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an "Energy Dashboard" 4.7 Application 2: Implementing key indicators to controllers 4.8 It is worth the effort 4.9 Nomenclature 4.10 References Part 2: Energy system assessment methods Chapter 5: Fired heater assessment 5.1 Introduction 5.2 Fired heater design for high reliability 5.3 Fired heater operation for high reliability 5.4 Efficient fired heater operation 5.5 Fired heater revamp 5.6 Nomenclature 5.7 References Chapter 6: Heat exchanger performance assessment 6.1 Introduction 6.2 Basic concepts and calculations 6.3 Understand Performance criterion - U values 6.4 Understand pressure drop 6.5 Heat exchanger rating assessment 6.6 Improving heat exchanger performance 6.7 Appendix: TEMA Types of Heat Exchangers 6.8 Nomenclature 6.9 References Chapter 7: Heat exchanger fouling assessment 7.1 Introduction 7.2 Fouling mechanisms 7.3 Fouling mitigation 7.4 Fouling mitigation for crude preheat in oil refining 7.5 Fouling resistance calculations 7.6 A cost-based model for clean cycle optimization 7.7 Revised cost-based model for clean cycle optimization 7.8 A practical method for clean cycle optimization 7.9 Putting all together - A practical example of fouling mitigation 7.10 Nomenclature 7.11 References Chapter 8: Energy loss assessment 8.1 Introduction 8.2 Energy loss audit 8.3 Energy loss audit results 8.4 Energy loss evaluation 8.5 Brainstorming 8.6 Energy audit report 8.7 Nomenclature 8.8 References Chapter 9: Process heat recovery opportunity assessment 9.1 Introduction 9.2 Data extraction 9.3 Composite curves 9.4 Basic concepts 9.5 Energy targeting 9.6 Pinch golden rules 9.7 Cost targeting: determine optimal ΔT_{min} 9.8 Case study 9.9 Be aware of sub-optimal 9.10 Integrated cost targeting and process design 9.11 Challenges for applying the systematic design approach 9.12 Nomenclature 9.13 References Chapter 10: Heat recovery modification assessment 10.1 Introduction 10.2 Network pinch - the bottleneck of existing heat recovery system 10.3 Identification of modifications 10.4 Automated network pinch retrofit approach 10.5 Case studies for applying the network pinch approach 10.6 References Chapter 11: Process integration opportunity assessment 11.1 Introduction 11.2 Definition of process integration 11.3 Plus and minus (+/-) principle 11.4 Grand composite curves 11.5 Appropriate placement principle for process changes 11.6 Examples of process changes 11.7 References Part 3: Process system assessment and optimization Chapter 12: Distillation operating window 12.1 Introduction 12.2 What is distillation 12.3 Distillation efficiency 12.4 Definition of feasible operating window 12.5 Understanding operating window 12.6 Typical capacity limits 12.7 Effects of design parameters 12.8 Design check list 12.9 Example calculations for developing operating window 12.10 Concluding remarks 12.11 Nomenclature 12.12 References Chapter 13: Distillation system assessment 13.1 Introduction 13.2 Define a base case 13.3 Calculations for missing and incomplete data 13.4 Building process simulation 13.5 Heat and material balance assessment 13.6 Tower efficiency assessment 13.7 Operating profile assessment 13.8 Tower rating assessment 13.9 Heat integration assessment for column design 13.10 Guidelines for reuse of an existing tower 13.11 Nomenclature 13.12 References Chapter 14: Distillation system optimization 14.1 Introduction 14.2 Tower optimization basics 14.3 Energy optimization for distillation system 14.4 Overall process optimization 14.5 Concluding remarks 14.6 References Part 4: Utility system assessment and optimization Chapter 15: Modeling of steam and power system 15.1 Introduction 15.2 Boiler 15.3 Deaerator 15.4 Steam turbine 15.5 Gas turbine 15.6 Letdown valve 15.7 Steam desuperheater 15.8 Steam flush drum 15.9 Steam trap 15.10 Steam distribution losses 15.11 Nomenclature 15.12 References Chapter 16: Establishing steam

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Sommario/riassunto

Exploring methods and techniques to optimize processing energy efficiency in process plants, *Energy and Process Optimization for the Process Industries* provides a holistic approach that considers optimizing process conditions, changing process flowschemes, modifying equipment internals, and upgrading process technology that has already been used in a process plant with success. Field tested by numerous operating plants, the book describes technical solutions to reduce energy consumption leading to significant returns on capital and includes an 8-point Guidelines for Success. The book provides managers, chemical and mechanical engineers, and plant operators with methods and tools for continuous energy and process improvements.

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