Thermal Energy Systems: Design and Analysis

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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
- Cavitation
- 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).

From reader reviews:

Sarah Davis:

This book untitled Thermal Energy Systems: Design and Analysis to be one of several books in which best seller in this year, this is because when you read this reserve you can get a lot of benefit on it. You will easily to buy this book in the book retailer or you can order it by means of online. The publisher in this book sells the e-book too. It makes you quickly to read this book, as you can read this book in your Touch screen phone. So there is no reason to you to past this publication from your list.

Paul Tirrell:

Thermal Energy Systems: Design and Analysis can be one of your starter books that are good idea. Many of us recommend that straight away because this publication has good vocabulary that can increase your knowledge in language, easy to understand, bit entertaining but nonetheless delivering the information. The article author giving his/her effort to get every word into enjoyment arrangement in writing Thermal Energy Systems: Design and Analysis although doesn't forget the main stage, giving the reader the hottest and also based confirm resource info that maybe you can be considered one of it. This great information can drawn you into brand-new stage of crucial thinking.

Gary Morrell:

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Nick Peoples:

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