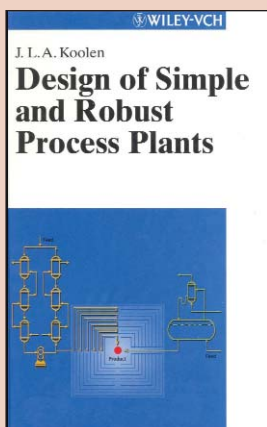


Books

Design of Simple and Robust Process Plants

J. L. A. Koolen, Wiley-VCH GmbH, Weinheim, Germany, \$245.50, 457 pp., ISBN# 3-527-29784-7 (Sept. 2001).



Process plants that are simple and robust in design are said to afford capital savings of 30–40% compared with conventionally designed plants, and may reduce operating costs by employing fewer persons and improving operations. Written by a pioneer in the field, this book details the methodologies of process design, control system design, and operation optimization for “simpler” plants, and offers design improvements for new and existing facilities.

Chapter 1 presents the design philosophies that lead to robust designs of integrated complexes and optimization design strategies that maximize profits. The evolution of a batch process and a distillation train is shown through several generations to the final form. The author also walks the reader through a quantitative methodology used to perform vulnerability assessments on integrated complexes.

Chapter 2 derives a formula that can be applied on various plant designs to quantify and compare their complexity. The reliability of components, and their ability to resist or prevent mishaps is also presented. Chapter 3 discusses ten schools of thought on how to systematically evaluate design alternatives to drive at the optimal process. The prerequisites for these philosophies — process knowledge, material properties and modeling capabilities — are also covered.

The objective of process synthesis and design optimization, which are key to determining the efficiency and economics of a process plant, is to systematically evaluate design alternatives to drive at the optimal process. Chapter 4 describes a stepwise methodology to achieve this goal. In this chapter, the “onion” model is broadened with integration, controllability and site integration.

Chapter 5 uses illustrative examples to describe process intensification tactics and process simplifications for specif-

ic unit operations; the presentation of these techniques follows an increasing order of design complexity. In Chapter 6, the principles of reliability and cost efficiency of design alternatives (based on cost-benefit analyses) are discussed. Reliability engineering, probabilistic risk assessment and site vulnerability are part of the instrumentation discussion in Chapter 7.

In Chapter 8, the focus shifts from process and equipment design to process automation, or what the author referred to as “hands-off” operation. Chapter 9 offers a historical overview of process optimization, with additional coverage of closed-loop optimization in continuous processes, while Chapter 10 explains guidelines for optimization based on industry practices. Chapter 11 summarizes the key elements of the ten design philosophies and details their implementation for planned and existing plants.

Numerous examples are presented to illustrate the results of simpler design approaches. Although most examples are taken from the chemical industry, the methodologies are applicable to food, pharmaceutical and water-treatment facilities. Although the book is intended for experienced engineers and managers involved in process design, control design and operation, it can also be interesting to students. Project engineers and managers should apply these new approaches to achieve competitive processes. The book will also prove to be an indispensable tool for all engineers in the operation, design, and development of processes. Moreover, it will inspire them in their daily work, and also open their eyes to the many opportunities and challenges that they will encounter in the future. Highly experienced process designers will also find stimulating suggestions in this book and can be sure that it will have a major impact on process plants by improving their simplicity and robustness in the future.

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Changing Our World: True Stories of Women Engineers

Sybil E. Hatch, American Society of Civil Engineers, New York, \$49.00, 232 pp., ISBN# 0784408416 (Feb. 2006).

Many people may not realize it, but engineers — particularly chemical engineers — touch nearly every aspect of our lives in the work that they do. This 14-chapter, full-color account chronicles the success stories of more than 200 women involved in various disciplines of engineering — from aerospace to agricultural, and entertainment to environmental — who have truly “changed our world.” Several AIChE members are featured in the book, including Deborah Grubbe and Dianne Dorland, who share their journeys as women of science into once male-dominated professions.

This book will inspire anyone — male or female. It makes for interesting reading for women engineers, and is highly recommended to elementary school teachers, high-school and college guidance counselors, parents of young school children, and individuals who are curious about what engineers really do.

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