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4.9 Accumulated Plastic Strain; 4.10 Strain Concentration at Field Joints Due to Coatings; 4.11 References; Part II: Pipeline Design; Chapter 5. Soil and Pipe Interaction; 5.1 Introduction; 5.2 Pipe Penetration in Soil; 5.3 Modeling Friction and Breakout Forces; 5.4 References; Chapter 6. Hydrodynamics around Pipes; 6.1 Wave Simulators; 6.2 Choice of Wave Theory; 6.3 Mathematical Formulations Used in the Wave Simulators; 6.4 Steady Currents; 6.5 Hydrodynamic Forces; 6.6 References; Chapter 7. Finite Element Analysis of In-situ Behavior; 7.1 Introduction; 7.2 Description of the Finite Element Model; 7.3 Steps in an Analysis and Choice of Analysis Procedure; 7.4 Element Types Used in the Model; 7.5 Non-linearity and Seabed Model; 7.6 Validation of the Finite Element Model; 7.7 Dynamic Buckling Analysis; 7.8 Cyclic In-place Behaviour during Shutdown Operations; 7.9 References; Chapter 8. Expansion, Axial Creeping, Upheaval/Lateral Buckling; 8.1 Introduction; 8.2 Expansion; 8.3 Axial Creeping of Flowlines Caused by Soil Ratcheting; 8.4 Upheaval Buckling; 8.5 Lateral Buckling; 8.6 Interaction between Lateral and Upheaval Buckling; 8.7 References; Chapter 9. On-bottom Stability; 9.1 Introduction; 9.2 Force Balance: the Simplified Method; 9.3 Acceptance Criteria; 9.4 Special Purpose Program for Stability Analysis; 9.5 Use of FE Analysis for Intervention Design; 9.6 References; Chapter 10. Vortex-induced Vibrations (VIV) and Fatigue; 10.1 Introduction; 10.2 Free-span VIV Analysis Procedure; 10.3 Fatigue Design Criteria; 10.4 Response Amplitude; 10.5 Modal Analysis; 10.6 Example Cases; 10.7 References; Chapter 11. Force Model and Wave Fatigue; 11.1 Introduction; 11.2 Fatigue Analysis; 11.3 Force Model; 11.4 Comparisons of Frequency Domain and Time Domain Approaches

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## Sommario/riassunto

Updated edition of a best-selling title Author brings 25 years experience to the work Addresses the key issues of economy and environment Marine pipelines for the transportation of oil and gas have become a safe and reliable way to exploit the valuable resources below the world's seas and oceans. The design of these pipelines is a relatively new technology and continues to evolve in its quest to reduce costs and minimise the effect on the environment. With over 25 years experience, Professor Yong Bai has been able to assimilate the essence of the applied mechanics

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