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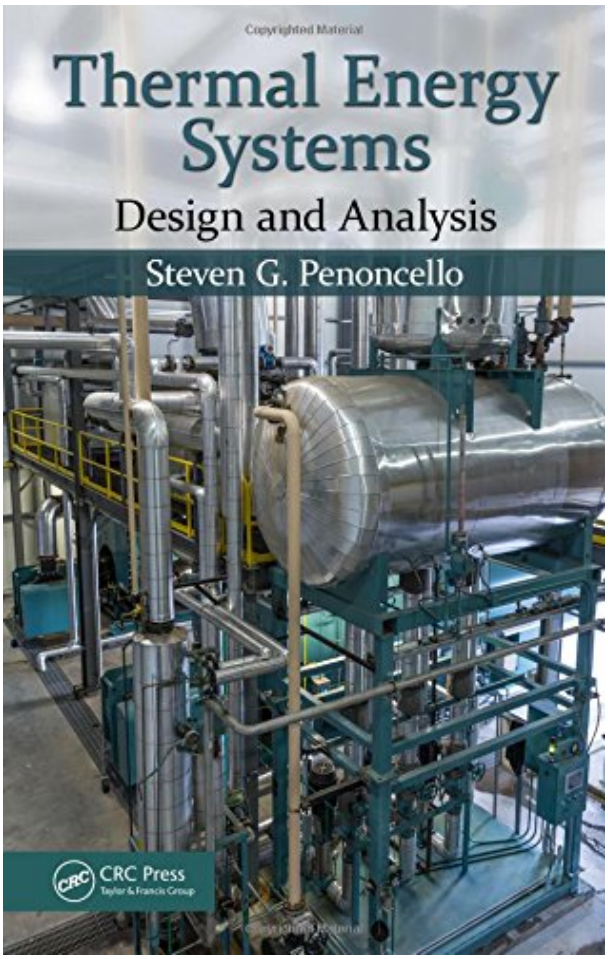

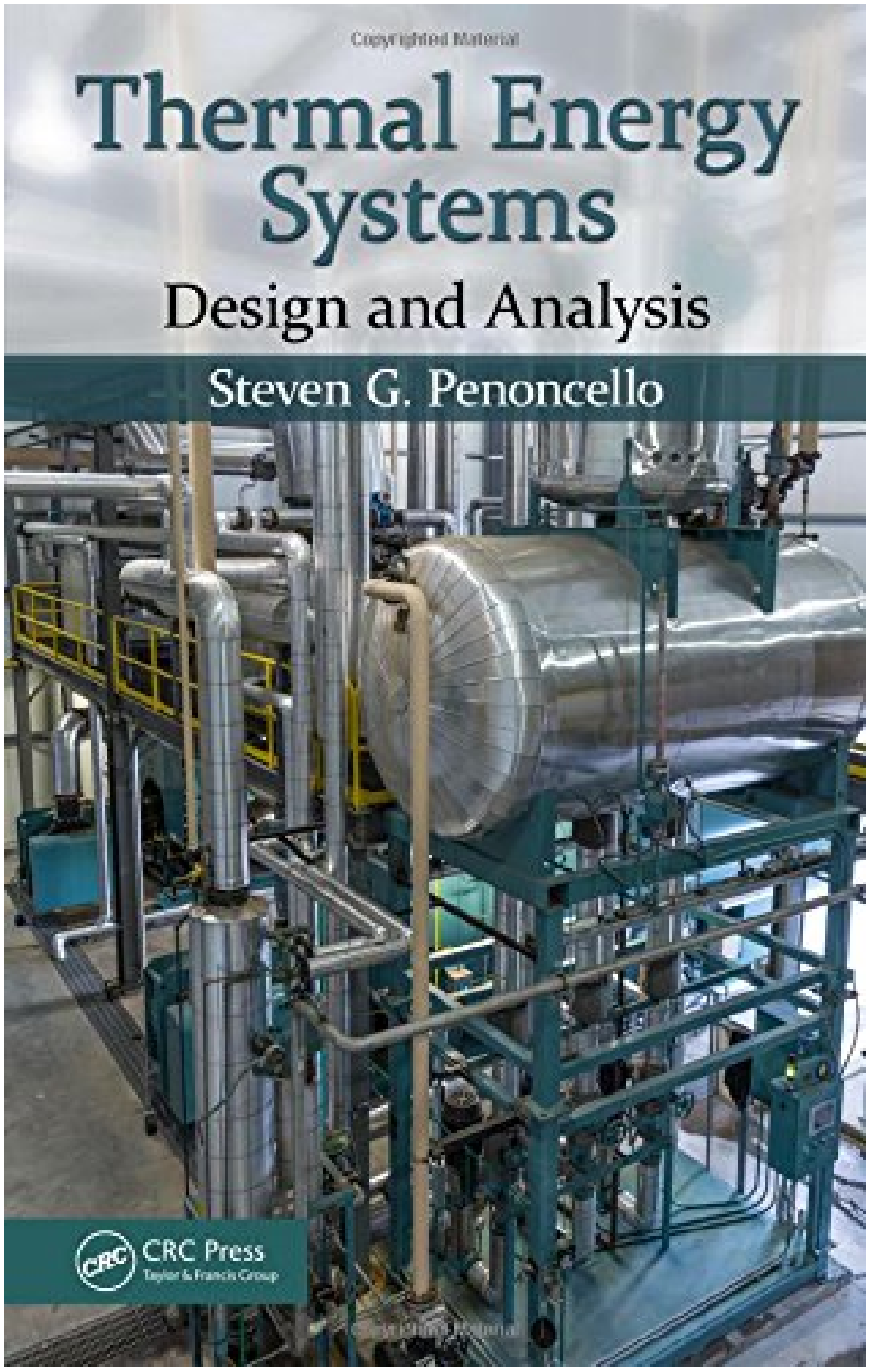

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"... includes a liberal number of examples throughout as well as an extensive list of student problems in each chapter. ... recommended as a text for an undergraduate mechanical engineering course as well as a reference for practical applications.umming Up: Recommended. Upper-division undergraduates and professionals/practitioners.
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Model a Thermal System without Lengthy Hand Calculations

Before components are purchased and a thermal energy system is built, the effective engineer must first solve the equations representing the mathematical model of the system. Having a working mathematical model based on physics and equipment performance information is crucial to finding a system's operating point. Thermal Energy Systems: Design and Analysis offers a fundamental working knowledge of the analysis and design of thermal-fluid energy systems, enabling users to effectively formulate, optimize, and test their own design projects.

Providing an understanding of the basic concepts of simulation and optimization, and introducing simulation and optimization techniques that can be applied to a system model, this text covers the basic foundations of thermal-fluid system analysis and design. It addresses hydraulic systems, energy systems, system simulation, and system optimization. In addition, it incorporates both SI and English units, and builds current state-of-the-art computer modeling skills throughout the book.

Topics covered include:

- Review of thermal engineering concepts
- Engineering economics principles
- Application of conservation and balance laws
- Review of fluid flow fundamentals
- Minor losses
- Series and parallel pipe networks
- Economic pipe diameter
- Pump performance and selection
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- Series and parallel pump systems
- The affinity laws for pumps
- Heat exchangers, LMTD, and e-NTU methods
- Regenerative HX, condensers, evaporators, and boilers
- Double-pipe heat exchangers
- Shell and tube heat exchangers
- Plate and frame heat exchangers
- Cross-flow heat exchangers
- Thermal energy system simulation
- Fitting component performance data
- Optimization using Lagrange multipliers

- Optimization using software

Thermal Energy Systems: Design and Analysis covers the concepts and the skills needed to plan, model, create, test, and optimize thermal systems; and to use computer simulation software through its use of Engineering Equation Solver (EES).

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