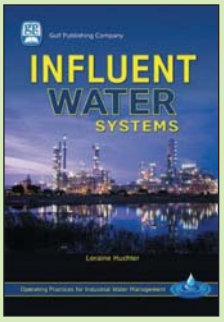
Books

Influent Water Systems

Loraine Huchler, Gulf Publishing Co., Houston, TX, 388 pp., $135, Sept. 2007, ISBN: 1-933762-09-8



Producing consistent, high-quality water is an art form that bridges the gap between a system's ideal design condition and the real-world conditions. Whether they are engineers or supervisors new to water treatment, operators need a mentor to teach them this art. Unfortunately, most mentors don't get around to writing down what they know. "Influent Water Systems" is the work of a mentor who has taken the time to document the essence of her art.

The book provides the documentation that instantly provides a refresher for operators at any experience level. It brings understanding to a potentially complex technical discussion with sidebars such as "Which Words?" and "Did you Know?" These sidebars explain relevant technical terms and to interject bits of useful trivia that plant personnel can use to improve the operation of their treatment system. For example, while discussing the control of coagulant addition to clarifiers, a sidebar titled "What are fish eyes?" explains what improperly wetted polymer looks like and provides an indicator to determine if polymer is being wasted.

Operational tricks of the trade are revealed in highlighted paragraphs. Do you need to enhance the removal of silica? You'll know how to after you read the highlighted paragraph on page 31. Do you know what a "double regeneration" is? You'll find out in the highlighted paragraph on page 103.

"Influent Water Systems" has five chapters. The first covers the essential chemistry that is the basis of a successful water treatment program. Additional chapters are devoted to the four treatment operations of clarification, filtration, ion exchange and reverse osmosis. Each chapter has a section devoted to "How [it] Works" that explains the theory, provides relevant equipment drawings and explains the accepted industry guidelines for key operating parameters. For example, Table 3-6, Pressure Filter Operating Specifications, identifies and quantifies the expected water quality from single-media filters at 1–5 NTU and <1 NTU for multimedia filters. Immediately, a troubleshooter has enough information to know if there's a problem and where to start looking for root causes. Just in case you don't remember what an NTU is (a measure of turbidity), it's defined right there — in an accompanying "Which Words" sidebar.

The final pages of each chapter outline suggested equipment and provide performance data sheets. Practitioners will find these data sheets a good start for troubleshooting and maintaining water treatment systems.

Make no mistake, "Influent Water Systems" is not intended as a textbook. There are few equations and no problems to work between its covers. It does not presume the operator is aware of information presented elsewhere in the book. Compiling a book in this format will inherently repeat some information under separate headings. For example, descriptions of resin bed regeneration and pictures of resin traps and resin thieves are found in the book's sections on water softening and on water demineralization. The redundant presentation of information would be tedious to read from cover to cover, but is a great format for a quick-read "how-to" manual.

"Influent Water Systems" blends useful chemistry, equipment descriptions and words of wisdom into a meaningful reference that will go a long way to help new and experienced water-treatment operators to master the art of continuously producing high-quality water. This book will earn its keep as a working reference to any water-treatment-system operator who needs a little mentoring.

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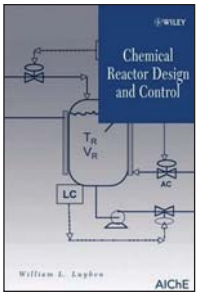
Chemical Reactor Design and Control

William L. Luyben, Wiley, Hoboken, NJ, 491 pp., $115, Aug. 2007, ISBN: 0-470-09770-0

"Chemical Reactor Design and Control" is a practical reference for chemical engineers seeking to optimize the design of chemical reactors and their control systems. Unlike numerous books that focus on steady-state reactor design, this work addresses the simultaneous design and dynamic control of real industrial chemical reactors.

It begins with a discussion of reactor basics, including kinetics and reaction equilibrium, the three types of classical reactors (continuous stirred tank (CSTR), batch and tubular plug flow) and their properties, heat trasfer in reactors, and reactor scale-up. Separate chapters are devoted to the design and control of each of the three reactor types, as well as heat exchanger/reactor systems and special types of industrial reactors such as fluidized catalytic crackers, gasifiers, furnaces, biochemical reactors and microscale reactors.



The book emphasizes temperature control and the critical impact of steady-state design on the dynamics and stability of reactors. It provides integrated coverage of the many practical and important issues involved in design of reactors and their control systems. It illustrates how to use process simulators, such as Matlab and Aspen, to facilitate design, and discusses how to use process simulators to address diverse issues and types of operations. It also incorporates numerous tables and shows step-by-step calculations with equations, and includes sample problems help readers to grasp the concepts.