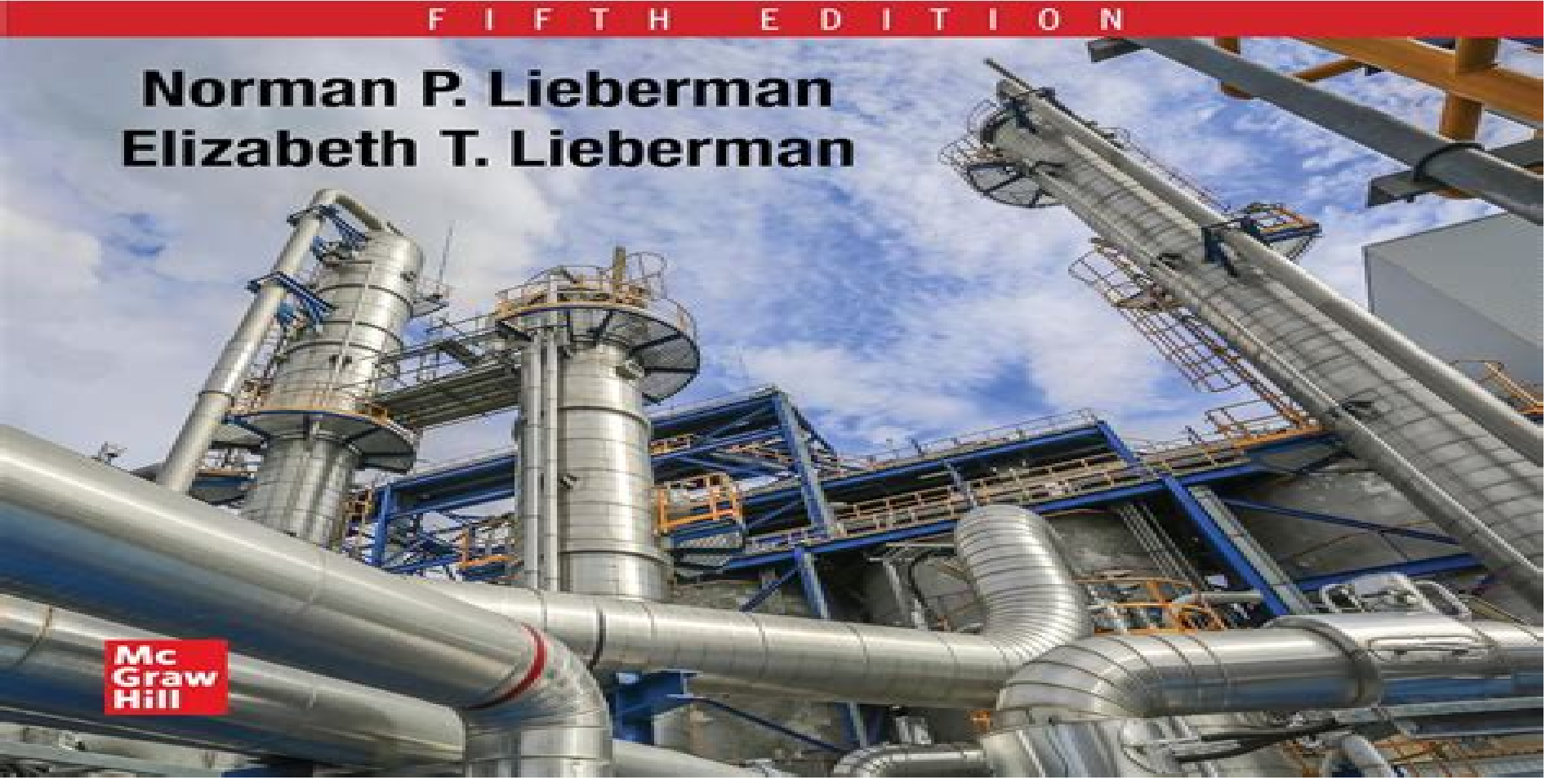


A WORKING GUIDE TO PROCESS EQUIPMENT

F I F T H E D I T I O N

**Norman P. Lieberman
Elizabeth T. Lieberman**

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A Working Guide To Process Equipment

Kathleen Armour



A Working Guide To Process Equipment:

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A Working Guide to Process Equipment, Fifth Edition Norman P. Lieberman, 2021-03-08 The latest methods for troubleshooting and maintaining process equipment While directed particularly at chemical and petroleum refining process equipment the new edition of A Working Guide to Process Equipment revised and fully up dated throughout remains applicable to a broad range of technicians and industries and explains how to diagnose troubleshoot and correct problems without complex equations and computer simulations without ever losing sight of the importance of direct field measurements and observations Nine new chapters cover Determining the Causes of Wet Steam Distillation Process Engineering Design Errors Technical Adventures from the Past Setting Pressure Relief Valves Applying Process Engineering Technology to Natural Gas Production Reduction of Flare Losses Suppressing CO₂ Emissions and Energy Conservation A Final Word The Earth's Oxygen Content Evaluating Distillation Tray Capacity Filled with examples and illustrations the new edition of this practical resource continues to demonstrate how theory applies to solving real world plant operation problems

Selected hand calculation methods are also provided You ll gain insights from decades of work from the two authors solving process problems and carrying out test runs in the field revamping equipment for better efficiency and the questions and answers explored in the Lieberman s Process Equipment Troubleshooting Seminars conducted

Working Guide to Process Equipment ,2008 **A Working Guide to Process Equipment, Fourth Edition** Elizabeth T. Lieberman,Norman P. Lieberman,2014-05-28 Publisher s Note Products purchased from Third Party sellers are not guaranteed by the publisher for quality authenticity or access to any online entitlements included with the product The latest methods for troubleshooting and maintaining process equipment Applicable to a broad range of technicians and industries and fully updated throughout A Working Guide to Process Equipment Fourth Edition explains how to diagnose troubleshoot and correct problems with chemical and petroleum refining process equipment Nine new chapters cover Tray design details Shell and tube heat exchanger design details Relief valve system design Vapor lock and exchanger flooding in steam systems Steam generation operating and design details Wastewater strippers Thermodynamics how it applies to process equipment Centrifugal pumps reducing seal and bearing failures Hand calculations for distillation towers Vapor liquid equilibrium absorption and stripping calculations Filled with examples and illustrations this practical resource demonstrates how theory applies to solving real world plant operation problems Selected hand calculation methods are also provided Comprehensive coverage includes Distillation Tower Trays Tower Pressure Control Distillation Towers Reboilers Tower Internals 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 Steam Generation Wastewater Strippers Vacuum Systems Steam Turbines Surface Condensers Shell and Tube Heat Exchangers Fired Heaters Refrigeration Systems Cooling Water Systems Catalytic Effects Centrifugal Pumps Control Valves Separators Centrifugal Compressors and Surge Reciprocating Compressors Corrosion Fluid Flow in Pipes Super Fractionation Stage Computer Control Field Troubleshooting

Working Guide to Process Equipment Norman P. Lieberman,Elizabeth T. Lieberman,2003 Working Guide to Process Equipment 2nd Ed carefully and clearly explains all the basic technical issues that you need to know to trouble shoot most process equipment problems This guide contains a wealth of useful diagnostic tips worked out calculations practical examples and informative illustrations to help you quickly pinpoint trouble and repair typical malfunctions in Trayed and packed distillation towers Natural and forced reboilers Partial and total condensers Steam systems and deaerators Vacuum systems Fired heaters Shell and tube heat exchangers Centrifugal compressors Gas turbines and reciprocating engines Centrifugal pumps and motor drivers In no time at all this essential problem solving manual will become your most trusted on the job tool for dealing effectively with costly equipment malfunctions

A Working Guide to Process Equipment Meenakshi Awasthi,2015-03 This book includes 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 **Working Guide to Process Equipment, Third Edition** Norman P. Lieberman, 2008 Filled with worked out calculations chemical engineers and plant operators can rely on this updated classic for diagnostic tips practical examples and detailed illustrations for pinpointing trouble and correcting problems in chemical process equipment

Petroleum Refining Design and Applications Handbook, Volume 1 A. Kayode Coker, 2018-07-31 There is a renaissance that is occurring in chemical and process engineering and it is crucial for today's scientists engineers technicians and operators to stay current With so many changes over the last few decades in equipment and processes petroleum refining is almost a living document constantly needing updating With no new refineries being built companies are spending their capital re tooling and adding on to existing plants Refineries are like small cities today as they grow bigger and bigger and more and more complex A huge percentage of a refinery can be changed literally from year to year to account for the type of crude being refined or to integrate new equipment or processes This book is the most up to date and comprehensive coverage of the most significant and recent changes to petroleum refining presenting the state of the art to the engineer scientist or student Useful as a textbook this is also an excellent handy go to reference for the veteran engineer a volume no chemical or process engineering library should be without Written by one of the world's foremost authorities this book sets the standard for the industry and is an integral part of the petroleum refining renaissance It is truly a must have for any practicing engineer or student in this area **Troubleshooting Vacuum Systems** Norman P. Lieberman, 2012-12-27

Vacuum systems are in wide spread use in the petrochemical plants petroleum refineries and power generation plants The existing texts on this subject are theoretical in nature and only deal with how the equipment functions when in good mechanical conditions from the viewpoint of the equipment vendor Also the existing texts fail to consider the interaction of the vacuum system with the process equipment it serves and the variability of the motive steam conditions change in cooling water temperature condenser fouling and erosion of the ejectors Here are some of the many questions answered in this groundbreaking volume Why does my first stage jet make a surging sound during hot weather Why does the vacuum suddenly break I've seen moisture condensing on the jet's body What's causing that Why do I have to steam out the drain legs from our condensers Superheated steam is making our vacuum worse Is this normal How can I locate and measure air leaks Reducing the steam pressure to my jets improves vacuum But why I can't pull the pre condenser bundle The shell side is fouling What should I do We're not getting our normal horsepower from our steam turbine Could this be a jet problem Raising the seal drum level improves vacuum Is there an explanation for this Our turbine exhaust steam pressure to our surface condenser has doubled in the last two years What should we do Restricting cooling water flow from our elevated

condensers improves vacuum Is this possible What s a converging diverging ejector all about What s the difference between a barometric condenser and a surface condenser Which is better

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