

1. Record Nr.	UNINA9910139403303321
Titolo	Guidelines for vapor cloud explosion, pressure vessel burst, BLEVE, and flash fire hazards
Pubbl/distr/stampa	Hoboken, New Jersey : , : Wiley, , 2010 ©2010
ISBN	1-118-20987-7 1-283-37163-4 9786613371638 0-470-64043-X 1-61583-627-6 0-470-64044-8
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (458 p.)
Collana	CCPS concept book Guidelines for vapor cloud explosion, pressure vessel burst, BLEVE, and flash fire hazards.
Disciplina	660.2804 660/.2804
Soggetti	Chemical plants - Fires and fire prevention Chemical plants - Safety measures Pressure vessels - Safety measures Chemicals - Fires and fire prevention Explosions - Prevention Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Guidelines for Vapor Cloud Explosion, Pressure Vessel Burst, BLEVE, and Flash Fire Hazards; CONTENTS; List of Tables; List of Figures; Glossary; Acknowledgements; 1. INTRODUCTION; 2. MANAGEMENT OVERVIEW; 2.1. Flash Fires; 2.2. Vapor Cloud Explosions; 2.3. Pressure Vessel Bursts; 2.4. BLEVEs; 2.5. Prediction methodologies; 3. CASE HISTORIES; 3.1. Historical experience; 3.2. Flash fires; 3.2.1. Donnellson, Iowa, USA: Propane Fire; 3.2.2. Lynchburg, Virginia, USA: Propane Fire; 3.2.3. Quantum Chemicals, Morris, Illinois, USA: Olefins Unit Flash Fire; 3.3. Vapor Cloud Explosions

3.3.1. Flixborough, UK: Vapor Cloud Explosion in Chemical Plant  
 3.3.2. Port Hudson, Missouri, USA: Vapor Cloud Explosion after Propane Pipeline Failure; 3.3.3. Jackass Flats, Nevada, USA: Hydrogen-Air Explosion during Experiment; 3.3.4. Ufa, West-Siberia, USSR: Pipeline Rupture Resulting In a VCE; 3.3.5. Phillips, Pasadena, Texas USA: Propylene HDPE Unit VCE and BLEVEs; 3.3.6. BP, Texas City, Texas USA: Discharge from Atmospheric Vent Resulting in a VCE; 3.4. Pressure Vessel Burst; 3.4.1. Kaiser Aluminum, Gramercy, Louisiana USA: Alumina Process Pressure Vessel Burst  
 3.4.2. Union Carbide Seadrift, Texas USA: Ethylene Oxide Distillation Column Pressure Vessel Burst  
 3.4.3. Dana Corporation, Paris, Tennessee USA: Boiler Pressure Vessel Burst; 3.5. BLEVE; 3.5.1. Procter and Gamble, Worms, Germany: Liquid CO<sub>2</sub> Storage Vessel Explosion; 3.5.2. San Juan Ixhuatepec, Mexico City, Mexico: Series of BLEVEs at LPG Storage Facility; 3.5.3. San Carlos de la Rapita, Spain: Propylene Tank Truck Failure; 3.5.4. Crescent City, Illinois, USA: LPG Rail Car Derailment; 3.5.5. Kingman, Arizona USA: LPG Railroad Tank Car BLEVE;

4. BASIC CONCEPTS  
 4.1. Atmospheric Vapor Cloud Dispersion  
 4.2. Ignition; 4.3. Thermal Radiation; 4.3.1. Point-Source Model; 4.3.2. Solid-Flame Model; 4.4. Explosions - VCE; 4.4.1. Deflagration; 4.4.2. Detonation; 4.5. Blast Effects; 4.5.1. Manifestation; 4.5.2. Blast Loading; 4.5.3. Ground Reflection; 4.5.4. Blast Scaling; 5. FLASH FIRES; 5.1. Overview of Experimental Research; 5.1.1. China Lake and Frenchmen Flats cryogenic liquid tests; 5.1.2. Maplin Sands Tests; 5.1.3. Musselbanks Propane Tests; 5.1.4. HSE LPG Tests of Flash Fires and Jet Fires; 5.2. Flash-Fire Radiation Models; 5.3. Sample Calculations

6. VAPOR CLOUD EXPLOSIONS  
 6.1. Introduction; 6.1.1. Organization of Chapter; 6.1.2. VCE Phenomena; 6.1.3. Definition of VCE; 6.1.4. Confinement and Congestion; 6.2. Vapor Cloud Deflagration Theory and Research; 6.2.1. Laminar Burning Velocity and Flame Speed; 6.2.2. Mechanisms of Flame Acceleration; 6.2.3. Effect of Fuel Reactivity; 6.2.4. Effect of Confinement; 6.2.5. Effect of Congestion; 6.2.6. Effects of Other Factors; 6.2.7. University of Leeds Correlation; 6.2.8. TOO GAME Correlation; 6.2.9. Shell CAM Correlation; 6.3. Vapor Cloud Detonation Theory and Research  
 6.3.1. Direct Initiation of Vapor Cloud Detonations

## Sommario/riassunto

This guide provides an overview of methods for estimating the characteristics of vapor cloud explosions, flash fires, and boiling-liquid-expanding-vapor explosions (BLEVEs) for practicing engineers. It has been updated to include advanced modeling technology, especially with respect to vapor cloud modeling and the use of computational fluid dynamics. The text also reviews past experimental and theoretical research and methods to estimate consequences. Heavily illustrated with photos, charts, tables, and diagrams, this manual is an essential tool for safety, insurance, regulatory, and engineeri