plant engineering. The chapter-end questions are intended to provide the students with a thorough reinforcement of the concepts discussed.

Technical Challenges and
Electricity Markets
Pre-Operational Activities

Thermal Power Plant
Materials for Ultra-Supercritical and
Advanced Ultra-Supercritical Power
Plants

This book provides a hybrid approach to fault detection and diagnostics. It presents a detailed analysis related to practical applications of the fault detection and diagnostics framework, and highlights

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recent findings on power plant nonlinear model identification and fault diagnostics. The effectiveness of the methods presented is tested using data acquired from actual cogeneration and cooling plants (CCPs). The models presented were developed by applying Neuro-Fuzzy (NF) methods. The book offers a valuable resource for researchers and practicing engineers alike.

Publisher Description

Desalination in Nuclear Power Plants presents the latest research on a variety of nuclear desalination techniques for different nuclear reactor

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systems; it includes also several aspects regarding competitiveness, sustainability, safety, and licensing process. Authors Alonso, del Valle, and Ramirez explore the possibilities of the cogeneration of water and electricity using a nuclear reactor. This book consolidates the latest research to provide readers with a clear understanding of the advantages and disadvantages of the thermal, membrane, and hybrid desalination processes, along with a comprehensive methodology to guide the reader on how to perform levelized cost analyses for

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water and electricity. The conditions for the coupling of nuclear reactors and desalination plants are presented, and techniques to maximize water and energy production and to reduce their corresponding costs are provided. Mathematical modeling techniques for different components of the power plant are also included based on mass and energy state equations, as well as different steam currents alternatives for coupling along with a proposed method for their evaluation. This book makes intelligible the wide range of electricity

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generating technologies available today, as well as some closely allied technologies such as energy storage. The book opens by setting the many power generation technologies in the context of global energy consumption, the development of the electricity generation industry and the economics involved in this sector. A series of chapters are each devoted to assessing the environmental and economic impact of a single technology, including conventional technologies, nuclear and renewable (such as solar, wind and hydropower). The technologies are presented

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in an easily digestible form. Different power generation technologies have different greenhouse gas emissions and the link between greenhouse gases and global warming is a highly topical environmental and political issue. With developed nations worldwide looking to reduce their emissions of carbon dioxide, it is becoming increasingly important to explore the effectiveness of a mix of energy generation technologies. *Power Generation Technologies* gives a clear, unbiased review and comparison of the different types of power generation

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technologies available. In the light of the Kyoto protocol and OSPAR updates, Power Generation Technologies will provide an invaluable reference text for power generation planners, facility managers, consultants, policy makers and economists, as well as students and lecturers of related Engineering courses. · Provides a unique comparison of a wide range of power generation technologies - conventional, nuclear and renewable · Describes the workings and environmental impact of each technology · Evaluates the economic viability of each

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different power generation
system

A Hybrid Approach for Power
Plant Fault Diagnostics

Marine Power Plant

Steam & Diesel Power Plant

Operators Exams

Vibrations of Power Plant

Machines

A Guide for Recognition of
Problems and Troubleshooting

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

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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.

Coal- and gas-based power plants currently supply the largest proportion of the world's power generation capacity, and are required to operate to increasingly stringent environmental standards. Higher temperature combustion is

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therefore being adopted to improve plant efficiency and to maintain net power output given the energy penalty that integration of advanced emissions control systems cause. However, such operating regimes also serve to intensify degradation mechanisms within power plant systems, potentially affecting their reliability and lifespan. Power plant life management and performance improvement critically reviews the fundamental degradation mechanisms that affect conventional power plant systems and components, as well as examining the operation and maintenance approaches and advanced plant rejuvenation and retrofit options that the industry are applying to ensure

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overall plant performance improvement and life management. Part one initially reviews plant operation issues, including fuel flexibility, condition monitoring and performance assessment. Parts two, three and four focus on coal boiler plant, gas turbine plant, and steam boiler and turbine plant respectively, reviewing environmental degradation mechanisms affecting plant components and their mitigation via advances in materials selection and life management approaches, such as repair, refurbishment and upgrade. Finally, part five reviews issues relevant to the performance management and improvement of advanced heat exchangers and power plant welds.

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With its distinguished editor and international team of contributors, Power plant life management and performance improvement is an essential reference for power plant operators, industrial engineers and metallurgists, and researchers interested in this important field. Provides an overview of the improvements to plant efficiency in coal- and gas-based power plants Critically reviews the fundamental degradation mechanisms that affect conventional power plant systems and components, noting mitigation routes alongside monitoring and assessment methods Addresses plant operation issues including fuel flexibility, condition monitoring and performance assessment

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POWER PLANT

ENGINEERING PHI Learning Pvt.
Ltd.

This text is designed for courses in powerplant technology, powerplant engineering, and energy conversion offered in departments of mechanical engineering and nuclear engineering. It is also suitable as a supplement to courses in energy analysis offered in mechanical or nuclear engineering departments or energy analysis programs. It covers fossil, nuclear and renewable-energy powerplants with equal emphasis, giving students a complete and detailed understanding of the entire spectrum of power generation systems.

Geothermal Power Plants

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Airframe and Powerplant Mechanics

Powerplant Handbook

An Introduction to Thermal Power

Plant Engineering and Operation

Standard Handbook of Powerplant

Engineering

A Guide for Early Career Engineers

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

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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

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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. Machine Learning and Data Science in the Power Generation Industry explores current best practices and quantifies the value-add in developing data-oriented computational programs in the power industry, with a particular focus on thoughtfully chosen real-world case studies. It provides a set of realistic pathways for organizations seeking to develop machine learning methods, with a discussion on data selection and curation as well as organizational implementation in terms of staffing and continuing operationalization.

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It articulates a body of case study–driven best practices, including renewable energy sources, the smart grid, and the finances around spot markets, and forecasting. Provides best practices on how to design and set up ML projects in power systems, including all nontechnological aspects necessary to be successful. Explores implementation pathways, explaining key ML algorithms and approaches as well as the choices that must be made, how to make them, what outcomes may be expected, and how the data must be prepared for them. Determines the specific data needs for the collection, processing, and operationalization of data within machine learning algorithms for power systems. Accompanied by

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numerous supporting real-world case studies, providing practical evidence of both best practices and potential pitfalls

Corrosion of nuclear materials, i.e. the interaction between these materials and their environments, is a major issue for plant safety as well as for operation and economic competitiveness. Understanding these corrosion mechanisms, the systems and materials they affect, and the methods to accurately measure their incidence is of critical importance to the nuclear industry. Combining assessment techniques and analytical models into this understanding allows operators to predict the service life of corrosion-affected nuclear plant materials, and to apply the most appropriate maintenance and

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mitigation options to ensure safe long term operation. This book critically reviews the fundamental corrosion mechanisms that affect nuclear power plants and facilities. Initial sections introduce the complex field of nuclear corrosion science, with detailed chapters on the different types of both aqueous and non aqueous corrosion mechanisms and the nuclear materials susceptible to attack from them. This is complemented by reviews of monitoring and control methodologies, as well as modelling and lifetime prediction approaches. Given that corrosion is an applied science, the final sections review corrosion issues across the range of current and next-generation nuclear reactors, and across such nuclear

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applications as fuel reprocessing facilities, radioactive waste storage and geological disposal systems. With its distinguished editor and international team of expert contributors, Nuclear corrosion science and engineering is an invaluable reference for nuclear metallurgists, materials scientists and engineers, as well as nuclear facility operators, regulators and consultants, and researchers and academics in this field. Comprehensively reviews the fundamental corrosion mechanisms that affect nuclear power plants and facilities Chapters assess different types of both aqueous and non aqueous corrosion mechanisms and the nuclear materials susceptible to attack from them Considers

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monitoring and control methodologies, as well as modelling and lifetime prediction approaches

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#

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**Gives Latest Information S In
Power Plant Engineering# Include
Large Number Of Problems Of Both
Indian And Foreign Universities#
Rich Contents, Lucid Manner**

**Power Plant Engineering
Engineering of Power Plant and
Industrial Cooling Water Systems
For Power Plant Professionals
POWER PLANT ENGINEERING**

Design and Operation

***Combined cycle power plants
are one of the most promising
ways of improving fossil-fuel
and biomass energy
production. The combination
of a gas and steam turbine
working in tandem to produce
power makes this type of
plant highly efficient and
allows for CO2 capture and
sequestration before***

combustion. This book provides a comprehensive review of the design, engineering and operational issues of a range of advanced combined cycle plants. After introductory chapters on basic combined cycle power plant and advanced gas turbine design, the book reviews the main types of combined cycle system. Chapters discuss the technology, efficiency and emissions performance of natural gas-fired combined cycle (NGCC) and integrated gasification combined cycle (IGCC) as well as novel humid air cycle, oxy-combustion turbine cycle systems. The book also reviews pressurised

fluidized bed combustion (PFBC), externally fired combined cycle (EFCC), hybrid fuel cell turbine (FC/GT), combined cycle and integrated solar combined cycle (ISCC) systems. The final chapter reviews techno-economic analysis of combined cycle systems. With its distinguished editor and international team of contributors, Combined cycle systems for near-zero emission power generation is a standard reference for both industry practitioners and academic researchers seeking to improve the efficiency and environmental impact of power plants. Provides a comprehensive review of the

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design, engineering and operational issues of a range of advanced combined cycle plants Introduces basic combined cycle power plant and advanced gas turbine design and reviews the main types of combined cycle systems Discusses the technology, efficiency and emissions performance of natural gas-fired combined cycle (NGCC) systems and integrated gasification combined cycle (IGCC) systems, as well as novel humid air cycle systems and oxy-combustion turbine cycle systems
A bestselling book since 1981, "Steam & Diesel" gives the answers to the oraland

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**written exams. (Study Guides)
Due to their continuing role in
electricity generation, it is
important that coal power
plants operate as efficiently
and cleanly as possible. Coal
Power Plant Materials and
Life Assessment reviews the
materials used in coal plants,
and how they can be assessed
and managed to optimize
plant operation. Part I
considers the structural alloys
used in coal plants. Part II
then reviews performance
modelling and life assessment
techniques, explains the
inspection and life-
management approaches that
can be adopted to optimize
long term plant operation,
and considers the technical**

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and economic issues involved in meeting variable energy demands. Summarizes key research on coal-fired power plant materials, their behavior under operational loads, and approaches to life assessment and defect management Details the range of structural alloys used in coal power plants, and the life assessment techniques applicable to defect-free components under operational loads Reviews the life assessment techniques applicable to components containing defects and the approaches that can be adopted to optimize plant operation and new plant and component design

Thermal Power Plants: Pre-Operational Activities covers practical information that can be used as a handy reference by utility operators and professionals working in new and existing plants, including those that are undergoing refurbishments and those that have been shut for long periods of time. It is fully comprehensive, including chapters on flushing boiler systems, various methods of testing steam generators, and the drying out of generators. This book will be invaluable for anyone working on the startup, commissioning, and operation of thermal power plants. It is also a great companion book to Sarkar's

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Thermal Power Plant: Design and Operation. Sarkar has worked with thermal power plants for over 40 years, bringing his experience in design and operations to help new and experienced practicing engineers perform effective pre-operational activities. Consolidates all pre-operational aspects of thermal power plants Explains how to handle equipment safely and work efficiently Provides guidance for new and existing power plants to help reduce outage time and save on budgets Power Plant Life Management and Performance Improvement Development, Validation, and

Application

***Contract Issues, Claims and
Disputes***

***Desalination in Nuclear Power
Plants***

***Nuclear Power Plant Design
and Analysis Codes***

Materials for Ultra-Supercritical and Advanced Ultra-Supercritical Power Plants provides researchers in academia and industry with an essential overview of the stronger high-temperature materials required for key process components, such as membrane wall tubes, high-pressure steam piping and headers, superheater tubes, forged rotors, cast components, and bolting and blading for steam turbines in USC power plants. Advanced materials for future advanced ultra-supercritical power plants, such as

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superalloys, new martensitic and austenitic steels, are also addressed. Chapters on international research directions complete the volume. The transition from conventional subcritical to supercritical thermal power plants greatly increased power generation efficiency. Now the introductions of the ultra-supercritical (USC) and, in the near future, advanced ultra-supercritical (A-USC) designs are further efforts to reduce fossil fuel consumption in power plants and the associated carbon dioxide emissions. The higher operating temperatures and pressures found in these new plant types, however, necessitate the use of advanced materials. Provides researchers in academia and industry with an authoritative and systematic

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overview of the stronger high-temperature materials required for both ultra-supercritical and advanced ultra-supercritical power plants Covers materials for critical components in ultra-supercritical power plants, such as boilers, rotors, and turbine blades

Addresses advanced materials for future advanced ultra-supercritical power plants, such as superalloys, new martensitic and austenitic steels Includes chapters on technologies for welding technologies

Power Generation Technologies
Machine Learning and Data Science
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