

1. Record Nr.	UNISA996208327903316
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Titolo	Structural reliability [[electronic resource] /] / Maurice Lemaire
Pubbl/distr/stampa	London, : ISTE Hoboken, NJ, : Wiley, 2009
ISBN	1-118-62310-X 1-282-16540-2 9786612165405 0-470-61170-7 0-470-39433-1
Descrizione fisica	1 online resource (510 p.)
Collana	ISTE ; ; v.84
Disciplina	624.171
Soggetti	Structural engineering - Mathematics Reliability (Engineering) Structural failures 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	Structural Reliability; Contents; Foreword; Preface; Chapter 1. Introduction; 1.1 An old history; 1.2 A modern attitude; 1.3 Reliability: a definition; 1.4 Which risk is acceptable?; 1.5 Today; 1.6 A little glossary; 1.7 The structure of this book; Chapter 2. Preliminary Approach to Reliability in Mechanics; 2.1 General points; 2.1.1 Reliability methods in mechanics; 2.1.2 A new attitude: overcoming obstacles; 2.2 Theoretical reliability in mechanics; 2.2.1 Reliability approach in mechanics; 2.2.2 Variables-component-system chain; 2.2.3 Theoretical reliability; 2.3 Stochastic modeling 2.3.1 Modeling based on available information 2.3.2 Construction of a stochastic model; 2.3.3 Random variable or stochastic process; 2.4 Mechanical modeling; 2.4.1 Representation model of physics; 2.4.2 Balance between resources and needs; 2.5 Mechanical-reliability coupling; 2.5.1 Reliability sensitivity analysis; 2.5.2 Reliability analysis; 2.5.3 Complexity of mechanical-reliability coupling; 2.5.4 Actors in

mechanical-reliability coupling; 2.6 Fields of application; 2.6.1 Reliability of offshore marine structures; 2.6.2 Soil mechanics; 2.6.3 Regulation; 2.6.4 Stochastic dynamics
 2.6.5 Integrity of structures 2.6.6 Stability; 2.7 Conclusion; Chapter 3. Elementary R - S Case; 3.1 Presentation of the problem; 3.1.1 Variables; 3.1.2 Design model; 3.1.3 Illustration; 3.2 Definitions and assumptions; 3.3 Random vector: a reminder; 3.3.1 Random vector; 3.3.2 Joint probability density; 3.3.3 Moments and correlation; 3.3.4 Independence and correlation; 3.4 Expressions of the probability of failure; 3.4.1 Probability of failure; 3.4.2 Distributions of R and S and probability Pf; 3.4.3 First expression of Pf; 3.4.4 Second expression of Pf; 3.4.5 Illustration
 3.4.6 Generalization of the probability of failure 3.5 Calculation of the probability of failure; 3.5.1 Calculation of Pf by direct integration; 3.5.2 Calculation of Pf by numerical integration; 3.5.3 Calculation of Pf by simulation; 3.5.4 Calculation of Pf by sampling and integration; 3.6 Rod under tension; 3.6.1 Data; 3.6.2 Probability of failure; 3.6.3 Analytical integration; 3.6.4 Simulation; 3.7 Concept of reliability index; 3.7.1 Rjanitzyne-Cornell index; 3.7.2 Hasofer-Lind index; 3.7.3 Naming point P*; 3.7.4 Application to the elementary Gaussian case
 3.7.5 Rod under tension: Hasofer and Lind index 3.8 Equation Pf = (-); 3.9 Exercises for illustration; 3.9.1 Study of a frame; 3.9.2 Resistance-stress problem; Chapter 4. Isoprobabilistic Transformation; 4.1 Recapitulation of the problem and the notation; 4.2 Case of independent variables; 4.2.1 Gaussian variables; 4.2.2 Independent variables; 4.3 Rosenblatt transformation; 4.3.1 Recapitulation; 4.3.2 Formulation; 4.3.3 Calculation of Pf; 4.3.4 Example: double exponential; 4.3.5 A warning about notation!; 4.3.6 Gaussian variable couple; 4.4 Approximation using a normal distribution
 4.4.1 Principle

Sommario/riassunto

This book describes the main methods used in the reliability of structures and their use in the design process leading to reliable products. This title provides the understanding needed to implement the variety of new reliability software programs.