

---

# Troubleshooting Process Operations

---

Understanding Process Equipment for Operators and Engineers  
Process Engineering Problem Solving  
Microsoft System Center Configuration Manager Field Experience  
Troubleshooting Natural Gas Processing  
Process Engineering for a Small Planet  
Site Reliability Engineering  
Problem Solving for Process Operators and Specialists  
Troubleshooting Process Operations  
Red Hat Enterprise Linux Troubleshooting Guide  
DevOps Troubleshooting  
Wastewater Treatment  
Four Types of Problems  
IT Essentials Companion Guide V7  
Analysis, Synthesis and Design of Chemical Processes  
Network Troubleshooting Tools  
Process Technology Troubleshooting  
Troubleshooting Process Plant Control  
Efficient Petrochemical Processes  
Process Equipment Malfunctions: Techniques to Identify and Correct Plant Problems  
Troubleshooting Vacuum Systems  
Coating and Drying Defects  
Practical Troubleshooting of Electrical Equipment and Control Circuits  
Working Guide to Process Equipment, Third Edition  
How to Develop Robust Solid Oral Dosage Forms  
Failure Mapping  
Successful Trouble Shooting for Process Engineers  
Troubleshooting Process Plant Control  
Distillation Troubleshooting  
Process Steam Systems  
Practical Process Research and Development  
Chemical Engineering Design  
Troubleshooting Process Operations  
Principles of Machine Operation and Maintenance  
Petroleum Refineries  
Hydroprocessing for Clean Energy  
Troubleshooting Centrifugal Pumps and their systems  
Practical Process Control  
Process Engineering  
Distillation Control, Optimization, and Tuning  
Process Plant Equipment

---

**CHASE KENDAL**


---

**Understanding Process Equipment for Operators and Engineers**

John Wiley &amp; Sons

Chemical Engineering Design, Second Edition, deals with the application of chemical engineering principles to the design of chemical processes and equipment. Revised throughout, this edition has been specifically developed for the U.S. market. It provides the latest US codes and standards, including API, ASME and ISA design codes and ANSI standards. It contains new discussions of conceptual plant design, flowsheet development, and revamp design; extended coverage of capital cost estimation, process costing, and economics; and new chapters on equipment selection, reactor design, and solids handling processes. A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus supporting data, and Excel spreadsheet calculations, plus over 150 Patent References for downloading from the companion website. Extensive instructor resources, including 1170 lecture slides and a fully worked solutions manual are available to adopting instructors. This text is designed for chemical and biochemical engineering students (senior undergraduate year, plus appropriate for capstone design courses where taken, plus graduates) and lecturers/tutors, and professionals in industry (chemical process, biochemical, pharmaceutical, petrochemical sectors). New to this edition: - Revised organization into Part I: Process Design, and Part II: Plant Design. The broad themes of Part I are flowsheet development, economic analysis, safety and environmental impact and optimization. Part II contains

chapters on equipment design and selection that can be used as supplements to a lecture course or as essential references for students or practicing engineers working on design projects. - New discussion of conceptual plant design, flowsheet development and revamp design - Significantly increased coverage of capital cost estimation, process costing and economics - New chapters on equipment selection, reactor design and solids handling processes - New sections on fermentation, adsorption, membrane separations, ion exchange and chromatography - Increased coverage of batch processing, food, pharmaceutical and biological processes - All equipment chapters in Part II revised and updated with current information - Updated throughout for latest US codes and standards, including API, ASME and ISA design codes and ANSI standards - Additional worked examples and homework problems - The most complete and up to date coverage of equipment selection - 108 realistic commercial design projects from diverse industries - A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus supporting data and Excel spreadsheet calculations plus over 150 Patent References, for downloading from the companion website - Extensive instructor resources: 1170 lecture slides plus fully worked solutions manual available to adopting instructors

*Process Engineering Problem Solving*  
Academic Press

Chemical production processes consist of many complex apparatuses involving both moving and static parts as well as interconnecting pipes, control mechanisms and electronics, mechanical and thermal stages, heat exchangers,

waste and side product processing units, power ducts and many others. Bringing such a complicated unit online and ensuring its continued productivity requires substantial skill at anticipating, detecting and solving acute problems. This book is the professional's and student's entrance to the fascinating and important world of trouble shooting for chemical, pharmaceutical and other production processes.

*Microsoft System Center Configuration Manager Field Experience* John Wiley & Sons

This book explains how rotating machinery works, and the role of the maintenance engineer in ensuring its proper operation. Stress is laid on the need for the trainee engineer to develop skills in diagnosis and troubleshooting as well as practical expertise in maintenance procedures.

*Troubleshooting Natural Gas Processing* JPS

Wastewater Treatment is another indispensable work from the author of Water Treatment. Both books are helpful tools for crisis identification and, most importantly, resolution. Tillman writes in a concise, well organized format - perfect for fast reference. This operator's guide presents basic troubleshooting and problem solving information for typical problems that can occur during the operation of processes used at municipal and industrial wastewater treatment plants. Common problems and the recommended operator responses are listed in tabular form for individual unit processes. Entry level operators will benefit greatly from the problems Tillman addresses, while experienced operators will appreciate it as a handy reference. The information compiled in this volume has been collected from various equipment manufacturers'

operation and maintenance manuals, U.S. Environmental Protection Agency (EPA) technology transfer documents, the authors personal experience as a plant Operations and Maintenance manual writer, and his experience as a plant manager and operator. He includes only the most common wastewater treatment unit processes. He gives an overview of the treatment objective of the unit process, and then provides each with a troubleshooting table divided into Indicators/Observations; Possible Cause; Check or Monitor; Possible Solutions columns. Wastewater Treatment reads like the best of training manuals. Tillman's know-how, combined with his clarity, make this book required occupational reading. The brief, straightforward format and easy-to-read tables make the guide an accessible problem solving reference.

**Process Engineering for a Small Planet** CRC Press

For the first time, process technicians have a resource designed specifically for them that will provide a comprehensive, thorough overview of modern troubleshooting methods and models. Process Technology Troubleshooting utilizes a simple to complex approach that encourages readers to master basic concepts before progressing to more advanced ones for increased comprehension. The book covers troubleshooting models that apply concepts from advanced instrumentation, the control loop, and process equipment and systems, and includes coverage of such processes as a simple pump-around and feed system, compressor system, heat transfer system, cooling tower system, boiler system, furnace system, distillation system, stirred reactor system, and separations system. Each of these

systems have operational information, set points, and start-up procedures. These sections include "what-if" scenarios and detailed illustrations. Process Technology Troubleshooting is an invaluable resource and reference for any novice, training manager or experienced process technician.

Site Reliability Engineering John Wiley & Sons

Avoid wasting time and money on recurring plant process problems by applying the practical, five-step solution in Process Engineering Problem Solving: Avoiding "The Problem Went Away, but it Came Back" Syndrome. Combine cause and effect problem solving with the formulation of theoretically correct working hypotheses and find a structural and pragmatic way to solve real-world issues that tend to be chronic or that require an engineering analysis. Utilize the fundamentals of chemical engineering to develop technically correct working hypotheses that are key to successful problem solving.

**Problem Solving for Process Operators and Specialists** John Wiley & Sons

This book is intended for those new to the use and abuse of centrifugal pumps. It is also for those whose involvement with pumps is so occasional, that they need a reminder of the basics.

Troubleshooting Process Operations McGraw Hill Professional

With a focus on the fundamentals and strategies of distillation columns, this book covers the process variables for continuous distillation columns, as well as four basic control strategies and the typical cases in which they are used. The author defines the inlet and outlet streams and process variables for a distillation column and then explains the overall concept of the separation and

purification that is performed.

Performance and product quality are described in terms of specification requirements, and tools and techniques for the optimization of quality performance are provided. Figures and graphs are included within the reference to illustrate concepts.

**Red Hat Enterprise Linux Troubleshooting Guide** John Wiley & Sons

Understanding Process Equipment for Operators and Engineers explains how process equipment functions. As problems often arise in plants that must be solved by unit engineers, this book offers successful solutions and methods for their implementation. The concepts explained are based on Norm Lieberman's personal, hands-on experience. Like you, Norm attended a university and was exposed to technical seminars which did not always provide the needed solutions. In this text, you will learn the functioning of a variety of equipment types, including Fired Heater Draft, Centrifugal Pump Head, Distillation Tray Efficiency, Vacuum Jets, Recip Compressors, Steam Turbines, Thermosyphon Circulation Reboilers and Air Cooler. - Includes methods and procedures on how to make field measurements - Outlines fire heater principles and operation and how they develop draft - Describes distillation column operation and methods to increase their efficiency - Includes computer modeling and provides use case examples

DevOps Troubleshooting Elsevier  
Provides a holistic approach that looks at changing process conditions, possible process design changes, and process technology upgrades Includes process integration techniques for improving process designs and for applying

optimization techniques for improving operations focusing on hydroprocessing units. Discusses in details all important aspects of hydroprocessing – including catalytic materials, reaction mechanism, as well as process design, operation and control, troubleshooting and optimization Methods and tools are introduced that have a successful application track record at UOP and many industrial plants in recent years Includes relevant calculations/software/technologies hosted online for purchasers of the book **Wastewater Treatment** Addison-Wesley

Comprehensively describes the equipment used in process steam systems, good operational and maintenance practices, and techniques used to troubleshoot system problems Explains how an entire steam system should be properly designed, operated and maintained Includes chapters on commissioning and troubleshooting various process systems and problems Presents basic thermodynamics and heat transfer principles as they apply to good process steam system design Covers Steam System Efficiency Upgrades; useful for operations and maintenance personnel responsible for modifying their systems

**Four Types of Problems** Elsevier Diagnose and Troubleshoot Problems in Chemical Process Equipment with This Updated Classic! Chemical engineers and plant operators can rely on the Third Edition of A Working Guide to Process Equipment for the latest diagnostic tips, practical examples, and detailed illustrations for pinpointing trouble and correcting problems in chemical process equipment. This updated classic contains new chapters on Control Valves, Cooling Towers, Waste Heat Boilers, Catalytic Effects, Fundamental Concepts of

Process Equipment, and Process Safety. Filled with worked-out calculations, the book examines everything from trays, reboilers, instruments, air coolers, and steam turbines...to fired heaters, refrigeration systems, centrifugal pumps, separators, and compressors. The authors simplify complex issues and explain the technical issues needed to solve all kinds of equipment problems. Comprehensive and clear, the Third Edition of A Working Guide to Process Equipment features: Guidance on diagnosing and troubleshooting process equipment problems Explanations of how theory applies to real-world equipment operations Many useful tips, examples, illustrations, and worked-out calculations New to this edition: Control Valves, Cooling Towers, Waste Heat Boilers, Catalytic Effects, and Process Safety Inside this Renowned Guide to Solving Process Equipment Problems • Trays • Tower Pressure • Distillation Towers • Reboilers • Instruments • Packed Towers • Steam and Condensate Systems • Bubble Point and Dew Point • Steam Strippers • Draw-Off Nozzle Hydraulics • Pumparounds and Tower Heat Flows • Condensers and Tower Pressure Control • Air Coolers • Deaerators and Steam Systems • Vacuum Systems • Steam Turbines • Surface Condensers • Shell-and-Tube Heat Exchangers • Fire Heaters • Refrigeration Systems • Centrifugal Pumps • Separators • Compressors • Safety • Corrosion • Fluid Flow • Computer Modeling and Control • Field Troubleshooting Process Problems [IT Essentials Companion Guide V7](#) Elsevier How to Develop Robust Solid Oral Dosage Forms from Conception to Post-Approval uses a practical and hands-on approach to cover the development

process of solid oral dosage forms in one single source. The book details all of the necessary steps from formulation through the post-approval phase and contains industry case studies, real world advice, and troubleshooting tips. By merging the latest scientific information with practical instructions, this book provides pharmaceutical scientists in formulation research and development with a concrete look at the key aspects in the development of solid oral dosage forms. - Focuses on important topics, such as robustness, bioavailability, formulation design, continuous processing, stability tests, modified release dosage forms, international guidelines, process scale-up, and much more - Part of the Expertise in Pharmaceutical Process Technology series edited by Michael Levin - Discusses common, real-world problems and offers both theoretical and practical solutions to these everyday issues

*Analysis, Synthesis and Design of Chemical Processes* John Wiley & Sons Identify, capture and resolve common issues faced by Red Hat Enterprise Linux administrators using best practices and advanced troubleshooting techniques About This Book Develop a strong understanding of the base tools available within Red Hat Enterprise Linux (RHEL) and how to utilize these tools to troubleshoot and resolve real-world issues Gain hidden tips and techniques to help you quickly detect the reason for poor network/storage performance Troubleshoot your RHEL to isolate problems using this example-oriented guide full of real-world solutions Who This Book Is For If you have a basic knowledge of Linux from administration or consultant experience and wish to add to your Red Hat Enterprise Linux

troubleshooting skills, then this book is ideal for you. The ability to navigate and use basic Linux commands is expected. What You Will Learn Identify issues that need rapid resolution against long term root cause analysis Discover commands for testing network connectivity such as telnet, netstat, ping, ip and curl Spot performance issues with commands such as top, ps, free, iostat, and vmstat Use tcpdump for traffic analysis Repair a degraded file system and rebuild a software raid Identify and troubleshoot hardware issues using dmesg Troubleshoot custom applications with strace and knowledge of Linux resource limitations In Detail Red Hat Enterprise Linux is an operating system that allows you to modernize your infrastructure, boost efficiency through virtualization, and finally prepare your data center for an open, hybrid cloud IT architecture. It provides the stability to take on today's challenges and the flexibility to adapt to tomorrow's demands. In this book, you begin with simple troubleshooting best practices and get an overview of the Linux commands used for troubleshooting. The book will cover the troubleshooting methods for web applications and services such as Apache and MySQL. Then, you will learn to identify system performance bottlenecks and troubleshoot network issues; all while learning about vital troubleshooting steps such as understanding the problem statement, establishing a hypothesis, and understanding trial, error, and documentation. Next, the book will show you how to capture and analyze network traffic, use advanced system troubleshooting tools such as strace, tcpdump & dmesg, and discover common issues with system defaults. Finally, the book will take you through a

detailed root cause analysis of an unexpected reboot where you will learn to recover a downed system. Style and approach This is an easy-to-follow guide packed with examples of real-world core Linux concepts. All the topics are presented in detail while you're performing the actual troubleshooting steps.

*Network Troubleshooting Tools* Elsevier

There is a large gap between what you learn in college and the practical knowhow demanded in the working environment, running and maintaining electrical equipment and control circuits. *Practical Troubleshooting of Electrical Equipment and Control Circuits* focuses on the hands-on knowledge and rules-of-thumb that will help engineers and employers by increasing knowledge and skills, leading to improved equipment productivity and reduced maintenance costs. *Practical Troubleshooting of Electrical Equipment and Control Circuits* will help engineers and technicians to identify, prevent and fix common electrical equipment and control circuits. The emphasis is on practical issues that go beyond typical electrical principles, providing a tool-kit of skills in solving electrical problems, ranging from control circuits to motors and variable speed drives. The examples in the book are designed to be applicable to any facility.

- Discover the practical knowhow and rules-of-thumb they don't teach you in the classroom
- Diagnose electrical problems 'right first time'
- Reduce downtime

### **Process Technology**

**Troubleshooting** John Wiley & Sons

*Practical Process Control* introduces process control to engineers and technicians unfamiliar with control techniques, providing an understanding of how to actually apply control in a real

industrial environment. It avoids analytical treatment of the numerous statistical process control techniques to concentrate on the practical problems involved. A practical approach is taken, making it relevant in virtually all manufacturing and process industries. There is currently no information readily available to practising engineers or students that discusses the real problems and such material is long overdue.

- An indispensable guide for all those involved in process control
- Includes equipment specification, troubleshooting, system specification and design
- Provided with guidelines of HOW TO and HOW NOT TO install process control

### **Troubleshooting Process Plant Control** John Wiley & Sons

This book provides methods to train process operators to solve challenging problems. The book is split into two parts. The first part consists of two parts; first developing a daily monitoring system and second providing a structured 5 step problem solving approach that combines cause and effect problem solving thinking with the formulation of theoretically correct hypotheses. The 5 step approach emphasizes the classical problem solving approach (defining the sequence of events) with the addition of the steps of formulating a theoretically correct working hypothesis, providing a means to test the hypothesis, and providing a foolproof means to eliminate the problem. The initial part of the book focuses on defining the problem that must be solved and obtaining the location, time and quantity based specifications of the problem. This part of the book also presents techniques to find and define problems at an early point before they progress to the critical

level. The second part of the book deals with the utilization of fundamental chemical engineering skills to develop a technically correct working hypothesis that is the key to successful problem solving. The primary emphasis is on simple pragmatic calculation techniques that are theoretically correct. It is believed that any operator can perform these calculations if he is provided the correct prototype. Throughout the book, the theory behind each pragmatic calculation technique is explained in understandable terms prior to presenting the author's approach. These techniques have been developed by the author in 50+ years of industrial experience. The book includes many sample problems and examples of real world problem solving. Using these techniques, theoretically correct working hypotheses can be developed in an expedient fashion.

*Efficient Petrochemical Processes*

Microsoft Press

A PRACTICAL GUIDE TO TROUBLESHOOTING PROCESS EQUIPMENT MALFUNCTIONS Process Equipment Malfunctions offers proven techniques for finding and fixing process plant problems and contains details on failure identification. Diagnostic tips, examples, and illustrations help to pinpoint and correct faults in chemical process and petroleum refining equipment. Complex math has been omitted. An essential resource for plant operators and process engineers, this book is based on the author's long career in field troubleshooting process problems. **COVERAGE INCLUDES:** Distillation tray malfunctions Packed tower problems Distillation tower pressure and composition control Fractionator product stripping Pumparounds Reboiled and steam side

strippers Inspecting tower internals Process reboilers--thermosyphon circulation Heat exchangers Condenser limitations Air coolers Cooling water systems Steam condensate collection systems Steam quality problems Level control problems Process plant corrosion and fouling Vapor-liquid separation vessels Hydrocarbon-water separation and desalters Fired heaters--draft and excess O<sub>2</sub> Disabling safety systems Vacuum systems and steam jets Vacuum surface condensers Centrifugal pump limitations Steam turbine drivers Centrifugal compressors Reciprocating compressors

**Process Equipment Malfunctions: Techniques to Identify and Correct Plant Problems** Pennwell Books

The book focuses on process control in the petroleum and refinery industries, with an emphasis on problem solving. The author explores various real life examples and relays the lessons learned from his career in this area. He explains many new yet straightforward concepts without the use of complex mathematics. This handy go-to emphasizes single and well-established process engineering principles that will help working engineers and operators switch manual control loops to automatic control.

Troubleshooting Vacuum Systems

Academic Press

A practical guide for ensuring a defect-free coating and drying process For professionals in the coating and drying industry, the world is a demanding place. New, technically complex products such as fuel cell membranes, thin film batteries, solar cells, and RFID chips require coatings of extreme precision. With the bar raised so high, understanding how to troubleshoot and eliminate defects on a coating line is an



essential skill for all personnel. Coating and Drying Defects, Second Edition provides manufacturing and quality control personnel, equipment operators and supervisors, and plant engineers and scientists with the full complement of proven tools and techniques for detecting, defining, and eliminating coating defects and operating problems, and for ensuring that they do not recur. Updating the valuable contents of the first edition, this practical Second Edition: Describes all major processes for coating and drying of continuous film on sheets or webs Covers technologies that have been recently developed to prevent defect formation and improve operating

procedures Provides a rational framework within which to assess and analyze virtually any defect that may arise Offers step-by-step guidelines for conducting every phase of the troubleshooting process, including defect prevention Going beyond simply describing a disparate set of troubleshooting techniques, this unique guide arms readers with a systematic, nonmathematical methodology encompassing the entire coating operation, becoming an indispensable resource for manufacturing and quality-control personnel as well as plant engineers, polymer scientists, surface scientists, organic chemists, and coating scientists.