1. Record Nr. UNINA9910743250103321

Autore	Huang Weiping
Titolo	Dynamics of deepwater riser : theory and method / / Weiping Huang [and three others]
Pubbl/distr/stampa	Singapore : , : Springer, , [2022] ©2022
ISBN	981-16-2887-4 981-16-2888-2
Descrizione fisica	1 online resource (293 pages)
Disciplina	627.98
Soggetti	Offshore structures - Design and construction Risers (Founding) Marine engineering
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Preface -- Contents -- 1 Deepwater Riser -- 1.1 Introduction -- 1.1.1 Developing Mode for Deepwater Oilfield -- 1.1.2 Facilities for Deepwater Oil &amp -- Gas Development -- 1.2 Deepwater Risers -- 1.2.1 Top Tensioned Riser -- 1.2.2 Catenary Riser -- References -- 2 Sea Loads -- 2.1 Introduction -- 2.2 Wave Loads -- 2.2.1 Wave Factors -- 2.2.2 Regular Wave Theory -- 2.2.3 Random Wave Theory -- 2.2.4 Wave Force on a Cylinder -- 2.3 Current Loads -- 2.3.1 Vortex Shedding in Steady Flow -- 2.3.2 Vortex Shedding Frequency -- 2.3.3 Vortex Induced Force -- 2.3.4 Vortex Shedding in an Oscillatory Flow -- References -- 3 Vibration of Structure -- 3.1 Single-Degree-Of-Freedom System -- 3.1.1 Dynamical Characteristics -- 3.1.2 Free Vibration -- 3.1.3 Forced Vibration -- 3.2 Multi DOF System -- 3.2.1 Dynamic Characteristics -- 3.2.2 Forced Vibration -- 3.3 Beam Vibration -- 3.3.1 Motion Equation -- 3.3.2 Frequency and Mode Shape of Simply Supported Beam -- 3.3.3 Effect of Tension -- 3.3.4 Effect of Large Deflection -- 3.3.5 Effect of Elastic Foundation -- 3.3.6 Transfer Matrix Method -- 4 Equation of Riser Vibration -- 4.1 Introduction -- 4.2 Rigid Riser Equation -- 4.2.1 Basic Equation -- 4.2.2 Inner Flow Effect -- 4.3 Flexible Riser Equation -- 4.3.1 Bending

Vibration Equation -- 4.3.2 Effect of Rigid Oscillation -- References -- 5 Riser Dynamic Characteristics -- 5.1 Introduction -- 5.2 Rigid Riser Dynamic Characteristics -- 5.2.1 Analytic Method -- 5.2.2 Transfer Matrix Method -- 5.2.3 Matrix Analysis Method -- 5.3 Simple Catenary Riser -- 5.3.1 Analytic Method -- 5.3.2 Transfer Matrix Method -- 5.3.3 Matrix Analysis Method -- 6 Wave Induced Vibration -- 6.1 Introduction -- 6.2 Wave Force -- 6.2.1 Wave -- 6.2.2 Load (API 2009) -- 6.2.3 Load Model (API 2009) -- 6.2.4 Conditions Affecting Hydrodynamic Loads (API 2009) -- 6.3 Analysis Model. 6.3.1 Structural Model -- 6.3.2 Boundary Conditions -- 6.3.3 System Model -- 6.4 Steel Catenary Riser -- 6.4.1 Motion Equation -- 6.4.2 FEM Mode -- 6.4.3 Pipe and Soil Interaction -- 6.4.4 Pipe and Soil Interaction Model -- 6.4.5 p-y Curve Method for Analyzing Interaction Between Pipe and Soil (Yang 2014) -- 6.5 Top Tensioned Riser -- 6.5.1 Motion Equation -- 6.5.2 Boundary Conditions -- 6.5.3 Coupled Analysis -- References -- 7 Vortex-Induced Vibration -- 7.1 Introduction -- 7.2 An Isolated Circular Cylinder -- 7.2.1 Synchronization and Lock-In -- 7.2.2 VIV in Two Degree-Of-Freedom -- 7.2.3 Random and Harmonic Vibration -- 7.3 Tandem Cylinders -- 7.3.1 Wake Pattern -- 7.3.2 Vortex Induced Force -- 7.3.3 Vibration Features -- 7.4 Vortex Induced Force Model -- 7.4.1 For Single Riser -- 7.4.2 Tandem Risers (Zhou 2017) -- 7.5 Steel Caternary Riser -- 7.5.1 Rigid Oscillation Equation -- 7.5.2 Coupling Motion Equation -- 7.6 Top Tensioned Riser -- 7.6.1 Motion Equation -- 7.6.2 Boundary Condition -- 7.6.3 Coupled Analysis -- References.