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Nota di contenuto	Reliability: Modeling, Prediction, and Optimization; Contents; Part A: Context of Reliability Analysis; 1 An Overview; 1.1 Introduction; 1.2 Illustrative Examples of Products and Systems; Example 1.1 Incandescent Electric Bulb; Example 1.2 Hydraulically Operated Fail-Safe Gate Valve; Example 1.3 Pneumatic Pump; Example 1.4 Brake Mechanism for Train Wagons; Example 1.5 Liquid Rocket Engine; Example 1.6 Electric Power System; 1.3 System and Product Deterioration and Failure; 1.3.1 Failures and Faults; 1.3.2 Failure Modes; 1.3.3 Failure Causes and Severity; 1.3.4 Deterioration 1.4 Concepts and History of Reliability1.4.1 Basic Concepts; 1.4.2 A Brief History of Reliability; 1.5 Product Life Cycle and Reliability; 1.6 Buyer's Perspective; 1.6.1 Individuals; 1.6.2 Businesses; 1.6.3 Government; 1.7 Manufacturer's Perspective; 1.8 Framework for Solving Reliability Related Problems; 1.8.1 Reliability Issues; 1.8.2 The Systems Approach; 1.9 Objectives of this Book; 1.10 Approach; 1.11 Outline of this Book; Notes; Exercises; 2 Illustrative Cases and Data Sets; 2.1 Introduction; 2.2 Reliability Data; 2.3 Cases; Case 2.1 Reliability of a Simple Part

Case 2.2 Reliability of a Major Component (Incomplete Data)
Case 2.3 Heart Pacemaker Data; Case 2.4 Automobile Warranty Data; Case 2.5 Industrial Product Sold in Batches; Case 2.6 Tensile Strength of Fibers; Case 2.7 Reliability of Hydraulic Systems; Case 2.8 Bus Motor Failure Data; Case 2.9 Lifetimes of Light Bulbs; Case 2.10 Air Conditioning Unit Failures; Case 2.11 Electronic Connectors; Case 2.12 Laser Weld Strength; Case 2.13 Clerical Errors; Case 2.14 Ball Bearing Data; Case 2.15 Helicopter Failure Data; Case 2.16 Compressor Failure Data; Case 2.17 Jet Engines

Case 2.18 Offshore Oil Exploration Equipment
Case 2.19 Throttle Failures; Case 2.20 Breaking Strengths of Single and Bundled Fibers; Case 2.21 Breaking Strengths of Carbon Fibers in Resin; Case 2.22 Stress Fatigue Failures, Tungsten Alloy; Case 2.23 Software Reliability; Case 2.24 Aircraft Radar Component Failures; Case 2.25 Ship Engine Maintenance; Case 2.26 Failures of Electronic Modules; Case 2.27 Nuclear Power Plant Cooling System; Notes; Exercises; Part B: Basic Reliability Methodology; 3 Collection and Preliminary Analysis of Failure Data; 3.1 Introduction

3.2 Data-Based Reliability Analysis
3.2.1 Levels of Data; 3.2.2 Types of Data and Data Sources; 3.2.3 Use of Data in Reliability Analysis; 3.3 Attribute Data; 3.3.1 Data Structure; 3.3.2 Count Data; 3.4 Test Data on Product Lifetimes (Failure Data); 3.4.1 Complete and Incomplete Data; 3.4.2 Types of Censoring; 3.5 Effect of Data Structure on Statistical Analysis; 3.5.1 Scales of Measurement; 3.5.2 Statistical Inference; 3.6 Basic Descriptive Statistics; 3.6.1 Frequency Distributions; 3.6.2 Other Graphical Methods; 3.6.3 Measures of Center; 3.6.4 Measures of Variability

3.6.5 Interpretation of the Mean and Standard Deviation

Sommario/riassunto

Bringing together business and engineering to reliability analysis With manufactured products exploding in numbers and complexity, reliability studies play an increasingly critical role throughout a product's entire life cycle-from design to post-sale support. Reliability: Modeling, Prediction, and Optimization presents a remarkably broad framework for the analysis of the technical and commercial aspects of product reliability, integrating concepts and methodologies from such diverse areas as engineering, materials science, statistics, probability, operations research, and management. Written
