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Machinery Vibration and Rotordynamics - John M. Vance 2010-06-17
An in-depth analysis of machine vibration in rotating machinery Whether it's a compressor on an offshore platform, a turbocharger in a truck or automobile, or a turbine in a jet airplane, rotating machinery is the driving force behind almost anything that produces or uses energy. Counted on daily to perform any number of vital societal tasks, turbomachinery uses high rotational speeds to produce amazing amounts of power efficiently. The key to increasing its longevity, efficiency, and reliability lies in the examination of rotor vibration and bearing dynamics, a field called rotordynamics. A valuable textbook for beginners as well as a handy reference for experts, Machinery Vibration and Rotordynamics is teeming with rich technical detail and real-world examples geared toward the study of machine vibration. A logical progression of information covers essential fundamentals, in-depth case studies, and the latest analytical tools used for predicting and preventing damage in rotating machinery. Machinery Vibration and Rotordynamics: Combines rotordynamics with the applications of machinery vibration in a single volume Includes case studies of vibration problems in several different types of machines as well as computer simulation models used in industry Contains fundamental physical phenomena, mathematical and computational aspects, practical hardware considerations, troubleshooting, and instrumentation and measurement techniques For students interested in entering this highly specialized field of study, as well as professionals seeking to expand their knowledge base, Machinery Vibration and Rotordynamics will serve as the one book they will come to rely upon consistently.
Practical Machinery Vibration Analysis and Predictive Maintenance - Cornelius Scheffer 2004-07-16
Machinery Vibration Analysis and Predictive Maintenance provides a detailed examination of the detection, location and diagnosis of faults in rotating and reciprocating machinery using vibration analysis. The basics and underlying physics of vibration signals are first examined. The acquisition and processing of signals is then reviewed followed by a discussion of machinery fault diagnosis using vibration analysis. Hereafter the important issue of rectifying faults that have been identified using vibration analysis is covered. The book also covers the other techniques of predictive maintenance such as oil and particle analysis, ultrasound and infrared thermography. The latest approaches and equipment used together with the latest techniques in vibration analysis emerging from current research are also highlighted. Understand the basics of vibration measurement Apply vibration analysis for different machinery faults Diagnose machinery-related problems with vibration analysis techniques
PRACTICAL CASE STUDIES ON VIBRATION ANALYSIS - Debasis Bhattacharyya 2021-06-01
Vibration analysis is one of the most popular contemporary technologies pertaining to fault diagnosis and predictive maintenance for machineries. Beginning with a segment on the basics of vibration analysis, this book further presents 30 authentic case studies involving problems encountered in real life. This book will serve as a useful guide for the beginners in the field and it will also be an asset to practicing engineers and consultants in developing new insights from the wide range of case studies presented in the book.
Database and Expert Systems Applications - DEXA 2022 Workshops - Gabriele Kotsis 2022-08-15
This volume constitutes the refereed proceedings of the workshops held at the 33rd International Conference on Database and Expert Systems Applications, DEXA 2022, held in Vienna, Austria, in August 2022: The 6th International Workshop on Cyber-Security and Functional Safety in Cyber-Physical Systems (IWCFS 2022); 4th International Workshop on Machine Learning and Knowledge Graphs (MLKgraphs 2022); 2nd International Workshop on Time Ordered Data (ProTime2022); 2nd International Workshop on AI System Engineering: Math, Modelling and Software (AISys2022); 1st International Workshop on Distributed Ledgers and Related Technologies (DLRT2022); 1st International Workshop on Applied Research, Technology Transfer and Knowledge Exchange in Software and Data Science (ARTE2022). The 40 papers were thoroughly reviewed and selected from 62 submissions, and discuss a range of topics including: knowledge discovery, biological data, cyber security, cyber-physical system, machine learning, knowledge graphs, information retriever, data base, and artificial intelligence.
Root Cause Failure Analysis - R. Keith Mobley 1999-06-16
Root Cause Failure Analysis provides the concepts needed to effectively perform industrial troubleshooting investigations. It describes the methodology to perform Root Cause Failure Analysis (RCFA), one of the hottest topics currently in maintenance engineering. It also includes detailed equipment design and troubleshooting guidelines, which are needed to perform RCFA on machinery found in most production facilities. This is the latest book in a new series published by Butterworth-Heinemann in association with PLANT ENGINEERING magazine. PLANT ENGINEERING fills a unique information need for the men and women who operate and maintain industrial plants. It bridges the information gap between engineering education and practical application. As technology advances at increasingly faster rates, this information service is becoming more and more important. Since its first issue in 1947, PLANT ENGINEERING has stood as the leading problem-solving information source for America's industrial plant engineers, and this book series will effectively contribute to that resource and reputation. Provides information essential to industrial troubleshooting investigations Describes the methods of root cause failure analysis, a hot topic in maintenance engineering Includes detailed equipment-design guidelines
Machinery Malfunction Diagnosis and Correction - Robert C. Eisenmann 1998
Specific, practical guidance for every individual involved with solving process machinery problems. The single source reference for explanations of fundamental machinery behavior, static and dynamic measurements, plus data acquisition, processing and interpretation. A variety of lateral and torsional analytical procedures, and physical tests are presented and discussed.
Noise and Vibration Analysis - Anders Brandt 2011-03-29
Noise and Vibration Analysis is a complete and practical guide that combines both signal processing and modal analysis theory with their practical application in noise and vibration analysis. It provides an invaluable, integrated guide for practicing engineers as well as a suitable introduction for students new to the topic of noise and vibration. Taking a practical learning approach, Brandt includes exercises that allow the content to be developed in an academic course framework or as supplementary material for private and further study. Addresses the theory and application of signal analysis procedures as they are applied in modern instruments and software for noise and vibration analysis Features numerous line diagrams and

illustrations Accompanied by a web site at www.wiley.com/go/brandt with numerous MATLAB tools and examples. Noise and Vibration Analysis provides an excellent resource for researchers and engineers from automotive, aerospace, mechanical, or electronics industries who work with experimental or analytical vibration analysis and/or acoustics. It will also appeal to graduate students enrolled in vibration analysis, experimental structural dynamics, or applied signal analysis courses.

Power Systems Protection, Power Quality -

Advances in Condition Monitoring of Machinery in Non-Stationary Operations - Giorgio Dalpiaz 2013-10-05 This book presents the processing of the third edition of the Condition Monitoring of Machinery in Non-Stationary Operations (CMMNO13), which was held in Ferrara, Italy. This yearly event merges an international community of researchers who met – in 2011 in Wroclaw (Poland) and in 2012 in Hammamet (Tunisia) – to discuss issues of diagnostics of rotating machines operating in complex motion and/or load conditions. The growing interest of the industrial world on the topics covered by the CMMNO13 involves the fields of packaging, automotive, agricultural, mining, processing and wind machines in addition to that of the systems for data acquisition. The participation of speakers and visitors from industry makes the event an opportunity for immediate assessment of the potential applications of advanced methodologies for the signal analysis. Signals acquired from machines often contain contributions from several different components as well as noise. Therefore, the major challenge of condition monitoring is to point out the signal content that is related to the state of the monitored component particularly in non-stationary conditions.

Practical Machinery Safety - David Macdonald 2004-07-16 Practical Machinery Safety aims to provide you with the knowledge to tackle machinery safety control problems at a practical level whilst achieving compliance with national and international standards. The book highlights the major international standards that are used to support compliance with EU regulations and uses these standards as a basis for the design procedures. It looks at the risk assessment processes used to identify hazards and to quantify the risks inherent in a machine. It introduces the concepts of safety categories as defined by standard EN954-1 (Safety of Machinery) and illustrates the principles of failsafe design, fault tolerance and self-testing. It also provides an introduction to machinery protection devices such as guards, enclosures with interlocks and guard-monitoring relays, locking systems, safety mats, photo-electric and electro-sensitive principles and the application of light curtains, a study of Safety Control System techniques, and introduces the principles of safety-certified PLCs. Plan and implement safety systems that deliver a safe working environment and compliance with national and international standards Apply simple risk assessments and hazard design methods to your own projects Identify hazards that occur with machinery and know how to deal with them

Vibration Problems in Machines - Arthur W. Lees 2020-07-02 Vibration Problems in Machines explains how to infer information about the internal operations of rotating machines from external measurements through methods used to resolve practical plant problems. Second edition includes summary of instrumentation, methods for establishing machine rundown data, relationship between the rundown curves and the ideal frequency response function. The section on balancing has been expanded and examples are given on the strategies for balancing a rotor with a bend, with new section on instabilities. It includes case studies with real plant data, MATLAB® scripts and functions for the modelling and analysis of rotating machines.

Vibration Fundamentals - R. Keith Mobley 1999-04-23 In a single useful volume, Vibration Fundamentals explains the basic theory, applications, and benefits of vibration analysis, which is the dominant predictive maintenance technique used with maintenance management programs. All mechanical equipment in motion generates a vibration profile, or signature, that reflects its operating condition. This is true regardless of speed or whether the mode of operation is rotation, reciprocation, or linear motion. There are several predictive maintenance techniques used to monitor and analyze critical machines, equipment, and systems in a typical plant. These include vibration analysis, ultrasonics, thermography, tribology, process monitoring, visual inspection, and other nondestructive analysis techniques. Of these techniques, vibration analysis is the dominant predictive

maintenance technique used with maintenance management programs, and this book explains the basic theory, applications, and benefits in one easy-to-absorb volume that plant staff will find invaluable. This is the second book in a new series published by Butterworth-Heinemann in association with PLANT ENGINEERING magazine. PLANT ENGINEERING fills a unique information need for the men and women who operate and maintain industrial plants. It bridges the information gap between engineering education and practical application. As technology advances at increasingly faster rates, this information service is becoming more and more important. Since its first issue in 1947, PLANT ENGINEERING has stood as the leading problem-solving information source for America's industrial plant engineers, and this book series will effectively contribute to that resource and reputation. Provides information essential to industrial troubleshooting investigations Describes root-cause failure analysis Incorporates detailed equipment-design guidelines

Advances in Condition Monitoring of Machinery in Non-Stationary Operations - Fakher Chaari 2015-07-16 The book provides readers with a snapshot of recent research and technological trends in the field of condition monitoring of machinery working under a broad range of operating conditions. Each chapter, accepted after a rigorous peer-review process, reports on an original piece of work presented and discussed at the 4th International Conference on Condition Monitoring of Machinery in Non-stationary Operations, CMMNO 2014, held on December 15-16, 2014, in Lyon, France. The contributions have been grouped into three different sections according to the main subfield (signal processing, data mining or condition monitoring techniques) they are related to. The book includes both theoretical developments as well as a number of industrial case studies, in different areas including, but not limited to: noise and vibration; vibro-acoustic diagnosis; signal processing techniques; diagnostic data analysis; instantaneous speed identification; monitoring and diagnostic systems; and dynamic and fault modeling. This book not only provides a valuable resource for both academics and professionals in the field of condition monitoring, it also aims at facilitating communication and collaboration between the two groups.

Vibration-based Condition Monitoring - Robert Bond Randall 2011-03-25 "Without doubt the best modern and up-to-date text on the topic, wirtten by one of the world leading experts in the field. Should be on the desk of any practitioner or researcher involved in the field of Machine Condition Monitoring" Simon Braun, Israel Institute of Technology Explaining complex ideas in an easy to understand way, Vibration-based Condition Monitoring provides a comprehensive survey of the application of vibration analysis to the condition monitoring of machines. Reflecting the natural progression of these systems by presenting the fundamental material and then moving onto detection, diagnosis and prognosis, Randall presents classic and state-of-the-art research results that cover vibration signals from rotating and reciprocating machines; basic signal processing techniques; fault detection; diagnostic techniques, and prognostics. Developed out of notes for a course in machine condition monitoring given by Robert Bond Randall over ten years at the University of New South Wales, Vibration-based Condition Monitoring: Industrial, Aerospace and Automotive Applications is essential reading for graduate and postgraduate students/ researchers in machine condition monitoring and diagnostics as well as condition monitoring practitioners and machine manufacturers who want to include a machine monitoring service with their product. Includes a number of exercises for each chapter, many based on Matlab, to illustrate basic points as well as to facilitate the use of the book as a textbook for courses in the topic. Accompanied by a website www.wiley.com/go/randall housing exercises along with data sets and implementation code in Matlab for some of the methods as well as other pedagogical aids. Authored by an internationally recognised authority in the area of condition monitoring.

Practical Centrifugal Pumps - Paresh Girdhar 2011-04-18 Practical Centrifugal Pumps is a comprehensive guide to pump construction, application, operation, maintenance and management issues. Coverage includes pump classifications, types and criteria for selection, as well as practical information on the use of pumps, such as how to read pump curves and cross reference. Throughout the book the focus is on best practice and developing the skills and knowledge required to recognise and solve pump problems in a structured and confident manner. Case studies provide real-world scenarios covering the design, set up, troubleshooting and maintenance of pumps. · A comprehensive guide to pump construction, design, installation, operation, troubleshooting and

maintenance. · Develop real-world knowhow and practical skills through seven real-world case studies · Coverage includes pump classifications, types and criteria for selection, as well as practical information on the use of pumps

Practical Power System Protection - Leslie Hewitson 2005-02-28
Designed to increase understanding on a practical and theoretical basis, this invaluable resource provides engineers, plant operators, electricians and technicians with a thorough grounding in the principles and practicalities behind power system protection. Coverage of the fundamental knowledge needed to specify, use and maintain power protection systems is included, helping readers to increase plant efficiency, performance and safety. Consideration is also given to the practical techniques and engineering challenges encountered on a day-to-day basis, making this an essential resource for all.

An Introduction to Random Vibrations, Spectral & Wavelet Analysis - D. E. Newland 2012-04-03
This classic describes and illustrates basic theory, with a detailed explanation of discrete wavelet transforms. Suitable for upper-level undergraduates, it is also a practical resource for professionals.

Asset Maintenance Engineering Methodologies - José Manuel Torres Farinha 2018-04-17
The book aims to be reading for asset maintenance management in a perspective of whole life cycle of any type of physical asset. It deals with acquisition management, including econometric models to evaluate its life cycle, and the maintenance policies to adopt during its life until withdrawal. It also covers vital areas such as EAM/CMMS systems and its integration with the many technologies that are used to aid condition monitoring and the internet of things to improve maintenance management and to increase equipment availability. This will equip readers with new management methodologies, their requisites, and its importance to the improvement of corporate competitiveness. Key Features • Presents life cycle analysis in asset management • Attribution of tools to improve the life cycle of equipment • Provides assistance on the diagnosis of the maintenance state • Presentation of the state-of-the-art of technology to aid maintenance • Explores integration of EAM/CMMS systems with internet of things

Vibration Spectrum Analysis - Steve Goldman 1991
Vibration Spectrum Analysis helps teach the maintenance mechanic or engineer how to identify problem areas before extensive damage occurs. Every rotating machine exhibits a unique characteristic vibration signature that is the sum of the design, manufacture, application, and wear of each of its components. This book explains how to monitor this signature and avoid damage.

Practical Electrical Equipment and Installations in Hazardous Areas - Geoffrey Bottrill 2005-02-15
This book provides the reader with an understanding of the hazards involved in using electrical equipment in Potentially Explosive Atmospheres. It is based on the newly adopted international IEC79 Series of Standards that are now harmonizing and replacing older national Standards. Explosion-proof installations can be expensive to design, install and operate. The strategies and techniques described in this book can significantly reduce costs whilst maintaining plant safety. The book explains the associated terminology and its correct use - from Area Classification through to the selection of explosion-protected electrical apparatus, describing how protection is achieved and maintained in line with these international requirements. The IEC standards require that engineering staff and their management are trained effectively and safely in Hazardous Areas, and this book is designed to help fulfill that need. A basic understanding of instrumentation and electrical theory would be of benefit to the reader, but no previous knowledge of hazardous area installation is required. * An engineer's guide to the hazards and best practice for using electrical equipment in Potentially Explosive Atmospheres. * Fully in line with the newly adopted international standards, the IEC79 series. * Clear explanations of terminology and background information make this the most accessible book on this subject.

Vibration Engineering and Technology of Machinery - Jyoti K. Sinha 2014-08-14
The VETOMAC-X Conference covered a holistic plethora of relevant topics in vibration and engineering technology including condition monitoring, machinery and structural dynamics, rotor dynamics, experimental techniques, finite element model updating, industrial case studies, vibration control and energy harvesting, and signal processing. These proceedings contain not only all of the nearly one-hundred peer-reviewed presentations from authors representing more than twenty countries, but also include six invited lectures from renowned experts: Professor K. Gupta, Mr W. Hahn, Professor A.W. Lees, Professor

John Mottershead, Professor J.S. Rao, and Dr P. Russhard. This work is of interest to researchers and practitioners alike, and is an essential book for most of libraries of higher academic institutes.

Vibrations of Rotating Machinery - Osami Matsushita 2017-05-22
This book opens with an explanation of the vibrations of a single degree-of-freedom (dof) system for all beginners. Subsequently, vibration analysis of multi-dof systems is explained by modal analysis. Mode synthesis modeling is then introduced for system reduction, which aids understanding in a simplified manner of how complicated rotors behave. Rotor balancing techniques are offered for rigid and flexible rotors through several examples. Consideration of gyroscopic influences on the rotordynamics is then provided and vibration evaluation of a rotor-bearing system is emphasized in terms of forward and backward whirl rotor motions through eigenvalue (natural frequency and damping ratio) analysis. In addition to these rotordynamics concerning rotating shaft vibration measured in a stationary reference frame, blade vibrations are analyzed with Coriolis forces expressed in a rotating reference frame. Other phenomena that may be assessed in stationary and rotating reference frames include stability characteristics due to rotor internal damping and instabilities due to asymmetric shaft stiffness and thermal unbalance behavior.

Innovation in Medicine and Healthcare Systems, and Multimedia - Yen-Wei Chen 2019-06-05
This book contains the proceedings of the KES International conferences on Innovation in Medicine and Healthcare (KES-InMed-19) and Intelligent Interactive Multimedia Systems and Services (KES-IIMSS-19), held on 17–19 June 2019 and co-located in St. Julians, on the island of Malta, as part of the KES Smart Digital Futures 2019 multi-theme conference. The major areas covered by KES-InMed-19 include: Digital IT Architecture in Healthcare; Advanced ICT for Medical and Healthcare; Biomedical Engineering, Trends, Research and Technologies and Healthcare Support System. The major areas covered by KES-IIMSS-19 were: Interactive Technologies; Artificial Intelligence and Data Analytics; Intelligent Services and Architectures and Applications. This book is of use to researchers in these vibrant areas, managers, industrialists and anyone wishing to gain an overview of the latest research in these fields.

Condition Monitoring Algorithms in MATLAB® - Adam Jablonski 2021-01-20
This book offers the first comprehensive and practice-oriented guide to condition monitoring algorithms in MATLAB®. After a concise introduction to vibration theory and signal processing techniques, the attention is moved to the algorithms. Each signal processing algorithm is presented in depth, from the theory to the application, and including extensive explanations on how to use the corresponding toolbox in MATLAB®. In turn, the book introduces various techniques for synthetic signals generation, as well as vibration-based analysis techniques for large data sets. A practical guide on how to directly access data from industrial condition monitoring systems (CMS) using MATLAB® .NET Libraries is also included. Bridging between research and practice, this book offers an extensive guide on condition monitoring algorithms to both scholars and professionals. "Condition Monitoring Algorithms in MATLAB® is a great resource for anyone in the field of condition monitoring. It is a unique as it presents the theory, and a number of examples in Matlab®, which greatly improve the learning experience. It offers numerous examples of coding styles in Matlab, thus supporting graduate students and professionals writing their own codes." Dr. Eric Bechhoefer Founder and CEO of GPMS Developer of the Foresight MX Health and Usage Monitoring System

Design of an Intelligent Embedded System for Condition Monitoring of an Industrial Robot - Alaa Abdulhady Jaber 2016-09-08
This thesis introduces a successfully designed and commissioned intelligent health monitoring system, specifically for use on any industrial robot, which is able to predict the onset of faults in the joints of the geared transmissions. However the developed embedded wireless condition monitoring system leads itself very well for applications on any power transmission equipment in which the loads and speeds are not constant, and access is restricted. As such this provides significant scope for future development. Three significant achievements are presented in this thesis. First, the development of a condition monitoring algorithm based on vibration analysis of an industrial robot for fault detection and diagnosis. The combined use of a statistical control chart with time-domain signal analysis for detecting a fault via an arm-mounted wireless processor system represents the first stage of fault detection. Second, the design and development of a sophisticated embedded microprocessor base station for online implementation of the intelligent

condition monitoring algorithm, and third, the implementation of a discrete wavelet transform, using an artificial neural network, with statistical feature extraction for robot fault diagnosis in which the vibration signals are first decomposed into eight levels of wavelet coefficients.

Formulas and Conversions -

Rotating Machinery Vibration - Maurice L. Adams 2000-10-24
This comprehensivereference/text provides a thorough grounding in the fundamentals of rotating machinery vibration-treating computer model building, sources and types of vibration, and machine vibration signal analysis. Illustrating turbomachinery, vibration severity levels, condition monitoring, and rotor vibration cause identification, Ro

Practical Machinery Management for Process Plants: Volume 2 - Heinz P. Bloch 1997-09-11
This newly expanded edition discusses proven approaches to defining causes of machinery failure as well as methods for analyzing and troubleshooting failures.

Machinery Failure Analysis and Troubleshooting - Heinz P. Bloch 1994

Vibration Basics and Machine Reliability Simplified - Mohammed Hamed Ahmed Soliman Soliman 2020-10-12
Vibration Analysis should present 50% of any condition monitoring program. This book include a practical guide to vibration analysis to prepare practitioners for levels I II & III to become certified analyst. Numerous examples with photos are included to present how to detect different types of equipment failure: bearing, shafts misalignment, unbalance, rotor problems, electric motors and more using spectrum analysis technique.

Handbook of Condition Monitoring - B. K. N. Rao 1996
Hardbound. The need to reduce costs has generated a greater interest in condition monitoring in recent years. The Handbook of Condition Monitoring gives an extensive description of available products and their usage making it a source of practical guidance supported by basic theory.This handbook has been designed to assist individuals within companies in the methods and devices used to monitor the condition of machinery and products.

Practical Hydraulic Systems: Operation and Troubleshooting for Engineers and Technicians - Ravi Doddannavar 2005-02-07
Whatever your hydraulic applications, Practical Hydraulic Systems: Operation & Troubleshooting For Engineers & Technicians will help you to increase your knowledge of the fundamentals, improve your maintenance programs and become an excellent troubleshooter of problems in this area. Cutaways of all major components are included in the book to visually demonstrate the components' construction and operation. Developing an understanding of how it works leads to an understanding of how and why it fails. Multimedia views of the equipment are shown, to give as realistic a view of hydraulic systems as possible. The book is highly practical, comprehensive and interactive. It discusses Hydraulic Systems construction, design applications, operations, maintenance, and management issues and provides you with the most up-to-date information and Best Practice in dealing with the subject. * A focus on maintenance and troubleshooting makes this book essential reading for practising engineers. * Written to cover the requirements of mechanical / industrial and civil engineering. * Cutaway diagrams demonstrate the construction and operation of key equipment.

Machinery Condition Monitoring - Amiya Ranjan Mohanty 2014-12-22
Find the Fault in the Machines Drawing on the author's more than two decades of experience with machinery condition monitoring and consulting for industries in India and abroad, Machinery Condition Monitoring: Principles and Practices introduces the practicing engineer to the techniques used to effectively detect and diagnose faults in machines. Providing the working principle behind the instruments, the important elements of machines as well as the technique to understand their conditions, this text presents every available method of machine fault detection occurring in machines in general, and rotating machines in particular. A Single-Source Solution for Practice Machinery Conditioning Monitoring Since vibration is one of the most widely used fault detection techniques, the book offers an assessment of

vibration analysis and rotor-dynamics. It also covers the techniques of wear and debris analysis, and motor current signature analysis to detect faults in rotating mechanical systems as well as thermography, the nondestructive test NDT techniques (ultrasonics and radiography), and additional methods. The author includes relevant case studies from his own experience spanning over the past 20 years, and detailing practical fault diagnosis exercises involving various industries ranging from steel and cement plants to gas turbine driven frigates. While mathematics is kept to a minimum, he also provides worked examples and MATLAB® codes. This book contains 15 chapters and provides topical information that includes: A brief overview of the maintenance techniques Fundamentals of machinery vibration and rotor dynamics Basics of signal processing and instrumentation, which are essential for monitoring the health of machines Requirements of vibration monitoring and noise monitoring Electrical machinery faults Thermography for condition monitoring Techniques of wear debris analysis and some of the nondestructive test (NDT) techniques for condition monitoring like ultrasonics and radiography Machine tool condition monitoring Engineering failure analysis Several case studies, mostly on failure analysis, from the author's consulting experience Machinery Condition Monitoring: Principles and Practices presents the latest techniques in fault diagnosis and prognosis, provides many real-life practical examples, and empowers you to diagnose the faults in machines all on your own.

Condition Monitoring with Vibration Signals - Asoke K. Nandi 2019-12-03
Provides an extensive, up-to-date treatment of techniques used for machine condition monitoring Clear and concise throughout, this accessible book is the first to be wholly devoted to the field of condition monitoring for rotating machines using vibration signals. It covers various feature extraction, feature selection, and classification methods as well as their applications to machine vibration datasets. It also presents new methods including machine learning and compressive sampling, which help to improve safety, reliability, and performance. Condition Monitoring with Vibration Signals: Compressive Sampling and Learning Algorithms for Rotating Machines starts by introducing readers to Vibration Analysis Techniques and Machine Condition Monitoring (MCM). It then offers readers sections covering: Rotating Machine Condition Monitoring using Learning Algorithms; Classification Algorithms; and New Fault Diagnosis Frameworks designed for MCM. Readers will learn signal processing in the time-frequency domain, methods for linear subspace learning, and the basic principles of the learning method Artificial Neural Network (ANN). They will also discover recent trends of deep learning in the field of machine condition monitoring, new feature learning frameworks based on compressive sampling, subspace learning techniques for machine condition monitoring, and much more. Covers the fundamental as well as the state-of-the-art approaches to machine condition monitoring—guiding readers from the basics of rotating machines to the generation of knowledge using vibration signals Provides new methods, including machine learning and compressive sampling, which offer significant improvements in accuracy with reduced computational costs Features learning algorithms that can be used for fault diagnosis and prognosis Includes previously and recently developed dimensionality reduction techniques and classification algorithms Condition Monitoring with Vibration Signals: Compressive Sampling and Learning Algorithms for Rotating Machines is an excellent book for research students, postgraduate students, industrial practitioners, and researchers.

Servitization and Physical Asset Management - Michael John Provost 2018-12-31
Servitization and Physical Asset Management, third edition, was developed to provide a structured source of guidance and reference information on the business opportunities linked to servitization and the management of physical assets. A growing trend in the global economy, servitization focuses on the actual deliverables of an asset from the perspective of the customer: electricity instead of the power plant, thrust instead of the engine, mobility instead of a plane or a car. The book offers high-level overviews of how to servitized and manage assets from a variety of perspectives, reviewing nearly 1,500 books, magazine articles, papers and presentations and websites. Written by Michael J. Provost, Ph.D., and a subject matter expert in modeling, simulation, analysis and condition monitoring, Servitization and Physical Asset Management, third edition, is an invaluable reference to those considering providing asset management services for the products they design and manufacture. It is also meant to support middle management wishing to know what needs to be done to look after the assets they are responsible for and who to

approach for help, and academics doing research in this field. Michael Provost, is a British engineer with a doctoral degree in thermal power from Cranfield University.

An Introduction to Predictive Maintenance - R. Keith Mobley 2002-10-24
This second edition of An Introduction to Predictive Maintenance helps plant, process, maintenance and reliability managers and engineers to develop and implement a comprehensive maintenance management program, providing proven strategies for regularly monitoring critical process equipment and systems, predicting machine failures, and scheduling maintenance accordingly. Since the publication of the first edition in 1990, there have been many changes in both technology and methodology, including financial implications, the role of a maintenance organization, predictive maintenance techniques, various analyses, and maintenance of the program itself. This revision includes a complete update of the applicable chapters from the first edition as well as six additional chapters outlining the most recent information available. Having already been implemented and maintained successfully in hundreds of manufacturing and process plants worldwide, the practices detailed in this second edition of An Introduction to Predictive Maintenance will save plants and corporations, as well as U.S. industry as a whole, billions of dollars by minimizing unexpected equipment failures and its resultant high maintenance cost while increasing productivity. A comprehensive introduction to a system of monitoring critical industrial equipment Optimize the availability of process machinery and greatly reduce the cost of maintenance Provides the means to improve product quality, productivity and profitability of manufacturing and production plants

Practical Batch Process Management - Mike Barker 2004-11-18
Historically batch control systems were designed individually to match a specific arrangement of plant equipment. They lacked the ability to convert to new products without having to modify the control systems, and did not lend themselves to integration with manufacturing management systems. Practical Batch Management Systems explains how to utilize the building blocks and arrange the structures of modern batch management systems to produce flexible schemes suitable for automated batch management, with the capability to be reconfigured to use the same plant equipment in different combinations. It introduces current best practice in the automation of batch processes, including the drive for integration with MES (Manufacturing Execution System) and ERP (Enterprise Resource Planning) products from major IT vendors. References and examples are drawn from DCS / PLC batch control products currently on the market. - Implement modern batch management systems that are flexible and easily reconfigured - Integrate batch management with other manufacturing systems including MES and ERP - Increase productivity through industry best practice

Mechanical Vibrations and Condition Monitoring - Juan Carlos A. Jauregui Correa 2020-03-18
Mechanical Vibrations and Condition Monitoring presents a collection of data and insights on the study of mechanical vibrations for the predictive maintenance of machinery. Seven chapters cover the foundations of mechanical vibrations, spectrum analysis, instruments, causes and effects of vibration, alignment and balancing methods, practical cases, and guidelines for the implementation of a predictive maintenance program. Readers will be able to use the book to make predictive maintenance decisions based on vibration analysis. This title will be useful to senior engineers and technicians looking for practical solutions to predictive maintenance problems. However, the book will also be useful to technicians looking to ground maintenance observations and decisions in the vibratory behavior of machine components. Presents data and insights into mechanical vibrations in condition monitoring and the predictive maintenance of industrial machinery Defines the key concepts related to mechanical vibration and its application for predicting mechanical failure Describes the dynamic behavior of most important mechanical components found in industrial machinery Explains fundamental concepts such as signal analysis and the Fourier transform necessary to understand mechanical vibration Provides analysis of most sources of failure in mechanical systems, affording an introduction to more complex signal analysis

Practical Machinery Safety - Dave Macdonald 2004
Practical Machinery And Automation Safety For Industry aims to provide you with the knowledge to tackle machinery safety control problems at a basic and practical level whilst achieving compliance with national and international standards. The book highlights the major international standards that are used to support compliance with EU regulations and uses these standards as a basis for the design procedures. It looks at the risk assessment processes used to identify hazards and to quantify the risks inherent in a machine. It introduces the concepts of safety categories as defined by standard EN954-1 (Safety of Machinery) and illustrates the principles of failsafe design, fault tolerance and self-testing. It also provides an introduction to machinery protection devices such as guards, enclosures with interlocks and guard-monitoring relays, locking systems, safety mats, photo-electric and electro-sensitive principles and the application of light curtains, a study of Safety Control System techniques, and introduces the principles of safety-certified PLCs. 1. Plan and implement safety systems that deliver a safe working environment and compliance with national and international standards. 2. Apply simple risk assessments and hazard design methods to your own projects 3. Identify hazards that occur with machinery and know how to deal with them

Fundamentals of Vibration Analysis - Nils O. Myklestad 2018-05-16
This concise textbook discusses vibration problems in engineering, dealing with systems of one and more than one degrees of freedom. A substantial section of Answers to Problems is included. 1956 edition.