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Nota di contenuto	Successful Trouble Shooting for Process Engineers; Contents; Preface; 1 What is Trouble Shooting?; 1.1 Characteristics of a Trouble-Shooting Problem; 1.1.1 Similarities among TS Problems; 1.1.2 Differences between TS Problems; 1.2 Characteristics of the Process Used to Solve Trouble-Shooting Problems; 1.2.1 How the Type of Problem Guides the TS Process or Strategy; 1.2.2 Five Key Elements Common to the TS Process; 1.3 Self-Test and Reflections; 1.4 Overview of the Book; 1.5 Summary; 1.6 Cases to Consider; 2 The Mental Problem-Solving Process used in Trouble Shooting; 2.1 Problem Solving 2.2 Trouble Shooting 2.2.1 Considerations when Applying the Strategy to Solve Trouble-Shooting Problems; 2.2.2 Problem-Solving Processes Used by Skilled Trouble Shooters; 2.2.3 Data Collection and Analysis: Approaches Used to Test Hypotheses; 2.3 Overall Summary of Major Skills and a Worksheet; 2.3.1 Getting Organized: the Use of a Trouble-Shooter's Worksheet; 2.3.2 Feedback about your Trouble Shooting; 2.4 Example Use of the Trouble-Shooter's Worksheet; 2.5 Summary; 2.6 Cases to Consider; 3 Rules of Thumb for Trouble Shooting; 3.1 Overall; 3.1.1 General Rules of Thumb and Typical Causes

3.1.2 Corrosion as a Cause; 3.1.3 Instruments, Valves and Controllers; 3.1.4 Rules of Thumb for People; 3.1.5 Trouble-Shooting Teams; 3.2 Transportation Problems; 3.2.1 Gas Moving: Pressure Service; 3.2.2 Gas Moving: Vacuum Service; 3.2.3 Liquid; 3.2.4 Solids; 3.2.5 Steam; 3.3 Energy Exchange; 3.3.1 Drives; 3.3.2 Thermal Energy: Furnaces; 3.3.3 Thermal Energy: Fluid Heat Exchangers, Condensers and Boilers; 3.3.4 Thermal Energy: Refrigeration; 3.3.5 Thermal Energy: Steam Generation; 3.3.6 High-Temperature Heat-Transfer Fluids; 3.4 Homogeneous Separation; 3.4.1 Evaporation; 3.4.2 Distillation; 3.4.3 Solution Crystallization; 3.4.4 Gas Absorption; 3.4.5 Gas Desorption/Stripping; 3.4.6 Solvent Extraction, SX; 3.4.7 Adsorption: Gas; 3.4.8 Adsorption: Liquid; 3.4.9 Ion Exchange; 3.4.10 Membranes: Reverse Osmosis, RO; 3.4.11 Membranes: Nanofiltration; 3.4.12 Membranes: Ultrafiltration, UF, and Microfiltration; 3.5 Heterogeneous Separations; 3.5.1 Gas-Liquid; 3.5.2 Gas-Solid; 3.5.3 Liquid-Liquid; 3.5.4 Gas-Liquid-Liquid Separators; 3.5.5 Dryer for GS Separation; 3.5.6 Screens for Liquid Solid Separation or Dewatering; 3.5.7 Settlers for LS Separation; 3.5.8 Hydrocyclones for LS Separation; 3.5.9 Thickener for LS Separation; 3.5.10 Sedimentation Centrifuges; 3.5.11 Filtering Centrifuge; 3.5.12 Filter for LS Separation; 3.5.13 Screens for Solid-Solid Separation; 3.6 Reactor Problems; 3.6.1 PFTR: Multitube Fixed-Bed Catalyst, Nonadiabatic; 3.6.2 PFTR: Fixed-Bed Catalyst in Vessel: Adiabatic; 3.6.3 PFTR: Bubble Reactors, Tray Column Reactors; 3.6.4 PFTR: Packed Reactors; 3.6.5 PFTR: Trickle Bed; 3.6.6 PFTR: Thin Film; 3.6.7 STR: Batch (Backmix); 3.6.8 STR: Semibatch; 3.6.9 CSTR: Mechanical Mixer (Backmix); 3.6.10 STR: Fluidized Bed (Backmix); 3.6.11 Mix of CSTR, PFTR with Recycle; 3.6.12 Reactive Extrusion

Sommario/riassunto

Chemical production processes consist of many complex apparatuses involving both moving and static parts as well as interconnecting pipes, control mechanisms and electronics, mechanical and thermal stages, heat exchangers, waste and side product processing units, power ducts and many others. Bringing such a complicated unit online and ensuring its continued productivity requires substantial skill at anticipating, detecting and solving acute problems. This book is the professional's and student's entrance to the fascinating and important world of trouble shooting for chemical, pharmaceutical and
