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Nota di contenuto	Safe Design and Operation of Process Vents and Emission Control Systems; CONTENTS; Preface; Acknowledgment; 1 Introduction; 1.1 Objective; 1.2 Relationship to Other CCPS Publications; 1.3 Industries and Operations Covered; 1.4 Intended Audience; 1.5 How to Use this Book; 1.6 References; 2 Management Overview; 2.1. Impact on Vent Header Systems; 3 Normal Process and Emergency Systems; 3.1 Types of Vent Header Systems; 3.1.1 Normal Process Vent Header Systems; 3.1.2 Emergency Vent Header Systems; 3.1.3 Combined Vent Header Systems; 3.1.4 Considerations; 3.2 Design Philosophy 3.2.1 Design Sequence 3.2.2 Hazards Associated with Combining Vent

Streams; 3.2.3 Inherent Safety; 3.2.4 Flammability and Combustibility; 3.2.5 Toxicity; 3.2.6 Reactivity; 3.2.7 Regulatory Issues; 3.3 Reference; 4 Combustion and Flammability; 4.1 Flammable Limits; 4.1.1 Mixture Stoichiometry; 4.1.2 Factors Influencing Flammable Limits; 4.1.3 Flammable Limit Variability; 4.1.4 Effects of Temperature on Flammable Limits; 4.1.5 Effects of Pressure on Flammable Limits; 4.1.6 Flammable Limits of Combined Gas Streams; 4.1.7 Cool Flame; 4.1.8 Hybrid Mixtures; 4.2 Limiting Oxidant Concentration 4.3 Deflagrations 4.4 Pressure Piling; 4.5 Detonation Phenomena; 4.5.1 Deflagration to Detonation Transition (DDT) and Run-Up Distance; 4.5.2 Overdriven and Stable Detonations; 4.5.3 Detonation Cell Size; 4.6 References; 5 UNDERSTANDING REQUIREMENTS; 5.1 Understanding the Sources; 5.1.1 Identify Vent Sources; 5.1.2 Identify Normal Process Vent Streams; 5.1.3 Normal Process Vent System, Design Case Scenario; 5.1.4 Define Interface Requirements; 5.1.5 Identify Hazard Scenarios That Could Result in Emergency Venting; 5.1.6 Vent Gas Characteristics for Emergency Venting 5.1.7 Emergency Venting Design Case Scenario 5.1.8 Liquid Entrainment or Condensation in Normal Process Vent Headers; 5.1.9 Two-Phase Venting; 5.1.10 Flammable Gases and Vapors; 5.1.11 Toxic and Noxious Materials; 5.1.12 Reactive Systems; 5.2 Regulatory Issues; 5.2.1 Historical Background; 5.2.2 Brief Review of Laws and Regulations; 5.2.3 Improved Air Quality; 5.3 At-Source Treatment Options; 5.4 Combining Vent Streams; 5.5 End-of-Line Treatment Systems; 5.6 Specify Design Requirements; 5.7 References; 6 DESIGN APPROACH; 6.1 Design Basis; 6.2 Merging Vent Streams 6.2.1 Features Favorable for Merging Steams 6.2.2 Features that do not Favor Merging Streams; 6.3 Vent Header Systems Handling Flammable Materials; 6.3.1 Explosion Prevention; 6.3.2 Operating Fuel Lean; 6.3.3 Operating Inerted; 6.3.4 Operating Fuel Rich; 6.3.5 Oxidizers Other Than Oxygen; 6.3.6 Explosion Protection; 6.3.7 Ignition Sources; 6.4 Vent Header Systems Handling Toxic Gases; 6.4.1 Operating Principles for Header Systems Handling Toxic Gases; 6.4.2 Piping Design; 6.4.3 Combined Relief Valve and Rupture Disk Devices; 6.5 Reactive Systems; 6.5.1 Reactive Systems Design Considerations 6.6 Mechanical Design Considerations

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## Sommario/riassunto

Process vent header collection systems are subject to continually varying compositions and flow rates and thus present significant challenges for safe design. Due to increasingly demanding safety, health, environmental, and property protection requirements, today's industrial designers are faced with the need to create increasingly complex systems for more effective treatment, dispersal, or disposal of process gases. Safe Design and Operation of Process Vents and Emission Control Systems provides cutting-edge guidance for the design, evaluation, and operation of these systems, with emp

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