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*Spend Analysis and Specification Development Using Failure Interpretation
Crane Gear Failure Analysis - Case Study, Observations, Lessons Learned, Recommendations
Applied Engineering Failure Analysis Principles and Applications of Tribology
Mechanical Design CRC Handbook of Lubrication
Dudley's Handbook of Practical Gear Design and Manufacture, Second Edition
Appearance of Gear Teeth Machinery Failure Analysis and Troubleshooting
Mechanical Engineering Gear Materials, Properties, and Manufacture
Second International Conference on Gearbox Noise, Vibration and Diagnostics
Friction, Wear, Lubrication Systematic Analysis of Gear Failures
Nomenclature of Gear Tooth Failure Modes Fundamentals of Gear Design
Using Dynamic Analysis for Compact Gear Design Gear Drive Systems
Fuels and Lubricants Handbook Failure Analysis Modal Failure Analysis of a Gear and Drive Ring Assembly
Introduction to Tribology Developments in Lubricant Technology The Art of Gear Fabrication
Handbook of Hydraulic Fluid Technology Failure Analysis in Engineering Applications AGMA Standard
Development of a Full-scale Transmission Testing Procedure to Evaluate Advanced Lubricants
Standard Handbook of Plant Engineering Practical Machinery Management for Process Plants: Volume 2
Practical Plant Failure Analysis Introduction to SolidWorks Major Process Equipment Maintenance and Repair
Practical Plant Failure Analysis Mechanical Design of Machine Elements and Machines Machinery Failure Analysis Handbook
Handbook of Practical Gear Design Hydraulic Failure Analysis Fundamentals of Machine Elements, Third Edition
Offshore Wind Energy Technology*

For more than 30 years the book Practical Gear Design, later re-titled Handbook of Practical Gear Design, has been the leading engineering guide and reference on the subject. It is now available again in its most recent edition. The book is a detailed, practical guide and reference to gear technology. The design of all types of gears is covered, from those for small mechanisms to large industrial applications. The presentation is designed for easy reference for those involved in practical gear design, manufacture, applications and problem solving. The text is well illustrated with clear diagrams and photographs. The many tables provide

needed reference data in convenient form. A unique, single source reference for all aspects of gears, Dudley's Handbook of Practical Gear Design and Manufacture, Second Edition provides comprehensive and consistent information on the design and manufacture of gears for the expert and novice alike. The second edition of this industry standard boasts seven new chapters and appendices as well as a wealth of updates throughout. New chapters and expanded topics include: Gear Types and Nomenclature, Gear Tooth Design, Gear Reactions and Mountings, Gear Vibration, The Evolution of the Gear Art, Novikov Gearing and the Inadequacy of the Term, and thoroughly referenced Numerical Data Tables. Features: Offers a single-source reference for all aspects of the gear industry Presents a comprehensive and self-consistent collection of knowledge, practical methods, and numerical tables Discusses optimal design and manufacture of gears of all known designs for the needs of all industries Explains concepts in accessible language and with a logical organization, making it simple to use even by beginners in the field Provides adequate recommendations for gear practitioners in all areas of gear design, production, inspection, and application Includes practical examples of successful use of tools covered in the Handbook ? Logically organized and easily understood, the Handbook requires only a limited knowledge of mathematics for adequate application to almost any situation or question. Whether you are a high-volume gear manufacturer or a relatively small factory, the Handbook and some basic common sense can direct the sophisticated design of any type of gear, from the selection of appropriate material, production of gear blanks, cutting gear teeth, advanced methods of heat treatment, and gear inspection. No other sources of information are necessary for the gear designer or manufacturer once they have the Handbook. The book substantially offers the latest progresses about the important topics of the "Mechanical Engineering" to readers. It includes twenty-eight excellent studies prepared using state-of-art methodologies by professional researchers from different countries. The sections in the book comprise of the following titles: power transmission system, manufacturing processes and system analysis, thermo-fluid systems, simulations and computer applications, and new approaches in mechanical engineering education and organization systems. Understanding why and how failures occur is critical to failure prevention, because even the slightest breakdown can lead to catastrophic loss of life and asset as well as widespread pollution. This book helps anyone involved

with machinery reliability, whether in the design of new plants or the maintenance and operation of existing ones, to understand why process equipment fails and thereby prevent similar failures. This is a practical guide for those who do the work of maintaining and improving the reliability of mechanical machinery. It is for engineers and skilled trades personnel who want to understand how failures happen and how the physical causes of the great majority can be readily diagnosed in the field. It explains the four major failure mechanisms, wear, corrosion, overload, and fatigue and, using easy-to-read charts, how they can be diagnosed at the site of the failure. Then, knowing the physical failure mechanics involved, the reader can accurately solve the human causes. To improve the reader's understanding, all the diagrams and most of the tables have been redrawn. The number of actual failure examples has been increased, plus the last chapter on miscellaneous machine elements includes new material on couplings, universal joints, and plain bearings. Features A practical field guide showing how to recognize how failures occur that can be used to solve more than 85% of mechanical machinery failures Incorporates multiple easy-to-follow logic trees to help the reader diagnose the physical causes of the failure without needing detailed laboratory analysis Explains how the mechanics, corrosion, materials science, and tribology of components can fit together to improve machinery reliability Includes more than 150 completely redrawn charts and tables, plus almost 250 actual failure photographs to help guide the reader to an accurate analysis Contains clear and detailed explanations of how lubricants function and the critical roles of corrosion and lubrication play in causing mechanical failures Failure Analysis in Engineering Applications deals with equipment and machine design together with examples of failures and countermeasures to avoid such failures. This book analyzes failures in facilities or structures and the ways to prevent them from happening in the future. The author describes conventional terms associated with failure or states of failure including the strength of materials, as well as the procedure in failure analysis (materials used, design stress, service conditions, simulation, examination of results). The author also describes the mechanism of fatigue failure and prediction methods to estimate the remaining life of affected structures. The author cites some precautions to be followed in actual failure analysis such as detailed observation on the fracture site, removal of surface deposits (for example, rusts) without altering the fracture size or shape, The book gives

examples of analysis of failure involving a crane head sheave hanger, wire rope, transmission shaft, environmental failure of fastening screws, and failures in rail joints. This book is intended for civil and industrial engineers, for technical designers or engineers involved in the maintenance of equipment, machineries, and structures. This updated edition is an invaluable source of practical cost-effective maintenance, repair, installation, and field verification procedures for machinery engineers. It is filled with step-by-step instructions and quick-reference checklists that describe preventive and predictive maintenance for major process units such as vertical, horizontal, reciprocating, and liquid ring vacuum pumps, fans and blowers, compressors, turboexpanders, turbines, and more. Also included are sections on machinery protection, storage, lubrication, and periodic monitoring. A new section examines centrifugal pumps and explains how and why they continue to fail. More new information focuses on maintenance for aircraft derivative gas turbines. This revised edition gives special attention throughout to maintenance and repair procedures needed to ensure efficiency, performance, and long life.

Mechanical Design: Theory and Applications, Third Edition introduces the design and selection of common mechanical engineering components and machine elements, hence providing the foundational "building blocks" engineers needs to practice their art. In this book, readers will learn how to develop detailed mechanical design skills in the areas of bearings, shafts, gears, seals, belt and chain drives, clutches and brakes, and springs and fasteners. Where standard components are available from manufacturers, the steps necessary for their specification and selection are thoroughly developed. Descriptive and illustrative information is used to introduce principles, individual components, and the detailed methods and calculations that are necessary to specify and design or select a component. As well as thorough descriptions of methodologies, this book also provides a wealth of valuable reference information on codes and regulations. Presents new material on key topics, including actuators for robotics, alternative design methodologies, and practical engineering tolerancing Clearly explains best practice for design decision-making Provides end-of-chapter case studies that tie theory and methods together Includes up-to-date references on all standards relevant to mechanical design, including ASNI, ASME, BSI, AGMA, DIN and ISO This handbook covers the general area of lubrication and tribology in all its facets: friction, wear lubricants (liquid, solid, and gas), greases, lubrication principles, applications to

various mechanisms, design principles of devices incorporating lubrication, maintenance, lubrication scheduling, and standardized tests; as well as environmental problems and conservation. The information contained in these two volumes will aid in achieving effective lubrication for control of friction and wear, and is another step to improve understanding of the complex factors involved in tribology. Both metric and English units are provided throughout both volumes. Considering that the biggest machines that do the most work are made up of smaller machines and components, it becomes obvious that when a large machine breaks, it is normally due to small components acting antagonistically. Detailing a time-tested method for increasing productivity and lowering operational costs, Spend Analysis and Specification Development Using Failure Interpretation explains how to establish performance-based procurement specifications for the components, devices, and items that contribute the most to operational downtime and repair/replacement costs. The book emphasizes the critical need to perform both spend and failure analysis in order to develop a procurement document, which will ultimately reduce overall costs. Accompanied by a CD with helpful material such as, specification checklists, case study worksheets, form letters, and return on investment (ROI) worksheets that you can customize to your needs, the text discusses how to: Identify the products that will cost the most if they fail Develop performance-based procurement specifications to reduce direct and indirect costs Examine cost analysis as it relates to operations, maintenance, and production Determine effective criteria based on properties, test results, and standards for each operation Written by an industry expert with decades of experience giving seminars, training customers and associates, and authoring numerous papers and articles, the text provides the real-world understanding of the influential components and materials' physical properties needed to engage in effective failure and spend analysis. It addresses product submission and monitoring and includes helpful tools so you can immediately get started on conducting your own cost-saving analysis.

COMPREHENSIVE REFERENCE TO THE MOST RECENT ADVANCEMENTS IN OFFSHORE WIND TECHNOLOGY *Offshore Wind Energy Technology offers a reference based on the research material developed by the acclaimed Norwegian Research Centre for Offshore Wind Technology (NOWITECH) and material developed by the expert authors over the last 20 years. This comprehensive text covers critical topics such as wind energy conversion systems*

technology, control systems, grid connection and system integration, and novel structures including bottom-fixed and floating. The text also reviews the most current operation and maintenance strategies as well as technologies and design tools for novel offshore wind energy concepts. The text contains a wealth of mathematical derivations, tables, graphs, worked examples, and illustrative case studies. Authoritative and accessible, Offshore Wind Energy Technology: Contains coverage of electricity markets for offshore wind energy and then discusses the challenges posed by the cost and limited opportunities Discusses novel offshore wind turbine structures and floaters Features an analysis of the stochastic dynamics of offshore/marine structures Describes the logistics of planning, designing, building, and connecting an offshore wind farm Written for students and professionals in the field, Offshore Wind Energy Technology is a definitive resource that reviews all facets of offshore wind energy technology and grid connection. Solve the machinery failure problems costing you time and money with this classic, comprehensive guide to analysis and troubleshooting Provides detailed, complete and accurate information on anticipating risk of component failure and avoiding equipment downtime Includes numerous photographs of failed parts to ensure you are familiar with the visual evidence you need to recognize Covers proven approaches to failure definition and offers failure identification and analysis methods that can be applied to virtually all problem situations Demonstrates with examples how the progress and results of failure analysis and troubleshooting efforts can be documented and monitored Failures of machinery in a plant setting can have wide-ranging consequences and in order to stay competitive, corporations across all industries must optimize the efficiency and reliability of their machinery. Machinery Failure Analysis and Troubleshooting is a trusted, established reference in the field, authored by two well-known authorities on failure and reliability. Structured to teach failure identification and analysis methods that can be applied to almost all problem situations, this eagerly awaited update takes in the wealth of technological advances and changes in approach seen since the last edition published more than a decade ago. Covering both the engineering detail and management theory, Machinery Failure Analysis and Troubleshooting provides a robust go-to reference and training resource for all engineers and managers working in manufacturing and process plants. Provides detailed, complete and accurate information on anticipating risk of component failure and avoiding equipment

downtime Presents documented failure case studies and analyzes the procedures employed to define events that led to component or systems failure Includes numerous photographs of failed parts to ensure readers are familiar with the visual evidence they need to recognize This outstanding reference provides the complete range of practical and theoretical information - with over 250 detailed illustrations, figures and tables - needed to design, manufacture and operate reliable, efficient gear drive systems, emphasizing parallel shaft and planetary units with spur and helical gearing. This book addresses the failures of structural elements, i.e. those components whose primary mission is to withstand mechanical loads. The book is intended as a self-contained source for those with different technical grades, engineers and scientists but also technicians in the field can benefit from its reading. All of the critical technical aspects of gear materials technology are addressed in this new reference work. Gear Materials, Properties, and Manufacture is intended for gear metallurgists and materials specialists, manufacturing engineers, lubrication technologists, and analysts concerned with gear failures who seek a better understanding of gear performance and gear life. This volume complements other gear texts that emphasize the design, geometry, and theory of gears. The coverage begins with an overview of the various types of gears used, important gear terminology, applied stresses and strength requirements associated with gears, and lubrication and wear. This is followed by in-depth treatment of metallic (ferrous and nonferrous alloys) and plastic gear materials. Emphasis is on the properties of carburized steels, the material of choice for high-performance power transmission gearing. Detailing the major developments of the last decade, the Handbook of Hydraulic Fluid Technology, Second Edition updates the original and remains the most comprehensive and authoritative book on the subject. With all chapters either revised (in some cases, completely) or expanded to account for new developments, this book sets itself apart by approach. The second edition of a bestseller, this book introduces tribology in a way that builds students' knowledge and understanding. It includes expanded information on topics such as surface characterization as well as recent advances in the field. The book provides additional descriptions of common testing methods, including diagrams and surface texturing for enhanced lubrication, and more information on rolling element bearings. It also explores surface profile characterization and elastic plastic contact mechanics including wavy surface contact, rough surface contact

models, friction and wear plowing models, and thermodynamic analysis of friction. *New and Improved SI Edition—Uses SI Units Exclusively in the Text* *Adapting to the changing nature of the engineering profession, this third edition of Fundamentals of Machine Elements aggressively delves into the fundamentals and design of machine elements with an SI version. This latest edition includes a plethora of pedagogy, providing a greater understanding of theory and design. Significantly Enhanced and Fully Illustrated* *The material has been organized to aid students of all levels in design synthesis and analysis approaches, to provide guidance through design procedures for synthesis issues, and to expose readers to a wide variety of machine elements. Each chapter contains a quote and photograph related to the chapter as well as case studies, examples, design procedures, an abstract, list of symbols and subscripts, recommended readings, a summary of equations, and end-of-chapter problems.* *What's New in the Third Edition:* *Covers life cycle engineering Provides a description of the hardness and common hardness tests Offers an inclusion of flat groove stress concentration factors Adds the staircase method for determining endurance limits and includes Haigh diagrams to show the effects of mean stress Discusses typical surface finishes in machine elements and manufacturing processes used to produce them Presents a new treatment of spline, pin, and retaining ring design, and a new section on the design of shaft couplings Reflects the latest International Standards Organization standards Simplifies the geometry factors for bevel gears Includes a design synthesis approach for worm gears Expands the discussion of fasteners and welds Discusses the importance of the heat affected zone for weld quality Describes the classes of welds and their analysis methods Considers gas springs and wave springs Contains the latest standards and manufacturer's recommendations on belt design, chains, and wire ropes* *The text also expands the appendices to include a wide variety of material properties, geometry factors for fracture analysis, and new summaries of beam deflection.* *Written by a manufacturing professional with extensive worldwide experience, this unique and complete guidebook places emphasis on teaching beginners and advanced planners how to process gears, and will enable manufacturing engineers familiar with machine shop practice to be specialists in the gear manufacturing field. The first few chapters are devoted to common gear nomenclature and analysis of processing of six typical gears, including explanations of the logic and reasoning for every sequence of operation. Subsequent chapters thoroughly describe*

production, selection of materials, heat treatment, plating, methods of cutting, hobbing, shaping, and grinding. Gear designers and entry-level manufacturing and processing engineers in the machine shop field will find this reference extremely helpful and valuable. These are the transactions of the Second International Conference on Gearbox Noise, Vibration and Diagnostics. The conference was held on the 16th and 17th of November 1995 and was organized by the Aerospace, Automobile and Railway divisions of the Institution of Mechanical Engineers. Provides a fundamental understanding of lubricants and lubricant technology including emerging lubricants such as synthetic and environmentally friendly lubricants • Teaches the reader to understand the role of technology involved in the manufacture of lubricants • Details both major industrial oils and automotive oils for various engines • Covers emerging lubricant technology such as synthetic and environmentally friendly lubricants • Discusses lubricant blending technology, storage, re-refining and condition monitoring of lubricant in equipment

A current and comprehensive treatment of tribology theory and applications. A solid understanding of tribology is essential for engineers in many fields working to design and ensure the reliability of machine parts and systems. Principles and Applications of Tribology is the first truly broad-based book on this vital subject. Moving from basic theory to practice, it examines tribology from the integrated viewpoint of mechanical engineering, mechanics, and materials science. It offers detailed coverage of the mechanisms of material wear, friction, and all of the major lubrication techniques--liquids, solids, and gases-- and examines a wide range of both traditional and state-of-the-art applications. Based on the author's extensive research and teaching experience in the areas of tribology, mechanics, and materials science for more than thirty years, this book emphasizes a contemporary knowledge of tribology that includes the emerging field of micro/nanotribology and various industrial applications, including cutting-edge topics such as magnetic information storage devices and microelectromechanical systems. Principles and Applications of Tribology is invaluable for mechanical, chemical, and materials engineers involved in product and process design, as well as graduate students and researchers in these areas. This senior undergraduate level textbook is written for Advanced Manufacturing, Additive Manufacturing, as well as CAD/CAM courses. Its goal is to assist students in colleges and universities, designers, engineers, and professionals interested in using SolidWorks as the design and 3D

printing tool for emerging manufacturing technology for practical applications. This textbook will bring a new dimension to SolidWorks by introducing readers to the role of SolidWorks in the relatively new manufacturing paradigm shift, known as 3D-Printing which is based on Additive Manufacturing (AM) technology. This new textbook: Features modeling of complex parts and surfaces Provides a step-by-step tutorial type approach with pictures showing how to model using SolidWorks Offers a user-Friendly approach for the design of parts, assemblies, and drawings, motion-analysis, and FEA topics Includes clarification of connections between SolidWorks and 3D-Printing based on Additive Manufacturing Discusses a clear presentation of Additive Manufacturing for Designers using SolidWorks CAD software "Introduction to SolidWorks: A Comprehensive Guide with Applications in 3D Printing" is written using a hands-on approach which includes a significant number of pictorial descriptions of the steps that a student should follow to model parts, assemble parts, and produce drawings. Applied Engineering Failure Analysis: Theory and Practice provides a point of reference for engineering failure analysis (EFA) cases, presenting a compilation of case studies covering a 35-year period, from the 1970s to 2012. This period spans the era from the time when slide rules were used routinely for engineering calculations, and when hard-copy photographs taken by film cameras were pasted onto typewritten sheets to make reports, to the present time when all these functions have become much less onerous through computer assistance. The cases are drawn from such diverse fields as mechanical engineering, metallurgy, mining, civil/structural engineering, electrical power systems, and radiation damage; the last two topics are quite scarce in current publications. It includes theoretical content that deals with useful topics in basic theory, material properties, failure mechanisms, EFA methodology, and applications. It provides high-quality illustrations throughout, which greatly helps to promote the understanding of the failure characteristics described. This book offers an integrated approach that serves as a useful first reference in the above topics, for undergraduate and postgraduate students, as well as for practicing engineers. The book provides a hands-on approach to EFA, which helps the user to develop an understanding of potential failure situations, to explore the consequences, and to better understand how to solve similar problems; it also helps users to develop their own techniques for most other engineering failure problems. The authors include a section on technical report

writing, which will assist failure investigators in getting their findings across. They also present simple engineering calculations that may serve as illustrative examples, and typical problems and solutions are included at the end of each chapter. This paper presents procedures for designing compact spur gear sets with the objective of minimizing the gear size. The allowable tooth stress and dynamic response are incorporated in the process to obtain a feasible design region. Various dynamic rating factors were investigated and evaluated. The constraints of contact stress limits and involute interference combined with the tooth bending strength provide the main criteria for this investigation. A three-dimensional design space involving the gear size, diametral pitch, and operating speed was developed to illustrate the optimal design of spur gear pairs. The study performed here indicates that as gears operate over a range of speeds, variations in the dynamic response change the required gear size in a trend that parallels the dynamic factor. The dynamic factors are strongly affected by the system natural frequencies. The peak values of the dynamic factor within the operating speed range significantly influence the optimal gear designs. The refined dynamic factor introduced in this study yields more compact designs than AGMA dynamic factors. Experimental tests were performed on the OH-58A helicopter main-rotor transmission in the NASA Lewis 500-hp Helicopter Transmission Test Stand. The testing was part of a joint Navy/NASA/Army lubrication program to develop a separate lubricant for gearboxes that would improve life and load-carrying capacity. The goal of the experiments was to develop a testing procedure using a MIL-L-23699 base reference oil to fail certain transmission components, and then to run identical tests with improved lubricants and demonstrate improved performance. The tests were directed at failing components that have given the Navy problems because of marginal lubrication. These failures included mast-shaft bearing micropitting, sun gear and planet bearing fatigue, and spiral bevel gear scoring. More than 900 hr of total run time were accumulated for these tests. Some success was achieved in developing a testing procedure to produce sun gear and planet bearing fatigue failures. Only marginal success was achieved in producing mast-shaft bearing micropitting and spiral bevel gear scoring. This newly expanded edition discusses proven approaches to defining causes of machinery failure as well as methods for analyzing and troubleshooting failures. Explores the detailed steps necessary to determine the causes of failure. First, the physical characteristics of a gear are studied: where the stress points

are, from what directions the forces are applied, where the movement of material progresses, and where strain patterns exist. Second, all external conditions and forces are considered. With this background information, a systematic examination is described from beginning to end, the end being a conclusion about the mode and cause of failure. Based on a December 1999 symposium held in Reno, this collection of 41 papers reviews new technologies being developed to address hydraulic wear and failure problems. The main subjects are tribological design, failure analysis, improved materials, seals, and the effects of fluids on hydraulic pump wComponent failures result from a combination of factors involving materials science, mechanics, thermodynamics, corrosion, and tribology. With the right guidance, you don't have to be an authority in all of these areas to become skilled at diagnosing and preventing failures. Based on the author's more than thirty years of experience, *Practical Plant Failure Analysis: A Guide to Understanding Machinery Deterioration and Improving Equipment Reliability* is a down-to-earth guide to improving machinery maintenance and reliability. Illustrated with hundreds of diagrams and photographs, this book examines · When and how to conduct a physical failure analysis · Basic material properties including heat treating mechanisms, work hardening, and the effects of temperature changes on material properties · The differences in appearance between ductile overload, brittle overload, and fatigue failures · High cycle fatigue and how to differentiate between high stress concentrations and high operating stresses · Low cycle fatigue and unusual fatigue situations · Lubrication and its influence on the three basic bearing designs · Ball and roller bearings, gears, fasteners, V-belts, and synchronous belts Taking a detailed and systematic approach, *Practical Plant Failure Analysis* thoroughly explains the four major failure mechanisms—wear, corrosion, overload, and fatigue—as well as how to identify them. The author clearly identifies how these mechanisms appear in various components and supplies convenient charts that demonstrate how to identify the specific causes of failure. A fully updated version of the popular *Introduction to Tribology*, the second edition of this leading tribology text introduces the major developments in the understanding and interpretation of friction, wear and lubrication. Considerations of friction and wear have been fully revised to include recent analysis and data work, and friction mechanisms have been reappraised in light of current developments. In this edition, the breakthroughs in tribology at the nano- and micro- level as well as recent

developments in nanotechnology and magnetic storage technologies are introduced. A new chapter on the emerging field of green tribology and biomimetics is included. Introduces the topic of tribology from a mechanical engineering, mechanics and materials science points of view Newly updated chapter covers both the underlying theory and the current applications of tribology to industry Updated write-up on nanotribology and nanotechnology and introduction of a new chapter on green tribology and biomimetics Taking a failure prevention perspective, this book provides engineers with a balance between analysis and design. The new edition presents a more thorough treatment of stress analysis and fatigue. It integrates the use of computer tools to provide a more current view of the field. Photos or images are included next to descriptions of the types and uses of common materials. The book has been updated with the most comprehensive coverage of possible failure modes and how to design with each in mind. Engineers will also benefit from the consistent approach to problem solving that will help them apply the material on the job. Here is the best single guide to efficient, cost-effective plant engineering - from construction to internal operation, maintenance, and management of the plant facility. With contributions from more than 70 well-known leaders in their specialties, this new edition of Standard Handbook of Plant Engineering offers you state-of-the-art information on the basic plant facility, plant operation equipment, repair and replacement methods, and much more. Packed with tables, formulas, charts, graphs, and checklists, the Second Edition now features greater emphasis on practical, hands-on information in the areas of maintenance, cost control, maintenance management, and staff training; more than 40% new material, with all sections revised and updated, and software listed for most topics; a Board of Advisors specifically chosen to select new and expanded coverage; and both metric and S.I. units for ease of use in domestic and international markets. Covering virtually every aspect of modern plant engineering, the new edition of this definitive handbook will give you the expertise required to keep manufacturing and service facilities operating at peak productivity.

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